UIC - I - <u>8-0</u>

WDW-3 PERMITS, RENEWALS, & MODS 2012 - Present

State of New Mexico Energy, Minerals and Natural Resources Department

Susana Martinez Governor

David Martin Cabinet Secretary

Brett F. Woods, Ph.D. Deputy Cabinet Secretary Jami Bailey, Division Director Oil Conservation Division



FEBRUARY 19, 2014

CERTIFIED MAIL RETURN RECEIPT NO: 0919 5938

Mr. Mike Holder Environmental Manager Navajo Refining Company, L.L.C. 501 E Main Street Artesia, NM 88210

RE: OCD RESPONSE TO COMMENTS ON DRAFT DISCHARGE PERMITS AND APPROVAL OF FINAL DISCHARGE PERMITS FOR THE THREE NAVAJO ARTESIA REFINERY UIC CLASS 1 INJECTION WELLS UICI-008-1 (WDW-1), UNIT LETTER O, SECTION 31, TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO UICI-008-2 (WDW-2), UNIT LETTER E, SECTION 12, TOWNSHIP 18 SOUTH, RANGE 27 EAST, NMPM, EDDY COUNTY, NEW MEXICO AND UICI-008-3 (WDW-3), UNIT LETTER N, SECTION 1, TOWNSHIP 18 SOUTH, RANGE 27 EAST, NMPM, EDDY COUNTY, NEW MEXICO

Dear Mr. Holder:

The Oil Conservation Division (OCD) has reviewed Navajo's comments of January 2, 2014 on its draft revised discharge permits of December 26, 2013. OCD evaluated Navajo's comments and accepted most of them.

The Discharge Permit renewals for the three Navajo Refining Company, LLC UIC Non-Hazardous Injection Wells specified above are **hereby approved** under the terms and conditions specified in the enclosed Discharge Permits.

Navajo's original discharge permits were issued in 1998 through 2008 and have been subsequently renewed. Navajo's discharge permit renewal applications were submitted pursuant to 20.6.2.3106 NMAC. OCD approves these discharge permit renewals pursuant to 20.6.2.3109A NMAC. Please note 20.6.2.3109G NMAC, which provides for possible future amendment of the permit. Please be advised that approval of this discharge permit does not relieve Navajo of liability of operations result in pollution of surface water, ground water, or the environment.

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Please note that 20.6.2.3104 NMAC specifies "When a permit has been issued, discharges must be consistent with the terms and conditions of the permit." Pursuant to 20.6.2.3107C NMAC, Navajo is required to notify the Director of any facility expansion, production increase, or process modification that would result in any change in the water quality or volume of the discharge.

All three discharge permits will expire on **June 1**, **2017**, and Navajo should submit discharge permit renewal applications in ample time before this date. Note that under 20.6.2.3106F NMAC, if a discharger submits a discharge permit renewal application at least 120 days before the discharge permit expires and is in compliance with the approved discharge permit, then the existing discharge permit will not expire until the application for renewal has been approved or disapproved.

The discharge permit renewal applications for the Navajo Artesia Refinery are subject to 20.6.2.3114 NMAC. Every billable facility submitting a discharge permit renewal application is assessed a non-refundable filing fee of \$100.00. OCD has already received filing fees for the two renewals. OCD revised WDW-3, which was renewed in 2012, by adding additional quarterly monitoring constituents so that Navajo could demonstrate that it does not inject characteristic hazardous waste. The permit fee for UIC Class I non-hazardous waste injection wells is \$4,500.00 per well. The Permittee shall submit \$9,000.00 amount within 30 days of its receipt of the discharge permits. Checks must be payable to the "New Mexico Water Quality Management Fund", and not the Oil Conservation Division.

Please make all checks payable to:

WATER QUALITY MANAGEMENT FUND C/O: OIL CONSERVATION DIVISION 1220 NORTH ST. FRANCIS DRIVE SANTA FE, NEW MEXICO 87505

If you have any questions regarding this matter, please contact Glenn von Gonten at 505-476-3488. On behalf of the staff of OCD, I wish to thank you and your staff for your cooperation during this discharge permit renewal process.

Thank you for your cooperation.

Jami Baly

Jami Bailey Director

JB/gvg

DISCHARGE PERMIT UICI-008-3 (WDW-3)

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department issues Discharge Permit UICI-008-3 (Discharge Permit) to Navajo Refining Company (Permittee) to operate its Underground Injection Control (UIC) Class I non-hazardous waste injection well (Waste Disposal Well No. 3 - API No. 30-015-26575, WDW-3) located 790 FSL and 2250 FWL, Unit Letter N, Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico at its Disposal Well Facility (Facility). The Facility is located approximately 10.5 miles southeast of the intersection of U.S. 285 and U.S. 82 in Artesia, New Mexico.

The Permittee is permitted to dispose of only non-hazardous (RCRA exempt and RCRA non-hazardous, non-exempt) oil field waste fluids into its Class I non-hazardous waste injection well (WDW-3). The Permittee may dispose of a maximum of 500 gallons per minute (gpm) of oil field waste fluids. Ground water that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 50 - 100 feet below ground surface and has a total dissolved solids (TDS) concentration of approximately 1,000 - 2,200 mg/l.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class I non-hazardous waste injection wells (see Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (see 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class I non-hazardous waste injection well (WDW-3) is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil field waste, other than non-hazardous oil field waste fluids into its Class I non-hazardous waste injection well (WDW-3), including, but not limited to, the on-site disposal of lube oil, glycol, antifreeze, and washdown water. The Permittee may not dispose of any industrial waste fluid that is not oil field waste that is generated at its refinery. The Ground Water Quality Bureau of the New Mexico Environment Department permits the management of all industrial fluids that are not generated in the oil field.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.

2. The injection of fluids into a large capacity cesspool is prohibited.

3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.

4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified in 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class I non-hazardous waste injection wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified in 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous waste fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (see Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT RENEWAL: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required \$100.00 filing fee. The Permittee shall submit the final \$4,500.00 permit fee for a Class I non-hazardous waste injection well to OCD with a check made payable to "Water Quality Management Fund" thirty days after the date that this permit is issued.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective 30 days from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on **June 1, 2017.** The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. If a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (see Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and the OCD's Environmental Bureau of any Facility expansion, any injection increase above the approved pressure limit or volume limit specified in Permit Condition 3.B.2, or process modification that would result in any significant modification in the discharge of water contaminants (see 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class I non-hazardous waste injection well (WDW-3) that was approved pursuant to the requirements of this 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

- or,
- **a.** Noncompliance by Permittee with any condition of this Discharge Permit;

b. The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

c. A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge

permit modification or termination (see Section 75-6-6 NMSA 1978; 20.6.2.51011 NMAC; and, 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

a. Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

b. Violation of any applicable state or federal effluent regulations or limitations; or

c. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (see Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS I NON-HAZARDOUS WASTE INJECTION WELL (WDW-3) DISCHARGE PERMIT:

1. The transfer provisions of 20.6.2.3111 NMAC do not apply to a discharge permit for a Class I non-hazardous waste injection well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class I non-hazardous waste injection well (WDW-3) discharge permit if:

a. The OCD Director receives written notice 30 days prior to the transfer date; and,

b. The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2.a shall:

a. Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgment that the succeeding Permittee shall be responsible for compliance with the Class I non-hazardous waste injection well discharge permit upon taking possession of the facility;

b. Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

c. Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance

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immediately or within a specified time period, or assess a civil penalty, or both (see Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (see Section 74-6-10A.2 NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a state or federal law or regulation (see Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS:

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS I NON-

HAZARDOUS WASTE INJECTION WELL (WDW-3): Pursuant to 20.6.2.5207B NMAC, the Permittee shall provide analysis of the injected fluids at least quarterly to yield data representative of their characteristics and to demonstrate pursuant to 20.6.2.5204A(3) NMAC that the injected fluids are not characteristically hazardous as determined by EPA SW-846 Method 1311 and the analytical methods specified in the Quarterly Monitoring List.

The Permittee shall analyze the injected fluids quarterly for the following characteristics:

- pH (Method 9040);
- Eh;
- Specific conductance;
- Specific gravity;
- Temperature;
- General ground water quality parameters (general chemistry/cations and anions, including: fluoride, calcium, potassium, magnesium, sodium bicarbonate, carbonate, chloride, sulfate, total dissolved solids, cation/anion balance, pH, and bromide using the methods specified in 40 CFR 136.3); and,
- EPA RCRA Characteristics for Ignitability (Methods 1010/1020 and ASTM standards), Corrosivity (Method 1110), and Reactivity (process knowledge);

The Permittee shall analyze the injected fluids quarterly for the constituents identified in the Quarterly Monitoring List (below) to demonstrate that the injected fluids do not exhibit the characteristic of toxicity using the Toxicity Characteristic Leaching Procedure, EPA SW-846 Test Method 1311 (see Table 1, 40 CFR 261.24(c)).:

EPA HW No.	Contaminant	SW-846 Methods	Regulatory Level (mg/L)
D004	Arsenic	6010C	5.0
D005	Barium	6010C	100.0
D018	Benzene	8021B	0.5
D006	Cadmium	6020A	1.0
D000	Carbon tetrachloride	8021B	0.5
D017	Carbon tetraemonde	8260B	0.5
D020	Chlordane	8081A	0.03
D021	Chlorobenzene	8021B	100.0
D021	Chiorobenizene	8260B	100.0
D022	Chloroform	8021B	6.0
		8260B	0.0
D007	Chromium	6020A	5.0
D023	o-Cresol	8270D	200.0
D024	m-Cresol	8270D	200.0
D025	p-Cresol	8270D	200.0
 D026	Cresol	8270D	200.0
D016	2.4-D	8151A	10.0
D027	1 4-Dichlorobenzene	8021B	75
D027		8121	1.5
		8260B	
		8270D	
D028	1,2-Dichloroethane	8021B	0.5
		8260B	
D029	1,1-Dichloroethylene	8021B	0.7
		8260B	
D030	2,4-Dinitrotoluene	8091	0.13
		8270D	
D012	Endrin	8081A	0.02
D031	Heptachlor (and its epoxide).	8081A	0.008
D032	Hexachlorobenzene	8121	0.13
D033	Hexachlorobutadiene	8021B	0.5
		8121 8260D	
D024	II and also a sthe	8200B	2.0
D034	Hexachioroethane	8121	3.0
D008	Lead	0020A 7421	5.0
D012	Lindona	/421	0.4
D013	Monourry	<u>0081A</u> 7470A	<u>0.4</u>
D009	wercury	7470A 7/71B	0.2
D014	Motheyychler	7471D 8081Δ	10.0
D014	wiethoxyellior	82700	10.0

D035	Methyl ethyl ketone	8015B	200.0
		8260B	
D036	Nitrobenzene	8091	2.0
		8270D	
D037	Pentrachlorophenol	8041	100.0
D038	Pyridine	8260B	5.0
		8270D	
D010	Selenium	7741A	1.0
D011	Silver	6010C	5.0
D039	Tetrachloroethylene	8260B	0.7
D015	Toxaphene	<mark>8081A</mark>	<mark>0.5</mark>
D040	Trichloroethylene	8021B	0.5
		8260B	
D041	2,4,5-Trichlorophenol	8270D	400.0
D042	2,4,6-Trichlorophenol	8041A	2.0
		8270D	
D017	2,4,5-TP (Silvex)	<mark>8151A</mark>	<mark>1.0</mark>
D043	Vinyl chloride	8021B	0.2
	-	8260B	

If o-, m-, and p-cresol concentrations cannot be differentiated, then the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/L.

If the quantitation limit is greater than the regulatory level, then the quantitation limit becomes the regulatory level.

2.B. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Renewal Application to cope with failure of a system(s) in the Discharge Permit.

2.C. CLOSURE: Prior to closure of the facility, the Permittee shall submit for OCD's approval, a closure plan including a completed form C-103 for plugging and abandonment of the Class I non-hazardous waste injection well (WDW-3). The Permittee shall plug and abandon its Class I non-hazardous waste injection well (WDW-3) pursuant to 20.6.2.5209 NMAC and as specified in Permit Condition 2.D.

1. **Pre-Closure Notification:** Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class I non-hazardous waste injection well (WDW-3). Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau must approve all proposed well closure activities before the Permittee may implement its proposed closure plan.

2. Required Information: The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee (and owner or operator, if appropriate);

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- Address of Permittee (and owner or operator, if appropriate);
- Contact person;
- Phone number;
- Number and type of well(s);
- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation, *etc.*);
- Proposed date of well closure;
- Name of Preparer; and,
- Date.

2.D. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class I non-hazardous waste injection well (WDW-3), it shall submit to OCD a plugging and abandonment plan that meets the requirements of 20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.E. RECORD KEEPING: The Permittee shall maintain records of all inspections required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.F. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified in 20.6.2.3103 NMAC, then it shall report a release to OCD's Environmental Bureau.

1. Oral Notification: As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter, the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;

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- The date, time, location, and duration of the discharge;
- The source and cause of discharge;
- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and,
- Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. Written Notification: Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.G. OTHER REQUIREMENTS:

1. Inspection and Entry: Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any effluent before or after discharge; and,
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. Advance Notice: The Permittee shall provide OCD's Environmental Bureau and Artesia District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class I non-hazardous waste injection well (WDW-3).

3. Environmental Monitoring: The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, and laboratory Quality Assurance/Quality Control (QA/QC).

2.H. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated with plugging and abandonment of the Class I non-hazardous waste injection well (WDW-3),

surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required herein above.

2.I. **REPORTING:**

a.

1. Quarterly Reports: The Permittee shall submit quarterly reports pursuant to 20.6.2.5208A NMAC to OCD's Environmental Bureau no later than 45 days following the end of each calendar quarter. The quarterly reports shall include the following:

- fluids:
- The physical, chemical and other relevant characteristics of injection

b. Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure; and

- c. The results of monitoring prescribed under Section 20.6.2.5207B NMAC.
- d. Weekly expansion tank volume fluid readings and the fluid volume additions or removals from the expansion tank.

2. Annual Report: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by June 1st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class I Non-Hazardous Waste Injection Well (WDW-3), Name of Permittee, Discharge Permit Number, API number of well, date of report, and person submitting report;
- Summary of Class I non-hazardous waste injection well (WDW-3) operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103(s);
- Monthly injection/disposal volume, including the cumulative total should be carried over to each year;

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- Maximum and average injection pressures;
- A copy of the quarterly chemical analyses shall be included with data summary and all QA/QC information;
- Copy of any mechanical integrity test chart(s), including the type of test, *i.e.*, duration, gauge pressure, *etc.*;
- Copy of fall-of test charts;
- Summary tables listing environmental analytical laboratory data for quarterly waste fluid samples. Any 20.6.2.3103 NMAC constituent(s) found to exceed a water quality standard shall be highlighted and noted in the annual report. The Permittee shall include copies of the most recent year's environmental analytical laboratory data sheets with QA/QC summary sheet information in conformance with the National Environmental Laboratory Accreditation Conference (NELAC) and EPA Standards;
- Brief explanation describing deviations from the normal injection operations;
- Results of any leaks and spill reports (include any C-141 reports);
- An Area of Review (AOR) annual update summary;
- A summary with interpretation of MITs, Fall-Off Tests, *etc.*, with conclusion(s) and recommendation(s);
- Records of the expansion tank monitoring pressure, fluid removals and/or additions indicating the well MIT condition;
- A summary of all major Facility activities or events, which occurred during the year with any conclusions and recommendations;
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and,
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS I NON-HAZARDOUS WASTE INJECTION WELL (WDW-3) OPERATIONS:

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206B NMAC to ensure that:

1. The maximum injection pressure at the wellhead shall not initiate new fractures or propagate existing fractures in the confining zone, or cause the movement of injection or formation fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to 20.6.2.5103 NMAC and during well stimulation.

2. Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class I non-hazardous waste injection well (WDW-3) is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall cease operations until proper repairs are made, notify the OCD's Environmental Bureau and Artesia District office within 24 hours, and shall not resume injection until the permittee has received approval from the OCD.

3. The annulus between the tubing and the long string of casing shall be filled with a fluid approved by the OCD Director and a pressure, also approved by the OCD Director shall be maintained on the annulus.

3.B. INJECTION OPERATIONS:

1. Injection Formation, Interval, and Waste Fluids: The Permittee shall inject only non-hazardous (RCRA exempt and RCRA non-hazardous, non-exempt) oil field waste fluid into the Lower Wolfcamp, Cisco, and Canyon Formations from 7,660 feet to 8,620 feet in its Class I non-hazardous waste injection well (WDW-3). The surface casing is set at 400 feet; the first intermediate casing is set at 2,604 feet; the second intermediate casing or production casing is set at 9,450 feet; the injection tubing is set at approximately 7,568 feet; and the packer is set at 7,575 feet. A cement plug is set at 9,022 feet within the production casing, which isolates the Class I non-hazardous injection well (WDW-3) from a deeper, completed production liner set at 10,119 feet. The Permittee shall ensure that the injected waste fluid enters perforations only within the above specified injection interval and is not permitted to escape to other formations or onto the surface.

2. Well Injection Pressure Limits and Injection Flow Rate: The Permittee shall ensure that the maximum wellhead or surface injection pressure on its Class I non-hazardous waste injection well (WDW-3) shall not exceed 1,530 psig and that the injection flow rate shall not exceed 500 gpm.

3. Pressure Limiting Device: The Permittee shall equip and operate its Class I non-hazardous waste injection well (WDW-3) or system with a pressure limiting device, or equivalent (*i.e.*, Murphy switch), in working condition which shall at all times limit surface injection pressure to the maximum allowable pressure for its Class I non-hazardous waste injection well (WDW-3).

The Permittee shall inspect and monitor the pressure-limiting device daily and shall report any pressure exceedances within 24 hours of detection to OCD's Environmental Bureau and Artesia District Office. The Permittee shall take all steps necessary to ensure that the injected waste fluids enter only the proposed injection interval and are not permitted to escape to other formations or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

OCD may authorize an increase in surface injection pressure if the Permittee performs a valid Step-Rate Test (SRT), which demonstrates that the proposed maximum surface injection pressure is less than the injection zone fracture pressure with an acceptable safety factor. If approvable, the Permittee must apply for a modification to this Discharge Permit pursuant to 20.6.2.3109 NMAC.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of injection pressure, flow rate, flow volume, and pressure on the annulus between the tubing and the long string of casing.

3.D. MECHANICAL INTEGRITY FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall conduct a mechanical integrity test (MIT) for its Class I non-hazardous waste injection well (WDW-3) at least once every five years or more frequently as the OCD Director may require for good cause during the life of the well. The Permittee shall also demonstrate mechanical integrity for its Class I non-hazardous waste injection well (WDW-3) by running a MIT every time it performs a well workover, including when it pulls the tubing or reseats the packer. The Permittee shall request MIT approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Artesia District Office. The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

The Permittee shall conduct a casing-tubing annulus MIT from the surface to the approved injection depth to assess casing and tubing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 300 psig measured at the surface. The Permittee shall follow OCD's 2004 *New Mexico Oil Conservation Division Underground Injection Control Program Manual* guidance when conducting a MIT. The Permittee shall submit the results of its MIT to OCD's Environmental Bureau and Artesia District Office within 30 days of completion. If any remedial work or any other workover operations are necessary, the Permittee shall comply with Permit Condition 3.F.

2. A Class I non-hazardous waste injection well has mechanical integrity if there is no detectable leak in the casing, tubing or packer which OCD considers to be significant at maximum operating temperature and pressure, and no detectable conduit for fluid movement out of the injection zone through the well bore, or vertical channels adjacent to the well bore which the OCD considers to be significant. The following criteria will determine if the Class I non-hazardous waste injection well (WDW-3) has passed the MIT:

a. The MIT passes if there is zero bleed-off during the test;

b. The MIT passes if there is a less than $a \pm 10\%$ change in the final test pressure compared to the starting pressure, if approved by OCD;

c. The MIT fails if there is more than 10% reduction in the final test pressure compared to the starting pressure or that the pressure does not stabilize within 10% of the starting pressure before the end of the MIT. The Permittee shall shut-in the well and investigate for leaks in accordance with Permit Condition 3.F. The Permittee shall not resume injection operations until approved by OCD.

d. When the MIT is not witnessed by OCD and fails, the Permittee shall shut-in the well and notify OCD within 24 hours of the failure of the MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

5. The Permittee shall conduct a Bradenhead test at least annually and each time that it conducts a MIT.

3.E. FALL-OFF TEST: The Permittee shall conduct a Fall-Off Test (FOT) to monitor the injection zone formation characteristics and pressure buildup over time in the injection zone at least every three years. The Permittee shall request FOT approval using form C-103 (Sundry Notices and Reports on Wells) sent to OCD's Environmental Bureau and Artesia District Office.

The Permittee shall follow OCD's 2007 *New Mexico Oil Conservation Division UIC Class I Well Fall-Off Test Guidance* or other OCD-approved FOT when conducting a FOT and shall shut down the well for a time sufficient to conduct a valid observation of the pressure fall-off curve. The Permittee shall submit the results of its FOT to OCD's Environmental Bureau and Artesia District Office within 30 days of completion, including color copies of the original charts.

3.F. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's Environmental Bureau prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Artesia District Office. After completing remedial work, pressure tests, or any other workover operations, the Permittee shall run a MIT in accordance with Permit Condition 3.D to verify that the remedial work has successfully repaired any problems.

3. G. EXTERNAL EXPANSION TANK: The Permittee shall equip its Class I non-hazardous waste injection well (WDW-3) with an external expansion tank system under constant 100 psig pressure connected to the casing-annulus. The Permittee shall fill the external expansion tank half-full with an OCD-approved liquid to establish an equilibrium volume and liquid level. The Permittee shall monitor the liquid levels in the external expansion tank at least weekly and shall record all additions or removals of liquids into or out of the external expansion tank. The Permittee shall record any loss or gain of fluids in the external expansion tank, and shall verbally notify OCD's Environmental Bureau within 5 days of any loss or gain of fluid greater than 5 barrels per month and shall comply with Permit Condition 3.F.

The Permittee shall provide the weekly expansion tank volume fluid volumes readings and the fluid volume additions or removals from the expansion tank on a quarterly basis and in the annual report.

3.H. INJECTION RECORD VOLUMES AND PRESSURES: The Permittee shall submit quarterly reports of its injection operations and well workovers. The Permittee shall record the minimum, maximum, and average flow waste injection volumes (including total volumes) and annular pressures of the injected waste fluids on a monthly basis, and shall submit the data to OCD on a quarterly basis and in the annual report. The Permittee shall fill the casing-tubing annulus with an OCD-approved liquid and install a Murphy pressure switch or equivalent, as described in the Permittee's permit renewal application, in order to detect leakage in the casing, tubing, or packer.

3.I. AREA OF REVIEW (AOR): The Permittee shall orally report to OCD's Environmental Bureau within 72 hours of discovery of any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class I non-hazardous waste injection well (WDW-3).

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc.*) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. QUARTERLY AND ANNUAL REPORTS: The Permittee shall submit its quarterly and annual reports to OCD as specified in Permit Condition 2.I.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class I non-hazardous waste injection well (WDW-3), conduct ground water restoration if applicable, and any post-operational monitoring as may be needed (see 20.6.2.5210B(17) NMAC) within 90 days of permit issuance (see 20.6.2.5210B(17) NMAC). The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.

Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Tuesday, November 06, 2012 7:12 AM
То:	Schultz, Michele (Michele.Schultz@hollyfrontier.com)
Cc:	VonGonten, Glenn, EMNRD
Subject:	Afidavit of Publication for WDW-3 Permit Renewal (UICI-008-0)

Micki:

The New Mexico Oil Conservation Division is in receipt of the above subject Affidavit.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental



October 31, 2012

Mr. Carl J. Chavez New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 1220 South St. Francis Drive Santa Fe, New Mexico 87505

<u>Certified Mail/Return Receipt</u> 7011 3500 0001 4786 3422

RE: Affidavit of Publication for WDW-3 Permit renewal Navajo Refining Co. LLC

Dear Mr. Chavez: 🗸

In accordance with Section D of 20.6.2.3108 NMAC Public Notice and Participation, Navajo Refining Company is submitting the Affidavit of Publication for the public notice requirements indicated in Section C for our Class 1 Injection Well Discharge Permit WDW-3. The Notice was published on October 5, 2012.

If you have questions regarding this submittal, please contact me by email at <u>micki.schultz@hollyfrontier.com</u>, or by phone at 575-746-5281.

Cordially,

Micki Schultz, P.E., CHMM Environmental Specialist

Attachments

Env. File: WDW-3 UIC Permit Renewal (REF.ART.12-4.A.02.D)

Affidavit of Publication	Copy of Publication:
STATE OF NEW MEXICO	PUBLIC NOTICE STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES DEPARTMENT
County of Eddy:	OIL CONSERVATION DIVISION In accordance with 20.6.2.3108.F NMAC, Navajo Refining Company, L.L.C.
Danny Scott A anny A car	Conservation Division (OCD) discharge permit to inject treated non-hazardous waste water effluent from the refinervision site wastewater treatment plant into
being duly sworn, says that he is the Publisher	a Class I (nonhazardous) injection well WDW-3 (API# 30-015-26575). The WDW-3 is located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico: The WDW-3 is located
of the Artesia Daily Press, a daily newspaper of general	approximately 14 miles E-SE of the intersection of I-285 and Hwy 82 (Artesia Refinery) or approximately 2.75 miles S of Hwy 82 and CR-225. The Artesia Refinery is located at 501 E. Main Street Artesia. New Mayico
circulation, published in English at Artesia, said county	Waste water from the refinery is generated from the treatment of waters from the processing of crude oil, including the removal of water entrained in crude
and state, and that the hereto attached	oil, the washing of crude oil to remove salts and sediment, water used for heating and cooling during refining, boiler blowdown, and stormwater collected from process portions of the refinery
Display Ad	Underground injection at WDW-3 occurs within the Lower Wolfcamp, Cisco and Canyon Formations within the injection interval from 7,660 to 8,620 feet
was published in a regular and entire issue of the said	(log depth). The injection rate into WDW-3 will not exceed 500 gpm and the maximum allowable surface injection pressure of 1530 psig. The injected refinery waste water quality is approximately 3,400 mo/L total dissolved solids
Artesia Daily Press, a daily newspaper duly qualified	(TDS). Formation fluids within the permitted injection interval exceed 10,000 mg/L TDS. Groundwater is first encountered in the area of WDW-3 at a depth
for that purpose within the meaning of Chapter 167 of	quality ranges from about 1,500 to 2,200 mg/L TDS. Persons interested in obtaining further information, submitting comments, or
the 1937 Session Laws of the state of New Mexico for	requesting to be on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the New Mexico Oil Conservation Division.
1 Consecutive weeks/days on the same	Director New Mexico Oil Conservation Division
day as follows:	1220 South St. Francis Drive Santa Fe, New Mexico 87505 Telenhone: (505) 476-3440
First PublicationOctober 5, 2102	When corresponding, please reference the name of the applicant and the well name.
Second Publication	
Third Publication	
Fourth Publication	
Fifth Publication	
Subscribed and sworn to before me this	
29th day of October 2012	
OFFICIAL SEAL Latisha Romine NOTARY PUBLIC-STATE OF NEW MEXICO My commission expires: 5/12/2015	
Chatistio Romine	
Latisna Romine Notary Public, Eddy County, New Mexico	

Affidavit of Publication	Copy of Publication:
STATE OF NEW MEXICO	AVISO PUBLICO ESTADO DE NUEVO MEXICO DEPARTMENTO DE ENERGIA, MINERALES Y RECURSOS NATURALES
County of Eddy:	DIVISION DE CONSERVACION DE PETROLEO Por medio de la presente, Navajo Company anuncia que de conformidad con
Danny Scott Nanny Acou	Agua de Nuevo México 20.6.2.3108.F NMAC, a la División de Conservación (del Petróleo de Nuevo México (NMOCD). Departamento del Medio Ambiente,
being duly sworn, says that he is the Publisher	un permiso de descarga para la invección aguas residuales de la planta Arte- sia de Navajo Refining Company, en el pozo de invección de denominación WDW-3 (API#30-015-26575). El pozo WDW-3 esta localizado en SE/4, SW/4 de Sección 1, Municipio 18 sur, Condado Eddy , Nuevo México, El WDW-3
of the Artesia Daily Press, a daily newspaper of general	está localizado aproximadamente a 14 millas E-SE de la intersección de I-285 y Hwy 82 (Refinería Artesia), o aproximadamente 2.75 millas S de Hwy. 82 y
circulation, published in English at Artesia, said county	Artesia, Nuevo México. La generación de aguas residuals de la Refinería Artesia es el resultado del
and state, and that the hereto attached	agua que se encuentran en al abastecimiento de crudo, el agua que se usa para el enfriamiento y calentamiento, el agua que se usa para retirar las sales idel abastecimiento de crudo, y para purgar la caldera
Display Ad	Las aguas residuals de WDW-3 se injectarán hacia las formaciones de Lower Wolfcamp, Cisco Y Canyon, ubicadas entre 7,660 y 8,620 pies (produndidad
was published in a regular and entire issue of the said	de registro). La tasa de inyección de WDW-3 no excederá los 500 gpm a una presión de inyección que no excederá los 1530 psig. Estas aguas residuals tendrán un contendido de total de sólidos disueltos (TDS) de 3,400 partes por millón. En al área en doide se angunta el porto (WDW-3) al organización de solidos disueltos (WDW-3) al organización de solidos de solidos disueltos (WDW-3) al organización de solidos de so
Artesia Daily Press, a daily newspaper duly qualified	subterránea se encuentra a una profundidad de 50 a 150 pies con un TDS de 1,500 a 2,200 partes por millón.
for that purpose within the meaning of Chapter 167 of	Personas interesadas en obtener mayores informes, presentar sus comentarios o solicitar que se les incluya en las listas de direcciones de una planta en especial para frituros avisos pueden poperse en contácto con el
the 1937 Session Laws of the state of New Mexico for	Jefe del Departamento del Medio Ambiente de la División de Conservación de Petróleo de Nuevo México:
1 Consecutive weeks/days on the same	Por favor enviar comentarios y preguntas a: Director New Mexico Oil Conservation Division
day as follows:	1220 South St. Francis Drive Santa Fe, New Mexico 87505
First Publication October 5, 2102	Teléfono: (505) 476-3440 Por favor incluir como referencia el nombre del applicante y denominación del Ipozo.
Second Publication	
Third Publication	
Fourth Publication	
Fifth Publication	
Subscribed and sworn to before me this	
29th day of October 2012	
OFFICIAL SEAL Latisha Romine	
NUTARY PUBLICSTATE OF NEW MEXICO	,
Latisha Romine	
Notary Public, Eddy County, New Mexico	· · ·



NM EMNRD OIL CONSERV 1220 S ST FRANCIS DR Leonard Lowe SANTA FE NM 87505

 ALTERNATE ACCOUNT: 56689

 AD NUMBER: 00380430 ACCOUNT: 00002212

 LEGAL NO:
 P.O. #:

 193 LINES 1 TIME(S)
 199.00

 AFFIDAVIT:
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 TAX:
 16.29

 TOTAL:
 215.29

AFFIDAVIT OF PUBLICATION

THE SANTA FE **MEXICAN**

Founded 1849

ok to pry one: el 10/19/2012

STATE OF NEW MEXICO COUNTY OF SANTA FE

1, V. Wright, being first duly sworn declare and say that 1 am Legal Advertising Representative of THE SANTA FE NEW MEXICAN, a daily newspaper published in the English language, and having a general circulation in the Counties of Santa Fe and Los Alamos, State of New Mexico and being a newspaper duly qualified to publish legal notices and advertisements under the provisions of Chapter 167 on Session Laws of 1937; that the publication # a copy of which is hereto attached was published in said newspaper 1 day(s) between 10/17/2012 and 10/17/2012 and that the notice was published in the newspaper proper and not in any supplement; the first date of publication being on the 17th day of October, 2012 and that the undersigned has personal knowledge of the matter and things set forth in this affidavit.

/S/ TISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 17th day of October, 2012

uy Maugalet Vigt (Del Notary // 13 - 2012Commission Expires:



SantaFeNewMexican.com

202 East Marcy Street, Santa Fe, NM 87501-2021 • 505-983-3303 • fax: 505-984-1785 • P.O. Box 2048, Santa Fe, NM 87504-2048

NOTICE OF PUBLICATION STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION Notice is hereby given that pursuant to Wa-ter Quality Control Commission Regulations (20.6.2.3106 NMAC) the following discharge permit application(s) has been submitted to the Di-rector of the New Mexico Oil Conservation Division (OCD), 1220 S. Saint_Francis Drive, Santa Fe, New Mexico 87505, and Telephone (505) Telephon. 476-3440: (UICI-008-0) Navajo G. G. (UICI-008-0) Navajo Refining Company, L.L.C. Michael G. McKee, Vice President and Refinery Man-ager, 501 East Main Street, P.O. Box Drawer 159, Artesia Now Mexico New Mexico 88211-0159, has sub-Mexico mitted an application for a Class I (non-hazfor a Class I (non-haz-ardous) Injection Well Discharge Permit for injection well WDW-3 (API# 30-015-26575) located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The injection well is located ap-proximately 10.5 miles S-SE of the inproximately 10.5 miles S-SE of the in-tersection of I-285 and Hwy 82 or approxi-mately 2.75 miles S of Hwy 82 and CR-225. Oil field exempt and Oil field exempt and non-exempt non-haz-ardous industrial waste, will be trans-ported about 12 miles underground from the Navajo-Artesia Refin-ery located at 501 E. Main Street, Artesia, NM via a 6 inch dia. pipeline to WDW-3 for disposal into the disposal into the Lower Wolfcamp the Lower Cisco, and Canyon Formations in the injection interval from 7660 to 8620 feet (log depth). The injection rate will not exceed 500 gpm at a maxi-mum surface injecmum surface injec-tion pressure of 1530 psig: The injected waste fluid contains approximately 3,400 mg/L total dissolved solids (TDS). Ground-water most likely to be affected by a spill, leak or accidental disbe affected by a spill, leak or accidental dis-charge is at a depth range of between 50 to 150 feet below the ground surface, with a concentration range of between 1500 to 2200 mg/L TDS. The discharge permit ad-diresses well acon-struction, operation, monitoring of the well, associated surwell, associated sur-face facilities, and

provides a contin-gency plan in the event of accidental spills, leaks, and spills, leaks, and other accidental discharges in order to protect fresh water. Protect fresh water. Any interested person may obtain further in-formation from the OCD and may submit written comments to the Division Director at the address given above. The applica-tion and draft permit may be viewed at the above address be-May be viewed at the above address be-tween 8:00 a.m. and 4:00 p.m., Monday through Friday, or may also be viewed at the OCD's web site http://www.emnrd.st ate nmus/cod/ ate.nm.us/ocd/. Per-sons interested in ob-taining a copy of the application and draft permit may contact OCD at the address given above. Prior to ruling on any pro-posed discharge permit or major modifi-mit or major modifi-cation, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which in-terested persons may submit comments or request that OCD hold a public hearing. Re-quests for a public hearing shall set forth hearing shall set to the reasons why a should be hearing should be held. A hearing will be held if the Director determines that there is significant public interest. If no public hearing is held, the Director will approve or disapprove the proposed permit based on available information, available information, including all com-ments received. If a public hearing is held, the director will ap-prove or disapprove the proposed permit based on information in the application along with informa-tion submitted at the hearing. hearing. Para obtener más información sobre esta solicitud en espan_ol, solicitud en espan_ol, sirvase comunicarse por favor: New Mex-ico Energy, Minerals and Natural Re-sources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conser-vation Division (Depto. Conservavation Division (Depto. Conserva-cio n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Dorothy 505-476-3461). Phillips, DONE at Santa Fe, New Mexico, on this 11th day of October 2012.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION Jami Bailey, Director PUB: 10-17-12 LEGAL: 94073

Affidavit of Publication	Сор
STATE OF NEW MEXICO	
Danny Scott A annu Cou	Notice is hereby c tions (20.6.2.310
being duly sworn, says that he is the Publisher	submitted to the I S. Saint Francis I 3440:
of the Artesia Daily Press, a daily newspaper of general	(UICI-008-0) Nav and Refinery Mar Mexico 88211-01
circulation, published in English at Artesia, said county	jection Well Disch cated in the SE/4 Eddy County, Ner
and state, and that the hereto attached	S-SE of the inters 82 and CR-225. will be transporte
Legal Notice	 located at 501 E. disposal into the interval from 766
was published in a regular and entire issue of the said	gpm at a maximu fluid contains app most likely to be a
Artesia Daily Press, a daily newspaper duly qualified	of between 50 to between 1500 to tion, operation, m
for that purpose within the meaning of Chapter 167 of	contingency plan charges in order t
the 1937 Session Laws of the state of New Mexico for	mit written comme plication and draft
1 Consecutive weeks/days on the same	and 4:00 p.m., Mo site http://www.en the application an
day as follows:	allow a period of a during which inter
First Publication October 12, 2102	hearing should be is significant public
Second Publication	If no public hearin permit based on a hearing is held, th
Third Publication	On information in Para obtener más carse por favor: 1
Fourth Publication	(Depto. Del Energy servation Division Drive, Santa Fe, I
Fifth Publication	DONE at Santa F STATE OF NEW I OIL CONSERVAT Jami Bailey, Direc
Subscribed and sworn to before me this	Published in the A
12th day of October 2012	MI to
OFFICIAL SEAL Latisha Romine NOTARY PUBLIC-STATE OF NEW MEXICO My commission expires: 5/12/2015	en en
Latisha Romine Notary Public, Eddy County, New Mexico	

Copy of Publication:



Chavez, Carl J, EMNRD

From: Sent: To: Subject: Chavez, Carl J, EMNRD Thursday, October 18, 2012 7:56 AM 'Schultz, Michele' RE: WDW-3 Public Notice 10/5

Micki:

Good morning. Let me know if you receive any public comments before COB 11/5.

OCD will issue a final approval within 15 days of 11/5 or by 11/20.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

From: Schultz, Michele [mailto:Michele.Schultz@hollyfrontier.com] Sent: Wednesday, October 17, 2012 7:30 AM To: Chavez, Carl J, EMNRD Cc: VonGonten, Glenn, EMNRD Subject: RE: WDW-3 Public Notice 10/5

Carl – I already sent you a certified letter with the affidavit of mailing, the list of a single property owner (BLM), and a proof sheet from the newspaper. Under Section C as agreed in the application, we are not required to post. It is my understanding that this completes our requirements for public and OCD notification.

Micki Schultz, P.E., CHMM Environmental Specialist, Water and Waste Programs Navajo Refining Company 575-746-5281 (office) 575-308-2141 (cell) <u>micki.schultz@hollyfrontier.com</u>

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us] Sent: Tuesday, October 16, 2012 4:32 PM To: Schultz, Michele Cc: VonGonten, Glenn, EMNRD Subject: WDW-3 Public Notice 10/5

Micki:

Good afternoon. OCD has received the public notice from the Artesia Newspaper today.

Since it posted 10/5, Navajo Refining Company LLC's (NRC) 30-day public comment period ends around COB on Monday 11/5. OCD's public notice posted on its website on 10/1 and Artesia Newspaper on 10/12. The 30-day public comment period will end around COB Monday 11/12.

Within 15-days of the end of NRC's public comment period, it must submit proof of notice (affidavit of mailings and list of property owners, proof of publication, an affidavit of posting) to the OCD for final approval.

If there are no public comments or requests for hearing, the OCD may issue a final discharge permit.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/</u>environmental.htm#environmental

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received this message in error, please advise the sender immediately by reply e-mail and do not retain any paper or electronic copies of this message or any

attachments. Unless expressly stated, nothing contained in this message should be construed as a digital or electronic signature or a commitment to a binding agreement.



RECEIVED OCD

October 10, 2012

Mr. Carl J. Chavez New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division <u>c</u> 1220 South St. Francis Drive Santa Fe, New Mexico 87505

Certified Mail/Return Receipt 7011 3500 0001 4786 3378

RE: Notice of completion of Public Notice requirements for WDW-3 Permit renewal Navajo Refining Co. LLC

Dear Mr. Chavez:

In accordance with Section D of 20.6.2.3108 NMAC Public Notice and Participation, Navajo Refining Company is submitting proof of notice for the public notice requirements indicated in Section C for our Class 1 Injection Well Discharge Permit WDW-3. Enclosed are copies of the Certified Mail returned receipt for the notice mailed to the Bureau of Land Management, and the notices in English and Spanish on page 10 of the Artesia Daily Press of October 5, 2012. The Bureau of Land Management is the owner of the property that well WDW-3 is located on, as well as landowner of the surrounding property.

If you have questions regarding this submittal, please contact me by email at micki.schultz@hollyfrontier.com, or by phone at 575-746-5281.

Cordially,

Micki Schultz, P.E., CHMM Environmental Specialist

Attachments

Env. File: WDW-3 UIC Permit Renewal (REF.ART.12-4.A.02.D)

Page 10 - The Artesia (NM) Daily Press - October 5, 2012

Obituary

Charlene Haynie in Post, Texas, She married Bobby Lee Beard on Jan 6, 1964. She worked in the medical iteld for 45-plus years for Dr. Carl Page and Jater, Covenant Haspital prior to her retire-Survivors include her daugh-

Surviver include her daughter.
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azy, Sept. 30, 2012 A visitation for family and pm. Sunday. Det, 7, at South Plains Church of Christ. Beard was born on Christmen Day, 1942, to Walter Byron and Comparison of Christ.

Beard was born on Christmas at wave restavent functalism. Day, 1942, to Walter Byron and com, Convicted killer from 2008 escape is arrested in Mexico CLOVIS 1AP) — Federal authorities say a convicted killer who escape from a New Mexico, prison in 2008 has been arrested in Mexico. The U.S. Markhals Service asys Edward Stats was used. Not Not IIS W. Chisam Authorities say be escaped from the Curry Courty Detention but had been on the tat of the Markhals Service 15 forms: Authorities say be escaped from the Curry Courty Detention but had been on the tat of the Markhals Service 15 forms: but had been on the tat of the Markhals Service 15 forms: but had been on the tat of the Markhals Service 15 forms: but had been on the tat of the Markhals Service 15 forms: but had been on the tat of the Markhals Service and the Stats was used. Salas was been on the tat of the Markhals Service and the Stats was used. But had been on the tat of the Markhals Service and the Stats was used. Salas was been on the tat of the Markhals Service and the Stats was used. But had been on the tat of the Markhals Service and the Stats was used. Stats was been on the tat of the Markhals Service and the Stats was used. But had been on the tat of the Markhals Service and the Stats was used. Stats data the stats of the Stats was used and the Stats was used and the Stats was used the Stats was used. Stats data the stats the Stats was used and the Stats was used the Markhals Stats was us

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SPECIALS

Gregg's Foods EEKEND SPEC Tu Tienda Richey and North First 746-3401 Natural Light 18 pk Cans Bud & Bud light Shursaving Man. thra Sat. 8:00 a.m. to 9:00 p.m. - Sun. 9:00 a.m. to 8 Master Card + Visa - WiC - Food Stamps - AFDC Flour \$1799 25 lb bag Naud Cokes All Flavors 12 pk Can ^{\$}14⁴⁹ \$12⁴⁹ Shursavin Shursaving Tomato Sauce Coors, Coors Light, Miller Lite Corona, Corona Light 12 pk bils ro2 pkg 3 for ⁸12 Asst. Crush Sodas 12 pk Can MUTH THURS Whole Fryers ving Corn, Green Be \$13⁹⁹ 3 for \$1 a la 2 for S . Aller ₱**10**99 Shurline Ketchup Large Gala Apples 79[¢]ъ 89* **59**¢ O_cO 14.5-15 Jim Beam Lord Calvert Kraft Barbecue 롑 1.75 Lt Edwind 99* 1.75Lt 2 lbs^{\$}] Sirloin End Chops Top Round London Broil weet Potatocs Limes ⁽¹⁾ 99[¢] ³23⁹⁹ ^{\$1599} \$**2**99 E D E) Тĥ Black Velvet Jose Cuervo 2 bs^{\$}1 10 for ^{\$}1 Bottom Round Steak Family Pack Boneless New York Strips 1.75 LT 750 ml Green Pears ettuce ^{\$1599|\$}19⁹⁹ *(*83) \$279 \$699 W. **89**¢ W.S. \$119 Jagermeister Canadi: Mist Bone-In Ribeye Potatoes 750 ml .75 L Steaks \$**6**99 10 lb bag ^{\$}21⁹⁹ ^{\$}24⁹⁹ C.

Public Record

ARTESIA POLICE DEPARTMENT

Oct. 5 ALARM

ALARM J:16 a.m. – Officer dis-patched to 201 E. Hermosa Drive in reference to a burglar alarm.

Mary Louise Grbac

Services are scheduled for 9:30 a.m. Tuesday, Oct. 9, at St. An-hony's Catholic Church for Mary Louise Grbae of 1104 Sears hony's Ci Ave., Arte

Ave., Artesia, Grbas, RJ, passed away Wednesskay, Cu. 3, 2012, at her home. Fr. Brian Guerrini, SS CC, will officiate at the services, with interment to itollow at Woobbins C emettery Visitation will begin at S p.n. Monday at SL. Anthony's. A rearry will be recited at 6.20 p.n. Monday at the church. Arrangemens are under the direction of Terpening & San Mur-nary, A full obtinary will be published in Sanday's edition of the Daily Press.

Stay in the loop online!

www.facebook.com/ ArtesiaNews &

ArtesiaBulldogSports

No report was taken. RECKLESS DRIVING 8:34 a.m. - Officer dis-patched to Seven Rivers High-way in reference to reckless carcless driving, rac-ing. WANTED SUBJECT

parcuce in 201 F., Hermisa recettes cardess driving, rac-brive in reference to a burglar pBLIC ASSIST 4:59 a.m. - Officer dis-patched to the 700 block for reference to a wanted subject. North 13" Street in reference a wanted subject. North 13" Street in reference to a wanted subject. DONESTIC 5:19 a.m. - Officer dis-patched to the 500 block of Ave. in reference to vandal-South 20" Street in reference ism. A report was taken. to a domestic signate patched to the 500 block of Ave. in reference to vandal-South 20" Street in reference ism. A report was taken. to a domestic signate

South 20" STEEL IN LARCENY to a domestic dispute ARREST patched to 1001 N. 15° St. in 11:00 a.m. - Larry Trouble-reference to larceny. A report iteld Jr. 44, of Lakewood, an- was taken. rested on a district warrant.

ALARM 7:22 a.m. - Officer dis-patched to 1102 W. Quay Avc. in reference to an audible alarm.

ALARM VANDALISM VANDALISM LARM 1126 a.m. - Officer dis-patched to 1010 W. Quay Ave. Drive in reference to vandal-in reference to an audible ism. A report was taken. ALARM 2147 p.m. - Officer dis-patched to 1010 W. Missouri reference to a burglar alarm. Ave. in reference to vandal-ism. A report was taken. Staten VANDALISM 2147 p.m. - Officer dis-patched to 1010 W. Missouri reference to a burglar alarm. Nor report was taken. Staten VANDALISM 2147 p.m. - Officer dis-patched to 1010 W. Missouri reference to a burglar alarm. Nor report was taken. Staten VANDALISM 2147 p.m. - Officer dis-patched to 1010 W. Missouri reference to a burglar alarm. Nor report was taken.

WANTED SUBJECT 4:59 p.m. – Officer dis-patched to 3300 W. Main St. in reference to a wantd subject. RECKLESS DRIVING 7:33 p.m. – Officer dis-patched to South 28* Street aud West Mussouri Avenue in reference to reckless/careless citiving, recing. No report was taken. LOST ITEM

taken. LOST ITEM 7:55 p.m. - Officer dis-patched to The Wellbead Restaurant and Brewpub in reference to a lost item LARCENY

LARCENY 10:11 p.m. - Officer dis-patched to 2601 W. Main St. in reference to larceny.

Service Notice



Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Thursday, October 11, 2012 8:58 AM
To:	'tod.stevenson@state.nm.us'; Wunder, Matthew, DGF; Allison, Arthur, DIA; Gonzales, Miley; Linda_Rundell@nm.blm.gov; 'psisneros@nmag.gov'; 'r@rthicksconsult.com'; 'sric.chris@earthlink.net'; 'nmparks@state.nm.us'; 'john.dantonio@state.nm.us'; 'peggy@gis.nmt.ed'; 'marieg@nmoga.org'; Fetner, William, NMENV; 'lazarus@glorietageo.com'; Winchester, Jim, NMENV; 'ron.dutton@xcelenergy.com'; 'cgarcia@fs.fed.us'; Kieling, John, NMENV; 'bsg@garbhall.com'; Schoeppner, Jerry, NMENV; 'claudette.horn@pnm.com'; 'ekendrick@montand.com'; 'staff@ipanm.org'; Gonzales, Elidio L, EMNRD; Leking, Geoffrey R, EMNRD; Dade, Randy, EMNRD; Bratcher, Mike, EMNRD; Perrin, Charlie, EMNRD; Kelly, Jonathan, EMNRD; Powell, Brandon,
Subject:	Navajo Refining Company- Underground Injection Control (UIC) Class I (Non- Hazardous) Injection Well (UICI-8-0) Discharge Permit (UICI-8-0) Renewal (Eddy County)

Ladies and Gentlemen:

The New Mexico Oil Conservation Division (OCD) recently posted a draft discharge permit, public notice and administrative completeness letter on its website (click here) for the above subject facility.

For more information about this facility, please click here.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at

http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

Susana Martinez Governor

John Bemis Cabinet Secretary

Brett F. Woods, Ph.D. Deputy Cabinet Secretary Jami Bailey Division Director Oil Conservation Division



SEPTEMBER 25, 2012

Mr. Michael G. McKee Vice President and Refinery Manager Navajo Refining Company, L.L.C. 501 East Main Artesia, New Mexico 88210

Re: Discharge Permit Renewal Application for Class I non-hazardous waste injection well (Waste Disposal Well No. 3 (WDW-3) - API No. 30-015-26575) located 790 FSL and 2250 FWL UL: N Section 1, T 18 S, R 27 E, Eddy County, New Mexico

Dear Mr. McKee:

The Oil Conservation Division (OCD) is in receipt of Navajo Refining Company, L.L.C.'s (NRC) discharge permit renewal application for its UIC Class I non-hazardous waste injection well. After review, OCD has determined that your application is "*administratively complete*" pursuant to New Mexico Water Quality Control Commission regulations (20.6.2.3108 NMAC).

NRC must now provide public notice and demonstrate that it has done so to OCD in a timely manner. OCD will also provide notice to various governmental groups. Depending upon the level of public interest, a hearing may be scheduled on this matter. Regardless, OCD will continue our review of the application and may request additional information.

If you have any questions, please do not hesitate to contact me by phone at (505) 476-3490, mail at the address below, or email at <u>CarlJ.Chavez@state.nm.us</u>. On behalf of the OCD, I wish to thank you and your staff for your cooperation during this discharge permit review process.

Sincerely,

ler. choper,

Carl J. Chávez Environmental Engineer

CJC/cjc

cc: OCD Artesia Office

NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to Water Quality Control Commission Regulations (20.6.2.3106 NMAC) the following discharge permit application(s) has been submitted to the Director of the New Mexico Oil Conservation Division (OCD), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, and Telephone (505) 476-3440:

(UICI-008-0) Navajo Refining Company, L.L.C. Michael G. McKee, Vice President and Refinery Manager, 501 East Main Street, P.O. Box Drawer 159, Artesia New Mexico 88211-0159, has submitted an application for a Class I (non-hazardous) Injection Well Discharge Permit for injection well WDW-3 (API# 30-015-26575) located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The injection well is located approximately 10.5 miles S-SE of the intersection of I-285 and Hwy 82 or approximately 2.75 miles S of Hwy 82 and CR-225. Oil field exempt and non-exempt non-hazardous industrial waste, will be transported about 12 miles underground from the Navajo-Artesia Refinery located at 501 E. Main Street, Artesia, NM via a 6 inch dia. pipeline to WDW-3 for disposal into the Lower Wolfcamp, Cisco, and Canyon Formations in the injection interval from 7660 to 8620 feet (log depth). The injection rate will not exceed 500 gpm at a maximum surface injection pressure of 1530 psig. The injected waste fluid contains approximately 3,400 mg/L total dissolved solids (TDS). Groundwater most likely to be affected by a spill, leak or accidental discharge is at a depth range of between 50 to 150 feet below the ground surface, with a concentration range of between 1500 to 2200 mg/L TDS. The discharge permit addresses well construction, operation, monitoring of the well, associated surface facilities, and provides a contingency plan in the event of accidental spills, leaks, and other accidental discharges in order to protect fresh water.

Any interested person may obtain further information from the OCD and may submit written comments to the Division Director at the address given above. The application and draft permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or may also be viewed at the OCD's web site <u>http://www.emnrd.state.nm.us/ocd/</u>. Persons interested in obtaining a copy of the application and draft permit may contact OCD at the address given above. Prior to ruling on any proposed discharge permit or major modification, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public hearing. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines that there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on available information, including all comments received. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the application along with information submitted at the hearing.

Para obtener más información sobre esta solicitud en espan □ol, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservacio'n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Dorothy Phillips, 505-476-3461).

DONE at Santa Fe, New Mexico, on this 25th day of September 2012.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION Jami Bailey, Director

ł,

DISCHARGE PERMIT UICI-008-0 (WDW-3)

1. GENERAL PROVISIONS:

1.A. PERMITTEE AND PERMITTED FACILITY: The Director of the Oil Conservation Division (OCD) of the Energy, Minerals and Natural Resources Department issues Discharge Permit UICI-008-0 (Discharge Permit) to Navajo Refining Company (Permittee) to operate its Underground Injection Control (UIC) Class I non-hazardous waste injection well (Waste Disposal Well NO. 3 - API No. 30-015-26575) located 790 FSL and 2250 FWL UL: N Section 1, T 18 S, R 27 E, Eddy County, New Mexico at its Disposal Well Facility (Facility). The Facility is located approximately 10.5 miles S-SE o the intersection of I - 285 and Hwy. – 82 or approximately 2.75 miles S of the intersection of Hwy. – 82 and CR-225.

The Permittee is permitted to dispose of only non-hazardous (CRA exempt and RCRA non-hazardous, non-exempt) oil-field waste fluids into its Class I non-hazardous waste injection well. The Permittee may dispose of a maximum of 500 gpm of oil-field waste fluids. Ground water that may be affected by a spill, leak, or accidental discharge occurs at a depth of approximately 50 - 10 feet below ground surface and has a total dissolved solids (TDS) concentration of approximately 1,00 - 2,200 mg/L.

1.B. SCOPE OF PERMIT: OCD has been granted the authority by statute and by delegation from the Water Quality Control Commission (WQCC) to administer the Water Quality Act (Chapter 74, Article 6 NMSA 1978) as it applies to Class I non-hazardous waste injection wells (See Section 74-6-4, 74-6-5 NMSA 1978).

The Water Quality Act and the rules promulgated pursuant to the Act protect ground water and surface water of the State of New Mexico by providing that, unless otherwise allowed by 20.6.2 NMAC, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless such discharge is pursuant to an approved discharge plan (See 20.6.2.3104 NMAC, 20.6.2.3106 NMAC, and 20.6.2.5000 through 20.6.2.5299 NMAC).

This Discharge Permit for a Class I non-hazardous waste injection well is issued pursuant to the Water Quality Act and WQCC rules, 20.6.2 NMAC. This Discharge Permit does not authorize any treatment of, or on-site disposal of, any materials, product, by-product, or oil-field waste, other than non-hazardous oil-field waste fluids into its Class I non-hazardous waste injection well, including, but not limited to, the on-site disposal of lube oil, glycol, antifreeze, washdown water, and cooling tower blowdown water. The Permittee may not dispose of any industrial waste fluid that is not generated in the oil-field. The Ground Water Quality Bureau of the New Mexico Environment Department permits the management of all field industrial fluids that are not generated in the oil-field.

Pursuant to 20.6.2.5004A NMAC, the following underground injection activities are prohibited:

1. The injection of fluids into a motor vehicle waste disposal well is prohibited.

NAVAJO REFINING COMPANY WASTE DISPOSAL WELL NO. 3

2. The injection of fluids into a large capacity cesspool is prohibited.

3. The injection of any hazardous or radioactive waste into a well is prohibited except as provided by 20.6.2.5004A(3) NMAC.

4. Class IV wells are prohibited, except for wells re-injecting treated ground water into the same formation from which it was drawn as part of a removal or remedial action.

5. Barrier wells, drainage wells, recharge wells, return flow wells, and motor vehicle waste disposal wells are prohibited.

This Discharge Permit does not convey any property rights of any sort nor any exclusive privilege, and does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state, federal, or local laws, rules or regulations.

The Permittee shall operate in accordance with the terms and conditions specified in this Discharge Permit to comply with the Water Quality Act and the rules issued pursuant to that Act, so that neither a hazard to public health nor undue risk to property will result (see 20.6.2.3109C NMAC); so that no discharge will cause or may cause any stream standard to be violated (see 20.6.2.3109H(2) NMAC); so that no discharge of any water contaminant will result in a hazard to public health (see 20.6.2.3109H(3) NMAC); so that the numerical standards specified in 20.6.2.3103 NMAC are not exceeded; and, so that the technical criteria and performance standards (see 20.6.2.5000 through 20.6.2.5299 NMAC) for Class I non-hazardous waste injection wells are met. Pursuant to 20.6.2.5003B NMAC, the Permittee shall comply with 20.6.2.1 through 20.6.2.5299 NMAC.

The Permittee shall not allow or cause water pollution, discharge, or release of any water contaminant that exceeds the Water Quality Control Commission (WQCC) standards specified at 20.6.2.3101 NMAC and 20.6.2.3103 NMAC or 20.6.4 NMAC (Water Quality Standards for Interstate and Intrastate Streams). Pursuant to 20.6.2.5101A NMAC, the Permittee shall not inject non-hazardous waste fluids into ground water having 10,000 mg/l or less total dissolved solids (TDS).

The issuance of this permit does not relieve the Permittee from the responsibility of complying with the provisions of the Water Quality Act, any applicable regulations or water quality standards of the WQCC, or any applicable federal laws, regulations or standards (See Section 74-6-5 NMSA 1978).

1.C. DISCHARGE PERMIT RENEWAL: This Discharge Permit is a permit renewal that replaces the permit being renewed. Replacement of a prior permit does not relieve the Permittee of its responsibility to comply with the terms of that prior permit while that permit was in effect.

1.D. DEFINITIONS: Terms not specifically defined in this Discharge Permit shall have the same meanings as those in the Water Quality Act or the rules adopted pursuant to the Act, as the context requires.

NAVAJO REFINING COMPANY WASTE DISPOSAL WELL NO. 3 UICI-008-0 SEPTEMBER 25, 2012

1.E. FILING FEES AND PERMIT FEES: Pursuant to 20.6.2.3114 NMAC, every facility that submits a Discharge Permit application for initial approval or renewal shall pay the permit fees specified in Table 1 and the filing fee specified in Table 2 of 20.6.2.3114 NMAC. OCD has already received the required \$100.00 filing fee. The final \$4,500.00 Class I non-hazardous waste injection well signed permit with check made payable to the "Water Quality Management Fund" shall be submitted to the OC on or before the stipulated time period.

1.F. EFFECTIVE DATE, EXPIRATION, RENEWAL CONDITIONS, AND

15 - 15 A.W.

PENALTIES FOR OPERATING WITHOUT A DISCHARGE PERMIT: This Discharge Permit becomes effective 30 days from the date that the Permittee receives this discharge permit or until the permit is terminated or expires. This Discharge Permit will expire on **August 3**, **2017.** The Permittee shall submit an application for renewal no later than 120 days before that expiration date, pursuant to 20.6.2.5101F NMAC. Aff a Permittee submits a renewal application at least 120 days before the Discharge Permit expires and is in compliance with the approved Discharge Permit, then the existing Discharge Permit will not expire until OCD has approved or disapproved the renewal application. A discharge permit continued under this provision remains fully effective and enforceable. Operating with an expired Discharge Permit may subject the Permittee to civil and/or criminal penalties (See Section 74-6-10.1 NMSA 1978 and Section 74-6-10.2 NMSA 1978).

1.G. MODIFICATIONS AND TERMINATIONS: The Permittee shall notify the OCD Director and the OCD's Environmental Bureau of any Facility expansion, any injection increase above the approved pressure limit or volume limit specified in Permit Condition 3.B.2, or process modification that would result in any significant modification in the discharge of water contaminants (See 20.6.2.3107C NMAC). The OCD Director may require the Permittee to submit a Discharge Permit modification application pursuant to 20.6.2.3109E NMAC and may modify or terminate a Discharge Permit pursuant to Sections 74-6-5(M) through (N) NMSA 1978.

1. If data submitted pursuant to any monitoring requirements specified in this Discharge Permit or other information available to the OCD Director indicate that 20.6.2 NMAC is being or may be violated, then the OCD Director may require modification or, if it is determined by the OCD Director that the modification may not be adequate, may terminate this Discharge Permit for a Class I non-hazardous waste injection well that was approved pursuant to the requirements of this 20.6.2.5000 through 20.6.2.5299 NMAC for the following causes:

...

(a) Noncompliance by Permittee with any condition of this Discharge Permit;

or,

(b) The Permittee's failure in the discharge permit application or during the discharge permit review process to disclose fully all relevant facts, or Permittee's misrepresentation of any relevant facts at any time; or,

(c) A determination that the permitted activity may cause a hazard to public health or undue risk to property and can only be regulated to acceptable levels by discharge
permit modification or termination (See Section 75-6-6 NMSA 1978; 20.6.2.51011 NMAC; and 20.6.2.3109E NMAC).

2. This Discharge Permit may also be modified or terminated for any of the following causes:

(a) Violation of any provisions of the Water Quality Act or any applicable regulations, standard of performance or water quality standards;

(b) Violation of any applicable state or federal effluent regulations or limitations; or

(c) Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge (See Section 75-6-5M NMSA 1978).

1.H. TRANSFER OF CLASS I NON-HAZARDOUS WASTE INJECTION WELL DISCHARGE PERMIT:

1. The transfer provisions of 20:6.2.3111 NMAC do not apply to a discharge permit for a Class I non-hazardous waste injection well.

2. Pursuant to 20.6.2.5101H NMAC, the Permittee may request to transfer its Class I non-hazardous waste injection well discharge permit if:

(a) The OCD Director receives written notice 30 days prior to the transfer

date; and,

(b) The OCD Director does not object prior to the proposed transfer date. OCD may require modifications to the discharge permit as a condition of transfer, and may require demonstration of adequate financial responsibility.

3. The written notice required in accordance with Permit Condition 1.H.2a shall:

(a) Have been signed by the Permittee and the succeeding Permittee, and shall include an acknowledgement that the succeeding Permittee shall be responsible for compliance with the Class I non-hazardous waste injection well discharge permit upon taking possession of the facility; and

(b) Set a specific date for transfer of the discharge permit responsibility, coverage and liability; and

(c) Include information relating to the succeeding Permittee's financial responsibility required by 20.6.2.5210B(17) NMAC.

1.I. COMPLIANCE AND ENFORCEMENT: If the Permittee violates or is violating a condition of this Discharge Permit, OCD may issue a compliance order that requires compliance

immediately or within a specified time period, or assess a civil penalty, or both (See Section 74-6-10 NMSA 1978). The compliance order may also include a suspension or termination of this Discharge Permit. OCD may also commence a civil action in district court for appropriate relief, including injunctive relief (See Section 74-6-10(A)(2) NMSA 1978). The Permittee may be subject to criminal penalties for discharging a water contaminant without a discharge permit or in violation of a condition of a discharge permit; making any false material statement, representation, certification or omission of material fact in a renewal application, record, report, plan or other document filed, submitted or required to be maintained under the Water Quality Act; falsifying, tampering with or rendering inaccurate any monitoring device, method or record required to be maintained under the Water Quality Act; or failing to monitor, sample or report as required by a Discharge Permit issued pursuant to a stateor federal law or regulation (See Section 74-6-10.2 NMSA 1978).

2. GENERAL FACILITY OPERATIONS

2.A. QUARTERLY MONITORING REQUIREMENTS FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELL: Pursuant to 20.6.2.5207B, the Permittee shall provide analysis of the injected fluids in the annual report to yield data representative of fluid characteristics.

That permit authorizes the Permittee to accept only oil-field wastes that are exempt from RCRA Subtitle C regulations and that do not contain Naturally Occurring Radioactive Material regulated pursuant to 20.3.1.1403 (NORM) and non-hazardous, non-exempt oil-field wastes that do not contain NORM. The Permittee is authorized to accept non-hazardous, non-exempt oil-field wastes on a case-by-case basis only after a hazardous waste determination is made by the generator. The Permittee is authorized to accept non-hazardous, non-exempt oil-field wastes only if those wastes are accompanied by an approved form C-138 (Request for Approval to Accept Solid Waste) and a "Generator Certificate of Waste Status," signed by the generator. The OCD Permit requires the Permittee to determine by analyzing the non-hazardous, non-exempt fluids that the waste fluids are non-hazardous before disposal or injection of the waste fluid into its Class I non-hazardous waste injection well.

The Permittee shall analyze the injected fluids quarterly for the following characteristics:

- pH;
- Eh;
- Specific conductance;
- Specific gravity;
- Temperature; and,
- General ground water quality parameters (general chemistry/cations and anions, including: fluoride, calcium, potassium, magnesium, sodium bicarbonate, carbonate, chloride, sulfate, total dissolved solids, cation/anion balance, pH, and bromide using the methods specified in 40 CFR 136.3.
- Aromatic and halogenated volatile hydrocarbon scan by EPA Method 8260C GC/MS. Semi-volatile Organics GC/MS EPA Method 8270B including 1 and 2methylnaphthalene.

- Heavy metals using the ICP scan (EPA Method 6010) and Arsenic and Mercury using atomic absorption (EPA Methods 7060 and 7470).
- EPA RCRA Characteristics for Ignitability, Corrosivity and Reactivity (40 CFR part 261 Subpart C Sections 261.21 261.23, July 1, 1992).

2.B. CONTINGENCY PLANS: The Permittee shall implement its proposed contingency plan(s) included in its Permit Renewal Application to cope with failure of a system(s) in the Discharge Permit.

2.C. CLOSURE: Prior to closure of the facility, the Permittee shall submit for OCD's approval, a closure plan including a completed form C-103 for plugging and abandonment of the disposal well. The Permittee shall plug and abandon its Class I non-hazardous waste injection well pursuant to 20.6.2.5209 NMAC and as specified in Permit Condition 2.D.

1. Pre-Closure Notification: Pursuant to 20.6.2.5005A NMAC, the Permittee shall submit a pre-closure notification to OCD's Environmental Bureau at least 30 days prior to the date that it proposes to close or to discontinue operation of its Class I non-hazardous waste injection well. Pursuant to 20.6.2.5005B NMAC, OCD's Environmental Bureau-must approve all proposed well closure activities before the Permittee may implement its proposed closure plan.

2. Required Information: The Permittee shall provide OCD's Environmental Bureau with the following information:

- Name of facility;
- Address of facility;
- Name of Permittee;
- Address of Permittee;
- Contact person;

Phone number;

- Number and type of well(s);
- Year of well construction;
- Well construction details;
- Type of discharge;
- Average flow (gallons per day);
- Proposed well closure activities (*e.g.*, sample fluids/sediment, appropriate disposal of remaining fluids/sediments, remove well and any contaminated soil, clean out well, install permanent plug, conversion to other type of well, ground water and vadose zone investigation; other);
- Proposed date of well closure;
- Name of Preparer; and,
- Date.

2.D. PLUGGING AND ABANDONMENT PLAN: Pursuant to 20.6.2.5209A NMAC, when the Permittee proposes to plug and abandon its Class I non-hazardous waste injection well, it shall submit to OCD a plugging and abandonment plan that meets the requirements of

20.6.2.3109C NMAC, 20.6.2.5101C NMAC, and 20.6.2.5005 NMAC for protection of ground water. If requested by OCD, Permittee shall submit for approval prior to closure, a revised or updated plugging and abandonment plan. The obligation to implement the plugging and abandonment plan as well as the requirements of the plan survives the termination or expiration of this Discharge Permit. The Permittee shall comply with 20.6.2.5209 NMAC.

2.E. RECORD KEEPING: The Permittee shall maintain records of all inspections required by this Discharge Permit at its Facility office for a minimum of five years and shall make those records available for inspection by OCD.

2.F. RELEASE REPORTING: The Permittee shall comply with the following permit conditions, pursuant to 20.6.2.1203 NMAC, if it determines that a release of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, has occurred. The Permittee shall report unauthorized releases of water contaminants in accordance with any additional commitments made in its approved Contingency Plan. If the Permittee determines that any constituent exceeds the standards specified at 20.6.2.3103 NMAC, then it shall report a release to OCD is Environmental Bureau.

1. Oral Notification: As soon as possible after learning of such a discharge, but in no event more than twenty-four (24) hours thereafter; the Permittee shall notify OCD's Environmental Bureau. The Permittee shall provide the following:

- The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility;
- The name and location of the facility;
- The date, time, location, and duration of the discharge;

• The source and cause of discharge;

- A description of the discharge, including its chemical composition;
- The estimated volume of the discharge; and,
- Any corrective or abatement actions taken to mitigate immediate damage from the discharge.

2. Written Notification: Within one week after the Permittee has discovered a discharge, the Permittee shall send written notification (may use a form C-141 with attachments) to OCD's Environmental Bureau verifying the prior oral notification as to each of the foregoing items and providing any appropriate additions or corrections to the information contained in the prior oral notification.

The Permittee shall provide subsequent written reports as required by OCD's Environmental Bureau.

2.G. OTHER REQUIREMENTS:

1. Inspection and Entry: Pursuant to Section 74-6-9 NMSA 1978 and 20.6.2.3107A NMAC, the Permittee shall allow any authorized representative of the OCD Director, to:

- Upon the presentation of proper credentials, enter the premises at reasonable times;
- Inspect and copy records required by this Discharge Permit;
- Inspect any treatment works, monitoring, and analytical equipment;
- Sample any effluent before or after discharge; and,
- Use the Permittee's monitoring systems and wells in order to collect samples.

2. Advance Notice: The Permittee shall provide OCD's Environmental Bureau and Artesia District Office with at least five (5) working days advance notice of any environmental sampling to be performed pursuant to this Discharge Permit, or any well plugging, abandonment or decommissioning of any equipment associated with its Class I non-hazardous waste injection well.

3. Environmental Monitoring: The Permittee shall ensure that any environmental sampling and analytical laboratory data collected meets the standards specified in 20.6.2.3107B NMAC. The Permittee shall ensure that all environmental samples are analyzed by an accredited "National Environmental Laboratory Accreditation Conference" (NELAC) Laboratory. The Permittee shall submit data summary tables, all raw analytical data, laboratory Quality Assurance/Quality Control (QA/QC), and Data Quality Objectives (DQOs).

2.H. BONDING OR FINANCIAL ASSURANCE: Pursuant to 20.6.2.5210B(17) NMAC, the Permittee shall maintain at a minimum, a single well plugging bond in the amount that it shall determine, in accordance with Permit Condition 5.B, to cover potential costs associated with plugging and abandonment of the Class I non-hazardous waste injection well, surface restoration, and post-operational monitoring, as may be needed. OCD may require additional financial assurance to ensure adequate funding is available to plug and abandon the well and/or for any required corrective actions.

Methods by which the Permittee shall demonstrate the ability to undertake these measures shall include submission of a surety bond or other adequate assurances, such as financial statements or other materials acceptable to the OCD Director, such as: (1) a surety bond; (2) a trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary; (3) a non-renewable letter of credit made out to the State of New Mexico; (4) liability insurance specifically covering the contingencies listed in this paragraph; or (5) a performance bond, generally in conjunction with another type of financial assurance. If an adequate bond is posted by the Permittee to a federal or another state agency, and this bond covers all of the measures specified above, the OCD Director shall consider this bond as satisfying the bonding requirements of Sections 20.6.2.5000 through 20.6.2.5299 NMAC wholly or in part, depending upon the extent to which such bond is adequate to ensure that the Permittee will fully perform the measures required herein above.

2.I. ANNUAL REPORT: The Permittee shall submit its annual report pursuant to 20.6.2.3107 NMAC to OCD's Environmental Bureau by **June 1**st of the following year. The annual report shall include the following:

- Cover sheet marked as "Annual Class I Non-Hazardous Waste Injection Well, Name of Permittee, Discharge Permit Number, API number of well, date of report, and person submitting report;
- Summary of Class I non-hazardous waste injection well operations for the year including a description and reason for any remedial or major work on the well with a copy of form C-103(s);
- Monthly injection/disposal volume, including the cumulative total should be carried over to each year;
- Maximum and average injection pressures;
- A copy of the quarterly chemical analyses shall be included with data summary with all QA/QC and DQO information;
- Copy of any mechanical integrity test chart(s), including the type of test, *i.e.*, duration, gauge pressure, *etc.*;
- Copy falloff test charts;
- Summary tables listing environmental analytical laboratory data for quarterly waste fluid samples. Any 20.6.2.3103 NMAC constituent(s) found to exceed a water quality standard shall be highlighted and noted in the annual report. The Permittee shall include copies of the most recent year's environmental analytical laboratory data sheets with QA/QC summary sheet information in conformance with the National Environmental Laboratory Accreditation Conference (NELAC) and EPA Standards;
- Brief explanation describing deviations from the normal injection operations;
- Results of any leaks and spill reports (include any C-141 reports);
- An Area of Review (AOR) annual update summary;
- A summary with interpretation of MITs, Falloff Tests, *etc.*, with conclusion(s) and recommendation(s);
- Records of the expansion tank monitoring pressure, fluid removals and/or additions indicating the well MIT condition.
- A summary of all major facility activities or events, which occurred during the year with any conclusions and recommendations;
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken;
- A summary of any new discoveries of ground water contamination with all leaks, spills and releases and corrective actions taken; and
- The Permittee shall file its Annual Report in an electronic format with a hard copy submittal to OCD's Environmental Bureau.

3. CLASS I NON-HAZARDOUS WASTE INJECTION WELL OPERATIONS:

3.A. OPERATING REQUIREMENTS: The Permittee shall comply with the operating requirements specified in 20.6.2.5206A NMAC and 20.6.2.5206B NMAC to ensure that:

1. The maximum injection pressure at the wellhead shall not initiate new fractures or propagate existing fractures in the confining zone, or cause the movement of injection or formation fluids into ground water containing 10.000 mg/l or less TDS except for fluid movement approved pursuant to 20.6.2.5103 NMAC.

2. Injection between the outermost casing and the well bore is prohibited in a zone other than the authorized injection zone. If the Permittee determines that its Class I nonhazardous waste injection well is discharging or suspects that it is discharging fluids into a zone or zones other than the permitted injection zone specified in Permit Condition 3.B.1., then the Permittee shall within 24 hours notify OCD's Environmental Bureau and Artesia District Office of the circumstances and action(s) taken. The Permittee shall cease operations until proper repairs are made and it has received approval from OCD to re-start injection operations.

Except during well stimulation, the maximum injection pressure shall not initiate 3. new fractures or propagate existing fractures in the injection zone;

The annulus between the tubing and the long string of casing shall be filled with a 4. fluid approved by the OCD Director and a pressure, also approved by the OCD Director shall be maintained on the annulus.

3.B. **INJECTION OPERATIONS:**

Injection Formation, Interval, and Wastewater: The Permittee shall inject 1. only non-hazardous (RCRA exempt and RCRA non-hazardous, non-exempt) oil-field waste fluid into the Lower Wolfcamp, Cisco and Canyon Formations from 7,660 feet to 8,620 feet in its Class I non-hazardous waste injection well. The surface casing is set at 400 feet; first intermediate casing is set at 2,604 feet; second intermediate casing or production casing is set at 9,450 feet; tubing is set at approximately 7,568 feet; and packer is set at 7,575 feet. A cement plug is set at 9,022 feet within the production casing, which isolates the injection well from a previous deeper completed production liner set at 10,119 feet. The Permittee shall ensure that the injected waste fluid enters perorations only within the above specified injection interval and is no permitted to escape through the cement plug and/or to other formations or onto the surface.

2. Well Injection Pressure Limits and Injection Flow Rate: The Permittee shall ensure that the maximum wellhead or surface injection pressure on its Class I non-hazardous waste injection well shall not exceed 1,530 psig and that the injection flow rate shall not exceed 500 gpm.

3. Pressure Limiting Device: The Permittee shall equip and operate its Class I non-hazardous waste injection well or system with a pressure limiting device, or equivalent (i.e., Murphy switch), in working condition, which shall, at all times, limit surface injection pressure to the maximum allowable pressure for its Class I non-hazardous waste injection well.

The Permittee shall monitor the pressure-limiting device daily and shall report all pressure exceedances within 24 hours of detecting an exceedance to OCD's Environmental Bureau. The Permittee shall take all steps necessary to ensure that the injected waste fluids enter only the

proposed injection interval and is not permitted to escape to other formations or onto the ground surface. The Permittee shall report to OCD's Environmental Bureau within 24 hours of discovery any indication that new fractures or existing fractures have been propagated, or that damage to the well, the injection zone, or formation has occurred.

OCD may authorize a proposed increase in surface injection pressure if the Permittee performs a valid Step-Rate Test (SRT), which demonstrates that the proposed injection pressure is below the injection zone fracture pressure with an acceptable factor of safety. If approvable, the Permittee must obtain a modification to this Discharge Permit pursuant to 20.6.2.3109 NMAC.

3.C. CONTINUOUS MONITORING DEVICES: The Permittee shall use continuous monitoring devices to provide a record of injection pressure, flow rate, flow volume, and pressure on the annulus between the tubing and the long string of casing.

3.D. MECHANICAL INTEGRITY FOR CLASS I NON-HAZARDOUS WASTE INJECTION WELLS:

1. Pursuant to 20.6.2.5204 NMAC, the Permittee shall conduct a mechanical integrity test (MIT) for its Class I non-hazardous waste injection well at least once every five years or more frequently as the OCD Director may require for good cause during the life of the well. The Permittee shall submit an OCD C-103 form for signature approval of specified MIT by the OCD Environmental Bureau with copy to the OCD Artesia Office; and after any well repairs are made, submit 30-days of corrective action(s) follow-up sundry form documentation of corrective action(s). The Permittee may seek MIT guidance from the OCD in advance of Sundry form submittals to facilitate approval of MIT field method(s). The Permittee shall notify OCD's Environmental Bureau 5 days prior to conducting any MIT to allow OCD the opportunity to witness the MIT.

An MIT shall also be conducted after well workovers, i.e., when tubing is pulled and/or after packer reseating. The Permittee shall conduct a casing-tubing annulus MIT from the surface to the approved injection depth to assess casing and tubing integrity. The MIT shall consist of a 30-minute test at a minimum pressure of 300 psig measured at the surface.

A Class I non-hazardous waste injection well has mechanical integrity if there is no detectable leak in the casing, tubing or packer which exceeds OCD Underground Injection Control Program Mechanical Integrity Test (MIT) "Pass/Fail" criteria.

2. The following criteria will determine if the Class I non-hazardous waste injection well has passed the MIT:

a. <u>Passes</u> if zero bleed-off during the test;

b. <u>Passes</u> if recorded well pressure fall-off curve shows end point stabilization or equilibrium within $\pm 10\%$ of the start pressure before end of test, when approved by an OCD inspector;

c. <u>Fails</u> if any final test pressure is greater than $\pm 10\%$ of starting pressure fall-off curve does not stabilize or equilibrate within $\pm 10\%$ of start pressure before the end of test. The

Permittee shall investigate for leaks and demonstrate the mechanical integrity of the well by ensuring that there are no leaks in the tubing, casing or packer, and injected or produced fluids are confined within the well piping and injection zone(s). The Permittee shall not resume injection operations until approved by OCD.

d. When the MIT is not witnessed by OCD and fails, the Permittee shall notify OCD within 24 hours of the failure of the MIT.

3. Pursuant to 20.6.2.5204C NMAC, the OCD Director may consider the use by the Permittee of equivalent alternative test methods to determine mechanical integrity. The Permittee shall submit information on the proposed test and all technical data supporting its use. The OCD Director may approve the Permittee's request if it will reliably demonstrate the mechanical integrity of the well for which its use is proposed.

4. Pursuant to 20.6.2.5204D NMAC, when conducting and evaluating the MIT(s), the Permittee shall apply methods and standards generally accepted in the oil and gas industry. When the Permittee reports the results of all MIT(s) to the OCD Director, it shall include a description of the test(s), the method(s) used, and the test results.

5. The Permittee shall conduct a Bradenhead test at least annually and each time that it conducts a MIT.

3.E. FALLOFF TEST: The Permittee shall conduct a Falloff Test (FOT) to monitor the injection zone formation characteristics and pressure buildup over time in the injection zone at least every three years. The Permittee shall request FOT approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Artesia District Office.

The Permittee shall run a FOT to determine what changes have occurred in the injection zone over time. The Permittee shall submit the results of its Fall-Off Test to OCD's Environmental Bureau and Artesia District Office within 30 days of completion. The Permittee shall implement its OCD approved FOT Plan when conducting a FOT.

3.F. WELL WORKOVER OPERATIONS: Pursuant to 20.6.2.5205A(5) NMAC, the Permittee shall provide notice to and shall obtain approval from OCD's Environmental Bureau prior to commencement of any remedial work or any other workover operations to allow OCD the opportunity to witness the operation. The Permittee shall request approval using form C-103 (Sundry Notices and Reports on Wells) with copies sent to OCD's Environmental Bureau and Artesia District Office.

3.G. EXTERNAL EXPANSION TANK: The Permittee shall equip its Class I nonhazardous waste injection well with an external expansion tank (tank) system under constant 100 psig pressure connected to the casing-annulus. The Permittee shall fill the external expansion tank half-full (250 gallon expansion tank) with an OCD-approved liquid to establish an equilibrium volume and liquid level. The Permittee shall monitor the liquid levels in the external expansion tank at least weekly and shall record all additions or removals of liquids into or out of the external expansion tank. The Permittee shall record any loss or gain of fluids in the external

expansion tank, and if significant, report the loss or gain to OCD's Environmental Bureau. The Permittee shall record the weekly expansion tank volume fluid volumes readings and the fluid volume additions or removals from the expansion tank on a quarterly basis or in the annual report. Any natural loss of fluid above 5 bbl. per month requires notification to the OCD within 5 days after having knowledge of loss. Any gain of packer fluid requires notification similar to previous sentence above. Any notifications with agency verbal approvals must be followed by submittal of OCD C-103 form with notice of intent for signature approval of specified corrective action(s) by the OCD; and after any well repairs are made, submit 30-days of corrective action(s) follow-up Sundry Form documentation of corrective action(s) to the OCD Environmental Bureau.

3.H. INJECTION RECORD VOLUMES AND PRESSURES: The Permittee shall submit quarterly reports of its injection operations and well workovers. The Permittee shall record the minimum, maximum, average flow waste injection volumes (including total volumes) and annular pressures of the injected waste fluids on a monthly basis, and shall submit the data to OCD on a quarterly basis or in the annual report. The Permittee shall fill the casing-tubing annulus with an OCD-approved liquid and install a Murphy pressure switch or equivalent, as described in the Permittee's permit renewal application, in order to detect leakage in the casing, tubing, or packer.

3.I. AREA OF REVIEW (AOR): The Permittee shall report within 72 hours of discovery any new wells, conduits, or any other device that penetrates or may penetrate the injection zone within a 1-mile radius from its Class I non-hazardous waste injection well.

4. CLASS V WELLS: Pursuant to 20.6.2.5002B NMAC, leach fields and other waste fluids disposal systems that inject non-hazardous fluid into or above an underground source of drinking water are UIC Class V injection wells. This Discharge Permit does not authorize the use of a Class V injection well for the disposal of industrial waste. Pursuant to 20.6.2.5005 NMAC, the Permittee shall close any Class V industrial waste injection well that injects non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes (*e.g.*, septic systems, leach fields, dry wells, *etc.*) within 90 calendar days of the issuance of this Discharge Permit. The Permittee shall document the closure of any Class V wells used for the disposal of non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes other than contaminated ground water in its Annual Report. Other Class V wells, including wells used only for the injection of domestic wastes, shall be permitted by the New Mexico Environment Department.

5. SCHEDULE OF COMPLIANCE:

5.A. ANNUAL REPORT: The Permittee shall submit its annual report to OCD by June 1st of each year.

5.B. BONDING OR FINANCIAL ASSURANCE: The Permittee shall submit an estimate of the minimum cost to properly close, plug and abandon its Class I non-hazardous waste injection well, conduct ground water restoration if applicable, and any post-operational monitoring as may be needed within 90 days of permit issuance (See 20.6.2.5210B(17) NMAC).

The Permittee's cost estimate shall be based on third person estimates. After review, OCD will require the Permittee to submit a single well plugging bond based on the third person cost estimate.



Chavez, Carl J, EMNRD

From:Chavez, Carl J, EMNRDSent:Wednesday, August 08, 2012 8:05 AMTo:'Schultz, Michele'; Holder, MikeCc:VonGonten, Glenn, EMNRDSubject:RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public
Notice Communique (20.6.2.3108 NMAC)

Micki:

The documents in English and Spanish look good.

Yes, when OCD deems your application to be "administratively complete", this marks the start of the public notice process for Navajo Refining Company and the OCD.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

From: Schultz, Michele [mailto:Michele.Schultz@hollyfrontier.com]
Sent: Wednesday, August 08, 2012 7:56 AM
To: Holder, Mike; Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl – I have attached the final version of the Public Notice as agreed upon previously, plus its Spanish translation, to complete our application submittal. I understand that I should wait for a written notice from your department that our application is administratively complete before beginning the actual public notice process. I will begin once I receive your notice.

Thanks!

Micki Schultz, P.E., CHMM Environmental Specialist, Water and Waste Programs Navajo Refining Company 575-746-5281 (office) 575-308-2141 (cell) <u>micki.schultz@hollyfrontier.com</u> From: Holder, Mike
Sent: Tuesday, August 07, 2012 7:03 AM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Holder, Mike; Schultz, Michele
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Thanks Carl - we have the flow chart and I have Subsurface preparing the translation so we can get everything to you.

Thanks! Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, August 07, 2012 7:00 AM
To: Holder, Mike
Cc: VonGonten, Glenn, EMNRD
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Good morning. I have submitted the draft permit to Glenn von Gonten (Acting Bureau Chief) who is coordinating with Sonny Swazo (Asst. to Gen. Counsel) who are responsible for the recent major changes to the Discharge Permits for the OCD.

Once they have completed their review and modifications to my draft permit, they will direct me to initiate the "Administrative Complete" process. Let me know if you need the flow-charts for the public notice process (20.6.2.3108 NMAC), once the OCD officially deems your application to be administratively complete.

Please contact me if you have questions. Thank you for your cooperation.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/</u>environmental.htm#environmental

From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Monday, August 06, 2012 7:12 AM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl – we've accepted all the changes and are having the translation done. Once complete we'll resubmit. Thanks for all your help.

Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Thursday, August 02, 2012 9:03 AM
To: Holder, Mike
Cc: VonGonten, Glenn, EMNRD
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Please find my final comments for your consideration.

Let me know if you accept, and submit the final draft (English and Spanish) to me for the OCD "Admin. Complete" review records.

This may mark the start of the start of the "Admin. Complete" review process. I have submitted a draft permit and associated documents to Glenn in preparation of the "Admin. Complete" process.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Wednesday, July 25, 2012 5:05 PM
To: Chavez, Carl J, EMNRD
Cc: Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl – see attached for revisions. I added a single sentence paragraph to provide additional detail on wastewater treatment plant influents and revised the attached figure to show that both process water & storm water flow to the WWTP. I double checked and the storm water (rain) that falls on the process units is captured in the process sewers and routed to the WWTP for treatment. We do have the 2nd RO unit installed and it is parallel to the first unit. They use the same discharge point (i.e., no new discharge point). Thanks for your help and look forward to hearing form you Tuesday.

Thanks, Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 25, 2012 2:09 PM
To: Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Please find attached suggested language in Navajo Refining Company's (NRC) Public Notice.

I am also attaching NRC's 2007 Public Notice because it reads well; however, NRC's most current draft does not conform very much to it. So, I have added some language. I struggled with inserting the 20.6.2.3108(F)(3) NMAC provision into the text.

Please contact me to discuss. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Wednesday, July 25, 2012 12:51 PM
To: Chavez, Carl J, EMNRD
Cc: Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl - let me know if this clears it up. I revised to make consistent w/OCD's and previous PNs.

Thanks, Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us] Sent: Wednesday, July 25, 2012 9:50 AM To: Holder, Mike Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Please find attached my final draft public notice.

Navajo's draft is a little confusing on the depth interval of injection. Consequently, I have attached Navajo's 2007 public notice to see if Navajo would like to stick with this type of format, text, language and the interval depth, etc. that is consistent with the OCD and the application well construction diagram?

Please contact me if you have questions.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental</u>

From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Wednesday, July 25, 2012 6:51 AM
To: Chavez, Carl J, EMNRD
Cc: Holder, Mike; Jerry Taylor; Schultz, Michele
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl – please see attached revised public notice per our discussion and let us know if you have any additional thoughts. Once we have your concurrence we'll provide the Spanish version. I've also attached the backup for the TDS levels presented in the notice (from the 2003 application).

Thanks for your help, Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Tuesday, July 24, 2012 8:18 AM
To: Schultz, Michele
Cc: Holder, Mike; Lackey, Johnny; VonGonten, Glenn, EMNRD
Subject: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Micki:

Good morning.

The OCD completed its preliminary review for "Administrative Completeness" of the above subject application last week.

The OCD is focused on the Appendix "O" Public Notice (PN) in the application. The public notice does not appear to satisfy all of the applicable conditions of 20.6.2.3108 NMAC (see attachments) and new information changes appear to be needed from past PNs based on more comprehensive information submitted in the application.

Please find attached the OCD flow charts for PN Renewal Applications and the OCD's draft PN with information on water quality, depth to the ground water, etc. that appears to be missing and/or not reflected in the public notice. Also, the Spanish version is absent. New information has changed (i.e., the injection interval, depth to GW, water quality updated info., etc.) as reflected in the OCD's draft PN.

Please contact me to discuss on or before 5 working days and resubmit your draft public notice to the OCD for approval or comment to ensure the information is accurate when disseminated to the public. This will need to be satisfied before OCD may deem the application to be administratively complete.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u>

Website: http://www.emnrd.state.nm.us/ocd/

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PUBLIC NOTICE

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

In accordance with 20.6.2.3108.F NMAC, Navajo Refining Company, L.L.C. hereby gives public notice of its application to renew the New Mexico Oil Conservation Division (OCD) discharge permit to inject treated non-hazardous waste water effluent from the refinery's on-site wastewater treatment plant into a Class I (nonhazardous) injection well WDW-3 (API# 30-015-26575). The WDW-3 is located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The WDW-3 is located approximately 14 miles E-SE of the intersection of I-285 and Hwy 82 (Artesia Refinery) or approximately 2.75 miles S of Hwy 82 and CR-225. The Artesia Refinery is located at 501 E. Main Street, Artesia, New Mexico.

Waste water from the refinery is generated from the treatment of waters from the processing of crude oil, including the removal of water entrained in crude oil, the washing of crude oil to remove salts and sediment, water used for heating and cooling during refining, boiler blowdown, and stormwater collected from process portions of the refinery.

Underground injection at WDW-3 occurs within the Lower Wolfcamp, Cisco and Canyon Formations within the injection interval from 7,660 to 8,620 feet (log depth). The injection rate into WDW-3 will not exceed 500 gpm and the maximum allowable surface injection pressure of 1530 psig. The injected refinery waste water quality is approximately 3,400 mg/L total dissolved solids (TDS). Formation fluids within the permitted injection interval exceed 10,000 mg/L TDS. Groundwater is first encountered in the area of WDW-3 at a depth range of approximately 50 to 150 feet below land surface. The groundwater quality ranges from about 1,500 to 2,200 mg/L TDS.

Persons interested in obtaining further information, submitting comments, or requesting to be on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the New Mexico Oil Conservation Division.

Comments and inquiries on regulations should be directed to:

Director New Mexico Oil Conservation Division 1220 South St. Francis Drive Santa Fe, New Mexico 87505 Telephone: (505) 476-3440

When corresponding, please reference the name of the applicant and the well name.

AVISO PUBLICO ESTADO DE NUEVO MEXICO DEPARTMENTO DE ENERGIA, MINERALES Y RECURSOS NATURALES DIVISION DE CONSERVACION DE PETROLEO

Por medio de la presente, Navajo Company anuncia que de conformidad con los requisitos de las regulaciones de la Comisión de Control de Calidad del Agua de Nuevo México 20.6.2.3108.F NMAC, a la División de Conservación del Petróleo de Nuevo México (NMOCD) . Departamento del Medio Ambiente, un permiso de descarga para la inyección aguas residuales de la planta Artesia de Navajo Refining Company, en el pozo de inyección de denominación WDW-3 (API#30-015-26575). El pozo WDW-3 esta localizado en SE/4, SW/4 de Sección 1, Municipio 18 sur, Condado Eddy , Nuevo México. El WDW-3 está localizado aproximadamente a 14 millas E-SE de la intersección de I-285 y Hwy 82 (Refinería Artesia), o aproximadamente 2.75 millas S de Hwy. 82 y CR-225. La Refinería Artesia se encuentra ubicada en 501 E. Main Street, Artesia, Nuevo México.

La generación de aguas residuals de la Refinería Artesia es el resultado del agua que se encuentran en al abastecimiento de crudo, el agua que se usa para el enfriamiento y calentamiento, el agua que se usa para retirar las sales del abastecimiento de crudo, y para purgar la caldera.

Las aguas residuals de WDW-3 se injectarán hacia las formaciones de Lower Wolfcamp, Cisco Y Canyon, ubicadas entre 7,660 y 8,620 pies (produndidad de registro). La tasa de inyección de WDW-3 no excederá los 500 gpm a una presión de inyección que no excederá los 1530 psig. Estas aguas residuals tendrán un contendido de total de sólidos disueltos (TDS) de 3,400 partes por millón. En el área en donde se encuentra el pozo (WDW-3), el agua subterránea se encuentra a una profundidad de 50 a 150 pies con un TDS de 1,500 a 2,200 partes por millón.

Personas interesadas en obtener mayores informes, presentar sus comentarios o solicitar que se les incluya en las listas de direcciones de una planta en especial para futuros avisos pueden ponerse en contacto con el Jefe del Departamento del Medio Ambiente de la División de Conservación de Petróleo de Nuevo México.

Por favor enviar comentarios y preguntas a: Director New Mexico Oil Conservation Division 1220 South St. Francis Drive Santa Fe, New Mexico 87505 Teléfono: (505) 476-3440

Por favor incluir como referencia el nombre del applicante y denominación del pozo.

Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Tuesday, August 07, 2012 7:00 AM
То:	'Holder, Mike'
Cc:	VonGonten, Glenn, EMNRD
Subject:	RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Good morning. I have submitted the draft permit to Glenn von Gonten (Acting Bureau Chief) who is coordinating with Sonny Swazo (Asst. to Gen. Counsel) who are responsible for the recent major changes to the Discharge Permits for the OCD.

Once they have completed their review and modifications to my draft permit, they will direct me to initiate the "Administrative Complete" process. Let me know if you need the flow-charts for the public notice process (20.6.2.3108 NMAC), once the OCD officially deems your application to be administratively complete.

Please contact me if you have questions. Thank you for your cooperation.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/</u>environmental.htm#environmental

From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Monday, August 06, 2012 7:12 AM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl – we've accepted all the changes and are having the translation done. Once complete we'll resubmit. Thanks for all your help.

Mike

From: Chavez, Carl J, EMNRD [mailto:Carl].Chavez@state.nm.us]
Sent: Thursday, August 02, 2012 9:03 AM
To: Holder, Mike
Cc: VonGonten, Glenn, EMNRD
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Please find my final comments for your consideration.

Let me know if you accept, and submit the final draft (English and Spanish) to me for the OCD "Admin. Complete" review records.

This may mark the start of the start of the "Admin. Complete" review process. I have submitted a draft permit and associated documents to Glenn in preparation of the "Admin. Complete" process.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Wednesday, July 25, 2012 5:05 PM
To: Chavez, Carl J, EMNRD
Cc: Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl – see attached for revisions. I added a single sentence paragraph to provide additional detail on wastewater treatment plant influents and revised the attached figure to show that both process water & storm water flow to the WWTP. I double checked and the storm water (rain) that falls on the process units is captured in the process sewers and routed to the WWTP for treatment. We do have the 2nd RO unit installed and it is parallel to the first unit. They use the same discharge point (i.e., no new discharge point). Thanks for your help and look forward to hearing form you Tuesday.

Thanks, Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us] Sent: Wednesday, July 25, 2012 2:09 PM To: Holder, Mike Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Mike:

Please find attached suggested language in Navajo Refining Company's (NRC) Public Notice.

I am also attaching NRC's 2007 Public Notice because it reads well; however, NRC's most current draft does not conform very much to it. So, I have added some language. I struggled with inserting the 20.6.2.3108(F)(3) NMAC provision into the text.

Please contact me to discuss. Thank you.

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Cc:	VonGonten, Glenn, EMNRD
Subject:	RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)
Attachments:	UICI-8-0 Navajo PN CJC 8-2-2012.doc

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Let me know if you accept, and submit the final draft (English and Spanish) to me for the OCD "Admin. Complete" review records.

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From: Holder, Mike [mailto:Mike.Holder@hollyfrontier.com]
Sent: Wednesday, July 25, 2012 12:51 PM
To: Chavez, Carl J, EMNRD
Cc: Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Carl - let me know if this clears it up. I revised to make consistent w/OCD's and previous PNs.

Thanks, Mike

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, July 25, 2012 9:50 AM
To: Holder, Mike
Subject: RE: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

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Please find attached my final draft public notice.

Navajo's draft is a little confusing on the depth interval of injection. Consequently, I have attached Navajo's 2007 public notice to see if Navajo would like to stick with this type of format, text, language and the interval depth, etc. that is consistent with the OCD and the application well construction diagram?

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Cc: Holder, Mike; Jerry Taylor; Schultz, Michele
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Carl – please see attached revised public notice per our discussion and let us know if you have any additional thoughts. Once we have your concurrence we'll provide the Spanish version. I've also attached the backup for the TDS levels presented in the notice (from the 2003 application).

Thanks for your help, Mike

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To: Schultz, Michele
Cc: Holder, Mike; Lackey, Johnny; VonGonten, Glenn, EMNRD
Subject: Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public Notice Communique (20.6.2.3108 NMAC)

Micki:

Good morning.

The OCD completed its preliminary review for "Administrative Completeness" of the above subject application last week.

The OCD is focused on the Appendix "O" Public Notice (PN) in the application. The public notice does not appear to satisfy all of the applicable conditions of 20.6.2.3108 NMAC (see attachments) and new information changes appear to be needed from past PNs based on more comprehensive information submitted in the application.

Please find attached the OCD flow charts for PN Renewal Applications and the OCD's draft PN with information on water quality, depth to the ground water, etc. that appears to be missing and/or not reflected in the public notice. Also, the Spanish version is absent. New information has changed (i.e., the injection interval, depth to GW, water quality updated info., etc.) as reflected in the OCD's draft PN.

Please contact me to discuss on or before 5 working days and resubmit your draft public notice to the OCD for approval or comment to ensure the information is accurate when disseminated to the public. This will need to be satisfied before OCD may deem the application to be administratively complete.

Thank you.

New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental</u>

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PUBLIC NOTICE

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

In accordance with 20.6.2.3108.F NMAC, Navajo Refining Company, L.L.C. hereby gives <u>public</u>_notice of its application to renew <u>a</u>_<u>the</u> <u>New Mexico Oil Conservation</u> <u>Division (OCD) discharge permit to inject treated non-hazardous waste water effluent</u> from the refinery's on-site wastewater treatment plant <u>refinery oilfield waste water from</u> <u>the Artesia Refinery reverse osmosis unit, boiler feed, and process units (Per 20.6.2.3108(F)(3))</u> ground water discharge permit for into a Class I (nonhazardous) injection well WDW-3 (API# 30-015-26575). The well-WDW-3 is located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The well-WDW-3 location__is located approximately 10.514 miles SE-SE of the intersection of I-285 and Hwy 82 (Artesia Refinery) or approximately 2.75 miles S of Hwy 82 and CR-225 or approximately 14 miles southeast of the Navajo Refining Company, LLC petroleum refining facility. The discharge results from the operation of Navajo's_Artesia Refinery is located at 501 E. Main Street, Artesia, New Mexico.

Waste water from the refinery is generated from the treatment of waters from the processing of crude oil, including the removal of water entrained in crude oil, the washing of crude oil to remove salts and sediment, water used for heating and cooling during refining, boiler blowdown, and stormwater collected from process portions of the refinery.

Underground injection at WDW-3 occurs within the Lower Wolfcamp, Cisco and Canyon Formations at an<u>within the</u> injection interval <u>from</u>of 7,660 to 8,620 feet (log depth). The injection rate into WDW-3 will not exceed 500 gpm at and a the maximum allowable surface injection pressure of 1530 psig.

The injected fluid-refinery oil field waste water quality is contains __approximately 3,400 mg/L total dissolved solids (TDS)._The TDS concentration of the naturally occurring formation __Formation _fluids within the permitted injection interval exceeds 10,000 milligrams per litermg/L TDS. Groundwater is first encountered in the area of WDW-3 at a depth range of approximately 75-50 to 150 feet below land surface. The groundwater guality exhibits a TDS concentration ranges of from about 1,500 to 2,200 mg/L TDS.

The Oil Conservation Division will accept comments and statements of interest regarding the application and will create a facility-specific mailing list for persons who wish to receive future notices. Interested parties may obtain information, submit comments, and request to be placed on a facility-specific mailing list by contacting the OCD at the following address:

Persons interested in obtaining further information, submitting comments, or requesting to be on a facility-specific mailing list for future notices may contact the Environmental Bureau Chief of the New Mexico Oil Conservation Division.

Comments and inquiries on regulations should be directed to:

State of New MexicoDirector Energy, Minerals and Natural Resources Department Oil Conservation DivisionNew Mexico Oil Conservation Division Environmental Bureau 1220 South St. Francis Drive Santa Fe, NewMMexico 87505 Telephone: (505) 476-3440

When corresponding, please reference the name of the applicant and the well name.

Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD					
Sent:	Tuesday, July 24, 2012 8:19 AM					
То:	Schultz, Michele (Michele.Schultz@hollyfrontier.com)					
Cc:	Holder, Mike (Mike.Holder@hollyfrontier.com); Lackey, Johnny					
~	(Johnny.Lackey@hollyfrontier.com); VonGonten, Glenn, EMNRD					
Subject:	Navajo Refining Company DP Application WDW-3 Class I (NH) Injection Well Public					
	Notice Communique (20.6.2.3108 NMAC)					
Attachments:	UICI-8-0 WDW-3 DRAFT PN 8-3-2012.doc; Renewal WQCC Notice Regs.pdf; PN Flow					
	Chart.20.6.2renewal.pdf					

Micki:

Good morning.

The OCD completed its preliminary review for "Administrative Completeness" of the above subject application last week.

The OCD is focused on the Appendix "O" Public Notice (PN) in the application. The public notice does not appear to satisfy all of the applicable conditions of 20.6.2.3108 NMAC (see attachments) and new information changes appear to be needed from past PNs based on more comprehensive information submitted in the application.

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Please contact me to discuss on or before 5 working days and resubmit your draft public notice to the OCD for approval or comment to ensure the information is accurate when disseminated to the public. This will need to be satisfied before OCD may deem the application to be administratively complete.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 Office: (505) 476-3490 E-mail: <u>Carl J. Chavez@State.NM.US</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u> "Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/</u>environmental.htm#environmental

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NOTICE OF PUBLICATION

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to Water Quality Control Commission Regulations (20.6.2.3106 NMAC) the following discharge permit application(s) has been submitted to the Director of the New Mexico Oil Conservation Division (OCD), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, and Telephone (505) 476-3440:

(UICI-008-0) Navajo Refining Company, L.L.C. Michael G. McKee, Vice President and Refinery Manager, 501 East Main Street, P.O. Box Drawer 159, Artesia New Mexico 88211-0159, has submitted an application for a Class I Injection Well Discharge Permit for injection well WDW-3 (API# 30-015-26575) located in the SE/4, SW/4 of Section 1, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico. The Facility is located approximately 10.5 miles S-SE of the intersection of I-285 and Hwy. - 82 or approximately 2.75 miles S of Hwy.-82 and CR-225. Oil field exempt and non-exempt, non-hazardous industrial waste, will be transported about 12 miles underground from the Navajo-Artesia Refinery located at 501 E. Main Street, Artesia, NM via a 6 inch dia. pipeline to WDW-3 for disposal into the Lower Wolfcamp, Cisco, and Canyon Formations in the injection interval from 7660 to 8620 feet (log depth). The injection rate will not exceed 500 gpm at a maximum injection pressure of 1530 psig. The injection fluid contains approximately 3,400 ppm TDS. Groundwater most likely to be affected by a spill, leak or accidental discharge is at a depth of approximately 50 to 150 feet below the ground surface, with a total dissolved solids concentration of about 1500 to 2200 mg/L. The discharge plan addresses well construction, operation, monitoring of the well, associated surface facilities, and provides a contingency plan in the event of accidental spills, leaks, and other accidental discharges in order to protect fresh water.

Any interested person may obtain further information from the OCD and may submit written comments to the Division Director at the address given above. The application and draft permit may be viewed at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, or may also be viewed at the OCD's web site <u>http://www.emnrd.state.nm.us/ocd/</u>. Persons interested in obtaining a copy of the application and draft permit may contact OCD at the address given above. Prior to ruling on any proposed discharge permit or major modification, the Director shall allow a period of at least thirty (30) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public hearing. Requests for a public hearing shall set forth the reasons why a hearing should be held. A hearing will be held if the Director determines that there is significant public interest.

If no public hearing is held, the Director will approve or disapprove the proposed permit based on available information, including all comments received. If a public hearing is held, the director will approve or disapprove the proposed permit based on information in the application along with information submitted at the hearing.

Para obtener más información sobre esta solicitud en espan⊡ol, sirvase comunicarse por favor: New Mexico Energy, Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo México), Oil Conservation Division (Depto. Conservacio´n Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New México (Contacto: Dorothy Phillips, 505-476-3461).

DONE at Santa Fe, New Mexico, on this 3rd day of August 2012.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION Jami Bailey, Director

Notice Requirements For Discharge Permit Renewals

20.6.2.3108 PUBLIC NOTICE AND PARTICIPATION:

A. Within 15 days of receipt of an application for a discharge permit, modification or renewal, the department shall review the application for administrative completeness. To be deemed administratively complete, an application shall provide all of the information required by Paragraphs (1) through (5) of Subsection F of 20.6.2.3108 NMAC and shall indicate, for department approval, the proposed locations and newspaper for providing notice required by Paragraphs (1) and (4) of Subsection B or Paragraph (2) of Subsection C of 20.6.2.3108 NMAC. The department shall notify the applicant in writing when the application is deemed administratively complete. If the department determines that the application is not administratively complete, the department shall notify the applicant of the deficiencies in writing within 15 days of receipt of the application and state what additional information is necessary.

B. Within 30 days of the department deeming an application for discharge permit or discharge permit modification administratively complete, the applicant shall provide notice, in accordance with the requirements of Subsection F of 20.6.2.3108 NMAC, to the general public in the locale of the proposed discharge in a form provided by the department by each of the methods listed below:

(1) for each 640 contiguous acres or less of a discharge site, prominently posting a synopsis of the public notice at least 2 feet by 3 feet in size, in English and in Spanish, at a place conspicuous to the public, approved by the department, at or near the proposed facility for 30 days; one additional notice, in a form approved by and may be provided by the department, shall be posted at a place located off the discharge site, at a place conspicuous to the public and approved by the department; the department may require a second posting location for more than 640 contiguous acres or when the discharge site is not located on contiguous properties;

(2) providing written notice of the discharge by mail, to owners of record of all properties within a 1/3 mile distance from the boundary of the property where the discharge site is located; if there are no properties other than properties owned by the discharger within a 1/3 mile distance from the boundary of property where the discharge site is located, the applicant shall provide notice to owners of record of the next nearest adjacent properties not owned by the discharger;

(3) providing notice by certified mail, return receipt requested, to the owner of the discharge site if the applicant is not the owner; and

(4) publishing a synopsis of the notice in English and in Spanish, in a display ad at least three inches by four inches not in the classified or legal advertisements section, in a newspaper of general circulation in the location of the proposed discharge.

C. Within 30 days of the department deeming an application for discharge permit renewal administratively complete, the applicant shall provide notice, in accordance with the requirements of Subsection F of 20.6.2.3108 NMAC, to the general public in the locale of the proposed discharge in a form provided by the department by each of the methods listed below:

(1) providing notice by certified mail to the owner of the discharge site if the applicant is not the owner; and

(2) publishing a synopsis of the notice, in English and in Spanish, in a display ad at least two inches by three inches, not in the classified or legal advertisements section, in a newspaper of general circulation in the location of the discharge.

D. Within 15 days of completion of the public notice requirements in Subsections B or C of 20.6.2.3108 NMAC, the applicant shall submit to the department proof of notice, including an affidavit of mailing(s) and the list of property owner(s), proof of publication, and an affidavit of posting, as appropriate.

E. Within 30 days of determining an application for a discharge permit, modification or renewal is administratively complete, the department shall post a notice on its website and shall mail notice to any affected local, state, federal, tribal or pueblo governmental agency, political subdivisions, ditch associations and land grants, as identified by the department. The department shall also mail or e-mail notice to those persons on a general and facility-specific list maintained by the department who have requested notice of discharge permit applications. The notice shall include the information listed in Subsection F of 20.6.2.3108 NMAC.

The notice provided under Subsection B, C and E of 20.6.2.3108 NMAC shall include:

(1) the name and address of the proposed discharger;

F.

(2) the location of the discharge, including a street address, if available, and sufficient information to locate the facility with respect to surrounding landmarks;

(3) a brief description of the activities that produce the discharge described in the application;

(4) a brief description of the expected quality and volume of the discharge;

(5) the depth to and total dissolved solids concentration of the ground water most likely to be affected by the discharge;

(6) the address and phone number within the department by which interested persons may obtain information, submit comments, and request to be placed on a facility-specific mailing list for future notices; and

(7) a statement that the department will accept comments and statements of interest regarding the application and will create a facility-specific mailing list for persons who wish to receive future notices.

G. All persons who submit comments or statements of interest to the department or previously participated in a public hearing and who provide a mail or e-mail address shall be placed on a facility-specific mailing list and the department shall send those persons the public notice issued pursuant to Subsection H of 20.6.2.3108 NMAC, and notice of any public meeting or hearing scheduled on the application. All persons who contact the department to inquire about a specific facility shall be informed of the opportunity to be placed on the facility-specific mailing list.

H. Within 60 days after the department makes its administrative completeness determination and all required technical information is available, the department shall make available a proposed approval or disapproval of the application for a discharge permit, modification or renewal, including conditions for approval proposed by the department or the reasons for disapproval. The department shall mail by certified mail a copy of the proposed approval or disapproval or disapproval or disapproval of the application for a discharge permit, and shall provide notice of the proposed approval or disapproval of the application for a discharge permit, modification or renewal by:

(1) posting on the department's website;

(2) publishing notice in a newspaper of general circulation in this state and a newspaper of general circulation in the location of the facility;

(3) mailing or e-mailing to those persons on a facility-specific mailing list;

(4) mailing to any affected local, state, or federal governmental agency, ditch associations and land grants, as identified by the department; and

(5) mailing to the governor, chairperson, or president of each Indian tribe, pueblo or nation within the state of New Mexico, as identified by the department.

I. The public notice issued under Subsection H shall include the information in Subsection F of 20.6.2.3108 NMAC and the following information:

(1) a brief description of the procedures to be followed by the secretary in making a final determination;

(2) a statement of the comment period and description of the procedures for a person to request a hearing on the application; and

(3) the address and telephone number at which interested persons may obtain a copy of the proposed approval or disapproval of an application for a discharge permit, modification or renewal.

J. In the event that the proposed approval or disapproval of an application for a discharge permit, modification or renewal is available for review within 30 days of deeming the application administratively complete, the department may combine the public notice procedures of Subsections E and H of 20.6.2.3108 NMAC.

K. Following the public notice of the proposed approval or disapproval of an application for a discharge permit, modification or renewal, and prior to a final decision by the secretary, there shall be a period of at least 30 days during which written comments may be submitted to the department and/or a public hearing may be requested in writing. The 30-day comment period shall begin on the date of publication of notice in the newspaper. All comments will be considered by the department. Requests for a hearing shall be in writing and shall set forth the reasons why a hearing should be held. A public hearing shall be held if the secretary determines there is substantial public interest. The department shall notify the applicant and any person requesting a hearing of the decision whether to hold a hearing and the reasons therefore in writing.

L. If a hearing is held, pursuant to Subsection K of 20.6.2.3108 NMAC, notice of the hearing shall be given by the department at least 30 days prior to the hearing in accordance with Subsection H of 20.6.2.3108 NMAC. The notice shall include the information identified in Subsection F of 20.6.2.3108 NMAC in addition to the time and place of the hearing and a brief description of the hearing procedures. The hearing shall be held pursuant to 20.6.2.3110 NMAC.

20.6.2 NMAC 17

[2-18-77, 12-24-87, 12-1-95, 11-15-96; 20.6.2.3108 NMAC - Rn, 20 NMAC 6.2.111.3108, 1-15-01; A, 12-1-01; A, 9-15-02; A, 7-16-06]



Chavez, Carl J, EMNRD

From:		Chavez, Carl J, EMNRD
Sent:	./	Friday, July 20, 2012 9:37 AM
То:		Chavez, Carl J, EMNRD
Subject:		UICI-008-0 WDW-3 Navajo Refining Company, L.L.C., Discharge Permit Credits Note to
-		File

This note is written to document the credits for the overall changes to the newly issued discharge permit and associated documents. The changes were made by Glenn von Gonten (Acting Environmental Bureau Chief) and Sonny Swazo (Assistant to the General Counsel).

Carl J. Chavez, CHMM

New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau

1220 South St. Francis Drive, Santa Fe, New Mexico 87505

Office: (505) 476-3490

E-mail: CarlJ.Chavez@State.NM.US

Website: http://www.emnrd.state.nm.us/ocd/

"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at <u>http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental</u>

1



June 29, 2012

Mr. Carl Chavez New Mexico Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505

RE: Discharge Permit Renewal Application for WDW-3, Class I Non-Hazardous Injection Well

Dear Mr. Chavez:

Navajo Refining Co. is submitting the attached discharge permit renewal application for its WDW-3, a Class 1 Non-Hazardous Wastewater Injection Well. The well, located approximately 14 miles east of the Navajo Refinery in Artesia, NM, is currently in service.

If you have questions regarding this renewal application, please contact Micki Schultz at (575) 746-5281, or by email at <u>micki.schultz@hollyfrontier.com</u>.

Cordially,

Micki Schultz

Micki Schultz, P.E., CHMM, REM Environmental Specialist, Water and Waste Programs Navajo Refining Company 575-746-5281 (office) 575-308-2141 (cell)

Attachments

ACKNOWLEDGEMENT OF RECEIPT OF CHECK/CASE

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Full Payment	_ or Annual Increr	ment			·



June 29, 2012

Mr. Carl Chavez New Mexico Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505

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Cordially,

Micki Schutt

Micki Schultz, P.E., CHMM, REM Environmental Specialist, Water and Waste Programs Navajo Refining Company 575-746-5281 (office) 575-308-2141 (cell)

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M. Malakan	

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INTRODUCTION

Navajo Refining Company, L.L.C. (Navajo), located in Artesia, New Mexico, is applying to repermit Class I Nonhazardous Waste Disposal Well No. 3 (WDW-3) which is located approximately 14 miles to the east of the facility. WDW-3 was initially permitted by the New Mexico Oil Conservation Division (OCD) in 2003 and has been operating under OCD issued Permit UIC-CLI-008-1.

The Navajo refinery is located at 501 East Main Street in Artesia, Eddy County, New Mexico. WDW-3 is one of three Class I nonhazardous waste injection wells operated by the Navajo refinery. The three injection wells are designated WDW-1, WDW-2 and WDW-3. All three wells are permitted to inject nonhazardous waste water into a subsurface Injection Zone consisting of the lower portion of the Wolfcamp Formation and the underlying Cisco and Canyon Formations. The depth and thickness of the Injection Zone at the three Navajo refinery injection wells are as follows:

- WDW-1: 7,450 to 9,016 ft KB
- WDW-2: 7,270 to 8,894 ft KB
- WDW-3: 7,303 to 8,894 ft KB

Please note that the three Navajo injection wells are permitted separately coinciding with the 10-year permit limit for each well. This permit renewal application is for WDW-3 only. Permit renewal applications for WDW-1 and WDW-2 are to be submitted in July 2013 and October 2014, respectively. Given the fact that all three Navajo wells are injecting into the same Injection Zone, modeling projections of pressure front and plume movement account for injection into the same zone by all three wells. This same modeling approach will be utilized when the permit application renewal documents are submitted for WDW-2 and WDW-3.

Information concerning the locations of oil and gas wells and freshwater wells within the regulatory 1-mile radius area of review (AOR) surrounding WDW-3 were obtained from New Mexico Oil Conservation Division (OCD) and New Mexico Water Rights Reporting System, respectively. No corrective action is needed for any of the artificial penetrations within the 1-mile radius AOR.



The regional and local geology have been evaluated, and no problems have been identified that will cause adverse effects as a result of the ongoing injection operations.

Reservoir characteristics of the Injection Zone indicate the reservoir has sufficient properties to accommodate the historical and planned future injection rate, volume and pressure from the three Navajo injection wells. Based on information gathered from the Navajo refinery injection well system, there are no adverse reactions identified with the waste stream and the well components of construction and the Injection Zone matrix and formation fluid.

WDW-3 meets the construction and operating standards set forth in 20.6.2.2505 NMAC. A procedure to permanently plug and abandon the well has been included per the requirements of 20.6.2.5209 NMAC.



DISCHARGE PERMIT APPLICATION FOR UNDERGROUND INJECTION CONTROL (UIC) CLASS I (NON-HAZARDOUS), CLASS III SOLUTION MINING, AND CLASS V WELLS (Refer to WQCC Regulations (20.6.2.5000 through 20.6.2.5299 NMAC) for assistance in completing this application) mail of the WQCC Regulations (20.6.2.5000 through 20.6.2.5299 NMAC) for assistance in completing this application) mail of the work of the additional information in item 9 is required for Class II, and Class V Underground Injection Control Wells. The additional information in item 9 is required for Class I and Class III Underground Injection Control Wells (see 20.6.2.5006 and 20.6.2.5101 NMAC). 1. Underground Injection Control Well Class:	Distr 1625 (575 Distr 811 (505 Distr 1220 (505	District I 1625 N. French Dr., Hobbs, NM 88240 (575) 393-6161 District II 811 S. 1 st St., Artesia, NM 88210 ^(~75) 748-1283 ict III , Rio Brazos Road, Aztec, NM 87410 (505) 334-6178 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505 (505) 476-3470	State of New Mexico nerals and Natural Resources Depa Oil Conservation Division Environmental Bureau 1220 South St. Francis Dr. Santa Fe, NM 87505 (505) 476-3440	Revised January 10, 2012 Submit Original Plus 1 Copy to Environmental Bureau 1 Copy to Appropriate District Office
□ New □ Renewal □ Modification The information in items 1 through 6 and items 8 through 14 is required for all Class I, Class III, and Class V Underground Injection Control Wells (see 20.6.2.5006 and 20.6.2.5101 NMAC). 1. Underground Injection Control Well Class: □ Class I (NH) □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Class V - Ground Water Management □ Class V - Geothermal □ Township 18 The Class I Main □ Township 18 The Clast Main □ Township </th <th>1</th> <th>DISCHARGE PE UNDERGROUND INJECTION CO CLASS III SOLUTION (Refer to WQCC <u>Regulation</u> for assistance i</th> <th>RMIT APPLICATION F NTROL (UIC) CLASS I (MINING, AND CLASS V (20.6.2.5000 through 20.6.2.529) in completing this application)</th> <th>'OR (NON-HAZARDOUS), V WELLS 9 NMAC)</th>	1	DISCHARGE PE UNDERGROUND INJECTION CO CLASS III SOLUTION (Refer to WQCC <u>Regulation</u> for assistance i	RMIT APPLICATION F NTROL (UIC) CLASS I (MINING, AND CLASS V (20.6.2.5000 through 20.6.2.529) in completing this application)	'OR (NON-HAZARDOUS), V WELLS 9 NMAC)
 The information in items 1 through 6 and items 8 through 14 is required for all Class I, Class III, and Class V Underground Injection Control Wells. The additional information in item 9 is required for Class I and Class III Underground Injection Control Wells (see 20.6.2.5006 and 20.6.2.5101 NMAC). I. Underground Injection Control Well Class: Class I (NH) Class III - Brine Well Class V - Geothermal Class V - Ground Water Management Class V - Other 2. Operator: Navajo Refining Company, L.L.C. Address: 501 East Main Artesia, NM 88210 Contact Person: Micki Schultz Phone: 575-746-5281 E-mail: Micki Schultz@holyfrontier. 3. Location: SE /4 SW /4 Section 1 Township 18S Range 27E Latitude: 32.7716 Josef J, S. W. (A Section 1) Township 192 Range 27E Latitude: 32.7716 Josef J, S. Quadrangle Topographic Map showing exact location of the facility site. Surface Owner: G Federal State Private Private Tribal Trust or Indian Allotment 5. Facility Description: Attach the adescription of the facility with a diagram depicting pertinent features, <i>i.e.</i>, facility/property boundaries, buildings, roads, fences, process areas, areas of discharge, aboveground piping, underground piping, wells (all types), pits, ponds, dikes, sumps, above and below-grade tanks, landfarms, landfill surface and/or ground water contamination abatement devices, <i>etc</i>. 6. Proposed discharge plan (see 20.6.2.3106C NMAC): Specify the methods or techniques that the owner/operate with the regulations. At a minimum include the following information:: (a) Quantity, quality and flow characteristics of the discharge; (b) Location of the discharge and of any bodies of water, watercourses and ground water discharge sites within one mile of the outside perimeter of the discharge; (c) Depth to and TDS concentration of the ground water most likely to be		🗌 New 🔀	Renewal 🗌 Modification	·
1. Underground Injection Control Well Class: ∑ Class I (NH) ☐ Class VI - Ground Water Management ☐ Class V - Other 2. Operator: Navajo Refining Company, L.L.C. Address:	The I Unde Unde	he information in items 1 through 6 and items 8 thron nderground Injection Control Wells. The additional nderground Injection Control Wells (see 20.6.2.500	ough 14 is required for all Class I, 0 l information in item 9 is required 6 and 20.6.2.5101 NMAC).	Class III, and Class V for Class I and Class III
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		information is available; and, (g) Any additional information that may in concentrations in excess of the standards of S	be necessary to demonstrate that the section 20.6.2.3103 NMAC or the	ne discharge permit will not result presence of any toxic pollutant at

Page 1

any place of withdrawal of water for present or reasonably foreseeable future use. OCD may require additional detailed information on site geologic and hydrologic conditions.

7. INFORMATION FOR CLASS I NONHAZARDOUS WASTE INJECTION WELLS AND CLASS III

BRINE WELLS (20.6.2,5210 NMAC): For Class I and III injection wells, attach the information required in Subsection B of Section 20.6.2.5210 NMAC. Include sources and an appropriate analysis of injection fluid and compatibility with the receiving formation produced water and if injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, *etc.*).

(a) Area of Review: A map showing the Class I non-hazardous waste injection well, or Class III well or well fields and the applicable area of review. Within the AOR, the map must show the number, name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features, including residences and roads;

(b) **Data Tabulation:** A tabulation of data on all wells within the AOR which may penetrate into the proposed injection zone. Such data shall include a description of each well's type, the distance and direction to the injection well or well field, construction, date drilled, location, depth, record of plugging and/or completion information;

(c) Corrective Action: For wells within the area of review which penetrate the injection zone, but are not properly completed or plugged, the corrective action proposed to be taken under Section 20.6.2.5203 NMAC;

(d) Maps and Cross-Sections: Maps and cross-sections indicating the general vertical and lateral limits of all ground water having 10,000 mg/l or less TDS within the AOR, the position of such ground water within the AOR relative to the injection formation, and the direction of water movement in each zone of ground water which may be affected by the proposed injection;

(e) **Geology:** Maps and cross-sections detailing the geology and geologic structure of the local area, including faults and the regional geologic setting;

(f) **Proposed Operating Data:** including;

- Average and maximum daily flow rate and volume of the fluid to be injected;
- Average and maximum injection pressure;
- Source of injection fluids and an analysis or description of their chemical, physical, radiological and biological characteristics;

(g) Formation Testing Program: Results of the formation testing program to obtain an analysis or description of the chemical, physical, and radiological characteristics of the receiving formation;

(h) Fluids and Pressure: Expected pressure changes, native fluid displacement, and direction of movement of the injected fluid;

(i) Stimulation Program: Proposed stimulation program;

(j) Injection Procedure: Proposed or actual injection procedure;

(k) **Drawings:** Schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(I) **Construction:** Pursuant to 20.6.2.5205 NMAC, the owner/operator must demonstrate that the construction and operation of Class I non-hazardous waste injection wells and Class III brine wells will not cause or allow movement of fluids into ground water having 10,000 mg/l or less TDS except for fluid movement approved pursuant to Section 20.6.2.5103NMAC. The owner/operator must provide the following information:

- Depth to the injection zone;
- Injection pressure, external pressure, annular pressure, axial loading, and other stresses that may cause well failure;
- Hole size;
- Size and grade of all casing strings, including wall thickness, diameter, nominal weight, length, joint specification, and construction material;
- Type and grade of cement;
- Rate, temperature, and volume of injected fluid;
- Chemical and physical characteristics of the injected fluid, including corrosiveness, density, and temperature;
- Chemical and physical characteristics of the formation fluids including pressure and temperature;
- Chemical and physical characteristics of the receiving formation and confining zones including lithology and stratigraphy, and fracture pressure; and
- Depth, thickness and chemical characteristics of penetrated formations which may contain ground water.

Include a cementing and casing program (provide details on liners, tubing, packers, size, setting depth, sacks of cement used, hole size, top of cement, and how top was determined, etc.), logging procedures, deviation checks, and a drilling, testing, and coring program for new wells.

Include the name of the injection formation and, if applicable, the field or pool name; the injection interval and whether it is perforated or open-hole; state if the well was drilled for injection or, if not, the original purpose of the well; give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations; and give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

(m) Contingency plans: Contingency plans to cope with all shut-ins or well failures so as to prevent movement of fluids into ground water having 10,000 mg/l or less TDS;

(n) MIT Monitoring Plans: MIT Monitoring Plans, including maps, for meeting the monitoring requirements of Section 20.6.2.5207 NMAC; and

(o) Additional Fluid Monitoring Plans For Class I Non-Hazardous Waste Injection Wells: Provide a fluid monitoring plan for the analysis of the injected fluids for Class I Wells at least quarterly to determine their characteristics. (See 20.6.2.5207B NMAC).

(p) Additional Fluid Monitoring Plans For Class III Wells: Provide a quarterly fluid monitoring plan for Class III wells that meets 20.6.2.5207C NMAC.

(q) **Financial Assurance:** Provide an instrument that documents the ability of the owner/operator to undertake measures necessary to prevent contamination of ground water after the cessation of operation, including the proper closing, plugging and abandonment of a well, ground water restoration if applicable, and any post-operational monitoring as may be needed. The Owner/Operator shall submit one of the following:

- A surety bond;
- A trust fund with a New Mexico bank in the name of the State of New Mexico, with the State as Beneficiary;
- A non-renewable letter of credit made out to the State of New Mexico;
- Liability insurance specifically covering the contingencies listed in this paragraph; or
- A performance bond, generally in conjunction with another type of financial assurance.

(r) Logging and testing data: Provide all available logging and testing program data on the well (if well logs have been filed with the Division, they need not be resubmitted).;

(s) Mechanical Integrity Data: Provide mechanical integrity data (see 20.6.2.5204 NMAC);

(t) Maximum Pressure and Flow Rate: Specify the anticipated maximum pressure and flow rates;

(u) **Formation Testing Program Data:** Provide the results of the formation testing program;

(v) **Compatibility:** Discuss the physical, chemical, and biological interactions between the injected fluids and fluids in the injection zone, and minerals in both the injection zone and the confining zone; and

(w) Area of review corrective actions: Discuss the status of corrective action(s) on defective wells in the area of review.

8. Modification(s): Attach a description of proposed modifications to existing discharge processes.

- 9. Inspection/Maintenance and Reporting: Attach a routine inspection, operation, and maintenance plan to ensure permit compliance.
- 10. Contingency plans: Attach a contingency plan for reporting and taking corrective action(s) to address any spills and/or releases.
- 11. Other information: Attach any additional information that may be necessary to demonstrate that the discharge permit will not result in concentrations in excess of the standards of Section 20.6.2.3103 NMAC or the presence of any toxic pollutant at any place of withdrawal of water for present or reasonably foreseeable future use.
- **Filing Fee:** Attach application filing fee of \$100.00. The check or money order must be made payable to Water Quality Management Fund. The permit fee will be required prior to permit issuance.
- 13. Draft Public Notice: Attach a draft of your public notice as specified in Subsection F of 20.6.2.3108 NMAC. All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the

owner of the surface of the land on which the injection well is to be located and to each leasehold operator within one-third mile of the well location. Proof of public notice must be submitted in accordance with 20.6.2.3108 NMAC for new and renewal applications for discharge permits.

CERTIFICATION:

I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information. I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and *imprisonment*.

Name: Michael G. McKee Signature: E-mail Address: Michael. McKee@Hullfrontier.com

Title: VP+ Ret. Manager Date: 26 June 2012

Disclaimer: Note that some of the above information may include non-WOCC or OCD <u>Regulated</u> items, i.e., pits, ponds, below-grade tanks, sumps, etc. that may require a separate application and/or permit process than WQCC regulated items through the OCD.

1.0 Underground Well Control Well Class

The Navajo refinery Waste Disposal Well No. 3 (WDW-3) is classified as a Class I Nonhazardous Waste Injection Well.

2.0 Operator

The operator information for WDW-3 is provided below:

Facility Address

Navajo Refining Company, L.L.C. 501 East Main Artesia, New Mexico 88210 (575) 748-3310

Contact Person

Micki Schultz, Environmental Specialist (575) 746-5281 Micki Schultz@hollyfrontier.com

3.0 Location

WDW-3 is located in the SE/4, SW/4, Section 1, Township 18 South, Range 27 East (790 feet from the south line and 2,250 feet from the west line of Section 1).

A topographic map showing the location of the Navajo refinery and WDW-3 is provided as Figure 1. An enlarged version of the topographic map showing the location of WDW-3 is provided as Figure 2.

4.0 Landowner(s)

The parcel of land where WDW-3 is located is owned by the following:



U.S. Department of the Interior Bureau of Land Management 620 Greene Street Carlsbad, New Mexico 88220 (575) 887-6544

The parcel of land where WDW-3 is located is surrounded by additional land owned by the Bureau of Land Management as shown in Appendix A.

5.0 Facility Description

The Class I non-hazardous UIC #3 is located approximately 14 miles east of the Navajo refinery, the largest refinery in New Mexico. Drawing 1 presents an aerial photograph of the refinery's location with respect to the wellhead facility, identifying pertinent features between the two sites. The wellhead facility is located within a fenced area that encloses the well, injection pumps, filters and piping, wellhead annulus measurement system (WAMS) on a contained concrete pad, and a power panel. The pumps and filters are located on a separate, contained concrete pad. There are no buildings or tanks, other than the 250 gallon glycol tank, associated with the WAMS unit.

6.0 Proposed Discharge Plan (see 20.6.2.3106C NMAC)

This permit renewal application is for an existing Class I nonhazardous waste injection well. Those portions of 20.6.2.3106C that are relevant to underground injection, especially 20.6.2.3103C (8), are addressed within Section 7.0 of this document.

- 6(a) is addressed in 7(f)
- 6(f) is addressed in 7(e)
- 6(b) is addressed in 7(a)
- 6(g) is addressed in 7(e)
- 6(c) is addressed in 7(d) 6(d) is addressed in 7(e)

6(e) measurement of flow is a flow meter at the wellhead with information transmitted electronically to the refinery control room.



7.0 Information for Class I Nonhazardous Waste Injection Well and Class III Brine Wells (20.6.2.5210 NMAC)

The following sections present the information required in Subsection B of Section 20.6.2.5210 NMAC.

7 (a) Area of Review

The WDW-3 Area of Review (AOR) consists of the area within a 1-mile radius surrounding the well as shown on Drawing 2. All potential sources of information relevant to the location of non-freshwater and freshwater wells within the AOR were reviewed.

Non-Freshwater Wells in Area of Review

The locations of non-freshwater artificial penetrations (oil and gas wells, exploratory tests, disposal wells, etc.) within the 1-mile radius AOR are identified in Drawing 2. A total of 123 non-freshwater artificial penetrations are present in the 1-mile radius AOR as shown on the map. Each artificial penetration is identified by a Map ID number. Table 1A presents a tabulation of the 125 non-freshwater artificial penetrations in the AOR.

Of the 125 non-freshwater artificial penetrations identified within the AOR, a total of 8 were advanced to a depth to penetrate the top of the Injection Zone.

Table 1B lists these wells. Appendix B contains records and schematics for these 125 non-freshwater artificial penetrations.

Freshwater Wells in Area of Review

Based upon information obtained from records maintained by the New Mexico Water Rights Reporting System, there are no freshwater wells within the 1-mile radius AOR.

Drawing 3 presents a topographic map depicting the 1-mile radius AOR. The map contains all surface bodies of water, mines (surface and subsurface), quarries, springs, and other surface features, including roads and residences.

There are no subsurface faults in the AOR known to have surface expression; therefore, no surface fault traces have been included on this map.

7 (b) Data Tabulation

Tables 1A and 1B present tabulations of the 123 non-freshwater artificial penetrations in the 1-mile radius AOR. Appendix B contains records for the 8 non-freshwater artificial penetrations that penetrate into the Injection Zone.

7 (c) Corrective Action

The available records for each artificial penetration that penetrates the top of the Injection Zone within the 1-mile radius AOR were evaluated to determine if corrective action would be required to prevent movement of fluids into or between USDWs which could be caused by pressures in the Injection Zone. These records are contained in Appendix B.

No corrective actions are warranted because all artificial penetrations have been properly constructed, plugged and/or abandoned, or are still operating.

7 (d) Maps and Cross-Sections

The base of the Underground Source of Drinking Water (USDW), groundwater with total dissolved solids concentration with less than 10,000 milligrams per liter (mg/L), occurs at a depth of approximately 3,150 feet above mean sea level. Figure 3 presents a generalized hydrogeologic cross-section for the local area. Figure 4 presents a published map indicating the direction of shallow groundwater movement in the local area.

The top of the WDW-3 Injection Zone is separated from the base of the USDW by several thousand feet of low permeability carbonates, siltstones and shale as depicted on the geologic cross-sections presented on Drawings 5, 6 and 7. Drawing 4 is a cross-section index map.



7 (e) Geology

The Navajo refinery is located in Eddy County, New Mexico on the Northwestern Shelf of the larger Permian Basin as shown on Figure 5. Figure 6 is stratigraphic column presenting the geologic formations relevant to the underground injection operations at WDW-3. The refinery is located on the southern flank of the Artesia-Vacuum anticline (also referred to as the Vacuum Arch), which trends east to west across the study area as shown Figure 7. Figure 8 is a published regional structural map of the San Andres Formation.

As depicted on the three geologic cross-sections presented on Drawings 5, 6, and 7, the subsurface geology in the area of the Navajo refinery is rather simplistic. Structural dip of all geologic formations is about 100 feet/mile to the southeast away from the Vacuum Arch depicted on Figure 7.

Injection Zone

The Injection Zone into which all three injection wells at the Navajo refinery are injecting is composed of the lower portion of the Wolfcamp Formation and the underlying Cisco and Canyon Formations. These formations occur in WDW-1, WDW-2 and WDW-3 at the depths shown in the table below.

	WDW-1 (KB = 3,693 ft		W	OW-2	WDW-3 (KB = 3,625 ft		
Injection			(KB =	3,623 ft			
Zone			MD Subsea				
Formations	below KB (ft)	Depth (ft)	below KB (ft)	Depth (ft)	below KB (ft)	Depth (ft)	
Lower Wolfcamp	7,450	-3,757	7,270	-3,647	7,303	-3,678	
Cisco	7,816	-4,123	7,645	-4,022	7,650	-4,025	
Canyon	8,475	-4,782	8,390	-4,767	8,390	-4,765	
Base of Injection Zone (base of Canyon)	9,016	-5,323	8,894	-5,271	8,894	-5,269	

The following are brief descriptions of the three geologic formations that form the Injection Zone.

Lower Portion of Wolfcamp Formation (Permian Age)

The lower portion of the Wolfcamp Formation is a light brown to tan, fine to medium grained, fossiliferous limestone with shale interbeds.

Cisco Formation (Pennsylvanian Age)

The Cisco Formation is a uniform, light-colored, chalky, fossiliferous limestone with shale interbeds.

Canyon Formation (Pennsylvanian Age)

The Canyon Formation is a white to tan to light brown fine grained, chalky, fossiliferous limestone with shale interbeds.

Drawing 8 presents a structure contour map of the Injection Zone and Drawing 9 presents an isopach map of the Injection Zone.

Confining Zone

The Confining Zone overlying the Injection Zone, in descending order, is composed of the Yeso Formation, Abo formation, and the upper portion of the Wolfcamp Formation. The following are brief descriptions of the three geologic formations that form the Confining Zone.

Yeso Formation (Permian Age)

The Yeso Formation consists of orange shale, light gray to while dolostone and bedded anhydrite.

Abo Formation (Permian Age)

The Abo Formation is a non-marine to marginal marine red shale and finegrained sandstone interbedded sequence.



Upper Portion of Wolfcamp Formation (Permian Age)

The upper portion of the Wolfcamp Formation is a light brown to tan, fine to medium grained, fossiliferous limestone with shale interbeds.

Drawing 10 presents a structure contour map of the Confining Zone and Drawing 11 presents an isopach map of the Confining Zone.

Faulting

No evidence has been found of any subsurface faulting within and immediately surrounding the 1-mile radius AOR that would provide hydraulic connection between the Injection Zone and the shallow USDW. The nearest documented subsurface fault is the "K-M" fault located approximately 17 miles to the northwest, well outside the geologic study area for the Navajo refinery.

Seismicity

The southeastern portion of New Mexico is historically an area of low seismicity with naturally occurring earthquakes being rare and of low magnitude. The Navajo refinery is located in one of the areas recognized as having the lowest level of seismic risk in the continental United States (Figure 9).

The potential for earthquakes to occur in the vicinity of the Navajo site are minimal. Appendix C presents a listing of all recorded seismic events within 200 miles of the Navajo refinery for the period from 1973 to late 2011.

The injection operations at the Navajo refinery do not have the potential to cause any seismic activity which could alter the confining capability of the subsurface Injection Zone and overlying Confining Zone.

Surface Geology and Flooding Potential

The surface geology of the local area is shown on Figure 10. The Pecos River, located about three miles east of Artesia is the only surface water body in the area of the Navajo refinery. Local annual rainfall is approximately 13.5 inches. As indicated on the topographic map on Figure 1, the land surface elevation at the refinery is higher than that near the river, therefore the potential for flooding at the Navajo refinery is minimal.



7 (f) Proposed Operating Parameters

Source and Description of Injection Fluid

The fluid injected into the Navajo injection wells is comprised of exempt and nonexempt nonhazardous oilfield waste that is generated in the refining process. Waste waters from process units, cooling towers, boilers, streams from water purification units, desalting units, recovered and treated ground water, and general waste waters will be blended to form the fluid to be injected into the injection wells. Table 2 and Appendix D present data characterizing the injection fluid.

Average and Maximum Daily Flow Rate and Volume

The maximum permitted composite injection rate into all three Navajo injection wells is 800 gpm. This rate of injection is equal to 1,152,000 gallons per day or 420,480,000 gallons per year or 4,204,800,000 gallons into the Injection Zone over the 10-year permit life of WDW-3.

However, the actual average composite injection rate for the three injection wells, based on historical data summarized in Appendix E, is approximately 400 gpm.

Average and Maximum Surface Injection Pressure

The average wellhead injection pressure is 752 psig and an estimated bottomhole pressure of 3,858 psia. Appendix E includes a tabulation of historical injection rates and associated surface injection pressure and bottom-hole pressure calculations.

The maximum operating injection wellhead pressure will not exceed 1,530 psi or 0.2 psi per foot of depth to the top of the Injection Zone at 7,650 feet, as required by the OCD Proposed Rule 21.B(7), dated October 6, 1997. The predicted pressures were determined using a program called PredictW and the equations used in the program can be found in Appendix E. The PredictW model was calibrated with historical injection volumes and measured bottom-hole pressures.



Maximum Allowable Surface Injection Pressure (MASIP) Calculation

Depth to top of Injection Zone in WDW-3 = 7,303 feet

7,303 feet x 0.2 psi/ft = 1,460 psi

7 (g) Formation Testing Program

Formation testing was conducted during the initial construction of the Navajo refinery injection wells to obtain site-specific data relating to the chemical, physical and radiological characteristics of the Injection Zone. Table 4 summarizes the results of the testing program.

The analysis of formation fluids can be found in Appendix F. All of the wells were converted oil and gas wells and no coring was completed in any of the wells. Correlations were done from offset wells.

7 (h) Fluids and Pressure

The following are descriptions of the changes in reservoir conditions that have been observed to-date and the predicted changes over the 10-year permit time frame for WDW-3. This information is based on the known historical rates and volumes that have been injected into the wells and future 10-year emplacement of a conservative rate and volume of injected fluids.

The interface between injected waste and the formation brine (the waste front) expands radially from the WDW-3 wellbore. As fluid is injected, the Injection Zone will continue to pressurize due to the resistance of fluid movement and the compression of the fluid and rock matrix.

Current Cone of Influence and Waste Plume Front

The maximum lateral spread of the waste front and pressurization during the operational life of WDW-3 to-date were initially calculated.



Calculated Cone of Influence (Current)

The current pressure cone of influence within the Injection Zone is presented on Drawing 12. This Cone of Influence is based on injection operations to-date.

Calculated Plume Front Migration (Current)

The radius of the current dispersed plume for the wells is as follows:

WDW-3: 1,494 feet

WDW-1: 2,898 feet (WDW-1 is approximately 7,900 feet from WDW-3)

WDW-2: 2,266 feet (WDW-2 is approximately 3,100 feet from WDW-3)

Future Cone of Influence and Waste Plume Front

The maximum lateral spread of the waste front and pressurization during the 10-year permit time frame for WDW-3 were calculated.

<u>Calculated Cone of Influence (10 Years)</u>

The predicted pressures were determined using a program called PredictW and the equations used in the program can be found in Appendix E. The predicted pressure cone of influence can be found on Drawings 13 through 16. The following four analyses were performed for the cone of influence calculations:

- 1. Injection into WDW-1 and WDW-2 with no injection into WDW-3
- 2. Injection into WDW-1 and WDW-3 with no injection into WDW-2

3. Injection into WDW-2 and WDW-3 with no injection into WDW-1

4. Injection into all three wells; WDW-1, WDW-2 and WDW-3

The cone of influence is defined here as the area within which increased Injection Zone pressures caused by injection of wastes would be sufficient to cause vertical fluid movement through any well or other conduit into a USDW. This demonstration shows that the extremely conservative worst-case cone of influence of the injection operations is smaller than the regulatory 1-mile radius AOR in which artificial penetrations were investigated.



In the worst case, an undocumented abandoned well is imagined to be open to both the Injection Zone and the base of the USDW. In addition, the well is imagined to be filled to within 100 feet of the ground surface with formation brine from the Injection Zone and fresh water from the base of the USDW. The cone of influence can be calculated by comparing the hydraulic heads of the Injection Zone and the lowermost USDW. It is only where the Injection Zone head is above the USDW head that fluid movement from the Injection Zone into the USDW could occur. This worst-case model of the potential effect of injection upon the USDW is extremely conservative, because no wells within the 1-mile radius AOR surrounding WDW-3 are open to both the Injection Zone and the USDW and are filled with brine.

The Injection Zone has a native pressure such that the resulting hydraulic head is lower than the head of the lowermost USDW. The pre-injection pressure of the injection interval was measured on July 30, 1998, in WDW-1 to be 2,928 psia at 7,911 feet below ground level (feet).

A sample of formation fluid was retrieved from formation fluid swabbed on July 25, 1998 from the perforations of the deeper Cisco interval, from 8,220 feet to 8,476 feet in WDW-1. The total dissolved solids (TDS) concentration of the sample was 33,000 mg/l, and the specific gravity of the sample at room temperature was 1.034. Formation fluid was swabbed on July 29, 1998, from the perforations of the shallower Cisco interval from 7.924 feet to 8.188 feet in WDW-1. The analysis of a sample of this fluid indicated that the TDS concentration of the sample was 18,000 mg/l, and the specific gravity at room temperature was 1.018. The chemical analysis of the formation fluid samples is included as Appendix F. These values compare favorably with information from the analysis of fluid retrieved during drill-stem test (DST) No. 5, which was conducted on August 26, 1993 in WDW-1 (Appendix F). The salinity of the formation fluid retrieved during DST No. 5 was reported as a chlorides concentration of 25,000 ma/L. The formation fluid is therefore assumed to have a sodium chloride concentration of 25,000 mg/L. The specific gravity of such a fluid is approximately 1.02.



The pre-injection pressure, P_i , at the top of the Injection Zone in WDW-3 at 7,660 feet RKB is 2,817 psia, as calculated below, based on a formation fluid specific gravity of 1.018. Using the lightest specific gravity in this calculation yields a high P_i , which is conservative.

$$P_i(7,660 \text{ feet}) = P_i(7,911 \text{ feet}) - (7,911 \text{ feet} - 7,660 \text{ feet}) (0.433 \text{ psi/ft}) (1.018)$$

= 2,928 psia - 111 psi
= 2,817 psia

The hydraulic head of the lowermost USDW is estimated to be 100 feet BGL. This estimate is reasonably conservative, as it is based on a static water level measurement of 81 feet.

The critical pressure, P_c , at 7,660 feet BGL that would be necessary to raise the hydrostatic head of the injection interval to the head of the lowermost USDW at 100 feet BGL is 3,329 psia, as calculated below:

P_c = (Top of Injection Zone - Base of USDW) (0.433 psi/ft)(1.018) + (Base of USDW - Head of USDW) (0.433 psi/ft) = (7,660 feet - 473 feet) (0.433 psi/ft) (1.018) + (473 feet - 100 feet) (0.433 psi/ft) = 3,329 psia

The critical increase in reservoir pressure, ΔP_c , above the native pressure that is necessary to raise the hydrostatic head of the Injection Zone to the head of the lowermost USDW is, therefore, 512 psi, as calculated below:

 $\Delta P_c = P_c - P_i$ = 3,329 psia - 2,817 psia = 512 psi

An increase in reservoir pressure greater than 512 psi would be sufficient to raise the head of the Injection Zone above the head of the lowermost USDW. The cone of influence is the area around the injection wells within which the increase in reservoir pressure caused by injection is greater than 512 psi.



PredictW was used to calculate the pressure increase throughout the Injection Zone at the end of the upcoming 10 years of injection into the three wells. Contour plots of the predicted pressure increase in the injection zone (Drawings 13 through 16) were generated using historical injection rates and volumes and the maximum injection rates permitted for WDW-1, WDW-2 and WDW-3. The gridded pressure increases created by PredictW are contoured using Surfer, a commercial contouring software package.

Conservative values for reservoir thickness and permeability were used to overestimate the predicted increase in reservoir pressure. The reservoir was assumed to have a thickness of 85 feet. The permeability of the reservoir was assumed to be 251 md based on previous falloff testing. The modeled kh, 21,335 md-ft (= 251 md x 85 feet), is 20 percent of the kh, 104,477 md-ft, that was determined from the pressure falloff test conducted in WDW-3 on January 27, 2012 (Appendix G). Using a low kh will yield a predicted pressure increase that is much greater than expected and a cone of influence that is much larger than expected. The porosity was assumed to be 10 percent.

The viscosity of the formation fluid with TDS concentration of 25,000 ppm at 130°F is 0.53 cp (Appendix D). The compressibility of the pore volume of the formation is c_r , is 5.5 x 10⁻⁶ psi⁻¹. The compressibility of the formation fluid is c_w , is 2.9 x 10⁻⁶ psi⁻¹. The total compressibility ($c_t = c_r + c_w$) is 8.4 x 10⁻⁶ psi⁻¹.

Historical injection data for WDW-1, WDW-2 and WDW-3 were used for the injection period from September 23, 1999 (initial injection at the site) through February 29, 2012. WDW-1, WDW-2 and WDW-3 are then modeled as injecting from February 29, 2012 through February 28, 2022, at a continuous rate of 800 gallons per minute (gpm) distributed among the three wells. The maximum modeled per-well injection rate for any one well is 400 gpm.

The 512-psi pressure-increase contour, which defines the outline of the worst-case cone of influence, is located less than one mile from WDW-1, WDW-2, and WDW-3, as shown on Drawing 16. An improperly abandoned wellbore or other conduit filled with formation fluid that is located farther than one mile from the proposed



wells would not transmit sufficient pressure from the Injection Zone to move fluids into the USDW. Navajo researched public and private sources of information about wells within the 1-mile radius AOR. Information was presented in Section 7 (b) that demonstrates that each of the injection zone penetrations is properly constructed to prevent migration of fluids into the USDW.

Modeled Plume Front Migration (10 Years in Future)

The lithologic character of the Injection Zone, with the resulting hydrodynamic characteristics, is expected to be horizontally uniform. Given the anticipated homogeneity of the Injection Zone, plume geometry during the active injection phase is expected to be cylindrical.

More than 175 feet of formation is anticipated to exist in the Injection Zone at the locations of the three Navajo injection wells. Each well is completed in the same interval with 100 to 200 feet of perforations per well. For a conservative estimate of the injection plume size, the plume radius is calculated on the basis of all flow emplaced in an 85-foot thick interval. Assuming a continuous injection rate of 400 gpm into WDW-3 and an injection period of 10 years, the radius of the concentrated plume from WDW-3 will be 2,788 feet. This is determined by:

$$T_{\rm c} = \left[\frac{(0.1337\,{\rm v\,t})}{(0.8\,\pi\,\phi\,{\rm h}}\right]^{1/2}$$

where:

t

0.1337 = fa	ictor to con	vert gallons	to cubic feet
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r_c = radius of the concentrated plume

v = annual injected volume in gallons

0.8 = factor to compensate for immovable connate water

 ϕ = formation porosity

h = thickness of the injection reservoir

= years of injection = 10 years

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$$r_{c} = \left[\frac{(0.1337 \times 88,668,260 \times 10)}{(0.8 \times 3.1416 \times 0.1 \times 85)} \right]^{1/2}$$

=2788 feet

The radius of the dispersed plume from WDW-3 after 10 years of continuous injection at 400 gpm is calculated to be 2,792 feet, as determined by:

$$r_d = 2.3 (C_d r_c)^{1/2} + r_c$$

where:

2.3 = constant

 r_d = radius of the dispersed plume

 c_d = coefficient of dispersion; for sandstone = 3, for limestone = 65

r_c = concentrated plume radius

 $r_d = 2.3 (65 \times 2,788)^{1/2} + 2788$

= 2,792 feet

<u>WDW-3</u>

The radius of the current dispersed plume versus 10 years of continuous injection at 400 gpm in the future for WDW-3 is as follows:

- Current plume radius: 1,494 feet
- Projected 10-year plume radius: 2,792 feet

By similar calculations, the radius of the current dispersed plume versus 10 years of continuous injection at 400 gpm in the future for WDW-1 and WDW-2 are as follows:

<u>WDW-1</u>

- Current plume radius: 2,898 feet
- Projected 10-year plume radius: 4,058 feet

WDW-1 is approximately 7,900 feet from WDW-3.

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<u>WDW-2</u>

- Current plume radius: 2,266 feet
- Projected 10-year plume radius: 3,086 feet

WDW-2 is approximately 3,100 feet from the WDW-3.

7 (i) Stimulation Program

Historical Information

The only stimulation performed on the well has consisted of acid treatments of which the majority was performed through coil tubing pumped across the existing perforation. No fracturing of the injection interval has been performed.

Future Stimulation Programs and Procedures

Currently no changes are planned in the way the well is stimulated. Navajo reserves the right to fracture the injection interval with approval from OCD. Approximately once every two years an acid stimulation is performed on the wells. The stimulation procedure will consist of pumping 4,000 gallons to 8,000 gallons of 15 percent NEFE Hydrochloric acid through coil tubing at 1 bpm to 2 bpm across the perforations. The acid will be displaced into the formation down the tubing at highest possible rate.

7 (j) Injection Procedure

Injection into all three Navajo injection wells is on a continuous basis. The injection fluid is routed from the refinery process areas via pipeline to each injection well. Figure 11 presents the pre-injection facilities for WDW-3.

Historical Injection Rates and Volumes

The historical rates and volumes can be found in Appendix E.

Predicted Injection Rates and Volumes

The maximum permitted composite injection rate into all three Navajo injection wells is 800 gpm. This rate of injection is equal to 1,152,000 gallons per day or

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420,480,000 gallons per year or 4,204,800,000 gallons into the Injection Zone over the upcoming 10 year permit life of WDW-3.

However, the actual average composite injection rate for the three injection wells, based on historical data summarized in Appendix E, is approximately 400 gpm.

7 (k) Drawings

Figure 11 presents a schematic of the pre-injection surface facilities. Figure 12 presents an as-built diagram of the below-grade portions of WDW-3. Figure 13 presents an as-built diagram of the WDW-3 wellhead.

7 (I) Construction

WDW-3 was converted from the following oil and gas well originally drilled to a depth of 9,450 feet in 1991:

Mewbourne Oil Company Navajo Chalk Bluff Federal No. 1 Section 1, Township 18 South, Range 27 East (API No. 30-015-26575)

The oil and gas well was converted to an injection well (WDW-3) in 2006. Appendix H includes excerpts from a report documenting the well conversion that provides relevant information about how the well was originally constructed and how it was converted to an injection well. Figure 12 presents an as-built diagram of the below-grade portions of WDW-3. Figure 13 presents an as-built diagram of the WDW-3 wellhead.

General Description of the Well

Size, Type, and Depth of Injection Tubing: The information for the tubing string was obtained from OCD records on file with the state and geophysical logs.

• **Tubing**: 4-1/2-inch, 11.6 pound per foot, steel construction, API grade J-55, with long thread connections (LTC).

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- **Packer**: Arrow X-1, 7-inch by 2-7/8-inch set in tension (37,000 pounds) at 7,575 feet.
- **Tubing Length**: 7,568 feet with a 0.54-foot, 4-1/2-inch by 2-7/8-inch crossover in the top of the packer. There are no profile nipples in the tubing or the packer as this was not a requirement of the permit.

Size, Type, and Depth of Casing: There are four casing strings in the well and one below the injection interval. The information for these casing strings was obtained from OCD records on file with the state and geophysical logs.

- **13-3/8-inch**, 54.5 pound per foot, steel construction, API grade J-55, with short thread connections (STC), set at a depth of 400 feet. The casing was cemented to the surface with 425 sacks of cement. The casing was set in an open hole with a diameter of 17.5 inches. This information was obtained from OCD records.
- **9-5/8-inch**, 36 pound per foot, steel construction, API grade J-55, STC, set at a depth of 2,604 feet. The casing was cemented to the surface with 1,025 sacks of cement. The casing was set in an open hole with a diameter of 12.25 inches. This information was obtained from OCD records.
- 7-inch, 26 pound per foot steel construction, API grade N-80 and P-110, STC, set at a depth of 9,450 feet. The casing was cemented with 1,350 sacks of cement to 900 feet from the surface. The casing was set in an open hole with a diameter of 8.75 inches. The top of cement and weight of the pipe was verified with a CBL and caliper log run on October 13, 2006. The remainder of the information was obtained from OCD records.

Below the cement plug at 9,022 feet is the top of a 4-1/2-inch liner. The liner is a string of 4-1/2-inch casing installed to a depth of 10,119 feet. There is a cast iron bridge plug set in the liner at 9,800 feet, which is above the original perforations between 9,861 feet and 9,967 feet. The current injection interval is above the

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plug at 9,022 feet. The cement plug also isolates the lower section of the original wellbore. This information was obtained from OCD records.

The top of cement was determined from a CBL that was run in the 7-inch casing string on October 13, 2006. The top of cement in the 7-inch casing was found at 900 feet below the surface. The top of cement in the 9-5/8-inch and 13-3/8-inch casing strings was verified through OCD records and volume calculations.

The 7-inch casing was perforated on October 14 and 15, 2006. The casing was perforated with a 0.5-inch diameter hole at 2 shots per foot on a 60° phasing. The perforations are located between 7,660 feet and 8,450 feet and from 8,540 feet to 8,620 feet.

The total depth of the well is 10,119 feet with the plug back depth at 9,022 feet. On August 30, 2009, fill was tagged at 8,986 feet.

Pipe		· · · · · · · · · · · · · · · · · · ·	Depth	Ref. to	Hole	Cement		
Size	Туре	Weight	Ground L	_evel (ft)	Size	Volume	Collapse	Yield
(in)		(lb/ft)	Тор	Bottom	(in)	(sks)	(psi)	(psi)
12 2/9	Conductor							
13-3/0	Casing, J-55	54-1/2	Surface	400	17.5	425	1130	2730
9-5/8	Surface Casing	36	Surface	2604	12.25	1025	2020	3520
	Protection, J-55						· ,	÷
7	Casing, N-80,							
	P-110	26 & 29	Surface	9450	8.75	1350	5410	7240
A 1/2	Injection Tubing,							
4-1/2	J-55	11.6	Surface	7561	6.184	N/A	4960	5350
7,070	Arrow X-1							
1 X Z-110	Packer	N/A	7561	7569	2.5	N/A	N/A	N/A
4-1/2	Liner, N-80	11.6	9051	10119	6.5	175	6350	7780

Current Loading on Pipe and Pipe Specifications

Depth to Injection Zone

The WDW-3 Injection Zone is 7,303 to 8,894 ft bls.

Pressures and Other Stresses That May Cause Well Failure

There are no known pressures or stresses that may cause failure of WDW-3.

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Hole Size

The borehole advanced for the original oil and gas well that was later converted to WDW-3 was 12.25 inches in diameter.

Well Casing Information

Figure 12 and Appendix H include information about the WDW-3 well casing. The preceding table provides an overview of the casing information.

Cement Information

Figure 12 and Appendix H include information about the WDW-3 cement.

Rate, Temperature and Volume of Injected Fluid

Average and Maximum Daily Flow Rate and Volume

The average injection rate for all three Navajo injection wells is approximately 400 gpm and the maximum permitted injection rate between the three wells is 800 gpm.

Temperature

The temperature of the injected fluid is within average ambient temperature ranges.

Volume of Injected Fluid

The maximum annual volume of injected fluid, based on a maximum injection rate of 800 gpm is 420,480,000 gallons.

Chemical and Physical Characteristics of Injected Fluid

The fluid injected into WDW-3 is comprised of exempt and nonexempt nonhazardous oilfield waste that is generated in the refining process. Waste waters from process units, cooling towers and boilers, streams from water purification units and desalting units, recovered and treated groundwater, and general wash waters are blended to form the fluid injected into WDW-3. Table 2 and Appendix D present data characterizing the injection fluid.



Chemical and Physical Characteristics of Formation Fluid

Formation testing was conducted during the initial construction of the Navajo refinery injection wells to obtain site-specific data relating to the chemical, physical and radiological characteristics of the Injection Zone. The formation fluid contained in the Injection Zone is compatible with the well construction components and the injected fluid. Formation fluid information pertinent to the reservoir calculations is included in Appendix E.

Chemical and Physical Characteristics of the Receiving Formation

The Injection Zone is porous carbonates of the lower portion of the Wolfcamp Formation, the Cisco Formation, and the Canyon Formation.

The lower portion of the Wolfcamp Formation (Lower Wolfcamp) is the shallowest porous unit in the proposed injection interval. The Wolfcamp Formation (Permian-Wolf campaign age) consists of light brown to tan, fine to medium-grained, fossiliferous limestones with variegated shale interbeds (Meyer, 1966, page 69). The top of the Wolfcamp Formation was correlated for this study to be below the base of the massive, dense dolomites of the overlying Abo Formation. The base of the Wolfcamp coincides with the top of the Cisco Formation. The thickness of log porosity greater than 5 percent in the entire Wolfcamp Formation ranges from 0 feet to 295 feet in a band three miles wide that trends northeast-southwest across the study area.

The Cisco Formation (Pennsylvanian-Virgilian age) of the Northwest Shelf is described by Meyer (1966, page 59) as consisting of uniform, light colored, chalky, fossiliferous limestones interbedded with variegated shales. Meyer (1966, page 59) also describes the Cisco at the edge of the Permian basin as consisting of biothermal (mound) reefs composed of thick, porous, coarse-grained dolomites. Locally, the Cisco consists of porous dolomite that is 659 feet thick in WDW-1, 745 feet in WDW-2, and 720 feet in WDW-3. The total thickness of intervals with log porosity greater than 5 percent is approximately 310 feet in WDW-1, 580 feet in WDW-2, and 572 feet in WDW-3. The total thickness with log porosity greater than 10 percent is approximately 100 feet in WDW-1, 32 feet in WDW-2, and 65 feet in WDW-3. The thickness of the porous intervals in the Cisco ranges from 0 feet in



the northwestern part of the study area to nearly 700 feet in a band three miles wide that trends northeast-southwest.

The Canyon Formation (Pennsylvanian-Missourian age) consists of white to tan to light brown fine grained, chalky, fossiliferous limestone with gray and red shale interbeds (Meyer, 1966, page 53). Locally, the Canyon occurs between the base of the Cisco dolomites and the top of the Strawn Formation (Pennsylvanian-Desmoinesian age). The total thickness of intervals with log porosity greater than 5 percent is 34 feet in WDW-1, 30 feet in WDW-2, and 10 feet in WDW-3. No intervals appear to have log porosity greater than 10 percent in any of the three injection wells.

Permeability measurements that range from less than 100 md to 2,733 md are available for the Lower Wolfcamp-Cisco-Canyon injection zone. Permeability measurements from hydrocarbon-producing intervals in the Wolfcamp, Cisco, and Canyon from Meyer (1966, Table) are summarized in Appendix I. Meyer reported permeabilities in the Cisco of up to 114 millidarcies (md), up to 38 md in the Canyon, and up to 200 md in the Wolfcamp.

Permeability was estimated to be 597 md from DST No. 5 conducted in WDW-1 on August 26, 1993. DST No. 5 was conducted near the top of the Cisco Formation from 7,817 feet to 7,851 feet (Appendix I).

Historical falloff data obtained during the life of the wells shows that the permeability ranges from 500 md to 1,000 md throughout the injection interval.

Chemical and Physical Characteristics of the Confining Zone

The Confining Zone extends from 4,000 feet to 7,450 feet in WDW-1, from 4,120 feet to 7,270 feet in WDW-2, and from 4,030 feet to 7,303 feet in WDW-3. The Confining Zone includes massive low-porosity carbonate beds and layers of shale in the Upper Wolfcamp, Abo, and Yeso Formations that will confine the injected fluids to the permitted Injection Zone (Lower Wolfcamp, Cisco, and Canyon Formations). The formations that comprise the Confining Zone are described below.



The Injection Zone is directly overlain by the confining layers of the upper portion of the Wolfcamp Formation. Three (3) DSTs were conducted in the upper portion of the Wolfcamp in WDW-1, in the interval from 7,016 feet to 7,413 feet, that indicate that the interval has low permeability and can confine injected fluids to the injection zone. An average permeability of 0.36 md was calculated from the data from DST No. 3, as follows:

$$k = 162.6 \frac{q \ B \ \mu}{mh}$$

$$= 162.6 \frac{(20 \ bbl/ \ 89 \ min \ x \ 1440 \ min/day)(1 \)(0.53 \ cp)}{(570.883 \ psi/cycle) \ (7382 \ feet \ - \ 7230 \ feet)}$$

$$= 162.6 \frac{(323.6 \ bpd)(1)(0.\ 53 \ cp)}{(570.883 \ psi/cycle) \ (152 \ feet)}$$

$$= 0.36 \ md$$

A permeability on the order of 0.1 md is at the low end of the permeability range for carbonates, and is at the high end of the permeability range for shales, according to Freeze and Cherry (1979, p. 29). Therefore, the low-permeability carbonates of the upper Wolfcamp will provide the first level of confinement for the Injection Zone.

The Abo Formation overlies the Wolfcamp and extends from 5,400 feet to 6,890 feet in WDW-1, from 5,506 feet to 6,728 feet in WDW-2, and from 5,380 feet to 6,745 feet in WDW-3. Although the Abo is well known as a major oil producer in the AOR, the producing intervals lie in the upper Abo, whose equivalents are above 6,100 feet in WDW-1 and above 6,200 feet in proposed Gaines Well No. 2. The deepest Abo test well in the AOR, Map ID No. 126, located 6,000 feet east (downdip) of WDW-3, was drilled to 6,412 feet. No Abo production in the AOR has been established below 6,298 feet, the producing interval in Map ID No. 112, located 3,800 feet southeast (downdip) of WDW-1. The base of the producing interval within the Abo Formation in the AOR, therefore, is over 900 feet above the top of the proposed injection zone. The lower 600 feet of the Abo Formation (below the deepest producing interval in the AOR), consisting primarily of dolomite with an average porosity less than 5 percent and interbedded shale, will serve as the secondary confining layer above the proposed injection zone.



The Yeso Formation, which will provide additional confining capabilities, directly overlies the Abo Formation. The top of the Yeso is not consistently identified in the AOR, according to well records submitted to the OCD and available scout tickets. However, the top of the Confining Zone can be considered to extend to the top of the low-porosity limestone interval below the higher-porosity dolomites below the Glorieta Member of the San Andres Formation (at 4,000 feet in WDW-1, 4,120 feet in WDW-2, and 4,030 feet in WDW-3). The Yeso consists of low-porosity carbonates and clastic beds. The Tubb shale, a shale interval that is up to 150 feet thick in some wells in the study area, also occurs in this interval. Although no faults are known to exist in the confining zone within the AOR, the Tubb shale will serve to prevent movement of fluids through a hypothetical unknown fault.

Depth, Thickness and Chemical Characteristics of Penetrated Formations Containing Ground Water

The base of the USDW, groundwater with total dissolved solids concentration with less than 10,000 milligrams per liter (mg/L), occurs at the base of the Tansill Formation. Figure 3 presents a hydrostratigraphic cross-section for the local area. Figure 4 presents a potentiometric surface map indicating the direction of groundwater movement in the freshwater aquifers.

The base of the USDW occurs at the following approximate depths in Navajo's three injection wells:

- WDW-1: approximately 493 feet KM (3,200 feet above mean sea level)
- WDW-2: approximately 473 feet KB (3,150 feet above mean sea level)
- WDW-3: approximately 420 feet KB (3,150 feet above mean sea level)

In the eastern part of the study area, at depth, the Tansill Formation is overlain by the Salado Formation (Permian - Ochoan age). The Salado consists of halite, polyhalite, anhydrite, and potassium salts, which are soluble. The Salado is overlain by the Rustler Formation (Permian - Ochoan age). In the AOR, which straddles the outcrop area of the Salado, and to the east, the Salado has been removed by solution by ground water flowing through the Rustler.



To the east, where the Rustler is present, the Rustler is the USDW. To the west, where the Rustler has been removed by erosion and the Salado has been removed by solution, the Tansill is the USDW. The Tansill Formation and the underlying Yates Formation comprise the Three Twins Member of the Chalk Bluff Formation known in outcrops in the region (Hendrickson and Jones, 1952, page 20), and listed as a freshwater-producing interval.

The top of the Injection Zone (Lower Wolfcamp, Cisco, and Canyon Formations) is separated from the base of the USDW by several thousand feet of lower permeability carbonates, siltstones and shales as follows:

- WDW-1: 6957 feet (7,450 feet 493 feet)
- WDW-2: 6,797 feet (7,270 feet 473 feet).
- WDW-3: 6,883 feet (7,303 feet 420 feet).

7 (m) Contingency Plans

WDW-3 is equipped with a high-level shutoff switch to prevent operation of the injection pump at pressures greater than the designated MASIP. The well is equipped with a low pressure shutoff switch that will deactivate the injection pump in the event of a surface leak. In addition, the well is equipped with a high/low pressure shutdown switch with a pressure sensor on the tubing/casing annulus. This pressure switch is intended to stop the injection pump in the event of 1) a tubing leak, or 2) a casing, packer, or wellhead leak.

If an alarm or shutdown is triggered, the cause of the alarm or shutdown will be immediately investigated.

- Immediately cease injection operations;
- Take all necessary steps to determine the presence or absence of a leak; and
- Provide verbal notification to OCD within 24 hours.

If the alarm or shutdown is not related to mechanical integrity and the cause of the alarm or shutdown is corrected, injection operations will be resumed. If the mechanical integrity of the well is in question, the well will remain out of service

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until the mechanical integrity of the well is restored to the satisfaction of OCD and the agency approves resumption of injection operations.

7 (n) MIT Monitoring Plans (20.6.2.5207 NMAC)

Navajo has an ongoing monitoring program that satisfies all applicable requirements of Section 20.6.2.5207.NMAC.

- The mechanical integrity of WDW-3 is demonstrated on an annual basis.
- Continuous monitoring devices are used to provide a record of injection pressure, flow rate, flow volume, and annular pressure.

The results of these monitoring activities are reported to NMED as required by regulation.

7 (o) Additional Monitoring Plans for Class I Non-Hazardous Waste Injection Wells (20.6.2.5207B NMAC)

Appendix J includes an Injected Fluids Monitoring Plan that describes the procedures to be carried out on a quarterly basis to obtain a detailed chemical and physical analysis of a representative sample of the injected fluid, including the quality assurance procedures. The plan will be updated as necessary.

The plan includes the following elements:

- The parameters for which the injected fluid will be analyzed and the rationale for the selection of these parameters;
- The test methods that will be used to test for these parameters;
- The sampling method that will be used to obtain a representative sample of the injected fluid being analyzed;
- Field sampling documentation methodologies;
- The commercial laboratory who performs the analysis; and
- Method of reporting analytical results to OCD.

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7 (p) Additional Monitoring Plans for Class III Wells (20.6.2.5207C NMAC)

This section is Not Applicable; WDW-3 is not a Class III well.

7 (q) Financial Assurance

Appendix K includes a well closure plan for WDW-3. The estimated cost to plug and abandon WDW-3 is presented in the table below. This cost estimate has been prepared to reflect the estimated costs that would be incurred by Navajo to abandon the well in accordance with the procedures in Appendix K.

Description of Service	Estimated Cost
Wireline (BHP, RTS, PFOT, Perforate)	20,000
Rental Tools	5,000
Pumping Service	10,000
Cementing Service	20,000
Excavating and Welding	2,500
Mud/Brine	5,000
Frac Tanks	2,500
Vacuum Trucks	2,500
Miscellaneous	2,500
SUBTOTAL	70,000
Field Supervision, Project Management, Procurement	25,000
Total Estimated Cost	\$95,000

Appendix L includes a copy of the financial assurance instrument that Navajo has established to provide the appropriate monies for plugging and abandoning WDW-3, any groundwater restoration that may be necessary, and any post-operational monitoring that may be required.

7 (r) Logging and Testing Data

Appendix M includes a copy of an open-hole log run on the original oil and gas well that was drilled in 1991 and later converted to WDW-3. Appendix N includes



copies of cased-hole logs that were run in WDW-3 as the well was being converted to disposal services.

7 (s) Mechanical Integrity Data (20.6.2.5204 NMAC)

Mechanical Integrity Testing (MIT) is conducted on WDW-3 on an annual basis in accordance with OCD regulations. Copies of each annual MIT report are submitted to OCD. Appendix G includes copies of the report documenting the most recent annual MIT work at WDW-3.

7 (t) Maximum Pressure and Flow Rate

As described in Section 7(f), the maximum composite injection rate into the three Navajo injection wells and maximum surface injection pressure are as follows:

- Maximum Injection Rate: 800 gpm
- Maximum Surface Injection Pressure: 1,460 psi

7 (u) Formation Testing Program Data

Appendix E includes the results of formation testing that was performed on the well when it was originally drilled as an oil and gas exploratory well.

7 (v) Compatibility

All components of WDW-3 that are in direct contact with the non-corrosive waste stream and formation fluids in the Injection Interval (e.g., wetted surfaces) are constructed of materials that are compatible with these fluids.

7 (w) Area of Review Corrective Actions

No corrective action plan is required for any of the artificial penetrations identified in the 1-mile radius AOR because all artificial penetrations have been properly constructed, plugged and/or abandoned in order to prevent movement of fluids



into or between USDWs which could be caused by pressures in the Injection Zone.

8.0 Modification(s)

There are no proposed modifications to existing discharge processes.

9.0 Inspection/Maintenance and Reporting

Navajo performs daily visual inspections of their three injection wells and the pipeline and performs required maintenance (PM) activities as scheduled to ensure safe operation of the wells.

Navajo performs routine reporting in accordance with the requirements of 20.6.2.5208.A NMAC for Class I nonhazardous waste injection wells.

10.0 Contingency Plans

Navajo has an Integrated Contingency Plan detailing responses to spills of all types, reporting spills/releases, mitigation and corrective actions, clean up and disposal as applicable. The remote WDW-3 is equipped with a high-pressure shutoff switch to prevent operation of the injection pump at pressures greater than the designated MASIP. The well is equipped with a low pressure shutoff switch that will deactivate the injection pump in the event of a surface leak. In addition, the well is equipped with a high/low pressure shutdown switch with a pressure sensor on the tubing/casing annulus. This pressure switch is intended to stop the injection pump in the event of 1) a tubing leak, or 2) a casing, packer, or wellhead leak.

If an alarm or shutdown is triggered at the wellhead, electronic signals are sent to the Control Room at the refinery notifying of the shutdown and the cause of the alarm or shutdown will be immediately investigated.

Operators will immediately cease injection operations at the wellhead and divert flow to another well; and notify Maintenance and Environmental to take all



necessary steps to determine the presence or absence of a leak; and Environmental will provide verbal notification to OCD within 24 hours.

If the alarm or shutdown is not related to mechanical integrity and the cause of the alarm or shutdown is corrected, injection operations will be resumed. If the mechanical integrity of the well is in question, the well will remain out of service until the mechanical integrity of the well is restored to the satisfaction of OCD and the agency approves resumption of injection operations.

11.0 Other Information

No additional information is required to demonstrate that the discharge permit will not result in concentrations in excess of the standards of Section 20.6.2.3103 NMAC or the presence of any toxic pollutant at any place of withdrawal of water for present or reasonably foreseeable future use.

12.0 Filing Fee

A check in the amount of \$100, made payable to Water Quality Management Fund, accompanies this permit renewal application document.

13.0 Draft Public Notice

20.6.2.3108.C requires that Navajo provide notice in accordance with 20.6.2.3108.F within thirty (30) days of OCD deeming the permit renewal application to be administratively complete. Appendix O includes a DRAFT copy of the public notice that will be published following receipt of written notification from OCD that this discharge permit renewal application has been deemed administratively complete.

Navajo understands the requirement to submit to OCD within 15 days of completion of public notice requirements stipulated Subsection C of 20.6.2.3108 NMAC proof of notice, including an affidavit of mailing(s) and the list of property owner(s), proof of publication, and an affidavit of posting, as appropriate.



The required certification language is included at the end of the completed OCD Discharge Permit Application Form in the front of this permit renewal application document. The appropriate Navajo refinery authority has signed the form.

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TABLE IA

NON-FRESHWATER (OIL AND GAS) WELLS IN WDW-3 AREA OF REVIEW NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

ID NO	ΑΡΙ	Sect	TWP	RNG	NS FTG	EW FTG	WELL NAME	OPERATOR	WELL TYPE	PLUG DATE	WELL STATUS	DRILLL DATE	DEPTH (ft)
1	30-015-00662	36	17S	27E	330S	330W	STATE NO. 2	ACREY, B L & F D	0	10/15/1942	P&A	10/15/1942	600
2	30-015-00676	36	17S	27E	330N	990W	EMPIRE ABO UNIT #017	LIME ROCK RESOURCES A, L.P.	0	N/A	ACTIVE	?	5797
3	30-015-00677	36	17S	. 27E	330S	990E	EMPIRE ABO UNIT #020	BP AMERICA PRODUCTION COMPANY	0	4/13/2009	P&A	3/17/1960	6013
4	30-015-00696	1	18S	27E	1980S	1980E	EMPIRE ABO UNIT #019Q	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	8/20/1959	6180
5	30-015-00697	_ 1	18S	27E	1980S	660E	EMPIRE ABO UNIT #020K	BP AMERICA PRODUCTION COMPANY	0	1/5/2003	P&A	1/5/2003	6185
6	30-015-00698	1 ·	_18S	27E	660S	1980E	EMPIRE ABO UNIT #191	BP AMERICA PRODUCTION COMPANY	S	N/A	ACTIVE	11/8/1959	6365
7	30-015-00699	1	18S	27E	940S	330E	EMPIRE ABO UNIT #020B	APACHE CORPORATION	0	N/A	ACTIVE	12/2/1961	6250
8	30-015-00703	1	18S	27E	1980S	660W	EMPIRE ABO UNIT #017A	BP AMERICA PRODUCTION COMPANY	0	3/27/2009	P&A	5/22/1995	6137
9	30-015-00704	1	18S	27E	1980N	660W	EMPIRE ABO UNIT J NO. 17	ARCO OIL & GAS	0	3/26/1959	P&A	3/26/1959	<u>59</u> 60
10	30-015-00705	1	_18S	27E	990S	660W	EMPIRE ABO UNIT #017B	BP AMERICA PRODUCTION COMPANY	0	7/21/2004	P&A	6/25/1959	6150
11	30-015-00706	1	18S	27E	2310N	1980W	EMPIRE ABO UNIT #018A	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	5/31/1959	6087
12	30-015-00707	1	18S	27E	1980S	1980W	EMPIRE ABO UNIT #018B	APACHE CORPORATION	0	N/A	ACTIVE	5/22/1959	6163
13	30-015-00708	1	18S	27E	660N	1980E	EMPIRE ABO UNIT #019B	LIME ROCK RESOURCES II-A, L.P.	0	N/A	ACTIVE	7/7/1959	6078
14	30-015-00709	1	18S	27E	1980N	1980E	EMPIRE ABO UNIT #019C	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	8/2/1959	6205
15	30-015-00710	1	18S	27E	660N	1980W	AAO FEDERAL No. 013	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	7/21/2004	6200
16	30-015-00711	1	18S	27E	1980 <u>N</u>	660E	EMPIRE ABO UNIT #020C	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	10/13/1959	6218
17	30-015-00712	1	18S	27E	647N	667W	EMPIRE ABO UNIT I NO. 17	ARCO OIL & GAS	0	1/24/1987	P&A	1/24/1987	5902
18	30-015-00713	1	18S	27E	995S	1644W	EMPIRE ABO UNIT #018D	BP AMERICA PRODUCTION COMPANY	0	9/27/2003	P&A	9/27/2003	6150
19	30-015-00715	1	18S	27E	330N	330W	SOUTH RED LAKE GRAYBURG UNIT #037	LEGACY RESERVES OPERATING LP	1	N/A .	ACTIVE	?	1820
20	30-015-00716	2	18S	27E	1980S	1830E	EMPIRE ABO UNIT #015	APACHE CORPORATION	Ó	N/A	ACTIVE	3/23/1959	6100
21	30-015-00718	2	18S	27E	330S	610W	PRE-ONGARD WELL #2	PRE-ONGARD WELL OPERATOR	0	N/A	P&A	?	512
22	30-015-00720	2	18S	27E	990N	1650E	RIVERWOLF UNIT #004	BP AMERICA PRODUCTION COMPANY	0	12/12/2008	P&A	10/21/1959	5881
23	30-015-00721	2	18S	27E	330N	990E	SOUTH RED LAKE GRAYBURG UNIT #036	FAIRWAY RESOURCES OPERATING LLC	0	N/A	P&A	11/6/1947	1705
24	30-015-00722	2	18S	27E	660S	660E	EMPIRE ABO UNIT #016A	APACHE CORPORATION	0	2/24/2009	P&A	1/20/1959	6114
25	30-015-00724	2	18S	27E	990N	330E	EMPIRE ABO UNIT #016B	LIME ROCK RESOURCES A, L.P.	0	N/A	ACTIVE	?	5920
26	30-015-00731	2	18S	27E	660S	1980E	EMPIRE ABO UNIT #015A	BP AMERICA PRODUCTION COMPANY	0	2/11/2009	P&A	11/19/1958	6135
27	30-015-00737	2	18S	27E	905N	1601E	SOUTH RED LAKE GRAYBURG UNIT #038	FAIRWAY RESOURCES OPERATING LLC	0	N/A	ACTIVE	5/23/1948	1685
28	30-015-00740	2	18S	27E	1650N	2197E	SOUTH RED LAKE GRAYBURG UNIT #040	MCQUADRANGLE, LC	1	7/10/2002	P&A	7/10/2002	5884
29	30-015-00741	2	18S	27E	2310N	1980E	EMPIRE ABO UNIT #015B	APACHE CORPORATION	0	N/A	ACTIVE	6/6/1959	5884
30	30-015-00742	2	18S	27E	1650N	990E	SOUTH RED LAKE GRAYBURG UNIT 39 WIW	S&J OPERATING COMPANY	0	2/8/1991	P&A	2/8/1991	1741
31	30-015-00744	2	18S	27E	2310S	1640E	STATE 1	COMPTON-SMITH	0	N/A	P&A	?	5962
32	30-015-00745	2	18S	27E	1980N	660E	STATE H #001	MACK ENERGY CORPORATION	0	3/7/2008	P&A	3/7/2008	6140
33	30-015-00868	11	18S	27E	660N	1980E	EMPIRE ABO UNIT #015C	BP AMERICA PRODUCTION COMPANY	0	7/16/2004	P&A	7/16/2004	6263
34	30-015-00869	11	18S	27E	330N	653E	EMPIRE ABO UNIT #016C	BP AMERICA PRODUCTION COMPANY	0	10/25/2004	P&A	10/25/2004	6211
35	30-015-00871	12	18S	27E	330N	330W	FEDERAL EA #001	RHONDA OPERATING CO	0	4/12/1994	P&A	4/12/1994	6219
36	30-015-00872	12	18S	27E	310S	990W	MAGRUDER NO. 1	MCKEE-JONES	0	2/18/1943	,P&A	2/18/1943	2000
37	30-015-00874	12	18S	27E	2310S	2355E	COMSTOCK FEDERAL #007	HARLOW ENTERPRISES LLC	0	N/A	ACTIVE	6/29/1948	1604
38	30-015-01215	1	18S	27E	667N	666E	EMPIRE ABO UNIT #020D	APACHE CORPORATION	0	N/A	ACTIVE	11/5/1959	6118
39	30-015-01218	36	17S	27E	330S	2310W	EMPIRE ABO UNIT #018	BP AMERICA PRODUCTION COMPANY	0	3/11/2009	P&A	3/11/2009	6849
40	30-015-01251	36	17S	27E	660S	1980E	EMPIRE ABO UNIT #019	BP AMERICA PRODUCTION COMPANY	0	4/27/2009	P&A	9/8/1959	6200
41	30-015-02610	6	18S	28E	955S	1750W	EMPIRE ABO UNIT #022C	APACHE CORPORATION	0	N/A	ACTIVE	8/5/1960	6243
42	30-015-02613	6	18S	28E	990N	660W	EMPIRE ABO UNIT #021B	APACHE CORPORATION	0	N/A	ACTIVE	12/30/1959	6119
43	30-015-02619	6	18S	28E	1990N	660W	EMPIRE ABO UNIT #021C	APACHE CORPORATION	0	N/A	ACTIVE	10/30/1959	6202

Map ID No. - Refer to Drawing 2 Well Type - O=Oil, I=Injction, G=Gas (ft) - Feet N/A - Not Applicable Well Status - PTABLE II Wells_in_1_Mile_Sorted= Plug Abandoned, TTABLE II Wells_in_1_Mile_Sorted=Temporarily Abandoned ? - Data Not Available

TABLE IA

NON-FRESHWATER (OIL AND GAS) WELLS IN WDW-3 AREA OF REVIEW NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

ID NO	API	Sect	тwр	RNG	NS FTG	EW FTG	WELL NAME	OPERATOR	WELL TYPE	PLUG DATE	WELL STATUS	DRILLL DATE	DEPTH (ft)
44	30-015-02622	6	18S	28E	2219S	660W	EMPIRE ABO UNIT #021D	APACHE CORPORATION	0	N/A	ACTIVE	1/23/1960	6194
45	30-015-02623	6	18S	28E	2248S	2075W	EMPIRE ABO UNIT #022F	APACHE CORPORATION	0	N/A	ACTIVE	2/22/1960	6210
46	30-015-02627	6	18S	28E	949S	990W	STATE M-AI #002	RUTH OIL CO, LLC	0	N/A	ACTIVE	10/21/1960	6225
47	30-015-10184	36	17S	27E	330S	920W	STATE #006	ASPEN OIL INC	0	N/A	ACTIVE	?	1343
48	30-015-20394	1	18S	27E	953S	2197E	EMPIRE ABO FEDERAL NO. 5	HUMBLE OIL & REFINING CO	0	4/9/1971	P&A	4/9/1971	3301
49	30-015-20535	12	18S	27E	330N	455Ŵ	FEDERAL EA 2	ROBERT G COX	0	8/7/1973	P&A	8/7/1973	6248
50	30-015-20894	12	18S	27E	1980N	660W	WDW #002	NAVAJO REFINING COMPANY	<u> </u>	N/A	ACTIVE	7/18/1973	10372
51	30-015-21395	6	18S	28E	2630N	1300W	EMPIRE ABO UNIT #211	APACHE CORPORATION	0	N/A	ACTIVE	2/11/1975	6200
52	30-015-21544	2	18S	27E	1110S	1322E	EMPIRE ABO UNIT #151	APACHE CORPORATION	0	N/A	T&A	11/4/1975	6285
53	30-015-21552	1	18S	27E	2500N	2500E	EMPIRE ABO UNIT #191	CFM OIL, LLC	0	N/A	ACTIVE	9/7/1975	6259
54	30-015-21553	1	18S	27E	2501N	20E	EMPIRE ABO UNIT #201	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	7/19/1975	6225
55	30-015-21554	1	18S	27E	1367S	1440W	EMPIRE ABO UNIT #181	BP AMERICA PRODUCTION COMPANY	0	4/17/2003	P&A	4/17/2003	6203
56	30-015-21623	36	17S	27E	360S	455W	STATE #007	GEORGE A CHASE JR & C SERVICE	0	N/A	ACTIVE	?	1366
57	30-015-21783	1	18S	27E	2490N	1299E	EMPIRE ABO UNIT #202	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	5/13/1976	6296
58	30-015-21792	1	18S	27E	1533S	2370W	EMPIRE ABO UNIT #182	LIME ROCK RESOURCES A, L.P.	0	N/A	ACTIVE	6/1/1976	6369
59	30-015-21825	2	18S	27E	320S	2602E	EMPIRE ABO UNIT #152	APACHE CORPORATION	0	N/A	T&A	6/17/1976	6335
60	30-015-21873	1	18S	27E	1526S	1470E	EMPIRE ABO UNIT #191A	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	9/23/1976	6350
61	30-015-22013	2	18S	27E	90S	1456E	EMPIRE ABO UNIT #153	BP AMERICA PRODUCTION COMPANY	0	10/30/2008	P&A	4/20/1977	6303
62	30-015-22051	2	18S	27E	1370S	2445W	EMPIRE ABO UNIT #141A	APACHE CORPORATION	0	N/A	ACTIVE	5/17/1977	3203
63	30-015-22096	1	18S	27E	2370S	1510W	EMPIRE ABO UNIT #183	APACHE CORPORATION	0	N/A	ACTIVE	7/24/1977	6210
64	30-015-22527	6	18S	28E	2630N	1930W	EMPIRE ABO UNIT #223	APACHE CORPORATION	0	N/A	ACTIVE	5/19/1978	6250
65	30-015-22559	1	18S	27E	2290S	2445W	EMPIRE ABO UNIT #184	APACHE CORPORATION	0	N/A	SHUT IN	7/25/1978	6200
66	30-015-22560	1	18S	27E	220S	1390E	EMPIRE ABO UNIT #192	BP AMERICA PRODUCTION COMPANY	. 0	N/A	ACTIVE	6/25/1978	6250
67	30-015-22568	11	18S	27E	400N	1450E	EMPIRE ABO UNIT #151B	BP AMERICA PRODUCTION COMPANY	0	8/16/2006	P&A	8/16/2006	6310
68	30-015-22569	11	18S	27E	560N	2588E	EMPIRE ABO UNIT #152B	BP AMERICA PRODUCTION COMPANY	0	9/24/2008	P&A	8/23/1978	6300
69	30-015-22608	2	18S	27E	100S	1950W	EMPIRE ABO UNIT #142	BP AMERICA PRODUCTION COMPANY	0	N/A	P&A	?	6200
70	30-015-22637	6	18S	28E	2450N	400W	EMPIRE ABO UNIT #212	APACHE CORPORATION	0	N/A	ACTIVE	12/28/1978	6267
71	30-015-22656	1	18S	27Ė	2400N	700E	EMPIRE ABO UNIT #203	APACHE CORPORATION	0	N/A	ACTIVE	10/10/1978	6225
72	30-015-22657	1	18S	27E	2490S	2200E	EMPIRE ABO UNIT #193	ALAMO PERMIAN RESOURCES, LLC	0	N/A	ACTIVE	10/26/1978	6225
73	30-015-22658	1	18S	27E	1500S	2130E	EMPIRE ABO UNIT #194	APACHE CORPORATION	0	N/A	ACTIVE	11/14/1978	6325
74 [·]	30-015-22669	2	18S	. 27E	800S	2500E	EMPIRE ABO UNIT #154	BP AMERICA PRODUCTION COMPANY	0	1/27/2009	P&A	12/4/1978	6200
75	30-015-22808	2	18S	27E	600S	1330E	EMPIRE ABO UNIT #156	BP AMERICA PRODUCTION COMPANY	0	2/5/2009	P&A	4/12/1979	6225
76	30-015-22815	1	18S	27E	670S	330W	EMPIRE ABO UNIT #171	LIME ROCK RESOURCES A, L.P.	0	N/A	ACTIVE	5/22/1979	6300
77	30-015-22816	1	18S	27E	1120S	 1440E	EMPIRE ABO UNIT L #192	ARCO OIL & GAS	0.	6/23/1980	ABANDONED	6/28/1980	6350
78	30-015-22834	11	18S	27E	225N	2280W	EMPIRE ABO UNIT #141B	APACHE CORPORATION	0	N/A	ACTIVE	5/21/1979	6225
79	30-015-22838	11	18S	27E	200N	1925E	EMPIRE ABO UNIT #153B	BP AMERICA PRODUCTION COMPANY	0	1/4/2009	P&A	5/6/1979	6225
80	30-015-22885	2	18S	27E	1040S	2025E	EMPIRE ABO UNIT #155	APACHE CORPORATION	0	N/A	T&A	5/1/1979	6202
81	30-015-22896	2	18S	27E	1820S	2550W	EMPIRE ABO UNIT #143A	WALTER SOLT, LLC	0	N/A	ACTIVE	5/13/1979	6108
82	30-015-22914	2	18S	27E	1310S	590E	EMPIRE ABO UNIT #161	COG OPERATING, LLC	O .	N/A	ACTIVE	9/13/1979	6225
83	30-015-23115	12	18S	27E	330N	380W	FEDERAL EA NO. 3	RHONDA OPERATING CO	0	3/16/1980	'P&A	3/16/1980	6300
84	30-015-23116	6	18S	28E	2050N	100W	EMPIRE ABO UNIT #213	APACHE CORPORATION	· 0	N/A	ACTIVE	6/2/1980	6242
85	30-015-23548	6	18S	28E	1950S	1000W	EMPIRE ABO UNIT #211A	APACHE CORPORATION	0	N/A	ACTIVE	7/17/1980	6311
86	30-015-25099	12	18S	27E	1809N	990E	COMSTOCK FEDERAL #006	HARLOW ENTERPRISES LLC	0	N/A	ACTIVE	9/11/1985	1652

Map ID No. - Refer to Drawing 2 Well Type - O=Oil, I=Injction, G=Gas (ft) - Feet N/A - Not Applicable Well Status - PTABLE II Wells_in_1_Mile_Sorted= Plug Abandoned, TTABLE II Wells_in_1_Mile_Sorted=Temporarily Abandoned ? - Data Not Available

TABLE IA

NON-FRESHWATER (OIL AND GAS) WELLS IN WDW-3 AREA OF REVIEW NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

	ΑΡΙ	Sect	TWP	RNG	NS FTG	FW FTG	WELLNAME						DEPTH (ft)
87	30-015-25201	12	185	27E	16505	1770W	COMSTOCK FEDERAL #002			PLUG DATE	ACTIVE	3/16/1985	1600
88	30-015-25270	12	185	27E	2310N	2310W	CHUKKA FEDERAL #001	BIH MILER		N/A	ACTIVE	<u> </u>	1600
89	30-015-25545	12	185	275	9905	990W	COMSTOCK FEDERAL #003			N/A		5/10/1986	1530
90	30-015-25649	12	185	275	16505	990W	COMSTOCK FEDERAL NO. 8			10/10/1096		2	2000
91	30-015-25675	7	185	285	940N	1757\/				10/10/1900		11/10/1088	1600
92	30-015-25738	12	185	20	2310N	2310E	COMSTOCK EEDERAL #000		0		ACTIVE		1586
03	30-015-25997	7	185	275	2070N	1757\/		HARLOW ENTERPRISES LLC	0			4/23/1987	1600
0/	30 015-26017	12	195	20	0000	165014	CONSTOCK EEDEBAL #010	EASTLAND OIL CO	0	N/A	ACTIVE	2/23/196/	2040
05	30-015-26017	12	100	275	660N	000	COMSTOCK FEDERAL #010		0	1/23/2003		1/23/2003	10141
95	30-015-26575	6	195	205	779N	990E				N/A	ACTIVE		10141
90	30-015-20373	1	195	20	1650N	125014	WDW-3 (ORIGINAL LUC.)		<u> </u>	N/A	ACTIVE	<u> </u>	10119
91	20.015-20141	6	100	2/6	0005	72014	CHALK BLUFF FEDERAL COM #002	MEWBOURNE OIL CO	G	N/A	ACTIVE	6/24/1991	10140
90	30-015-20943	0	105	20E	9903	73000			G	N/A	ACTIVE	4/16/1992	10200
99	30-015-27 163	1	185	27E	19805	990E	CHALK BLUFF FEDERAL COM #003	MEWBOURNE OIL CO	G	N/A	ACTIVE	1/16/1993	10150
100	30-015-27280	30	1/5	2/E	0005	99000	CHALK BLUFF 36 STATE #001		0	N/A	ACTIVE	3/30/1993	10060
101	30-015-31087	0	185	28E	9905	330W			0	3/17/2008	P&A	7/15/2000	446
102	30-015-31319	7	185	28E	2310N	330W	LAUREL STATE #003	EASTLAND OIL CO	0	N/A	ACTIVE	1/31/2001	1630
103	30-015-31592	36	1/S	27E	3305	2310E	RAMAPO #007	ROJO GRANDE COMPANY LLC	0	12/21/2001	P&A	12/21/2001	612
104	30-015-32307	1	18S	27E	330N	990W	AAO FEDERAL #001	APACHE CORPORATION	0	N/A	ACTIVE	12/10/2002	3851
105	30-015-32308	1	18S	27E	430N	2310W	AAO FEDERAL #002	APACHE CORPORATION	0	N/A	ACTIVE	9/19/2002	4150
106	30-015-32309	. 1	18S	27E	330N	1690E	AAO FEDERAL #003	APACHE CORPORATION	0	N/A	ACTIVE	4/10/2003	4125
107	30-015-32310	1	18S	27E	990N	990E	AAO FEDERAL #004	APACHE CORPORATION	0	N/A	ACTIVE	5/4/2004	4100
108	30-015-32946	2	18S	27E	2210S	1650E	SCBP STATE #1	APACHE CORPORATION	0	N/A	ACTIVE	4/26/2005	3880
109	30-015-32959	1.	18S	27E	1650N	875W	AAO FEDERAL #005	APACHE CORPORATION	0	N/A	ACTIVE	10/12/2004	3900
110	30-015-33473	1	18S	27E	1750N	1650S	AAO FEDERAL #007	MARBOB ENERGY CORP	0	N/A	ACTIVE	4/4/2005	4100
111	30-015-33784	1	18S	27E_	1650N	330W	AAO FEDERAL #008	MARBOB ENERGY CORP	0	N/A	ACTIVE	2/25/2005	4310
112	30-015-34071	1	18S	27E	2169N	1963W	AAO FEDERAL #006	MARBOB ENERGY CORP	0	N/A	ACTIVE	8/5/2005	3977
113	30-015-34387	1	18S	27E	1980S	630W	AAO FEDERAL #009	MARBOB ENERGY CORP	0	N/A	ACTIVE	1/17/2006	3950
114	30-015-34555	1	18S	27E	890S	660W	AAO FEDERAL #011	MARBOB ENERGY CORP	0	N/A	ACTIVE	3/9/2006	4100
115	30-015-34576	1	18S	27E	2060S	2160W	AAO FEDERAL #010	MARBOB ENERGY CORP	0	N/A	ACTIVE	10/26/2006	4000
116	30-015-34998	1	18S	27E	890S	1650W	AAO FEDERAL #012	MARBOB ENERGY CORP	0	N/A	ACTIVE	9/21/2006	4075
117	30-015-35814	2	18S	27E	2063N	441E	STATE H NO 2	MACK ENERGY CORPORATION	0	N/A	ACTIVE	1/11/2008	7545
118	30-015-36281		18S	27E	2193S	1520W	SUN DEVILS FEDERAL NO. 001	MACK ENERGY CORPORATION	0	N/A	PERMIT TO DRILL	?	6000
119	30-015-39324	36	17S	27E	480S	2210E	BIG BOY STATE NO. 6	COG OPERATING, LLC	0	N/A	PERMIT TO DRILL	?	5072
120	30-015-39898	1	18S	27E	1258N	1005E	EMPIRE ABO UNIT #412	APACHE CORPORATION	. 0	N/A	NEW	?	6300
121	30-015-39899	1	18S	27E	1305N	2535W	EMPIRE ABO UNIT #016	APACHE CORPORATION	0	N/A	NEW	?	6300
122	30-015-39900	1	18S	27E	1120N	1205W	EMPIRE ABO UNIT #016	APACHE CORPORATION	0	N/A	NEW	?	6300
123	30-015-00695	1	18S	27E	1650S	330W	HILL NO. 1	WILLIAM & EDWARD HUDSON	0	6/18/1948	P&A	6/18/1948	?
124	30-015-00717	2	18S	27E	1980S	660E	EMPIRE ABO UNIT #016	APACHE CORPORATION	0	N/A	ACTIVE	2/6/1995	6100
125	30-015-00701	1	18S	27E	330N	330W	SOUTH RED LAKE GRAYBURG UNIT 37 WIW	FAIRWAY RESOURCES OPERATING LLC	0	N/A	ACTIVE	?	?

Map ID No. - Refer to Drawing 2 Well Type - O=Oil, I=Injction, G=Gas (ft) - Feet N/A - Not Applicable Well Status - PTABLE II Wells_in_1_Mile_Sorted= Plug Abandoned, TTABLE II Wells_in_1_Mile_Sorted=Temporarily Abandoned ? - Data Not Available

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TABLE 1B

NON-FRESHWATER (OIL AND GAS) WELLS IN WDW-3 AREA OF REVIEW PENETRATING TOP OF INJECTION ZONE NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

ID									WELL	PLUG	WELL	DRILL	DEPTH
NO	API	SECT	TWP	RNG	NS FTG	EW FTG	WELL NAME	OPERATOR	TYPE	DATE	STATUS	DATE	(ft)
50	30-015-20894	12	18S	27E	1980N	660W	WDW #002	NAVAJO REFINING COMPANY		N/A	ACTIVE	7/18/1973	10372
96	30-015-26575	6	18S	28E	778N	995W	WDW-3	NAVAJO REFINING COMPANY		N/A	ACTIVE	?	10119
97	30-015-26741	1	18S	27E	1650N	1350W	CHALK BLUFF FEDERAL COM #002	MEWBOURNE OIL CO	G	N/A	ACTIVE	8/24/1991	10140
95	30-015-26404	. 12 .	18S -	27E -	660N	990E	FEDERAL T #001	APACHE CORPORATION		N/A_	ACTIVE	9/13/1990	10141
99	30-015-27163	1	18S	27E	1980S	990E	CHALK BLUFF FEDERAL COM #003	MEWBOURNE OIL CO	G	N/A	ACTIVE	1/16/1993	10150
98	30-015-26943	6	18S	28E	990S	730W	CHALK BLUFF 6 STATE #001	MEWBOURNE OIL CO	G	N/A	ACTIVE	4/16/1992	10200
100	30-015-27286	36	17S	27E	660S	990W	CHALK BLUFF 36 STATE #001	MEWBOURNE OIL CO	0	N/A	ACTIVE	3/30/1993	10060
117	30-015-35814	2	18S	27E	2063N	441E	STATE H NO 2	MACK ENERGY CORPORATION	0	N/A	ACTIVE	1/11/2008	7545

Map ID No. - Refer to Drawing 2 Well Type - O=Oil, I=Injection, G=Gas (ft) - Feet N/A - Not Applicable ? - Data Not Available

TABLE 2 INJECTION FLUID CHARACTERIZATION DATA NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

	February 2011	May 2011	August 2011	November 2011	February 2012
Miscellaneous					
Reactive Cyanide (mg/Kg)	<40.0	<40.0	<40.0	<40.0	<40.0
Reactive Sulfide (mg/Kg)	<40.0	<40.0	<40.0	<40.0	<40.0
Chloride (mg/L)	410	213	404	332	519
Sulfate (mg/L)	1,510	2,240	2,290	2,350	1,870
Alkalinity (Total) (mg/L)	441	243	302	217	466
Sp. Cond. (umhos/cm)	6,270	4,680	7,380	5,430	5,990
Ignitability (oF)	>212	>212	>212	>212	>212
pH (S.U.)	7.40	7.85	8.11	7.52	7.30
TDS (mg/L)	3,310	3,400	4,320	4,840	3,890

mg/Kg Milligrams per kilogram.

mg/L Milligrams per liter.

umhos/cm Micromhos per centimeter.

°F Degrees Fahrenheit.

S.U. Standard Units

> Greater Than.











EXPLANATION

Direction of Groundwater Movement



NORTHW	EST SHE	F,	CENTRA	L BASIN PLATFORN		
A	ge		Strata	Oil Plays		
STR 2	NORVATIN	CI	ninte			
i uuuc	bend	Sa	anta Rosa			
	Vaccos	D				
Destances	CELICAN	Sa	alado			
		dno	Tanslll			
G		0r	Yates	Artesia Platform Sandstone		
	Guadaluoian	esia	Seven Rivers			
		Arte	Queen			
	an sain a thairte		Grayburg	Upper San Andres and Grayburg Platform - Artesia Vacuum Trend		
	and a second	1	San Andres	Upper San Andres and Grayburg Platform - Central Basin Platform Trend		
			Glorleta	angen an han an a		
		Yeso	Paddock	Leonardian Restricted		
	eceonalular,		Blinebry Tubb	Platform Carbonate		
			Drinkard			
			Ábo	Abo Platform Carbonate		
	Wolfcamplan	Hu	eco ("Wolfcamp")	Wolfcamp Platform Carbonate		
			Bough			
	, virgilari		Cisco	Northwest Shelf Upper Pennsvivanian		
	Missourian		Canyon	Carbonate		
<u>Š</u>				Northwest Shelf		
ST ST	Des Montesian	Contraction	Strawn	Strawn Patch Reef		
	Atokan		Atoka			
Ă.	Morrowan		Morrow			
Miss.			undivided			
	Upper		Woodford			
new	Middle					
	Lower	tan tani	Thirtyone	Devonian Thirtyone Deepwater Chert		
	Upper		Wilsten	Wristen Buildups and Platform Carbonate		
Sill.	Middle					
		4.5. 8 .8.2	Alexandra Constant and a start of the			



FIGURE 6

STRATIGRAPHIC COLUMN









SURFACE	GEOLO)GIC	MAP
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DATE: 05/30/12	CHECKED BY:	JOB NO: 60D6781
DRAWN BY: WDD	APPROVED BY:	DWG. NO:



FIGURE 11 PRE-INJECTION SURFACE FACILITIES NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

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BELOW GROUND DETAILS

- 1. <u>Surface Casing</u>: $13\frac{3}{8}$ ", $54\frac{1}{2}$ " lb/ft, J-55 set in a 17 $\frac{1}{2}$ " open hole at 400' and cemented to the surface with 425 sacks of Class C cement.
- 2. <u>First Intermediate Casing</u>: $9\frac{5}{8}$ ", 36 lb/ft, J-55 set in a 12 $\frac{1}{4}$ " open hole at 2604' and cemented to the surface with 1025 sacks Class C cement.
- 3. <u>Injection Tubing</u>: 4 ¹/₂", 11.6 lb/ft, J-55 LT&C set at 7568'.
- 4. Squeeze Perforations: 7050' 7102' with 80 sacks.
- 5. Squeeze Perforations: 7262' 7278' with 100 sacks.
- 6. Squeeze Perforations: 7304' 7314' with 80 sacks.
- 7. Arrow X-1 Packer 7" x $2\frac{7}{8}$ " set at 7575', 37K Tension, no nipples.
- 8. Old Open Perforations: 7676' 7698'.
- Perforations: 7660' 8450', 2 JSPF, 60°, 0.5" 10/14/06.
- 10. Perforations: 8540' 8620', 23 SPF, 60°, 0.5" 10/15/16.
- 11. Cement Plug: top tagged at 9022'.
- 12. Liner Top: $4\frac{1}{2}$ " set at 9051'.
- 13. <u>Second Intermediate Casing</u>: 7", 29 lb/ft, N-80 and P-110 steel set in an $8\frac{3}{4}$ " open hole at 9450' with 1350 sacks of Type H cement from 900' to 9450'.
- 14. Cast Iron Bridge Plug set at 9800' with 35' cement.
- 15. Old Perforations: 9861' 9967'
- 16. <u>Production Liner</u>: $4\frac{1}{2}$ ", 17 lb/ft, J-55 set in a $6\frac{1}{4}$ " open hole from 9051' to 10119' with 175 sacks Type H cement.





WELLHEAD DETAILS

- A. Top Connection: $4\frac{1}{2}$ " EUE, 2 $\frac{7}{8}$ " 8rd, 2 $\frac{7}{8}$ " bull plug, $\frac{1}{2}$ " NPT 5000 lb gauge.
- B. Flange: $4\frac{1}{16}$ " 3K x $4\frac{1}{2}$ " UPTBG 3K
- C. Tree Gate Valves: 4 1/16" 3K
- D. Upper Tree Assembly: A5PP, 4 $\frac{1}{2}$ ", 7 $\frac{1}{16}$ " 3K x 4 $\frac{1}{16}$ " 3K
- E. Annulus Valve: $2\frac{1}{16}$ 5K
- F. Flange: 2 ¹/₁₆" 5K x 2" LP 5K
- G. Annulus Valve: 2" ball valve 3K





SURROUNDING LAND OWNERSHIP INFORMATION





APPENDIX B

AREA OF REVIEW WELL FILES AND SCHEMATICS





MAP ID NO. 50

NAVAJOR FEFINING COMPANY WASTE DISPOSAL WELL NO. 2

API NO. 30-015-20894





DIONOUT PREVENTER HOOK-UP FOR DRILLING BELOW INTERMEDIATE CASING

- 1. BLOWOUT PREVENTERS AND MASTER VALVE TO BE FLUID OPERATED AND ALL PITTINGS MUST BE IN GOOD CONDITION (MINIMUM: WP - 3000 PS1, TEST - 6000 PS1).
- 2. EQUIPMENT THROUGH WHICH BIT MUST PASS SHALL BE AS LARGE AS THE INSIDE DIAMETER OF CASING THAT IS BEING DRILLED THROUGH.
- 3. KELLY COCK REQUIRED (MINIMUM: 3000 PSI WP, 6000 PSI TEST)
- 4. OMSCO OR COMPARABLE SAFETY VALVE MUST BE AVAILABLE ON RIG FLOOR AT ALL TIMES WITH PROPER CONNECTION OR SUB. (MINIMUM: 3000 PSI WP, 6000 PSI TEST)



A**>-(0	PRODUCTION COMP	ANY	DIAMO	ND Featra	e kus Com
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1640	NORTH		660	e san e se s	WEST
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50' _1	Amoco 100% 160 Acres NM- 6853 Amoco 100% 160 Acres		ATE ON KTE ON	· · · · · · · · · · · · · · · · · · ·	Arrest from the second

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drilling into the <u>Wolfcamp formation</u> and used until production casing is run and cemented. <u>Monitoring</u> equipment shall consist of the following:

- (1) A recording pit level indicator to determine pit volume gains and losses.
- (2) A mud volume measuring device for accurately determining mud volume necessary to fill the hole on trips.
- (3) A flow sensor on the flow-line to warn of any abnormal mud returns from the well.
- 6. When coming out of the hole with drill pipe, the annulus shall be filled with mud before the mud level drops below 150 feet. The volume of mud required to fill the hole shall be watched, and any time there is an indication of swabbing, or influx of formation fluids, proper blowout prevention precautions must be taken. The mud shall not be circulated and conditioned except on or near bottom, unless well conditions prevent running the pipe to bottom.
- 7. A copy of these requirements shall be posted on the rig floor or in the dog house during the drilling of the well.

Áames A. Knauf

District Engineer

Lease No.	NM-6852	
Well	Amoco Production Co. 1-Diamond Federal Gas Com.	
Drillsite	1980/N 660/W 12-18S-27E	
Depth	10,000' Morrow	
Approved	July 6, 1973	

Form 9-1211 C (May 1963)	`	N. M. U. C.	C. COPY. SOBMIT IN TI (Other instru	R ICATE I	form approved. () udget Bureau No.	J 42-R1425.
		TED STATES		ila., 30-1	015-208	94
. •	DEPARIMEN		RIUR	5. LEASE	DESIGNATION AND SI	BRIAL NO.
	N FOR PERMIT		PEN OR PLUG		IAN, ALLOTTER OR TR	TIBE NAME
IA. TIPE OF WORK		TO DRIEL, DELI				
DI b. TYPE OF WELL OIL WELL	RILL X				ND EDEPAL OR LEASE NAME	GAS (D
2. NAME OF OPERATOR AMOCO Produ	ction Company,	- 1111.9	1973	9. WELL	NO	
3. ADDRESS OF OPERATOR		301 /	1314		1	
BOX 68, HOBBS, 4. LOCATION OF WELL ()	N. M. 88240 Report location clearly and	d in accordance With Say	State requirements.*)	Sance	AND POOL, OR WILL	hoout
At surface 1980 FNL At proposed prod. 20	x 660 FAL	Sec. 12 Unit	E, SE4 NW/4) (COOC) 11. SEC., AND (T., E., M., OR BLK.	URBUU
14. DISTANCE IN MILES	AND DIRECTION FROM NEA	BEST TOWN OR POST OFFI	C#•	12-1 12. COUNT	B-27 N	<u>MPM</u>
				ED		N.M.
10. DISTANCE FROM PRO LOCATION TO NEARS: PROPERTY OR LEASE (Also to nearest dr	PUSED ⁶ ST LINE, FT. Ig. unit line, if any)	16. ?	O. OF ACRES IN LEASE	17. NO. OF ACRES AS TO THIS WELL		
TO NEAREST WELL, OR APPLIED FOR, ON T	DRILLING, COMPLETED, HIS LEASE, FT.	10. 1		DTODY	E TUULS	
21. ELEVATIONS (Show W 3607' (hether DF, RT, GR, etc.)	9	<u></u>		ROX. DATE WORK WIT	LL STABT*
23.]	PROPOSED CASING AN	D CEMENTING PROGR	AM		<u></u>
BIZE OF HOLE	BIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANT	NTT OF CEMENT	
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		4.5 - 11.8		500' ABOU PAY.	E UPPERM	1057
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IN ABOVE SPACE DESCRIP zone. If proposal is to preventer program, if an	E PROPOSED PROGRAM : If drill or deepen directions by.	proposal is to deepen or ally, give pertinent data	plug back, give data on pr on subsurface locations ar	resent productive sone ad measured and true v	and proposed new p rortical depths. Give	productive ve blowout
SIGNED	. E. York		AREA ENGINEER	DA1		1973
(This space for red	eral or State office use)		J	UL 6 1973		
PERMIT NO.	c.K.	Pis	TRICT ENGINER		JUL 6.19	973
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JUL 1 0 1973

P. O. Drewer U Artesia, New Maxico 88210 D. C. C. ARTESIA, OFFICE

July 9, 1973

Mr. Jim York Amoco Production Company Post Office Box 68 Hobbs, New Mexico 88240

Bear Mr. York:

This is to confirm my telephone conversation with you today whereby we requested that the 8-5/8-inch casing string be set in the top of the San Andres formation (approximately 2,000 feet below the surface) in your No. 1 Biamond Pederal Gas Com. well on lease NH-6852 in the SWENNE sec. 12, T. 18 S., R. 27 E., N.M.P.M., Eddy County, New Mexico.

Sincerely yours,

James A. Knauf

District Engineer

cc: Roswell N.M.O.C.C. (2)

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JUL 1 0 1973

D. C. C. ARTESIA, OFFICE

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Amoco Production C	ompany_	RECEIVED	DIAMOND FED. JAS CUN
3 ADDRESS OF OPERATOR		JUL 2 5 1973	9. WEI.I. NI
BUX 08, FUBDS, N. M. C 4 TOCATION OF WELL (Report lo See also space 17 below.)	O240 cation clearly and in accordance with (any State requirements.	10 FILD AND FOOL, OR WILDCAY
At surface	A	ARTESIA, OFFICE	SCOGGIN DRAW- MORROW
1980 FNL × 660) FWL SEC. 12 (UNI	τ E , SE/4 NW/4)	STIRVEY OR ABEA
14. PERMIT NO.	15. ELEV. TIONS (Show whethe 361)7 GL	3623' R.D.B	$\begin{array}{c c c c c c c c c c c c c c c c c c c $
18. Che	eck Appropriate Box To Indicate	2 Nature of Notice, Report, or (Diher Data
NOTICE O	די אסודאדאז דס:	p#86Ue	UENT REPORT OF :
TEST WATER SHUT-OFF	PULL OR ALTER CASING	WATER SHUT-OFF	ALTERING CASING
SHOOT OR ACIDIZE	ABANDON®	SHOOTING ORACIDIZING	· ABANDONMENT*
(19ther)	CHANGE PL: NB	(Other) (Nore: Report results Completion or Recomp	of multiple completion on Well letion Report and Log form.)
17. ID SCRIPE PROPOSED OR COMPLE proposed work. If well is nent to this work.) *	TED OFFRATIONS ((learly state all perti- directionally drilled, give subsurface (nent details, and give pertinent dates ocations and measured and true vertic	, including estimated date of starting any al depths for all markers and zone, perti-
Della Driga	. spuaded 11"	hole 3: PM 7-18-	73.
On 1-22-73,	8% OD 32" 8K	R. 55 Casing	was set
@ 1955 W/ 70	OSx Incor 2% B	elt 100 sil medi	. Cine. 200 Sr.
Tyter WO2	18 hours, tested	Casing w/ 500	ps, for 30 min.
A 0	,	· · · · · · · · · · · · · · · · · · ·	
Reduced h	ole to 178° e 1	955 and Alsu	mid Arilling.
		, · ·	RECEN
			JULIVED
			U. S. GEDLOG 1973
			ARTESIA, MON SURVEY
)			MEXICO
18. I hereby certify that the three SIGNED 424	going is true and correct	DMINISTRATIVE ASSISTANT	DATE JUL 2 3 1973
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APPROVED CONDITION OF APPROVA	ELIP ANY:	· · · · · · · · · · · · · · · · · · ·	
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	Ċ	GEOLOGIC	AL SURVE	Y	reverse	NM-6	852
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1a. TYPE OF WE	LL: OIL			Other		7. UNIT AGREEM	ENT NAME
L TYPE OF CON	IPLETION:		···	PFC	IVE	DIAMOND	FED. GAS (
	OVER DEEL	PLCG BACK	EESVR.	Other		S. PARM OR LEAD	SE NAME
Amoco F	Production C			SEP 2	4 1973	9. WELL NO.	
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At total depth						12-18-2	ייימאן א
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INSTR ONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency. or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments abould be listed on this form, see item 35.

Hem 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments,

items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified. for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: "Sacks Coment": Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool. Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

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37. BUMMARY OF POROUS ZONES :

. SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DEILL-STEM TESTS, INCLUDING . DEPTH INTERVAL TESTED, CUBHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND BECOVERIES GEOLOGIC MARKERS 38. TOBMATION TOP BOTTOM DESCRIPTION. CONTENTS. ETC. TOP NAMB GITEL INO MEAS. DEPTH TRUE VEBT. DEPTH ABO 506 WOLFCAMP 6 ÷ ISCO 8 STRAWN \mathbf{O} C. 1.1.1. TOKA 9 460 PROW 725 5. HESTED 158 ID bab 33R Miss Lm 10

U.S. GOVERNMENT PRINTING OFFICE : 1963-O-683636

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Our use this t	form for proposals Use "APPLICATIO	to drill or to deepen N FOR PERMIT- " f	or plug back or such propos	to a different reservoir. als.)		
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Amoco Produc	tion Compa	ny /	RE	CEIVED	3. FARM ORE NA >	
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14. CERNIT SO.		5. ELEVATIONS (Show w	hether DF. ST.	GR, etc.)	12-18-27 NA	MAN MATE
· · · · · · · · · · · · · · · · ·		36	23 R.T	D.B.	EDDY N	I.M.
16.	Check Appro	priate Box To Ind	icate Natur	e of Notice, Report,	or Other Data	
N FRE WATER SHUT-OF FRACTURE TREAT	P	OR ALTER CASING		SU WATER SHUT-OFF FRACTURE TREATMENT	REPAIRING WELL	
SHOOT OR ACIDIZE	ABAN	IDON*	Z	SHOOTING OR ACIDIZING (Other)	ABANDON MENT*	·
Other) 17. 16.8 RIBE PROPOSED OR proposed work. If	COMPLETED OPERATI	uss (Clearly state all drilled, give subsure	pertinent del	ails, and give pertinent d	completion Report and Log form.) lates, including estimated date of at erical depths for all markets and	arting a
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N. M. O. C. C. COU UN D STATES SUBMIT IN TRIPT DEPARTMENI OF THE INTERIOR Verse side) Form pp. aved. CO Form 9-331 (May-1963) G. LEASE DESIGNATION AND SERIAL NO. NM- 6852 **GEOLOGICAL SURVEY** SUNDRY NOTICES AND REPORTS ON WELLS (Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT-" for such proposals.) REC 7. UNIT AGREEMENT NAME GAS W7.1.) DAMOND FED. GAS COM WELL PQ V ΗΟιΕ 1 OTHER NAME OF OPERATOR SEP - 6 1974 Amoco Production Company 3. ADDRESS OF OPERATOR 9. WELL NO. O. C. C. BOX 68, HOB8S, N. M. 88240 LOCATION OF WELL (Report location clearly and in accordance with any State Antificitients) State and an anti-state and an accordance with any State Antificitients at surface 10. FIELD AND FOOL, OR WILDCAT SCOGGIN DRAW-MORROW 1980 FNLY 660 FWL Sec. 12 (UNIT E, SE/A NW/A) 12-18-27 12. COUNTY OF PARISA 18. NMPM 15. ELEVATIONS (Show whether DF. ST. OR. etc.) 14. PERMIT NO. 3623 RD R EDDV NM 16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data NOTICE OF INTENTION TO: SUBSBOUENT REPORT OF : TEST WATER SHUT-OFF PULL OR ALTER CASING WATER SHUT-OFF RBPAIRING WELL FRACTURE TREAT MULTIPLE COMPLETS ALTERING CASING FRACTURS TREATMENT 273 100 BILOOT OR ACIDIZE ABANDON[®] SHOOTING OR ACIDIZING ABANDONMENT* REPAIR WELL CHANGE PLANS (Other) (Nors: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) (Other) 17. DESCRIBE PROPUSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent is work.) * sical abandonment of were concluded 8-31-13. gged and abandoned as follows: Sx CEMENT INTERUAL LENGTH FORMATION 45 9775- 9765 100 MORROW 50 7535-7435 100' Cisco 40 5556 - 5456 100' 80 3720 - 3620 50 876 CSA 'Eso 2045 - 1945 40 1995 enc Surface & erected P. A marker. 10 all intervals filled up muc. Rocation to be cleaned i levelled A. A. $\overline{\mathcal{X}}$ 18. I hereby certify that egoing is true TITLE ADMINISTRATIVE ASSISTANT . 5 1973 DATE _SEP SIGNED This space for Federal or Sinte office us 34.0 ្តត្រូ APPROVED BY TITLE DATE CONDITIONS OF LEPROVAL TP ANT. 705 207 USGS ALE EP 62 I- DIV BEEKNIMIN I- Susp ACTING DISTRICT ENGINEER See Instructions on Reverse Side . RRJ 1- ARCO

EXHIBIT "D" SKETCH OF WELL PAD

FRED POOL DRILLING, INC. Well #2 Chukka Federal SW4xNW44, Sec. 12: T-18-S, R-27-E



EXHIBIT "D" SKETCH OF WELL PAD

FRED POOL DRILLING, INC. Well #2 Chukka Federal SW4NW4, Sec. 12: T-18-S, R-27-E



ENERGY AND MINERALS DEPARTMENT

DIL CONSERVATION DIVISIC

SANTA FE, NEW MEXICO 37501

Form C-102 Revised 10-1-79

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il Letter Sect	ion Township		Range	County	
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		<u>_</u>	LESIA		40 40
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3. If more than on dated by commu Yes X If answer is "n this form if nece No allowable wi forced-pooling, o	nitization, unitization No If answer is " o," list the owners an essary.) Il be assigned to the v or otherwise) or until a	whership is dedic , force-pooling. et 'yes,'' type of cons d tract descriptio well until all inter non-standard unit	ated to the well, c? solidation ns which have a ests have been , eliminating su	ctually been consol consolidated (by c ch interests, has be	of all owners been consol idated. (Use reverse side ommunitization, unitizatio en approved by the Divisi
	1				CERTIFICATION
19801				I heret tained best of	y certify that the information can herein is true and complete to th 1 my knowledge and belief.
60' X				Position Presi Company Fred	dent Pool Drilling, Inc.
ر مەربىيە ۋەرەر بىرىمىدىن بىرىمىدىنىيە بىرىمىيە بىرىمىيە بىرىمىيە بىرى					5-85
				l herel shawn (notes d under m is true knowled	by certify that the well locatio on this plat was plotted from fiel of actual surveys made by me a by supervision, and that the sam and correct to the best of m fige and belief.
				Date Surv Registere	eyed d Prolossional Engineer
			l !		

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· · · · · · · · · · · · · · · · · · ·		Drawer-DD-	106	er Instructions on	Budget. Burea	en. u No. 42-R14
RECEIVED DI		ITED STATES		reverse side)	30-115-2	0894
AUG 3 0 1985	GFOL	OGICAL SURVE	Y		5. LEASE DESIGNATION	AND SERIAL N
	N OR PERMIT		FEPEN OR P	UG BACK	6. IF INDIAN, ALLOTTE	E OR TRIBE NAM
12 TENE					-	
b. TYPE OF WELL		DEEPEN] <u>PL</u> I	JG BACK 🗌	7. UNIT AGBEEMENT N	(ame
OIL GA	ELL OTHER	Reentry	SINGLE X	MULTIPLE	S. FARM OR LEASE NA	MB
Fred Pool Dril	lling, Inc.	,		•	Chukka Feder 9. WELL NO.	al
3. ADDRESS OF OPERATOR				· · · · · · · · · · · · · · · · · · ·		
P. O. BOX 1393 4. LOCATION OF WELL (Re	3, Roswell, N. eport location clearly a	M. 88201 nd in accordance with	any State requireme	nts.*)	Artosia All	= 5/7
At surface	50' FWT.		· ·		11. BEC., T., B., M., OB AND SURVEY OB AN	BLK. BLK.
At proposed prod. zone			(Unit E)		Sec. 12 m 1	0 C D J
14. DISTANCE IN MILES A	AND DIRECTION FROM NI	EAREST TOWN OR POST	OFFICE*	<u></u>	12. COUNTY OR PARISH	0-5, R-2
11 air miles e	east-southeast	of Artesia,	N.M. 16. NO. OF ACRES IN	LEASE 17. NO.	Eddy	NM
LOCATION TO NEAREST PROPERTY OR LEASE I. (Also to nearest drig	r INE, FT. 5. unit line. if any)	660'	160	TO	THIS WELL	
18. DISTANCE FROM PROPO TO NEAREST WELL, DE	OSED LOCATION [*] RILLING, COMPLETED,	16501	19. PROPOSED DEPTH	20. ROT	ARY OR CABLE TOOLS	
OR APPLIED FOR, ON THE 21. ELEVATIONS (Show whe	ther DF, RT, GR, etc.)	1650	1945		22. APPROX. DATE WO	RK WILL STAR
3607	GR			· · · · · · · · · · · · · · · · · · ·	8-31-85	
23.		PROPOSED CASIN	G AND CEMENTING	PROGRAM		
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FO	OT SETTING D	<u>БРТН</u>	QUANTITY OF CEME	NT
12/4" 210	8_5/8"	<u>32</u> 17		Circ		
Chiefe a re-e	in pla	nd Fed. Gas	Com #1 plugge	d and abando	oned 8-31-73.	
Chy. A This is a re-e	in <i>fla</i> entry of Diamo	nd Fed. Gas	Com #1 plugge	d and abando 70: 10,372	oned 8-31-73. १	
Chyr, A This is a re-e	in <i>fla</i> entry of Diamo	nd Fed. Gas	Com #1 plugge	d and abando 70: 10,372	oned 8-31-73. ર	
Congrad This is a re-e	entry of Diamo	nd Fed. Gas (Com #1 plugge	d and abando $\mathcal{T}O: \mathcal{IO}, \mathcal{Z}\mathcal{IO}$	oned 8-31-73.	
This is a re-e	entry of Diamo	nd Fed. Gas (1) Well loca 2) Supplement	Com #1 plugge	d and abando 70: 10,372 ge dedicatio data	oned 8-31-73. 2 on plat	
Congrad This is a re-e	entry of Diamo	 Well loca Well loca Supplement Surface of Designation 	Com #1 plugge	d and abando 70: 10,372 ge dedicatio data or	oned 8-31-73. 2 on plat	
This is a re-e	entry of Diamo	 Well loca Supplement Surface of Designation Original 	Com #1 plugge ation & acrea ntal drilling use plan ton of operat approved app	d and abando 70: 10, 372 ge dedication data or lication by	oned 8-31-73. 2 on plat Amoco Productio	on Co.
This is a re-e	entry of Diamo	 Well loca Supplement Surface of Designat: Original for Diar 	Com #1 plugge ation & acrea ntal drilling use plan ton of operat approved app mond Federal	d and abando <i>TO: 10,37;</i> ge dedicatio data or lication by Gas Com #1	oned 8-31-73. 2 on plat Amoco Productio	on Co.
Cuy - S This is a re-e	entry of Diamo	 Well loca Supplement Surface of Designation Original for Diar 	Com #1 plugge ation & acrea htal drilling ise plan ion of operat approved app mond Federal	d and abando 70: 10,372 ge dedicatio data or lication by Gas Com #1	oned 8-31-73. 2 on plat Amoco Productio	on Co.
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This is a re-e This is a re-e At At N ABOVE SPACE DESCRIBE Sone. If proposal is to o Preventer program in any	PROPOSED PROGRAM: I drill or deepen direction	 Well loca Supplement Surface ut Designat: Original for Diar f proposal is to deeponally, give pertinent	Com #1 plugge ation & acrea ttal drilling use plan lon of operat approved app mond Federal en or plug back, give data on subsurface lo	d and abando 70: 10, 372 ge dedicatio data or Lication by Gas Com #1 data on present pro- cations and measure	oned 8-31-73. 2 on plat Amoco Productio ductive zone and propose ed and true vertical depti	on Co. Poly d new product 18. Give blow
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m 9–331 ay 1963)	LTED	STATES	SUBMIT IN THE ICA	TE: Form ap Budget 1 5. LEASE DESIGN	proved. Bureau No. 42-R142
	GEOLOGIC	AL SURVEY	MIL Verse sine)	NM 68	352
CI IN	NOTICES AN			6. IF INDIAN, ALLA	DTTEE OR TRIBE NAME
(Do not use this	s form for proposals to drill on Use "APPLICATION FOR P	r to deepen or plug ba ERMIT-" for such pro	CERCEIVED BY OIL		
OIL CAS WELL WELL	OTHER		SEP 11 1985	8. FARM OR LEASE	T NAME
FRED POOL	L DRILLING, INC.		O. C. D. ARTESIA, OFFICE	<u>Chukka Fe</u> 9. WELL NO.	ederal
P.O.Box LOCATION OF WELL (See also space 17 be	1393 Roswel Report location clearly and in low.)	1 N.M. 882 accordance with any S	01 tate requirements.*	2 10. FIELD AND POO	MOR WHIDCAT
1980 DNL Unit E	660 FWL SW눈 NW눈			Artesia ^{11. SEC., T., E., M., SUBVEY OR Sec. 12-T}	OB BLK. AND AREA 185- R 27E
PERMIT NO.	15. ELEVATION	ONS (Show whether DF,)	RT, GR, etc.)	12. COUNTY OB PA	RISH 13. STATE
<u> </u>	Check Appropriate F	Box To Indicate No	iture of Notice. Report	or Other Data	
	NOTICE OF INTENTION TO:	1	sus	SEQUENT REPORT OF:	
TEST WATER SHUT-(Fracture treat Shoot or acidize	DFF PULL OR ALTER MULTIPLE COM ABANDON*	R CASING	WATEB SHUT-OFF Fracture treatment Shooting or acidizing	BEPAIR	NG WELL
REPAIR WELL	CHANGE PLANS	•	(Other)	ults of multiple complet	tion on Well
DESCRIBE PROPOSED C proposed work. I nent to this work.) 9-5-	-85: Drilled c	nly state all pertinent give subsurface locatio EMENT OUT O	details, and give pertinent do not and measured and true ve f surface from	ntes, including estimated rtical depths for all ma	date of starting an rkers and zones perti
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(May 1963) DED STATLS Drawor Dother instruction of servers and proposals of the result of the server side side of the server side of the s	NE NE
GEOLOGICAL SURVEY CONTACT OF A	NE E OR TRIBE NAME
SUNDRY NOTICES AND REPORTS ON WELLS (Do not use this form for proposals to drill or to deepen or plus back the full ME Gee Mr. Use "APPLICATION FOR PERMIT-" for auch proposals.)	NE IS
(Do not use this form for proposals to drill or to deepen or plug back the full ME for Effective	s s ral
1. OIL WELL WILL OTHER REPORT Y WELL WILL OTHER REPORT OTHER REPORT Y 2. NAME OF OPERATOR O. C. D. Fred Pool Drilling, Inc. ARTESIA, OFFICE 3. ADDRESS OF OPERATOR O. C. D. P. O. Box 1393 Roswell, N.M. 88201 Chukka Feder 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* 10. FIELD AND POOL, OF At surface Artesia fe	sra1
well KD well Dorner Tee entry Well TO 1000 2. NAME OF OPERATOR O. C. D. Fred Pool Drilling, Inc. ARTESIA, OFFICE 3. ADDRESS OF OPERATOR P. O. Box 1393 Roswell, N.M. 88201 4. Location of well (Report location clearly and in accordance with any State requirements.* 2 10. Field AND Pool, or Artesia fee	eral
Fred Pool Drilling, Inc. O. C. D. 3. ADDRESS OF OPERATOR ARTESIA, OFFICE 9. WELL NO. 9. WELL NO. 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* 2 10. FIELD AND POOL, OF A BUTACE 10. FIELD AND POOL, OF A BUTACE	ral
3. ADDRESS OF OPERATOR 9. WELL NO. P.O.BOX 1393 ROSWell, N.M. 88201 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* 10. FIELD AND POOL, OF ACTION OF WELL (Report location clearly and in accordance with any State requirements.* At surface Artesia f	
P.O.Box 1393 Roswell, N.M. 88201 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface Artesia 6	
Artesia (1 WILDCAT
1980 FNL 660 FWL Unit E SWY NWY	11 Pool
Sec, 12-T18	S-R27E
14. PERMIT NO. 15. ELEVATIONS (Show whether DP, RT, CR, etc.) 12. COUNTY OF PARISH 3001520894 3607 GR Eddy	13. STATE NM,
16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data	
NOTICE OF INTENTION TO: SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF PULL OR ALTER CASING WATER SHUT-OFF REPAIRING W	FELL
FRACTURE TREAT MULTIPLE COMPLETE FRACTURE TREATMENT	SING
SHOOT OR ACIDIZE ABANDON" SHOOTING OR ACIDIZING X ABANDONMEN	T*
(Other)	on Well
17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers nent to this work.) *	and zones perti-
	;;
September 8,1985	
Perforations: 1446-56 ft. and 1459-62	
14 SNOTS. Apidized with 1000 cellene NE 15%, and20 000	
gallons Versagel; $30,000\# 20/40$ sand and $12,000 \# 10/20$ sand.	
	·
Pumping well back to test.	
SED - CAL	
1	
	7
18. I hereby certify that the foregoing is true and correct SIGNED Perta Job TITLE Vice - president DATE 9-11	L-85
18. I hereby certify that the foregoing is true and correct SIGNED <u>Prota</u> <u>Job</u> <u>TITLE Vice - president</u> <u>DATE 9-11</u> (This spuce for Federal or State office use)	L-85
18. I hereby certify that the foregoing is true and correct SIGNED Serta Dod TITLE Vice - president DATE 9-11 (This spuce for Federal or State office use) ACCEPTED FOR RECORD	L-85
18. I hereby certify that the foregoing is true and correct SIGNED <u>Peorta</u> <u>Job</u> <u>TITLE Vice - president</u> <u>DATE 9-11</u> (This spuce for Federal or State office use) APPROVED BY <u>ACCEPTED FOR RECORD</u> CONDITIONS OF APPROVAL, BE ANY	L-85
18. I hereby certify that the foregoing is true and correct SIGNED <u>Proved</u> <u>Job</u> <u>TITLE Vice - president</u> <u>DATE 9-11</u> (This spuce for Federal or State office use) APPROVED BY <u>ACCEPTED FOR RECORD</u> CONDITIONS OF APPROVAL, OF ANY SEP 16 1985 *See Instructions on Reverse Side	L <u>-85</u>

dsr,

SUPPLEMENTAL DRILLING DATA

FRED POOL DRILLING, INC. WELL #2 CHUKKA FEDERAL SW4NW4, SEC. 12, T-18-S, R-27-E EDDY COUNTY, NEW MEXICO

1. SURFACE FORMATION: Artesia Group of Permian Age. (Elev. 3607')

2. ESTIMATED TOPS OF GEOLOGIC MARKERS:

Yates	275'	Grayberg	1650'
Seven Rivers	475'		
Queen	1225'		

3. ANTICIPATED POROSITY ZONES:

Water - Above 300' Oil - 1500-2500'

4. CASING DESIGN:

Size	Interval	Weight	Grade	Joint
8 5/8"	0 - 2000'	32#		

- 5. SURFACE CONTROL EQUIPMENT: Control head.
- 6. CIRCULATING MEDIUM: KCL water.
- 7. AUXILIARY EQUIPMENT: None considered necessary on this shallow development well.
- 8. <u>TESTING, LOGGING AND CORING PROGRAM</u>: No coring or DST's are planned. Electric logs will include an cement bond log and a Compensated Neutron Log with Gamma Ray.
- 9. ABNORMAL PRESSURES, TEMPERATURES OR GASES: None anticipated.
- 10. <u>ANTICIPATED STARTING DATE</u>: It is planned that operations will commence about August 31, 1985. Duration of drilling, completion and testing operations should be one to five days.
- 11. <u>RE-ENTRY DETAILS</u>: Drill out cement plug at top of casing. Clean hole to plug at 1945' with tubing. Pressure test casing to be sure it does not leak. Run cement bond log from 1945' to surface. Perforate the Penrose section from 1450' to 1470' acidize and swab test.

harms have all		_ .	Draw	er D	Q.						YSF
DECEIVED B	Y	U. TTEL	D STATE	$\frac{11a}{S}$	· ^{NM} submi	1 9	I DUCA	TE*	- 1	Form	approved. Bureau No. 42-R355.5
RLCLI	DEPAF	TMENT C	OF THE	IN ⁻	TERIOF	2	(See o structi	ther in-	5 LEASE DE	RICNA	TION AND SERIAL NO.
SFP 23 198	5	GEOLOGIC	AL SUR	VEY		-	revers	e side)	NM 685	310m 52	TION AND BEALAD NO.
WEIA DO	MPLETION	N OR RECC	MPLETIC	NR	REPORT	AN		*	6. IF INDIAN	, ALL	OTTEE OR TRIBE NAME
19 PREERADIONT	()E: 0:	IL IV UAS			RF-	and	tra		7 17 10 10 10 10	PRACEN	VO RANE
ARTESTAT	MPLETION:	ELL 1 WELL	DRY	Ц.	Other <u>AL</u>	en			I. UNIT AGRI	ge di en	AL DAME
NEW WELL	WORK D	N D PLOG N BACK	DIFF. EESVR.	<u> </u>	Other	<u>.</u>			S. FARM OR	LEASE	E NAME
2. NAME OF OPER	ATOR Decl Dec	11. T.	1						<u>Chukk</u>	a_]	Federal
3. ADDRESS OF OF	POOL DI	1111ng, 1nd	C.V	;		بر منتقد من		. <u> </u>	9. WELL NO.	2	
P.O.	Box 1393	Roswel	L1. N.M.	.882	201	•••			10. FIELD AN	D PO	A, OB MILDOAT
4. LOCATION OF W	ELL (Report loca	tion clearly and in	accordance w	ith any	y State requir	emen	(sta)*		Artesi	a	Dil Poot
At surface 1	980 FNL60	50 FWL SV	vz NWz	Uni	t E	•_			11. SEC., T., I OR AREA	R., М.,	OR BLOCK AND SULVEY
At top prod. in 1446- F At total depth	nterval reported L.	below					. • • .		Sec. 12	-T	185-R27E
1912 fr			14. PERMI	T NO.	1	DATE	ISSUED		12. COUNTY (or	13. STATE
	•		30015	208	94	9-3	30-85		Eddy		NM
15. DATE SPUDDED	16. DATE T.D.	REACHED 17. DA	TE COMPL. (Re	ady to	prod.) 18.	ELE	VATIONS (DF	, RKB, I	T, GR, ETC.)*	19.	ELEV. CASINGHEAD
8-30-83	9-0-80	UIG. BACK T.D.: ND	-10-85	MULT	TIPLE COMPL.	360	J/ GR	VALS	BOTARY TOO	<u> 3</u>	GOT GR
1912 Fr	1	912 ft	н	OW MA	NY.		DRILL	EDBY	x		1
24. PRODUCING INT	ERVAL(S), OF THE	S COMPLETION-TO	P. BOTTOM, NA	ME (M	D AND TVD)*	······································				2	5. WAS DIRECTIONAL
1446-14	62 ft.										NT -
Penrose	2										NO
26. TYPE ELECTRIC	AND OTHER LOGS	I RUN					•			21. V	WAS WELL CORED
23.	aled Neut		ING RECORD	(Repo	ort all strings	set i	n well)		<u> </u>		no
CASING SIZE	WEIGHT, LE	./FT. DEPTH S	ET (MD)	HOL	E SIZE		СЕМВ	NTING	RECORD		AMOUNT PULLED
8 5/8	32#	2000		11	11		circul	ate	d		0
								<u> </u>			
29.		LINER RECORI)		i		30.	т	UBING RECO	RD	<u> </u>
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEME	NT*	SCREEN (MD	,	SIZE	ľ	EPTH SET (MI	D)	PACEER SET (MD)
							2 3/8	3	1804 ft		
31 PERFORATION BI	CORD (Interval	Aize and number)									
		,			DEPTH INT	AC ERVAL	(MD)	AMO	UNT AND KIN	<u>SQU</u>	MATERIAL USED
1446-56	ft.	holos			1446-	56		100	0 821 1	NF	15% 30 000
1459-62	[C, 14	notes			1459-	62		gal	. Versa	gel	; 30,000 #
								<u>20/</u>	40 sand	<u>;12</u>	<u>,000# 10/2</u> 0
32 *	<u> </u>			PROD	COTION			san	d		
DATE FIRST PRODUC	TION	DUCTION METHOD (Flowing, gas li	ft, pu	mping—size a	nd t	pe of pump)	WELL S	STATU	s (Producing or
9-12-8	5 P	umping	•						Pro	o <u>d</u> u	cing
DATE OF TEST	HOURS TESTER	CHOFE SIZE	PROD'N. F TEST PER	OR IOD	OIL-BBL.		GAS-MCF		WATER-BBL.		GAS-OIL BATIO
9-12-85 FLOW, TUBING PRESS,	CASING PRESS	Inone	016		<u>51</u> GAS	(087)	TSTM	ATER		OIL G	BAVITT-APL (COBE.)
40#	40#	24-HOUR RAT	re	31	TS	ΤM	ren en	V HEL	LOKD	3	5
34. DISPOSITION OF	GAS (Sold, used fo	r fuel, vented, etc.)		•		Au	QI	TEST WITNES	SED B	Y
vented						<u>S</u>	EP 19	1995	Fred Po	<u> 201</u>	, Jr.
COMDENS	ated Neu	tron log	mailed	9-	10-85		- •				,
36. 1 hereby certify	that the forego	ing and attached i	nformation is	comple	ete an Con 174	4 , 44	determined	from e	ill azailable re	corda	
SIGNED TH	enta A	al	ጥ የጥዮ ም	Vid	ce Pres	id	ent	* **.uu	AILU DATE	9	-13-85
		<u> </u>		 	<u> </u>		·····	·			

*(See Instructions and Spaces for Additional Data on Reverse Side)

INSTR! ONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

Item 4: if there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments. Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified,

for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: "Sacks Coment": Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool. Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

FORMATION		BOTTOM	DESCRIPTION CONTENTS ETC			1)P
					NAME	MEAS, DEPTH	TRUE VERT. DEPTH
Queen & Gravburg	0 65 1100 1365	65 1100 1365 1570	Caliche and red bed Salt, red bed and anhydrite Dolomite and anhydrite Sand dolomite	· · · · · · · · · · · · · · · · · · ·			-
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U.S. GOVERNMENT PRINTING OFFICE : 1963-O-683636

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Citian Ution	OIL CONSERV	VATION DIVIS JN	
1 A M 1 A F 2	RECEIVED BY	EW MEXICO 87501	-
U.S.U.S.	SFD 18 1985	. ,	
	REQUEST F	OR ALLOWABLE	
OPENATON I	O. C. D.	AND SPORT OIL AND NATURAL CAS	
I. PROMATION OFFICE			
Fred Pool Drill	ing, Inc.		
P.O. Box 1393	Roswell, N.M. 8820)]	
Reason(s) for hiling (Check proper bas	i) Change in Transmiss of	Other (Please explain)	······································
Recompletion	cit Dry		HEAD GAS MUST NOT BE
Change in Ownership	Caeinghend Gae 🗌 Conc		AFTER - 10-24-85
If change of ownership give name		UNLESS	AN EXCEPTION FROM
and address of previous owner			M. IS OBTAINED
LESCRIPTION OF WELL AND	Well No. Pool Name, Including	Formation Kind of Le	ase (
Chukka Federal	2 Artesia Oil	Pool State, Fed	eral or Fee Federal 6852
Lordian E 10	00 N		
Unit Letter <u>E</u> : 19	<u>XU</u> Feet From The <u>North</u> L	Ine and <u>660</u> Feet Fro	m The West
Line of Section 12- T	waship 185 Bange	27Е , МИРМ, Е	ddy co.
. DESIGNATION OF TRANSPOR	TER OF OIL AND NATURAL G	AS	
Name of Authorized Transporter of Oil	Conderisate	Address (Give address to which app	roved copy of this form is to be sent
Navajo Crude 01	L Purchasing	Address (Give address to which app	.M. 88210
Phillips Petrol	eum	Bartlesville, Okla	
if well produces off or liquida, give location of tinks.	Unit Sec. Twp. Rge.	Is gas actually connected?	vhen
!! this production is commingled wit	that from any other lease or pool	give commingling order number:	
COMPLETION DATA	Ott Well Gas Well	New Well Workover Tilester	Due Deals - Come Back, South B
Designate Type of Completio	n = (X)	X t	Prog mace - Some ressy, Officer
Date Spudded	Date Compl. Ready to Prod.	Total Dopth	P.B.T.D.
Lievations (DF, ILES, RT, GR, etc.)	Vame of Producing Formation	Top Oil/Gas Pay	<u>1912 ft.</u> Tubing Depth
<u>GR 3607</u>	Penrose	1446 ft.	1804
1446-56 1450-62	••		Depth Casing Shoe
1979.04		D CEMENTING RECORD	
	TUBING, CASING, AN		
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FRED POOL, JR.

September 25,1985

P. O. Box 1393 Roswell, NM 88201

New Mexico Energy and Resources Board P.O.Box 2088 Santa Fe, N.M. 87501

RE: Chukka Federal No. 2" Lease No. 6852 SW/4 NW/4 Sec. 12-18S-27E Eddy County, N.M.

Gentlemen,

Please be advised that the above well was spudded on 8-3-85 and completed as a producing well on September 10,1985. This well was potentialed at 31 barrels per day of oil and gas was TSTM.

All necessary records and logs have been filed with the appropriate offices.

Sincerely,

Penta Pool

STATE OF NEW MEXICO

OIL CONSERVATION DIVISION

Drawer DD Artesis, MM.

DISTRICT OFFICE #2

Sept. thru Dec. 1985

SUPPLEMENT TO THE OIL PRORATION SCHEDULE

DATE _____ September 24, 1985

PURPOSE _______ALLOWABLE ASSIGNMENT - NEW OIL Effective September 12, 1985 an allowable of 31 barrels of oil per day is hereby assigned to Fred Pool Drilling, Incorporated, Chukke Federal

#2-E-12-18-27 in the Artesia Queen Grayburg San Andres Pool.

L - F

<u>MP</u> - P

Sept. Total - 589 bbls. Oct. Total - 961 bbls. Nov. Total - 930 bbls. Dec. Total - 961 bbls.

> Form. - Penrose Perfs. - 1446' - 1462' Comp. - 9-10-85 TD . - 1912'

LAC:fa

Fred Pool Drig., Inc.

NRC PP

OIL CONSERVATION DIVISION

DISTRICT SUPERVISOR

LEASE PURCHASED FROM FRED	POOL DRILLING, INC. 09/01/90.	ACC CI 17 17 17 10 17 10 11 10 11 10 11 10 11 10 11 10 10	RECEIVED
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LEASE PURCHASED FROM FRED	POOL DRILLING, INC. 09/01/90.		
proposed work. If well is directionally drilled, nent to this work.)	give subsurface locations and measured and true vertical d	lepths for all markers and to	nes perti
	(NOTE: Report results of Completion or Recompletion	multiple completion on Well on Report and Log form.)	
SHOOT OR ACIDIZE ABANDON®	SHOOTING OR ACIDIZING	ABANDONMENT*	x
TEST WATER SHUT-OFF PULL OR ALTE FRACTURE TREAT MULTIPLE CON	R CASING WATER SHUT-OFF IPLETEFBACTUBE TREATMENT	BEPAIRING WELL ALTERING CABING	
NOTICE OF INTENTION TO :	auassqua (T REPORT OF:	
Check Appropriate I	Box To Indicate Nature of Notice, Report, or Oth	er Data	
DERNIT NO. 15. ELEVAT	IONS (Show whether OF, RT, GR, etc.)	EDDY N	IM
NO. 21L, LUDI UU., NM		SEC. 12, TWP 18S,	RGE.
UNIT LETTER E, 1980 FT. FNL AN	D 660 FWL, SECTION 12, TS 18S,	1. SEC., T., B., M., OR BLK. AND BURVEY OR AREA	
LOCATION OF WELL (Report location clearly and in See also space 17 below.) At surface	ACCORDANCE WITH ANY State requirements.	ARTESIA O-G-SA	AT
P. O. DRAWER 3488, MIDLAND, TX	<u>79702</u> O. C. D.		
THE EASTLAND OIL COMPANY /	OCT 19 '90	CHUKKA FEDERAL	
WELL A WELL OTHER		3. FARM OR LEASE NAME	
01L [7] CAS	RECEIVED	7. UNIT AGREEMENT NAME	
Use "APPLICATION FOR I	Dr to deepen or plug back to a different reservoir.		
Do not use this form for proposals to drill (Do		O IF INDIAN, ALLOTTEE OR THE	BE NAME
BUREAU OF LAN SUNDRY NOTICES AN (Do not use this form for proposals to drill of	ID PEROPTS ON WELLS	NM 6852	

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Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

1	~"			-,			
Submit 5 Copies Appropriate District Office DISTRICT 1	Energy,	State of Minerals and N	New Mexico latural Resources	Departmen	RE(CEIVED	Form C-104 Revised 1-1-89 See Instructions
P.O. Box, 1980, Hobbs, NM 88240 DISTRICT II P.O. Drawer DD, Antesia, NM 88210	OIL	OIL CONSERVATION DIVISION P.O. Box 2088				1 18 '90	al Bottom of Page
DISTRICT III	S	anta Fe, New I	Mexico 87504-2	2088	(i, C. D.	
1000 Rio Brazos Rd., Aztec, NM 874	^{IO} REQUEST F TO TR	OR ALLOW	ABLE AND AU	THORIZA RAL GAS	ATION ¹⁸¹	iesia, office	
Operator		<u></u> .			Well A	PINO.	
Address				· · · · ·		-015-208:	
P. U. DRAWER 348 Reason(s) for Filing (Check proper box	8, MIDLAND, TE	XAS 79702	Other (P	lease explain)	 I		
Recompletion	Change i Oil	n Transporter of:	ŀ				
Change in Operator	Casinghead Gas] Condensate	EFFECT	IVE 09/	01/90		
If change of operator give name	ED POOL DRILLI	NG, INC.,	P. O. DRAWER	1393,	ROSWELI	, NM 882	01
IL DESCRIPTION OF WEL	LAND LEASE						
Lesse Name	Well No.	Pool Name, Inclu	ding Formation		Kind of	Lease	Lease No. 6852
Location		Tim Fork &	North		<u> </u>		West
Unit Letter	;	_ Feet From The _ 27E	Line and		Feel	From The	DY
Jecuon Iowns		Kange D	, <u>NMPM</u> ,	·			County
II. DESIGNATION OF TRA	NSPORTER OF O	IL AND NATU	URAL GAS				·
NAUME OF Authorized Transporter of Oil NAVAJO CRUDE OIL PU	RCHASING		Address (Give add	ARTESTA	approved c . NM 88	opy of this form \210	is to be sentj
Name of Authorized Transporter of Casi PHILLIPS PETROLEUM	nghead Gas 🔀	or Dry Gas	Address (Give add BARTLESVI	ess to which	approved c	opy of this form	is to be sent)
f well produces oil or liquids,	Unit Sec.	Twp. Rge	ls gas actually con	octed?	When ?		
this production is commingled with the V. COMPLETION DATA	t from any other lease or	pool, give comming	ling order number:	·····			
	Oil Well	Gas Well	New Well Wor	kover I	Deepen	Plug Back San	ne Res'v Diff Res'v
Designate Type of Completion	Date Compl. Ready to	Prod.	Total Depth	l		P.B.T.D.	l
levations (DF, RKB, RT, GR, etc.)	Name of Producing Fo	mation	Top Oil/Gas Pay	_		Subing Depth	
criorations					——— r	Jepth Casing Sh	0e
		<u></u>	(D) (C) (T) (C) D				
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						·	
TEST DATA AND REQUES	T FOR ALLOWA	BLE			I		
LWELL (Test must be after r	ecovery of total volume of	f load oil and must	be equal to or exceed	top allowabl	e for this de	pth or be for fu	ll 24 hours.)
le First New Oil Run To Tank	Date of Test	•	Producing Method (P	iow, pump, g	as 191, etc.)	0	anted ID-
agth of Test	Tubing Pressure		Casing Pressure		C	hoke Size	0-26-90
tual Prod. During Test	Oil - Bhis.		Waler - Bbis.		G	as-MCF	hg OP
AS WELL	•		_				
mal Prod. Test - MCF/D	Length of Test		Bbls. Condensate/MN	1CF	G	avity of Conder	Itale
	`					ore Size	
ling Method (pitot, back pr.)	Tubing Pressure (Shut-in	0	Casing Pressure (Shu	-ia)	l d	IORO DEC	
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INSTRUCTIONS: This form is to be filed in compliance with Rule 1104
1) Request for allowable for newly drilled or deepened well must be accompanied by tabulation of deviation tests taken in accordance with Rule 111.

All sections of this form must be filled out for allowable on new and recompleted wells.
 Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
 Senarate Form C-104 must be filled for each pool in multiply completed wells.

District I 1625 N. French	Dr., Hobbs, l	NM 88240	0	Si Ecorev, N	ate of New linerals & Na	Mexico itural Resour	ces			Revis	sed March 12, 1999	elhi
BII South First, District III	Artunin, NM Rd., Aztec, I	88210 NM 87410	0	UIL CON 2 Si	NSERVATIO 040 South P anta Fe. NM	DN DIVISI acheco	20212	222324 3u	binit to A	Approp Sta F	riate District Ollice ate Lease - 6 Copies fee Lease - 5 Copies	fr'of
2040 South Pach	icco, Santa Fo	:, NM 875	505			12	APR	1909		AMI	ended report	
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Post Offi	ce Box	Comp 159	any				э.	1	⁄ ŀ	/ .	³ API Number	
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Lewer	Wellca	mp Ci	ieco-Cany	n Injecti	on-Zona.	<u>Navajo</u>	/ŋj	ection	<u>Pec</u>	MO	Penn.	
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·	No		920)'	Stra	wn					5/15/99	
	·		A	²¹ Propos	ed Casing a	nd Cement	Prog	ram				
	ilze		9.5/9"	Cae	12 16/0	1005 fe	48 		$\int \Omega$		Surface	
7.7/	8"		5-1/2"		7 lb/ft	9200 fe	et	Caliner y	/ol. +20	%	Surface	
" Describe It o p	mpased progra	un. 162bir	application is to	DEEPEN or PI	LUG BACK give the	data on the present	producti	ive zone and prope	osed new pr	uductive	zone. Describe the	
Indoward prevention program, if any. Use additional shrets if necessary. Proposed Reentry of The Eastland Oil Company (originally Fred Pool Drilling, Inc.) Chukka Federal No. 2 (PBTD 1912 feet, September 10, 1985) formerly Amoco Production Company Diamond Federal Gas Com. No. 1 (OTD 10,372 feet, P&A August 31, 1973). The well currently produces oil and gas from perforations from 1446 feet to 1462 feet (Penrose.)												
Navajo will 1/2 inch ca Formations	Navajo will squeeze the perforations from 1446 feet to 1462 feet, drill out cement plugs, and clean out the well to 9200 feet, set 5- 1/2 inch easing at 9200 feet and cement to the surface, perforate porous intervals in the Lower Wolfcamp, Cisco, and Canyon Formations between 7270 feet and 9200 feet, and conducted injectivity tests.											
Attached ar	e the Well	Locali	ion Plat and	Drilling P	ogram.		<u> </u>					
" I hereby cirtif	y that the info nd belief.	rmaliun gi	iven above is tru	and complete	n the best of	OL	L CO	NSERVA	TION	DIVI	SION	
Signature:		00 <i>1</i>	Naus		A ₁	proved by:		hem l	u,	kis	N. BGX	
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Tille: Env.	Mar. f	w	ater 1 W	laste	Ap	proval Date: S	- 3	3-99	Expiration	Date: 1	5-3-00	
Date: 4/211	;^ 44		Muna:	5-748-3	311	inditions of Approva	al :	· ·		•		
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2040 South Pache	co, Sunta Fe	, NM 87505 WF		CATIO	N AND AC	REAGE DEDIC	CATION PL	AT AME	NDED REPOR
	API Numbe	r	T	Pool Cod	e .		¹ Pool Na	IBC	
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378VForm C-102.000

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OIL CONSERVATION DIVISION 2040 South Pacheco Santa Fe, NM 87505 (505) 827-7133 Fax: (505) 827-8177
(PLEASE DELIVER THIS FAX)
To: TIM GUMM - ARTESIA OCO SAX 748-9720
From: WAYNE PRICE - OCD SF
Date: 4/30/99
Number of Pages (Includes Cover Sheet) 76
Message: APPRIVED BOND FOR NAVAJO WOW #2
CLASS I INSECTION WELL (COPY)
If you have any trouble receiving this, please call: (505) 827-7133



NEW MEX J ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION 2040 South Pachaco Street Santa Fa, New Moxico 87695 (605) 827-7133

April 19, 1999

<u>CERTIFIED MAIL</u> <u>RETURN RECEIPT NO. Z 559 573 590</u>

J.S. Ward & Son, Inc. 104 South Fourth Street Artesia, New Mexico 88210-2195

Attention: Mr. Gary Sims

Re: Navajo Refining Company Discharge Plan UIC-CLI-008-2 Bond No. 58 96 12
\$ 95,000.00 One-Well Plugging Bond to the State of New Mexico for Class I Injection Well WDW#2 1980' FNL and 660' FWL - Sec 12-Ts18s-R27e N.M.P.M. Eddy, County, New Mexico J.S. Ward & Son, Inc., Principal

> Gulf Insurance Company, Surety Bond 58 96 12

The New Mexico Oil Conservation Division hereby approves the above-captioned One-Well Plugging Bond.

RAND CARROLL, Legal Counsei

RC/wp

OCD Artesia Office cc: Gulf Insurance Company

PROJECT BILLING INFORMATION SHEET

Proposal No. 71Z5678 Project No. 70D6806 **Original Proposal/Project** Submittal Date: 4/23/12 CLIENT INFORMATION Bio-Lab Inc. Is this a revision: Yes \square No \square Company Name: * Attention Line: * Steve Marr **Revision Date:** "Billing" Address: * 1400 East Michigan Street Adrian, Michigan 49221 Ioe Thatcher Project Manager: * "Main" Telephone No: * (517) 265-6138 Ext. 253 (Steve Marr) Fax No. Project Manager's Tele. No.* (517) 605-0908 (Joe Thatcher's Cell #) Fax No. Physical (Delivery) Address: * Salesperson (One Only): **Email Address** Taxable 🗌 Nontaxable 🗌 Client's PO/Contract No. P.O. 4500349691 PO/Contract Date: 04/23/12 Description of Work (TO BE PRINTED ON INVOICE): * Well No. 1 MIT and Falloff Survey RWS Subsurface Project Manager: State Work Performed (One Only): MI BILLING METHOD: (You must complete only one of the following billing methods): (1) X 2011 Price List Less %, % Handling Charge, or % Procurement Fee (2) _____ 2004 Price List Less ____%, ____% Handling Charge, or ____% Procurement Fee (2) _____ Lump-Sum (Project Manager to Notify Accounting When to Bill) (3) _____ Special Billing (Describe:) (4) _____ Standard Government Billing:____% Overhead, ____% Fixed Fee (Attach Form OF-60) APPROVED PROJECT BUDGET: / CRITICAL DEADLINES: Amount to be Billed: (A) \$ 11,670 Proposal Due Date: 3/20/2012 Subsurface Project Cost: (B) \$ Project Start-up Date: Gross Profit (C=A-B) \$ **Project Completion Date:** Gross Profit: (D=C/A) % PROJECT CODES (One Code Per Line): ** PREPARATION: *** Industry Sector Code: RFP Received: Yes 🗌 No 🗍 **Business Line Code:** Written Verbal Service Type Code: PBI Prepared By: RWS Project Type Code:

* Maximum of 30 characters. This description will appear on all client billing information. Be concise.

** See back of Project Billing Information Sheet for Business Line/Service Type/Project Type codes.

*** A completed (i) RFP for a proposal or (ii) manpower summary and cost estimate for a project should be attached. Revised 7-27-01



J. S. Ward & Son, Inc.

101 South Fourth Street (505) 746-2796 FAX (505) 746-4244 Artesia, New Mexico 88210-2195

April 22, 1999

. 26

State of New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division 2040 South Pacheco Street Santa Fe, New Mexico 87505-5472

Attention: Mr. Roger Anderson

Re: Navajo Refining Company Bond No. 58 96 12 \$95,000 One-Well Plugging Bond to the State of New Mexico for Class I Injection Well Chukka Federal #2

Dear Mr. Anderson:

Enclosed please find the captioned bond through Gulf Insurance Company which we trust you find in order and acceptable for filing.

Very truly yours,

J. S. WARD & SON, INC.

By S. Dary Simon

SGS:emb

Enclosure

cc: Navajo Refining Company Post Office Box 159 Artesia, New Mexico 88211-0159 Attention: Mr. Joe Akins - Copy of Bond & Invoice

MEE 60 FEARS

Navajo Rei_ding Company	Gulf Insurance Company
PRINCIPAL	SURETY
Post Office Box 159	101 South Fourth Street
Artesia, New Mexico 88211-	0159 Artesia. New Mexico 88210-2195
By Ming Ale	A puy min
	/ V Artorning-In-Face
(Note: Principal, if corporation, affix corporate seal here.)	(Mote: Corporate sursty affix corporate seal large.)

ACKNOWLEDGENERT FORM FOR NATURAL PERSONS

STATE OF 22. COUNTY OF

On this ______day of ______, before we personally appeared ______, to se known to be the persons (persons) described in and who executed the foregoing instrument and acknowledged that he (they) executed the same as his (their) free act and deed.

IN WITHESS WHEREOF, I have berownto out my hand and seal on the day and year in this certificate first above written.

Notary Public

LARY Public

OFFICIAL STAT.

My commission out

NOTARY PUBLIC STATE OF

1-16-2001

Rits Boadle

Hy Commission Expires

ACKNOWLEDGENERE PORM FOR CORPORATION

STATE OF New Mexico

On this 22nd day of <u>ADT11</u>, 1999, before an personally appeared <u>JACK P. Raid</u>, to an personally known who, being by me duly sworn, did say that he is <u>President</u> of <u>Navajo Refining Company</u> and that the foregoing instrument was signed and sealed on behalf of said corporation by authority of its board of directors, and acknowledged said instrument to be the free act and deed of said corporation.

IN WITHERS WEREDT, I have hereunto set my hand and seal on the day and year in this certificate first above written.

1-16-2001 Wy Commission Expires

ACCHONLEDGEMENT FORM FOR CORPORATE SURETY

STATE OF <u>New Mexico</u>)ss.

On this 22nd day of <u>April</u>, 1999, before an appeared S. Gary Sims <u>Attorney-in-Fact</u> of <u>Gulf Insurance Company</u> and that the foregoing instrument was signed and sealed on behalf of said corporation by suthority of its board of directors, and acknowledged said instrument to be the free set and deed of said corporation. IN WINESS WEREDR, I have bernunto set my hand and soal on the day and year in this certificato first above written.

first above written.	Edwing Mr. Bismlitt				
17-10-01 By Commission Expires	Notary Public		OFFICIAL SEAL EDWINA M. BRAMLETT NOTART FUBLIC STREE OF NEW MEXICO My Commission Expand		

(Note: Corporate surety attach power of sttormsy.)

OTL I πό

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS:

NEN JU JO TAL IC' IV LII

That GULF INSURANCE COMPANY, a corporation of the State of Missouri, hereinalter called "Company," does hereby appoint

CHARLENE M. WARD or S. GARY SIMS or JOHN C. KNIGHT

ARTESIA, NEW MEXICO

April 12

is the and lawful Altomey in fact to make execute, seal and deliver on its behalf, as surely, any and all bonds and undertakings of surelyship., not to exceed \$250,000.00 or any bond where the penalty is not stated in the bond form. No authority is granted where the attorney in fact is a party at interest in the bond.

The execution of such bonds or undertakings in pursuance of these presents shall be as binding upon the Company as if they had been executed and acknowledged by the regularly elected officers of the Company.

This Power of Attorney is issued pursuant to and by authority of the following resolution of the Board of Directors of the Company, adopted affective July 1, 1983, and now in full force and effect;

is that the President, or any Series Vice Pr nt, or any Vice President, or the Secretary, or any Appletant Secretary may appoint Adomnya in-lack in any state, lumi resent the Country and the act on its barked which the scope of the suffering granted to them, in writing, which authenty star include the power to make, execute, sent and deliver on behall all this Con is, and as its BCI and dood, any set of hands and undersuit AS SUIT m d a io and of ng that the ordinary course of surery business may require, including suffamily to appoint agains for the too of process in any jurisdiction, state or ledgest, and zalidnity to allest to the signa re of the President, or any Sur or Vice Presid N. OF SHY VICE PRESIDENT, OF the Se ry, er anv Assistant Sources ity any allicenil or other statement relating to the foregoing, and to certify to a copy of any of the typicors of the Company and to any rest A Sci may be removed and the authority granted him revelued by the President, or any Senior Vice President, or a and to verify any allidavit or other state ns adopted by its goard of Directors; and any out nior Vice President, of any Vice President, or the Socializity, or any Assis nt Secret are, or by the Ream

This Power of Attorney and Certificate are signed and scaled by facsimile under and by authority of the following resolution of the Board of Directors of the Company, adopted effective July 1, 1983, and now in full force and effect:

ure of the President, as all any Senier Vice President, or at any Vice Pr ond, or of the Secretary, or of any Assistant Eccretary, and the seal of the Company may be allo ty of to any carbificate scheing therete Acon Anoneys indact by purper 10 any ac no entre di econo ting and effecting bonds and under ngs and other will os ol N IN Re and and and to the sufficiency of the last 15-in-lact, 23 well as for the and ne of age was lot the su wice of process in any just the second state in the second second to and coefficients of . 1953) ng ayah evity of such age He: and any such power of allottey as certificate bear an suach formi e or b t Stal shall W STAT STAT SLICT COMMENDE WOL SHIEL the set seat that by Sech 1 esign ie and face te soul shall be valid and binding upon the Colligany at the to all descused and in the future with respect to any band or a taking to which they are estacted."

of, the Company has caused this Power of Attorney to be signed and its corporate seal to be allowed by its authorized officer this

30ch

say of June

, 19₉₁.

Cliffere R. Beard . 1992

April

. 199.

CERTIFICATE

I, the undersigned, do hereby certify that the original Power of Attorney of which the foregoing is a true and correct copy is in full force and effect, and the increase solutions are true and correct transcripts from the records of GULF INSURANCE COMPANY and that the above named officer was on the date pacual () by the foregoing Power of Attorney authorized to execute this Power of Attorney.

It seal of Gull Insurance Company this

-1111 HARDNUM

Le Ro-liney Rechel

22nd and

STATE OF HEN HERICO

ONE-UTLL PLUGGING DOND

FOR CHAVES, ECOY, LEA, MCKIMLEY, RIO ARRIBA, NOOSEVELT. SANDOVAL, AND SAN JUAN COUNTIES ONLY

BOND N	a. <u>58</u>	96	12	
AMOUNT	07 308	\$95	,000	5.00
COUNTY	Edd	7		_

MOIE: For wells less than 5,000 feet deep, the minimum bond is \$5,000.00* For wells 5,000 to 10,000 feet deep, the minimum bond is \$7,500.00# For wells more than 10,000 fest deep, the minimum band is \$10,000.00

*Under certain conditions, a well being drilled under a 85,000.00 or \$7,500 bond any be permitted to be drilled as much as 300 feet deeper than the normal maximum depth, i.e., a well being drilled under a \$5,000.00 bond may be permitted to go to \$,500 feet, and a well being drilled under a \$7,500.00 bond may be permitted to go to 10,500 feet. (See Rule 101)

File with 011 Conservation Division, P. O. Box 2088, Santa Fe 87501

KNOW ALL HEM BY THESE PRESENTS:

Navajo Refining Company That . CHARACTERINA CONTRACTOR (a corporation organized in the State of New Mexico , with its principal office in the city , State of New Mexico of Artesia _____ sud authorized to do business in the State of New Mexico), as FRINCIPAL, and _____ Gulf Insurance Company corporation organized and existing under the Laws of the State of Missouri _, and authorized to do business in the State of New Mexico, as SUREIY, are held firmly bound unto the State of New Hexico, for the use and benefit of the Oil Conservation Division of New Maxice pursuant to Section 70-2-12, New Maxico Statutes Annotated, 1978 Compliation, as amended, in the sum of Ninety-Five Thousand Dollars lawful money of the United States, for the payment of which, well and truly to be made, said PRINCIPAL and SURETY hereby bind themselves, their successors and assigns, jointly and suverally, firmly by these presents.

The conditions of this obligation are such that:

URENZAS, The above principal has heratofore or may bereafter enter into oil and gas lease, or carbon dioxide (CO,) gas leases, or balium gas leases, or brine mineral leases with the State of New Mexico; and

LANEREAS, The above principal has heretofore or may bereafter enter into oil and gas leases, or carbon dioxide (CO.) gas leases, or helium gas leases, or brine mineral leases on lands patented by the United States of America to private individuals, and on lands otherwise owned by private individuals; and

LHEREAS, The above principal, individually, or in association with one or more other parties, bes commenced or may commence the drilling of one well not to exceed a depth of _____ 9200 feet, to prospect for and produce oil or gas, or carbon dioxide (CD.) gas or belies gas, or does own or may acquire, own or operate such well, or such well started by others on land enbraced in said State oil and gas leases, or carbon dioxide (CD.) leases, or helium gas leases, or brinn minerals, and on land patented by the Wolted States of America to private individuals, and on land otherwise owned by private 1205 individuals, the identification and 1980' FNL and 660' FWL **well** 18 location ##1d being being , Section _ . Township WWWWWWWWWWWW

Eddy Range _ County, Hew Maxico.

NOW, THEREFORE, If the showe bounden principal and surety or either of them or their successors or essions, or any of them, shall plug said well when dry or upon shandowed in accordance with the rules, regulations, and orders of the Oil Conservation Division of New Menico in such way so to confine the oil, gos, brine, and weter in the strate in which they are found, and to prevent them from encaping inte other stratas

THEM, THEREFORE, This obligation shall be mull and void; otherwise and in default of complete compliance with any and all of said obligations, the same shall remain in full force and effect.

Signed	and	scaled	this	22nd	day	of	April .	1999)
			5				•		

ATTACHMENT A

Sunday, May 9, 1999

Pressure testing the 8-5/8 inch Surface Casing from 1922 feet (KB) to 30 feet (KB) using a fresh water fluid. Pressure testing was performed after the perforations between 1446 feet and 1462 feet were squeezed with cement.

Pressure Test No. 1

Time	Cumulative Time	Pressure		Delta Pressure
(hrs.)	(minutes)	(psig)	(psi)	
1303	0	660		
1308	5	660		0
1313	10	660		0
1318	15	660		0
1323	20	660		0
1328	25	659		-1
1333	30	659		0

Total =-1 psi per 30 minutes

Pressure Test No. 2

Time	Cumulative Time	Pressure		Delta Pressure
(hrs.)	(minutes)	(psig)	(psi)	
1333	0	659		
1338	5	659		0
1343	10	659		0
1348	15	658		-1
1353	20	658		0
1358	25	657		-1
1303	30	657		0

Total =-2 psi per 30 minutes







REFINING COMPANY

EASYLINK 62905278

501 EAST MAIN STREET • P. O. BOX 159 ARTESIA, NEW MEXICO 88211-0159 FAX (505) 746-6410 ACCTG (505) 746-6155 EXEC (505) 748-9077 ENGR (505) 746-4438 P / L

May 10, 1999

Mr. Tim Gumm State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division 811 South First Street Artesia, New Mexico 88210

-123456.

RE: Re-Entry for Navajo Refining Company's Waste Disposal Well No. 2

Dear Mr. Gumm:

Navajo Refining Company (Navajo) has contracted Subsurface Technology, Inc. to re-enter, test and complete Waste Disposal Well No. 2 (WDW-2), formerly the Chukka Federal No. 2 operated by The Eastland Oil Company. The United States Department of the Interior, Bureau of Land Management approved the Application for Permit to Drill or Deepen on April 27, 1999. Subsequent approval from the State of New Mexico Oil Conservation Commission (OCD) was granted on Tuesday, May 4, 1999.

Navajo initiated field operations on Wednesday, May 5, 1999. The existing pumping equipment, rods, and tubing were removed from the wellbore. The perforations from 1446 feet to 1462 feet were squeezed using 100 sacks of Class 'H' cement (approximately 50 sacks of cement were displaced into the perforated interval). The cement was allowed to cure and drilled out to a total depth of 1922 feet (KB)(1911 feet below ground level).

On Sunday, May 9, 1999, the 8-5/8 inch surface casing, set from 1955 feet (KB) to surface, was pressure tested for internal mechanical integrity between 1922 feet (KB) and 30 feet (KB) using a packer set at 30 feet. The 8-5/8 inch surface casing was pressure tested to 660 pounds per square inch and monitored at the surface for one hour (Attachment A). The fluid used for testing was a clean fresh water fluid. A pressure loss of 1 psi (0.15%) was observed during the first 30 minutes of the test. A pressure loss of 2 psi (0.30%) was observed during the last 30 minutes of the test. The results from the pressure test confirmed internal mechanical integrity of the 8-5/8 inch surface casing from 1922 feet (KB) to 30 feet (KB).

The 8-5/8 inch surface casing was originally set in an 11 inch open-hole to a depth of 1955 feet (KB) and cemented to surface using 700 sacks of Class 'H' cement with 2% gel and 100 sacks of Class 'H' neat. A total of 200 sacks of cement was recorded circulated to surface. The calculated volume between an 11 inch hole and 8-5/8 inch casing is (0.2407 cubic feet per foot X 1955 feet) 471 cubic feet. The volume of cement pumped is (1.18 cubic feet per sack X 800 sacks) 944 cubic feet for an excess of 473 cubic feet or 400 sacks circulated to surface. The calculated volume of cement and apparent volume of actual cement pumped indicated excess cement was circulated to surface.

On Sunday, May 9, 1999, Halliburton Logging Services completed a cement bond and microsiesmogram (same as a variable density log) logging survey within the 8-5/8 inch casing from a wireline total depth of 1919 feet (KB) to the surface (Attachment B). The results from the survey indicate a continuous column of cement from 1922 feet to surface with good bonding characteristics. The cement behind the 8-5/8 inch casing will provide an effective hydraulic seal to prevent the movement of groundwater fluids into the underground source of drinking water with a base at 473 feet.

Please review and approve the pressure testing and cement bond log results at your earliest convenience. Navajo will proceed with the mobilization of the drilling rig Wednesday, May 12, 1999 and begin re-entry of the WDW-2 wellbore according to the approved drilling program. Navajo will periodically contact the OCD, Artesia office with a status update of the re-entry operations. The Bureau of Land Management will be notified in sufficient time for a representative to witness the cementing of the 5-1/2 inch protection casing.

Should you have any questions or concerns, please call me at (505) 748-3311.

Sincerely yours,

More Mare

Darrell Moore Environmental Manager for Water and Waste

c: Mr. David Glass Bureau of Land Management Roswell Field Office 2909 West Second Street Roswell, New Mexico 88201

> Mr. Brian Rogers Subsurface Technology, Inc. 7020 Portwest, Suite 100 Houston, Texas 77024

File: Injection Wells



March 30, 1999

Mr. Barry Hunt Bureau of Land Management Carlsbad Resource Area 620 East Greene Street Carlsbad, New Mexico 88220-6292

RE: Navajo Refining Company Proposed WDW-2, Eddy County, New Mexico Request for On-Site Inspection of Wellsite Subsurface Project No. 60A4937

Dear Mr. Hunt:

Navajo Refining Company (Navajo) is purchasing an existing well in Eddy County, New Mexico for planned use as a Class I nonhazardous effluent disposal well, and plans to reenter and test the well in the next few months. The well is on federal land. Subsurface Technology, Inc. (Subsurface), formerly Envirocorp Services & Technology, Inc., on behalf of Navajo, requests your participation in an on-site inspection of the wellsite as soon as possible.

Pertinent information about the existing well is provided below:

Lease Number:	NM 6852
Current Operator: Lease:	The Eastland Oil Company (September 1990 to present) Chukka Federal No. 2
Former Operator:	Fred Pool Drilling Company (August 1985 to September 1990)
Former Operator: Former Lease:	Amoco Production Company (July 1973 to August 1985) Diamond Federal Gas Com. No. 1
Location:	1980' FNL, 660' FWL (SW/4 NW/4, Unit Letter E) 12- T18S-R27E
Topographic Map (Attachm	ent A)
Original Total Depth: Plugged-Back Total Depth: Well Schematic (Attachmen	10,372 feet 1912 feet t B) $RECEIVED RECEIVED$
Status:	The well is producing from the Penrose from perforations

between 1446 feet and 1462 feet. Navajo is committee

ENVIROCORP SERVICES & TECHNOLOGY, INC.

7020 PORTWEST DRIVE, #100 HOUSTON, TEXAS 77024 713/880-4640 FAX 713/880-3248

Mr. Barry Hunt Bureau of Land Management March 30, 1999 Page 2

negotiating to purchase the well from Eastland Oil Company. The purchase should be completed by April 1, 1999.

Navajo proposes to reenter the well, squeeze the perforations from 1446 feet to 1462 feet, drill out the plugs and clean out the well to approximately 9200 feet, set 5-1/2 inch casing at 9200 feet and cement it to the surface, and conduct one or more injectivity tests. The proposed injection intervals are porous zones in the lower portion of the Wolfcamp Formation (7270 feet to 7645 feet), the Cisco Formation (7645 feet to 8390 feet), and the Canyon Formation (8390 feet to 8894 feet). Navajo's proposed reentry, testing, and recompletion procedure is included as Attachment C. A schematic of the well after recompletion is included as Attachment D.

Subsurface is currently preparing a discharge plan application for the Class I well for Navajo to submit to the New Mexico Oil Conservation Division and the BLM Roswell office near the end of April 1999. Subsurface is also preparing BLM Form 3160-3 (Application for Permit to Drill) for Navajo to submit to the BLM Roswell office.

Please contact me at (713) 880-4640 to schedule an on-site inspection of the wellsite. Do not hesitate to call me if you need additional information or if you have questions.

Sincerely,

naucy J. niemann

Nancy L. Niemann Senior Geologist

NLN/paf Attachments

c: Joe Lara – BLM, Carlsbad David Glass – BLM, Roswell Wayne Price – OCD, Santa Fe Tim Gum – OCD, Artesia Phil Youngblood – Navajo Darrell Moore – Navajo George Walbert – Holly Petroleum, Inc.

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ATTACHMENT B



BELOW GROUND DETAIL

All depths are referenced to the kelly bushing elevation of 13 feet. The surface elevation is 3610 feet.

1. Base of the USDW at 473'.

2. Casing: 8-5/8", 32 lb/ft, set at 1955' in an 11" hole. Cemented to surface with 700 sacks of cement.

3. Perforations: 1446' - 1462'.

4. PBTD: 1912'.

5. Cement Plug: 40 sacks from 1912' to 2045'.

6. Cement Plug: 50 sacks from 3620' to 3720'.

7. Cement Plug: 40 sacks from 5456' to 5556'.

8. Cement Plug: 50 sacks from 7435' to 7535'.

9. Cement Plug: 45 sacks from 9675' to 9775'.

10. Hole Size: 7-7/8".



HOUSTON,TX. SOUTH BEND, IN. BATON ROUGE, LA.

ATTACHMENT III-2 NAVAJO REFINING COMPANY CURRENT WELL CONFIGURATION CHUKKA FEDERAL No. 2

Date: 03/10/99 Checked By: NLN Job No.: 60A4937 Drawn By: LKM Approved By: NLN File: WDW2A.DS4

ATTACHMENT C

DRILLING AND RECOMPLETION PROCEDURE FOR NAVAJO REFINING COMPANY'S PROPOSED WDW-2

- 1. Obtain all permits and approvals for the reentry, testing and completion of a currently existing well.
- 2. Move in and rig up a workover unit. Remove the pumping equipment and pull the tubing out of the well.
- 3. Go in the hole with a squeeze packer and squeeze the perforations from 1446 feet to 1462 feet with 100 sacks of Class "H" cement. Allow the cement to cure.
- 4. Drill out the cement, circulate the well clean and pressure test the squeezed perforations at 500 psig for 30 minutes. Pull the squeeze tools out of the hole.
- 5. Conduct a CBL/VDL survey from 1912 feet to the surface. Submit the results of the pressure test and CBL/VDL survey to the OCD and the BLM for their review and approval prior to mobilizing the drilling rig.
- 6. After receiving approval from the OCD and the BLM to continue the reentry, prepare the location for the selected drilling rig. Construct the lined reserve pits, dig out the cellar, and install a mousehole and rathole.
- 7. Move in and rig up the rotary drilling rig and install the blowout preventers.
- 8. Drill out the following cement plugs and conduct deviation surveys every 1000 feet or on trips:
 - a. 1912 feet to 2045 feet, 40 sacks
 - b. 3620 feet to 3720 feet, 50 sacks
 - c. 5456 feet to 5556 feet, 40 sacks
 - d. 7435 feet to 7535 feet, 50 sacks
- 9. Clean the well out to a depth of 9200 feet and circulate and condition the hole for logging. Make a wiper trip to the base of the 8-5/8 inch surface casing while strapping the drillpipe.
- 10. Conduct a formation microimager (FMI) survey with gamma ray from the well's total depth to 4000 feet. Continue the four-arm caliper survey to the 8-5/8 inch

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Subsurface Technology, Inc.

ATTACHMENT C (Continued)

casing shoe. Process the FMI for fracture identification over the lower 200 feet of the confining zone and zones of interest in the injection zone, if warranted.

- 11. Spot a gelled pill at 9200 feet and lay down the drillpipe.
- 12. Run the 5-1/2 inch casing with a packoff shoe and float collar to 9200 feet. Install a "DV" tool at 5500 feet. Run centralizers at approximately 120-foot intervals.
- 13. Cement the 5-1/2 inch casing in place. Use a minimum of 20% excess cement as calculated from the caliper log. Circulate cement to the surface and allow to cure.
- 14. Clean out the mud pits and release the drilling rig 12 hours after cementing the 5-1/2 inch casing in place.
- 15. Stabilize the 5-1/2 inch casing at the surface using ready-mix cement.
- 16. Move in and rig up the completion rig pump, tank, power swivel, and work string. Install the blowout preventer.
- 17. Run in the well with a 4-3/4 inch bit to the "DV" tool and test the casing to 1500 psig for 30 minutes.
- 18. Drill out the "DV" tool and clean out the wellbore to the float collar. Test the casing to 1500 psig for 30 minutes. Circulate the wellbore with clean brine, preceded by 15% HCL to clean the casing. Trip the work string out of the well.
- 19. Conduct the casing inspection, CBL/VDL, and differential temperature surveys.
- 20. Perforate the selected injection interval as determined from the open hole logs. (Zone 1).
- 21. Run in the well with a packer and tailpipe. Set the packer above the top perforation and swab test the perforated interval. Recover at minimum two tubing volumes of the reservoir fluid for analysis (Note: Set up H₂S monitoring equipment prior to swabbing operations).
- 22. Acidize the zone using diverters. Pull the packer out of the well.
- 23. Perforate the next selected injection interval as determined from the open hole logs (Zone 2).

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Subsurface Technology, Inc.

2

ATTACHMENT C (Continued)

- 24. Run a retrievable bridge plug and packer into the well and isolate Zone 2.
- 25. Acidize Zone 2 using diverters. Pull the retrievable bridge plug and packer out of the well, laying down the work string.
- 26. Conduct an injection test down the 5-1/2 inch casing at 420 gpm for 12 hours followed by a pressure falloff test.
- 27. Conduct a differential temperature survey and radioactive tracer survey to determine the injection profile.
- 28. Run the injection tubing and packer. Fill the annulus with corrosion inhibited brine.
- 29. Wait for the well system to come to thermal stabilization (approximately 24 hours).

30. Conduct an annulus pressure test witnessed by the OCD.

31. Rig down and move out all equipment and close the reserve pit.

32. Install the annulus monitoring system and return the well to the client.

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ATTACHMENT D



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CONDITIONS OF APPROVAL - DRILLING

Operator's Name: <u>Navajo Refining Company</u> Well No. <u>2</u> - WDW Location: <u>1980' FNL & 660' FWL</u> sec. <u>12</u>, T. <u>18 S.</u>, R. <u>27 E.</u> Lease: <u>NM-6852</u>

I. DRILLING OPERATIONS REQUIREMENTS: [Deepening]

1. The Bureau of Land Management (BLM) is to be notified at (505) 887-6544 in sufficient time for a representative to witness:

A. Cementing casing: <u>5-1/2</u> inch

2. Unless the injection casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

II. CASING:

1. Minimum required fill of cement behind the <u>5-1/2</u> inch injection casing is <u>sufficient to circulate to the</u> surface.

III. PRESSURE CONTROL:

1. Before drilling into the <u>100 foot 8-5/8 inch surface casing shoe cement plug at approximately 1912 feet</u>. the blowout preventer assembly shall consist of a minimum of One Annular Preventer, Two Ram-Type Preventers, and a Kelly Cock/Stabbing Valve

2. Minimum working pressure of the blowout preventer and related equipment (BOPE) shall be <u>3000</u> psi.

3. After drilling into the <u>100 foot 8-5/8 inch surface casing shoe cement plug at approximately 1912 feet</u> and before drilling into the <u>100 foot Abo cement plug at approximately 5450 feet</u>, the BOPE shall be tested as described in Onshore Order No. 2. Any equipment failing to test satisfactorily shall be repaired or replaced.

A. The results of the test will be reported to the BLM Carlsbad Resource Area office at 620 East Greene Street, Carlsbad, New Mexico 88220-6292.

B. Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.

C. Testing must be done in a safe workman like manner. Hard line connections shall be required.



Subsurface Technology, Inc.

EXHIBIT C

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Map courtesy of Midland Map Company



SURFACE USE PLAN

NAVAJO REFINING COMPANY PROPOSED WDW-2 1980' FSL, 660' FWL of 12-T18S-R27E EDDY COUNTY, NEW MEXICO

- 1. <u>Existing Roads</u>: Existing roads that lead to the proposed drillsite are shown on Exhibit A.
- 2. <u>Access Roads To Be Constructed</u>: No new access road is proposed.
- 3. <u>Location of Existing Wells</u>: Existing wells within one mile of proposed WDW-2 are shown on Exhibit B.
- 4. <u>Location of Proposed Facilities If Well Is Completed</u>: The well will be shut in after completion and testing.
- 5. <u>Location and Type of Water Supply</u>: Water for reentry, testing, and completion operations will be purchased from a commercial water hauler.
- 6. <u>Source of Construction Materials</u>: Materials required for construction of the site will be taken from a state-owned pit.
- 7. Methods of Handling Waste Disposal:
 - A. Drill cuttings will be disposed of in the drilling pits.
 - B. Drilling fluids will be allowed to evaporate in the drilling pits until the pits are dry.
 - C. Water produced during tests will be disposed of in the drilling pits.
 - D. Trash, waste paper, garbage, and junk will be buried in a trash pit and covered with a minimum of 24 inches of dirt. All waste material will be contained to prevent scattering by the wind. Location of the trash pit is shown on Exhibit C.

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- E. All trash and debris will be buried or removed form the wellsite after finishing drilling and/or completion operations.
- 8. Ancillary Facilities: None anticipated.

9. <u>Wellsite Layout</u>:

- A. The wellsite will be surveyed, and a 400' x 400' area will be staked and flagged.
- B. The dimensions and relative location of the drill pad, mud pit, and trash pit, with respect to the wellbore, are shown on Exhibit C.
- C. Existing topsoil to a depth of 6 inches will be lifted and stockpiled at the northeastern (uphill) end of the well pad. The stockpiled topsoil will be located uphill to avoid mixing with subsurface materials.
- D. The well pad will be surfaced with material found in place.
- E. The pits for mud and cuttings will be lined with 6-mil plastic.

10. Plans for Restoration of Surface:

- A. After completion of drilling and/or completion operations, all equipment and other material not needed for operations will be removed. Pits will be filled and the location cleaned of all trash and junk.
- B. Any unguarded pits containing fluids will be fenced until they are filled.
- C. After abandonment, all equipment, trash, and junk will be removed and the location cleaned.
- D. The stockpiled topsoil will be spread over the surface of the location.
- 11. Surface Ownership: U.S. Department of Interior, Bureau of Land Management.

2

ENVIROCORP

- 12. <u>Archaeological Survey</u>: An archaeological survey of the drill pad was submitted to the BLM on July 31, 1985, on behalf of Fred Pool Drilling Company. An archeological survey was conducted by Navajo Refining Company and will be submitted by Navajo under separate cover.
- 13. <u>Operator's Representatives</u>: Representatives responsible for assuring compliance with the approved Surface Use Plan:

Mr. Darrell Moore Navajo Refining Company Post Office Box 159 Artesia, New Mexico 88211 505/748-3311 Mr. Jim Bundy Subsurface Technology, Inc. 7020 Portwest Drive, Suite 100 Houston, Texas 77024 713/880-4640

Exhibits

- A. Topographic Map
- B. Oil and Gas Map
- C. Sketch of Well Pad



14. Certification:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions that exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Navajo Refining Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

4/15/99 Date

Water - Waste Title

Navajo Refining Company

BOP Minimum Requirements

- a. 11-inch, 3000-psi working pressure double-hydraulic BOP.
- b. 11-inch, 3000-psi working pressure annular BOP.
- c. 3-inch, 3000-psi working pressure manual choke manifold.

A schematic of the BOP stack is included as Exhibit A.

- 8. Drill out the following cement plugs and conduct deviation surveys every 1000 feet or on trips:
 - a. 1912 feet to 2045 feet, 40 sacks
 - b. 3620 feet to 3720 feet, 50 sacks
 - c. 5456 feet to 5556 feet, 40 sacks
 - d. 7435 feet to 7535 feet, 50 sacks

Estimated Tops of Geologic Formations

San Andres	2005'	Lower Wolfcamp	7270'
Yeso	4210'	Cisco	7645'
Abo	5506'	Canyon	8390'
Wolfcamp	6728'	Strawn	8894'

No fresh water or hydrocarbons are expected to be encountered.

Expected Bottom-Hole Pressure and Hazards

The expected bottom-hole pressure is 3500 psia at the total depth of 9200 feet. The bottom-hole pressure was determined from the pressure measured in Navajo's WDW-1, or 2928 psia, at 7924 feet. Navajo's WDW-1 is completed in the same interval proposed for WDW-2 and is located 11,000 feet northeast of WDW-2 in 31-T17S-R28E. The average specific gravity of the fluid between 7924 feet and 9200 feet is expected to be 1.034, which is the specific gravity of the fluid swabbed from the interval between 8220 feet and 8476 feet in WDW-1. The expected bottom-hole pressure at 9200 feet in proposed WDW-2 is calculated below:

BHP (9200 feet) = $2928 \text{ psia} + (9200 \text{ feet} - 7924 \text{ feet}) \times 0.433 \text{ psi/ft} \times 1.034$ = 3500 psia

2

ENVIROCORP

No abnormal pressures or temperatures or other hazards are expected while drilling or testing the well. Hydrogen sulfide monitoring equipment will be set up prior to swabbing operations.

- Clean the well out to a depth of 9200 feet and circulate and condition the hole for logging. Make a wiper trip to the base of the 8-5/8 inch surface casing while strapping the drillpipe.
- 10. Conduct a formation microimager (FMI) survey with gamma ray from the well's total depth to 4000 feet. Continue the four-arm caliper survey to the 8-5/8 inch casing shoe. Process the FMI for fracture identification over the lower 200 feet of the confining zone and zones of interest in the injection zone, if warranted.
- 11. Spot a gelled pill at 9200 feet and lay down the drillpipe.
- 12. Run the 5-1/2 inch, 17-lb/ft, J-55, LT&C casing with a packoff shoe and float collar to 9200 feet. Install a "DV" tool at approximately 5800 feet. Run centralizers at approximately 120-foot intervals.
- 13. Cement the 5-1/2 inch casing in place. Use a minimum of 20% excess cement as calculated from the caliper log. Circulate cement to the surface and allow to cure.

Cement Program

- a. Stage 1 Cement (total depth to 5800 feet): Lightweight Class H with fly ash, gel, friction reducer, and salt mixed with fresh water.
- b. Stage 2 Lead Cement (5200 feet to the surface): Lightweight Class C with gel and bridging agents mixed with fresh water.
- c. Stage 2 Tail Cement (5800 feet to 5200 feet): Class C mixed with fresh water.
- 14. Clean out the mud pits and release the drilling rig 12 hours after cementing the 5-1/2 inch casing in place.

3

15. Stabilize the 5-1/2 inch casing at the surface using ready-mix cement.



- 16. Move in and rig up the completion rig pump, tank, power swivel, and work string. Install the blowout preventer.
- 17. Run in the well with a 4-3/4 inch bit to the "DV" tool and test the casing to 1500 psig for 30 minutes.
- 18. Drill out the "DV" tool and clean out the wellbore to the float collar. Test the casing to 1500 psig for 30 minutes. Circulate the wellbore with clean brine, preceded by 15% HCL to clean the casing. Trip the work string out of the well.
- 19. Conduct the casing inspection, CBL/VDL, and differential temperature surveys.
- 20. Perforate the selected injection interval as determined from the open hole logs. Depending on the height of the perforated interval, the interval may be perforated in two stages, as Zone Nos. 1 and 2.
- 21. Run in the well with a packer and tailpipe. Set the packer above the top perforation and swab test the perforated interval. Recover at minimum two tubing volumes of the reservoir fluid for analysis (Note: Set up H₂S monitoring equipment prior to swabbing operations).
- 22. Acidize the perforated zone (Zone 1) using diverters. Pull the packer out of the well.
- 23. Perforate the next selected injection interval (Zone 2) as determined from the open hole logs.
- 24. Run a retrievable bridge plug and packer into the well and isolate Zone 2.
- 25. Acidize Zone 2 using diverters. Pull the retrievable bridge plug and packer out of the well, laying down the work string.
- 26. Conduct an injection test down the 5-1/2 inch casing at 420 gpm for 12 hours, followed by a pressure falloff test.
- 27. Conduct a differential temperature survey and radioactive tracer survey to determine the injection profile.

4

ENVIROCORP

28. Run the injection tubing and packer. Fill the annulus with corrosion inhibited brine.

29. Wait for the well system to come to thermal stabilization (approximately 24 hours).

30. Conduct an annulus pressure test witnessed by the OCD.

31. Rig down and move out all equipment and close the reserve pit.

32. Install the annulus monitoring system and return the well to the client.

Logging, Testing, And Coring Program

A formation fluid sample will be retrieved from the proposed injection zone in proposed WDW-2. Navajo will conduct injectivity testing in the injection zone of proposed WDW-2.

No coring is planned.

The proposed logging program is described below:

HOLE/CASING	OPEN-HOLE LOGS	CASED-HOLE LOGS
· .	Proposed WDW-2	
11 inch Surface Borehole (8-5/8 inch Casing) 1995 feet		Logs Run in 1973: Gamma Ray Logs Proposed on Reentry: Cement Bond/Variable Density Casing Inspection Log
7-7/8 inch Long-String Borehole (5-1/2 inch Casing) 9200 feet	Logs Run on August 27, 1973: Dual Induction-Laterolog/ Spontaneous Potential Compensated Neutron/ Formation Density Caliper Gamma Ray Logs Proposed on Reentry: Fracture Identification Log 4-Arm Caliper	Logs Proposed on Reentry: Cement Bond/Variable Density Casing Inspection Log Differential Temperature Log Radioactive Tracer Survey

ENVIROCORP

Subsurface Technology, Inc.

5



- A = ANNULAR-TYPE BLOWOUT PREVENTER 11-inch throughbore, 3000-psi working pressure
- R = RAM-TYPE BLOWOUT PREVENTER 11-inch throughbore, 3000-psi working pressure
- S = DRILLING SPOOL WITH SIDE OUTLET CONNECTIONS FOR CHOKE AND KILL LINES

MANUAL CHOKE MANIFOLD 3-inch throughbore, 3000-psi working pressure

Source: API RP 53: Recommended Practices for Blowout Prevention Equipment Systems

ENVIROCORP .	HOUSTON, TX, SOUTH BENN, SL BATON ROUGS, LA
EXHIBIT A	
BLOWOUT PREVENTE AND MINIMUM REQUI	R STACK REMENTS
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produces oil	and gas from pe	rforations f	Erom	1446 feet	to 140	52 feet	(Penrose).	-

Navajo will squeeze the perforations from 1446 feet to 1462 feet, drill out cement plugs and clean out the well to 9200 feet, set 5-1/2 inch casing at 9200 feet and cement to the surface, perforate porous intervals in the Lower Wolfcamp, Cisco, and Canyon Formations between 7270 feet and 9200 feet, and conduct injectivity tests. Post TO-1

Attached are the Well Location Plat, Drilling Program, and Surface Use Plan.

SUBJECT TO ANA OTZI

Ro-entry APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND

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PERMIT XO.

APPROVED BY

Application approval does not warrant or eartify that the applicant bolds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereas. CONDITIONS OF APPROVAL, IF ANT:

APPROVAL DATE

(ORIG. SGD.) DAVID R. GLASS

PETROLEUM ENGINEER

APR 27 1999

5-28-99

"See Instructions On Reverse Side

the 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the state of the formation of formation of the statements or representations as to any matter within its jurisdiction.

TTLE

Noted at 15	Hobbs, NI	VI 88240	1ك	ergy, Mi	State-of-New nerals & Natura	N MEXICO Il Resources Depar	x at	Revised	March 17, 1999
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14. Certification:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions that exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Navajo Refining Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

4/15/99 Date

2 Mine 1 Moore Title

Navajo Refining Company

CIST N.M. Oil Cons. Division 811 S. 1st Street TELEPHONE FAX APPENNA SUCCESSOMPANY **^5) 748-3311** (505) 746-6410 ACCTG (505) 746-6155 EXEC **ASYLINK** (505) 748-9077 ENGR 62905278 501 EAST MAIN STREET . P. O. BOX 159 (505) 746-4438 P / L ARTESIA, NEW MEXICO 88211-0159 May 10, 1999 RECEIVED 0) 9 Mr. Tim Gumm BU State of New Mexico MAY 1 3 1999 Energy, Minerals and Natural **Resources** Department **Oil Conservation Division** OSWELL NW W.

RE: Re-Entry for Navajo Refining Company's Waste Disposal Well No. 2

1.A.C

Dear Mr. Gumm:

811 South First Street Artesia, New Mexico 88210

Navajo Refining Company (Navajo) has contracted Subsurface Technology, Inc. to re-enter, test and complete Waste Disposal Well No. 2 (WDW-2), formerly the Chukka Federal No. 2 operated by The Eastland Oil Company. The United States Department of the Interior, Bureau of Land Management approved the Application for Permit to Drill or Deepen on April 27, 1999. Subsequent approval from the State of New Mexico Oil Conservation Commission (OCD) was granted on Tuesday, May 4, 1999.

Navajo initiated field operations on Wednesday, May 5, 1999. The existing pumping equipment, rods, and tubing were removed from the wellbore. The perforations from 1446 feet to 1462 feet were squeezed using 100 sacks of Class 'H' cement (approximately 50 sacks of cement were displaced into the perforated interval). The cement was allowed to cure and drilled out to a total depth of 1922 feet (KB)(1911 feet below ground level).

On Sunday, May 9, 1999, the 8-5/8 inch surface casing, set from 1955 feet (KB) to surface, was pressure tested for internal mechanical integrity between 1922 feet (KB) and 30 feet (KB) using a packer set at 30 feet. The 8-5/8 inch surface casing was pressure tested to 660 pounds per square inch and monitored at the surface for one hour (Attachment A). The fluid used for testing was a clean fresh water fluid. A pressure loss of 1 psi (0.15%) was observed during the first 30 minutes of the test. A pressure loss of 2 psi (0.30%) was observed during the last 30 minutes of the test. The results from the pressure test confirmed internal mechanical integrity of the 8-5/8 inch surface casing from 1922 feet (KB) to 30 feet (KB).

An Independent Refinery Serving ... NEW MEXICO • ARIZONA • WEST TEXAS • NORTHERN MEXICO

The 8-5/8 inch surface casing was originally set in an 11 inch open-hole to a depth of 1955 feet (KB) and cemented to surface using 700 sacks of Class 'H' cement with 2% gel and 100 sacks of Class 'H' neat. A total of 200 sacks of cement was recorded circulated to surface. The calculated volume between an 11 inch hole and 8-5/8 inch casing is (0.2407 cubic feet per foot X 1955 feet) 471 cubic feet. The volume of cement pumped is (1.18 cubic feet per sack X 800 sacks) 944 cubic feet for an excess of 473 cubic feet or 400 sacks circulated to surface. The calculated volume of cement and apparent volume of actual cement pumped indicated excess cement was circulated to surface.

On Sunday, May 9, 1999, Halliburton Logging Services completed a cement bond and microsiesmogram (same as a variable density log) logging survey within the 8-5/8 inch casing from a wireline total depth of 1919 feet (KB) to the surface (Attachment B). The results from the survey indicate a continuous column of cement from 1922 feet to surface with good bonding characteristics. The cement behind the 8-5/8 inch casing will provide an effective hydraulic seal to prevent the movement of groundwater fluids into the underground source of drinking water with a base at 473 feet.

Please review and approve the pressure testing and cement bond log results at your earliest convenience. Navajo will proceed with the mobilization of the drilling rig Wednesday, May 12, 1999 and begin re-entry of the WDW-2 wellbore according to the approved drilling program. Navajo will periodically contact the OCD, Artesia office with a status update of the re-entry operations. The Bureau of Land Management will be notified in sufficient time for a representative to witness the cementing of the 5-1/2 inch protection casing.

Should you have any questions or concerns, please call me at (505) 748-3311.

Sincerely yours,

ull Moore

Darrell Moore Environmental Manager for Water and Waste

c: Mr. David Glass Bureau of Land Management Roswell Field Office 2909 West Second Street Roswell, New Mexico 88201

> Mr. Brian Rogers Subsurface Technology, Inc. 7020 Portwest, Suite 100 Houston, Texas 77024

File: Injection Wells

APPROVED

JUN 02 1999

(ORIG_SGD), DAVID R. GLASS AUTHORIZED OFFICER, MINERALS BUREAU OF LAND MANAGEMENT



Patterson Drilling Company 410 N. Loraine Street - (915) 682-9401 T

Midland, Texas 79701

RECEIVED

JUN 0 4 1999

SUBSURFACE TECHNOLOGY, INC.

June 2, 1999

Drilling Department Subsurface Construction Corporation 7020 Port West, Ste 100 Houston, TX 77024

RE: **Inclination Report** Navajo WDW-2 Sec 12; T-18-S; R-27-E

Gentlemen:

The following is an inclination survey on the above referenced well located in Eddy County, New Mexico:

2898' - 0.25 3838' - 0.25 4783' - 0.50 6106' - 0.75 6633' - 0.50

Sincerely,

Edwards Rebucca

Rebecca A. Edwards Administrative Assistant

STATE OF TEXAS

COUNTY OF MIDLAND

The foregoing was acknowledged before me this 2nd day of June, 1999 by Rebecca A. Edwards.

NOTARY PUBLIC

Vorter

)

MY COMMISSION EXPIRES:

TREVA FORRESTER NOTARY PUBLIC STATE OF TEXAS My Camm, Exp. 9-2-2000

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or ed well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests ted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, items 25 through 29 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE Northwestern New Mexico Southeastern New Mexico

		110111111	
T. Canyon	8390	T. Ojo Alamo	T. Penn. "B"
T. Strawn	8894	T. Kirtland-Fruitland	T. Penn. "C"
T. Atoka		T. Pictured Cliffs	T. Penn. "D"
T. Miss		T. Cliff House	T. Leadville
T. Devonian		T. Menefee	T. Madison
T. Silurian		T. Point Lookout	T. Elbert
T. Montoya		T. Mancos	T. McCracken
T. Simpson		T. Gallup	T. Ignacio Otzte
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IMPORTANT WATER SANDS

T. Chinle

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Include data on rate of water inflow and elevation to which water rose in hole.

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	То	Thickness In Feet	Lithology] [From	То	Thickness In Feet	Lithology
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Subant To Appropriate E	histrict Office		State of New M	Mexico			Form C-105
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23			CASING RE	CORD (Repo	rt all string	s set in well))
ASING SIZE	WEIG	IT LB./FT.	DEPTH SET	HOLE SIZE	CEMENT	ING RECORD	AMOUNT PULLED
13-3/8"	1	N/A	40'	N/A		N/A	None
8-5/8"		32	1995'	11"	800 sac	cs circulated	None
5-1/2"		17	8869'	7-7/8"	1570 sac	ks circulated	None
<u></u>							
<u> </u>							
24.	TOP	L	INER RECORD	LCORENI	23.	DEPTH SET	
SIZE	10P	BOLIOM	SACKS CEMENT	SUREEN	SIZE	DEPTH SET	PACKER SET
·					5-1/2"	1528	/528
<u> </u>					1		
26. Perforation re	cord (interval, size,	and number)					
75701 - 76201	76761 += 77761	70761 += 707 41	70501 +- 7000	DEPTH INTERVAL	AMOUN1	AND KIND MAT	ERIAL USED
15/0 10 /620',	10/0 10 //30',	1820 10 1834',	1030 10 100U,	7570' to 8300	, 10,000 g	allons of 15% H	ICI, plus 4600 pounds
/886 to /904',	/910 to /936'.	7944 to 7964',	/990° to 8042',		of rock s	alt as diverter	
8096' to 8116',	8191 to 8201',	8304' to 8319',	8392 TO 83997				
(2 spt for total)	or 598 holes).				I		
28			PRO	DUCTION			• •
Date First Productio	n I	Production Method (Flowing, gas lift, pumpin	g - Size and type pump) Well Sta	tus (Prod. or Shut-in	1)
N/A	\		N/A			N	/A
Date of Test	Hours Tested	Choke Size	Prod'n For	Oil - Bbl	Gas - MCF	Water - Bbl.	Gas - Oil Ratio
N/A	N/A	N/A	Test Period				
Flow Tubing Press.	Casing Pressure	Calculated 24-	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravi	ty - API - (Corr.)
-		Hour Rate					
29 Disposition of G	as (Sold used for f	up vented etc.		L	,	Test Witnessed	Bv
= /. craposition of O		,					-,
		<u> </u>	N/A			1	
30. List Attachment	s	<u> </u>	N/A	·	<u>.</u>		<u> </u>
30. List Attachment	s		N/A Deviat	ion Report			tiot
30 List Attachments	s v that the informa	tion shown on bot	N/A Deviat	ion Report true and complete to	the best of my	knowledge and be	lief
30. List Attachment	s v that the informa	tion shown on bot	N/A Deviat h sides of this form as	ion Report true and complete to	the best of my i	knowledge and be	liej
30. List Attachments	s v that the informa v W Mix	tion shown on bot.	N/A Deviat h sides of this form as	ion Report true and complete to Macceritte Eur	the best of my i Mar	knowledge and be	11ej 7/14/44

m 3160-4 ¥,,1992)	UNITED ST	ATES		Son athe	NM~88210	2834 DESIGNATIK	Expires: Fe	NO.	
DEPAR	IMENI OF IT		K 9	1 f@@nee	9 300) · ·	NM 6852	S OR TRIBE NAM	/E	2
	ETION OF RECO	MPLETION RE		DIOG	•	4		. 1	
TYPE OF WELL				Class	s I Waste	7. UNIT AGREEMENT	NAME	D- Ro	3
	WELL WELL		Al -1	Disp	osal Well	1		CD'CCELLS	7 0
TYPE OF COMPLETION:				Reer	ntrv	8. FARM OR LEASE N	AME, WELL NO.	APT CO	
WELL	PERFER PLOG	GENVR				WDW-2	\	SIA.	
NAME OF OPERATOR Y						9. API WELL NO.	894	EL LI DI CLY	ver b
ADORESS AND TELEPH	DNEAD		<u></u>			10. FIELD AND POOL	ORVIDCAT	- PENK O	-
Post Office	Box 159, Ar	tesia, New	Mexico	88211	<u>l</u>	-L. WOTEC	mp-Cise	- Canyon 769	18
AL BUTTER			-	_		OR AREA	BLOCK AND SUN	(VET	
1980	FNL and 660	' FWL Unit	Letter	E		Section 12	, Townsh	nip 18 South	
At top prot, strands report						Range 27 E	ast, Uni	it Letter E	
Same At total depth		TA PERMIT NO.		DATE ISS	UED	12 COUNTY ON	13. STATE		
Same		WDW-2		Apri	1 27, 1999	PARISH - Eddy	New N	lexico	
DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMP (Road)	to prod.)	L	18. ELEVATIONS (DF. F	RKB, RT, GR, ETC.)*		19. ELEV. CASINGHEAD	
-18-73	8-27-73	6-8-99			3607' GL;	3623' RKB	~	3609' GL	
COTAL DEPTH MD	170 21. PLUG, BACK	1.0, MD & TVD 2	HOW MANY	·	DRILLED BY		uus	CABLE TOOLS	
			AND TVOP	•		ALL 25, WAS DIRECTIONAL	SURVE MADE?		
• Wolfcamp-C	isco-Canyon	,				Yes			
YPE ELECTRIC AND OTHE	RLOGSRUN Fractu	re Finder a	and Cal	iper	Logs,	27. WAS WELL CORE	רכ		
Inductio	n Laterlog, C	CASING RECOR	Neutro	<u>n. ro</u>	(Report all strings set i	1sity in well)	N	0	
3 SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET	HOLE	SIZE	TOP OF CE	MENT, CEMENTING REG	CORD.	AMOUNT PLUED	
13-3/8"	<u>N/A</u>	40'	N/	A	Surface	900 (1)		None	
<u>13-3/8"</u> <u>8-5/8"</u> 5-1/2"	<u>N/A</u> 32 17	40' 1995' 8869'	N/ 11 7-	A 7/8"	Surface Surface. Surface.	800 sx C1 1570 sx C1	H	None None	
<u>13-3/8"</u> 8-5/8" 5-1/2"	N/A 32 17	40' 1995' 8869'	N/ 11 7-	A 7/8"	Surface Surface. Surface. and ClC	800 sx Cl 1570 sx Cl	H	None None None	
13-3/8" 8-5/8" 5-1/2"	N/A 32 17 LINER RECORD BOTTOM (MD)	40' 1995' 8869' SACKS CEMENT	N/ 11 7-	A 7 / 8 " N (MD)	Surface Surface. Surface. and C1C 30	800 SX C1 1570 SX C1 TUBING RECORD	Н	None None None PACKER SET (MO)	
13-3/8" 8-5/8" 5-1/2" size TOP (MD)	N / A 32 17 LINER RECORD BOTTOM (MD)	40' 1995' 8869' SACKS CEMENT	N/ 11 7- SCREE	A 7 / 8 " N (MD)	Surface Surface. Surface. and ClC 30 stre 3-1/2"	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528 '	H H T (MO	None None None PACKER SET (MD) 7528 '	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR	N / A 32 17 LINER RECORI BOTTOM (MD)	40' 1995' 8869' SACKS CE MENT	N/ 11 7- SCREE	A 7 / 8 " N (MD)	Surface Surface. and ClC 30 32 3-1/2" ACID, SHO	800 SX C1 1570 SX C1 TUBING RECORD DEPTH SE 7528 '	H H T (MO NT SQUEEZE, 1	None None None PACKER SET (MO) 7528 '	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (ND) PERFORATION RECOR 570'-7620',	N / A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676' - 7736',	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834'	N/ 11 7- SCREE 32 757	A 7 / 8 " N (MD)	Surface Surface. Surface. and ClC 30 stre 3-1/2" ACID, SHO ERVAL (MD) 2200;	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528 ' T, FRACTURE, CEME AMOUNT A	H H T (MD NT SQUEEZE, I ND KIND OF M	None None None Packer Set (MD) 7528 '	
13-3/8" 8-5/8" 5-1/2" SUZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880',	N/A 32 17 LINER RECORI BOTTOM (MD) 0 (Interval, size an 7676' - 7736', 7886' - 7904',	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834' 7916' - 7936'	N/ 11 7- SCREE 32 757	A 7/8" N (MD) EPTH INT 0 ' to	Surface Surface. Surface. and Clo 30 30 3-1/2" ACID. SHO ERVAL (MD) 8399'	800 sx C1 1570 sx C1 TUBING RECORD CEPTH SE 7528 ' T FRACTURE, CEME AMOUNT A 10, 000 ga 4600 pound	H TIMO NT SQUEEZE, I ND KIND OF M 1 LONS 15 ds of ro	None None None None PACKER SET (MD) 7528 ' TERIAL USED & HC1. plus ock salt as	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201'	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676' - 7736', 7886' - 7904', 7990' - 8042', 8304' - 8319'	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399'	N/ 11 7- SCREE 32 757	A 7/8" N(MD) EPTH INT 0' to	Surface Surface. Surface. and ClC 30 sze 3-1/2" ACID, SHO ERVAL (MD) 8399'	800 sx Cl 1570 sx Cl TUBING RECORD DEPTH SE 7528' 7, FRACTURE, CEME AMOUNT A 10,000 ga 4600 pound divertar	H H T (MO NT SQUEEZE, I ND KIND OF MU 110ns 15 ds of ro	None None None None PACKER SET (MD) 7528' ETC. NTERIAL USED Status Ck salt as	
<u>13-3/8"</u> <u>8-5/8"</u> <u>5-1/2"</u> <u>SIZE TOP (MD)</u> <u>PERFORATION RECOR</u> 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 jspf for to	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676'-7736', 7886'-7904', 7990'-8042', 8304'-8319', ptal of 598 b	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834' 7916' - 7936' 8096' - 8116' 8395' - 8399' oles)	N/ 11 7- SCREE 32 257 757	A 7/8" N(MD) EPTH INT 0' to	Surface Surface. Surface. and ClC 30 scc 3-1/2" ACID. SHO ERVAL (MD) 8399'	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' T. FRACTURE. CEME AMOUNT A 10,000 ga 4600 pound diverter	H H NT SQUEEZE, I ND KIND OF MU 11015 15 ds of ro	None None None None PACKER SET (MD) 7528 ' TERIAL USED & HC1. plus ock salt as	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (HD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 jspf for to E FIRST PRODUCTION	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676' - 7736', 7886' - 7904', 7990' - 8042', 8304' - 8319', pt al of 598 b PRODUCTION #	40' 1995' 8869' SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399' 01es) AETHOD (F)	N/ 11 7- SCREE 32 757 PR Dowing, ges ift	А 7 / 8 " N (MD) 0 * to DDUCTIO <i>pumping</i>	Surface Surface. Surface. and ClC 30 SIZE 3-1/2" ACID, SHO ERVAL (MD) 8399' N size and type of pump)	800 sx Cl 1570 sx Cl TUBING RECORD DEPTH SE 7528' 7, FRACTURE, CEME AMOUNT A 10, 000 ga 4600 pound divertar	H H T (MO NT SQUEEZE, I ND KIND OF MU LLONS 15 ds of ro	None None None None PACKER SET (MD) 7528 ' ETC. NTERIAL USED S HC1. plus ock salt as	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 jspf for to E FIRST PRODUCTION N/A	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676'-7736', 7886'-7904', 7990'-8042', 8304'-8319', 51al of 598 b PRODUCTION N	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834' 7916' - 7936' 8096' - 8116' 8395' - 8399' 01es) AETHOD (F)	N/ 11 7- SCREE 32 257 757 PR(SCREE) 4	А 7/8" N (MD) DEPTH INT 0' to DDUCTION pumping	Surface Surface. Surface. and ClC 30 sze 3-1/2" ACID. SHO ERVAL (MD) 8399'	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' T. FRACTURE. CEME AMOUNT A 10,000 ga 4600 pound diverter	H H NT SQUEEZE, I ND KIND OF MU LLONS 15 ds of ro	None None None None PACKER SET (MO) 7528' ETC. ATERIAL USED & HC1. plus ock salt as S (Producing or enu-in) N/A	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 jspf for to FIRST PRODUCTION N/A E OF TEST	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676' - 7736', 7886' - 7904', 7990' - 8042', 8304' - 8319', pt al of 598 b PRODUCTION M HOURS TESTED N/A	40' 1995' 8869' SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399' 01es) AETHOD (F) N/ CHOKE SIZE N/A	N/ 11 7- SCREE 32 57 757 PROD'N F TEST PER	A 7 / 8 " N (MD) 0 T to DUCTIO pumping- OR	Surface Surface. Surface. and ClC 30 stze 3-1/2" ACID, SHO ERVAL (MD) 8399' N size and type of pump) OlL-BBL.	800 sx Cl 1570 sx Cl TUBING RECORD DEPTH SE 7528' 7, FRACTURE, CEME AMOUNT A 10,000 ga 4600 pound divertar GAS-MCF.	H H T (MO NT SQUEEZE, I ND KIND OF MU Llons 15 ds of ro WELL STATU WATER-BBL	None None None None None PACKER SET (MD) 7528 ' ETC. ATTERIAL USED S HC1. plus ock salt as S (Producing or ana-in) N/A GAS-OIL RATIO	
13-3/8" 8-5/8" 5-1/2" SUZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 ispf for to FIRST PRODUCTION N/A E OF TEST /A	N/A 32 17 LINER RECORI BOTTOM (MD) 0 (Interval, size an 7676' - 7736', 7886' - 7904', 7990' - 8042', 8304' - 8319', 5121 of 598 b PRODUCTION M HOURS TESTED N/A CASING PRESENTED	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834' 7916' - 7936' 8096' - 8116' 8395' - 8399' 01es) AETHOD (F) K/A CHOKE SIZE N/A	N/ 11 7- SCREE SCREE 32 C 757 PROVN F TEST PER OUL BRI	A 7 / 8 " 7 / 8 " 7 / 8 " 7 / 8 " 7 / 7 / 8 " 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 /	Surface Surface. Surface. and ClC 30 scr 3-1/2" ACID. SHO ERVAL (MD) 8399' 8399' N streend (ype of pump) CIL-BBL.	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' T. FRACTURE. CEME AMOUNT A 10,000 ga 4600 pound divertar GAS-MCF. ECORD	H H H NT SQUEEZE, I ND KIND OF MU LODS 15 ds of ro WELL STATU WATER-BBL	None None None None None None T528' T528' ETC ATERIAL USED NTERIAL USED NTERIAL USED S (Producing or shut-in) N/A GAS-OIL RATIO	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 jspf for to FIRST PRODUCTION N/A E OF TEST /A W, TUBING PRESS	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Intervel, size en 7676' - 7736', 7886' - 7904', 7886' - 7904', 7990' - 8042', 8304' - 8319', ptal of 598 b PRODUCTION F HOURS TESTED N/A CASING PRESSURE N/A	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399' 10165 AETHOD (FI N/ CHOKE SIZE N/A 24-HOUR RATE CALCULATED	N/ 11 7- SCREE 32 757 PRI Wing, ges kit, A PROD'N. F TEST PER OKL-BBL	A 7 / 8 " 7 / 7 / 8 " 7 / 7 / 8 " 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 / 7 /	Surface Surface. Surface. and Clo 30 30 3-1/2 " ACID, SHO ERVAL (MD) 8399 ' N size and type of pump) Cil-BBL. EPTED FOR R	800 SX C1 1570 SX C1 TUBING RECORD DEPTH SE 7528' 7. FRACTURE, CEME AMOUNT A 10, 000 ga 4600 pound divertar GAS-MCF. ECORD WATER-BBL	H H T (MO NT SQUEEZE, I ND KIND OF M LONS 15 ds of ro WELL STATU WATER-BBL	None None None None None None None Packer SET (MD) 7528 ' ETC. NTERIAL USED Statused Statused N/A CAS-OIL RATIO 	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MO) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 ispf for to K/A E OF TEST /A W, TUBING PRESS /A DISPOSITION OF (Sold, u	N/A 32 17 LINER RECORI BOTTOM (MD) 0 (Intervel, size an 7676' - 7736', 7886' - 7904', 7990' - 8042', 8304' - 8319', 0 tal of 598 b PRODUCTION N HOURS TESTED N/A CASING PRESSURE N/A and for fuel, vented, etc.)	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834' 7916' - 7936' 8096' - 8116' 8395' - 8399' 01es) AETHOD (FI N/ CHOKE SIZE N/A 24-HOUR RATE CALCULATED	N/ 11 7- SCREE SCREE 32 757 PROD'N F TEST PER OIL-BBL OIL-BBL	A 7/8" N(MD) EPTH INT 0' to DDUCTION Pumping OR ACC	Surface Surface. Surface. and Clo 30 size 3-1/2" ACID, SHO ERVAL (MD) 8399' N size and type of pump) CiL-BBL. EPTED FOR R	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' 7. FRACTURE. CEME AMOUNT A 10. 000 ga 4600 pound divertar GAS-MCF. ECORD WATER-BBL 9-	H H T IMD NT SQUEEZE, I ND KIND OF M L OTS 15 ds of rc WELL STATU WATER-BBL OIL GRAVITY TEST WITNE	None None None None None None None T228' TERC ATERIAL USED NTERIAL USED S (Producing or shaking N/A [GAS-OIL RATIO SSED BY	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 ispf for to FIRST PRODUCTION N/A E OF TEST /A W, TUBING PRESS /A DISPOSITION OF (Sold, UN)	N/A 32 17 LINER RECORI BOTTOM (MD) 0 (Interval, size an 7676'-7736', 7886'-7904', 7990'-8042', 8304'-8319', 01 al of 598 b PRODUCTION P HOURS YESYED N/A CASING PRESSURE N/A Sed for fuel, vented, etc.)	40' 1995' 8869' SACKS CEMENT SACKS CEMENT SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399' 01es) AETHOD (FI N/ CHOKE SIZE N/A 24-HOUR RATE CALCULATED	N/ 11 7- SCREE 32 757 PROVN P TEST PER OIL-BBL OIL-BBL		Surface Surface. Surface. and Clo 30 30 31 3-1/2" ACID. SHO ERVAL (MD) 8399' N size and type of pump) C(L-BBL. PTED FOR F STER 199	800 sx C1 1570 sx C1 TUBING RECORD DEFINISE 7528' T. FRACTURE, CEME AMOUNT A 10,000 ga 4600 pound divertar GAS-MCF. ECORD MATER-BBL 9-	H H T (MO NT SQUEEZE, I ND KIND OF MU 1 LOTS 15 ds of ro WELL STATO WATER-BBL OIL GRAVITY TEST WITNE	None None None None None None None None	
13-3/8" 8-5/8" 5-1/2" SUZE TOP (MO) PERFORATION RECOR 570'-7620', 858'-7880', 944'-7964', 191'-8201', 2 ispf for to K/A E OF TEST /A W, TUBING PRESS /A DISPOSITION OF (Sold, UNIT) Deviation	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Interval, size an 7676'-7736', 7886'-7904', 7990'-8042', 8304'-8319', 0141 of 598 b PRODUCTION N HOURS TESTED N/A CASING PRESSURE N/A Seed for fuel, vented, etc.) Report	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826' - 7834' 7916' - 7936' 8096' - 8116' 8395' - 8399' 01es MATHOD (FI N/ CHOKE SIZE N/A 24HOUR RATE CALCULATED	N/ 11 7- SCREE SCREE 32 757 57 57 57 57 57 57 57 57 5	A 7/8" N(MD) 0'to DUCTION DUCT	Surface Surface. Surface. and Clo 30 size 3-1/2" ACID SHO ERVAL (MD) 8399' 8399' N size and type of pump) OiL-BBL. PTED FOR R STE 29 199 ARY GOUR	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' T. FRACTURE. CEME AMOUNT A 10,000 ga 4600 pound divertar GAS-MCF. ECORD UNITE -BBL 9- EY	H H H T IMD NT SQUEEZE, I ND KIND OF M L ONS 15 ds of rc WELL STATU WATER-BBL OIL GRAVITY TEST WITNE	None None None None None None None Secolarity 7528' ETC. ATERIAL USED S (Producing or S (Producing or S and inf) N/A [GAS-OIL RATIO SSED BY	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR 570'-7620', 7858'-7880', 944'-7964', 191'-8201', 2 jspf for to FIRST PRODUCTION N/A E OF TEST /A W, TUBING PRESS /A DISPOSITION OF (Sold, UN) N/A LIST OF ATTACHMENTS Deviation Thereby certify that	N/A 32 17 LINER RECORI BOTTOM (MD) 0 (Interval, size an 7676'-7736', 7886'-7904', 7990'-8042', 8304'-8319', 0 10 598 b PRODUCTION A HOURS TESTED N/A CASING PRESSURE N/A and for fuel, verted, etc.) Report the foregoing and attac	40' 1995' 8869' SACKS CEMENT SACKS CEMENT SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399' 01es) AETHOD (F) CHOKE SIZE N/A 24-HOUR RATE CALCULATED Ched information is	N/ 11 7- SCREE 32 757 PROD'N F TEST PER OIL-BBL OIL-BBL OIL-BBL		Surface Surface. Surface. and Clo 30 sce 3-1/2" ACID. SHO ERVAL (MD) 8399' N size and type of pump) Cil-BBL. PTED FOR R STED FOR R STED FOR R STED FOR R	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' T. FRACTURE. CEME AMOUNT A 10, 000 ga 4600 pound diverter GAS-MCF. ECORD WATER-BBL G- EY UNT all available re	H H H T (MO NT SQUEEZE, I ND KIND OF MU L ONS 15 ds of ro WELL STATU WATER-BBL OIL GRAVITY TEST WITNE CORDS.	None None None None PACKER SET (MO) 7528' ETC ATERIAL USED & HC1. plus ock salt as S (Producing or enut-in) N/A GAS-OIL RATIO 	
13-3/8" 8-5/8" 5-1/2" SIZE TOP (MD) PERFORATION RECOR '570'-7620', '858'-7880', '944'-7964', 191'-8201', 2 ispf for to FIRST PRODUCTION N/A E OF TEST /A W. TUBING PRESS /A DISPOSITION OF (Sold, U N/A E OF ATTACHMENTS Deviation Thereby certify that FD	N/A 32 17 LINER RECORD BOTTOM (MD) 0 (Intervel. size an 7676' - 7736', 7886' - 7904', 7990' - 8042', 8304' - 8319', 5131 of 598 b PRODUCTION A HOURS TESTED N/A CASING PRESSURE N/A CASING PRESSURE N/A	40' 1995' 8869' SACKS CEMENT SACKS CEMENT 7826'-7834' 7916'-7936' 8096'-8116' 8395'-8399' 101es) AETHOD (FI N/ CHOKE SIZE N/A 24-HOUR RATE CALCULATED Ched information is	N/ 11 7- SCREE 32 COMPACTION PROD'N F PROD'N F PROD'N F PROD'N F PROD'N F PROD'N F PROD'N F PROD'N F PROD'N F COMPACTION PROD'N F		Surface Surface Surface and Clo so so 3-1/2" ACID SHO ERVAL (MD) 8399' 8399' N size and type of pump) OIL-BBL PTED FOR R COLFIE COLFOR R COLFIE COLFOR R COLFIE COLFOR R COLFIE COLFOR R COLFIE COLFOR R COLFIE COLFOR R COLFIE COLFIE COLFIE COLFOR R COLFIE	800 sx C1 1570 sx C1 TUBING RECORD DEPTH SE 7528' T. FRACTURE, CEME AMOUNT A 10,000 ga 4600 pound diverter CAS-MCF. ECORD MATER-BBL 9- EY UNT OF GYMADIE re	H H H T (MO NT SQUEEZE, I ND KIND OF MU L ONS 15 ds of ro WELL STATU WATER-BBL OIL GRAVITY TEST WITNE Cords. DATE	None None None None None None None PACKER SET (MD) 7528 ' ETC. ATERIAL USED S (Producing or Status) N/A GAS-OIL RATIO 	
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Patterson Drilling Company RECEION. Coraine Street - (915) 682-9401 Mintand JTexas 79701 RECEIVE

JUN 0 4 1999

SUBSURFACE TECHNOLOGY, INC.

June 2, 1999

Drilling Department Subsurface Construction Corporation 7020 Port West, Ste 100 Houston, TX 77024

RE: Inclination Report Navajo WDW-2 Sec 12; T-18-S; R-27-E

Gentlemen:

The following is an inclination survey on the above referenced well located in Eddy County, New Mexico:

2898' - 0.25 3838' - 0.25 4783' - 0.50 6106' - 0.75 6633' - 0.50

Sincerely,

Rebecca Edwards

Rebecca A. Edwards Administrative Assistant

STATE OF TEXAS

COUNTY OF MIDLAND

The foregoing was acknowledged before me this 2nd day of June, 1999 by Rebecca A. Edwards.

MY COMMISSION EXPIRES:



en mester

NOTARY PUBLIC

TELEPHONE 5) 748-3311



REFINING COMPANY

FAX (505) 746-6410 ACCTG (505) 746-6155 EXEC (505) 748-9077 ENGR (505) 746-4438 P / L

CASYLINK 62905278

501 EAST MAIN STREET • P. O. BOX 159 ARTESIA, NEW MEXICO 88211-0159

July 19, 1999



Mr. James Amos United States Department of the Interior Bureau of Land Management P.O. Box 1778 Roswell, NM 88220

RE: Well Completion Report for Navajo's WDW-2i in E-12-T18S, R27E

Dear Mr. Amos,

Enclosed, please find two (2) copies of form OMB Form 1004-0137 pertaining to our WDW-2 injection well. If there are any questions concerning this submission, please call me at 505-748-3311. Thank you for your time in this matter.

Sincerely, NAVAJO REFINING COMPANY

Darrell Moore Environmental Mgr. for Water and Waste

Encl.

An Independent Refinery Serving . . . NEW MEXICO • ARIZONA • WEST TEXAS • NORTHERN MEXICO







Chavez, Carl J, EMNRD

From: Sent: To: Cc: Subject: Chavez, Carl J, EMNRD Thursday, August 12, 2010 1:55 PM 'Moore, Darrell'; Dade, Randy, EMNRD Lackey, Johnny RE: Mechanical Integrity Tests

Darrell:

OCD confirms that the annual MITs performed on WDW-1 (UICI-8) and WDW-2 (UICI-8-1) passed.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Moore, Darrell [mailto:Darrell.Moore@hollycorp.com] Sent: Thursday, August 12, 2010 10:39 AM To: Chavez, Carl J, EMNRD; Dade, Randy, EMNRD Cc: Lackey, Johnny Subject: MIT's

Carl

Attached, please find the charts for the MIT's that were performed on our Injection wells WDW-1 and WDW-2 today. Both wells passed the Mechanical Integrity Tests with no drop off in pressure. As you know, the MIT on WDW-3 was performed earlier in the year and was submitted to OCD. In addition, there was no pressure on either of the well's bradenhead. If there are any questions concerning this submission, please call me or email me. Thank you.

Darrell Moore Environmental Manager for Water and Waste Navajo Refining Company, LLC Phone Number 575-746-5281 Cell Number 575-703-5058 Fax Number 575-746-5451

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Submit I Copy To Appropriate District	State of New Me	xico	Form C-103		
<u>District 1</u> - (575)-393-6161	Energy, Minerals and Natu	ral Resources	Revised August 1, 2011		
1625 N French Dr., Hobbs, NM 88240			WELL API NO.		
811 S First St , Artesia, NM 88210	OIL CONSERVATION	DIVISION	30-015-20894		
District III - (505) 334-6178	1220 South St. Francis Dr.		STATE STATE		
$\frac{1000}{\text{District IV}} = (505) 476-3460$	Santa Fe, NM 87505		6. State Oil & Gas Lease No. 6852		
1220 S St Francis Dr , Santa Fe, NM		·			
SUNDRY NOTI	CES AND REPORTS ON WELLS		7 Lesse Name or Unit Agreement Name		
(DO NOT USE THIS FORM FOR PROPOS DIFFERENT RESERVOIR USE "APPLIC	SALS TO DRILL OR TO DEEPEN OR PLU CATION FOR PERMIT" (FORM C-101) FC	JG BACK TO A DR SUCH	Chukka WDW-2		
Type of Well Oil Well	Gas Well Other Injection W	الم	8. Well Number WDW-2		
2. Name of Operator		cu	9 OGRID Number		
Navajo Refining Company					
3. Address of Operator	······································		10. Pool name or Wildcat Navajo Permo-		
Post Office Box 159, Artesia, New	/ Mexico 88211		Penn 96918		
4. Well Location					
Unit Letter <u>E</u> :	1980feet from the	line an	id 660 feet from the West line		
Section 12	Township 18S	Range 27E	NMPM County Eddy		
	11. Elevation (Show whether DR,	RKB, RT, GR, etc.)			
	3607' GL, 3623' RKB				
12. Check A NOTICE OF IN PERFORM REMEDIAL WORK TEMPORARILY ABANDON PULL OR ALTER CASING DOWNHOLE COMMINGLE	Ippropriate Box to Indicate N TENTION TO: PLUG AND ABANDON CHANGE PLANS MULTIPLE COMPL	ature of Notice, SUB REMEDIAL WORI COMMENCE DRII CASING/CEMENT	Report or Other Data SEQUENT REPORT OF: <		
OTHER: PERFORM PRESSURE F PRESSURE TEST	ALLOFF TEST, ANNULUS	OTHER:			
 13. Describe proposed or complos of starting any proposed wo proposed completion or record October 17, 2011 – Perform bottomhole gauges into WD October 18, 2011 – Continu October 19, 2011 – At 12:1 established for WDW-2 and October 20, 2011 – At 7:00 October 21,2011 – All three October 22, 2011 – At 7:00 very slowly, making 7-minu 3000 ft, 2000 ft, 1000 ft, surt top of the fill. Turn the well 	eted operations. (Clearly state all p rk). SEE RULE 19.15.7.14 NMAC ompletion. n an annulus pressure test with an ir W-1, WDW-2, and WDW-3 by 11 ie injection into all three wells. Spm, the offset wells WDW-1 and continue for a 30 hour injection pe bpm, WDW-2 will be shut in for a 3 e wells will continue to be shut in w am, acquire downhole pressure gau ite gradient stops while coming out face). Run in hole with a temperatu lls back to Navajo personnel.	bertinent details, and C. For Multiple Con attial pressure of 600 45am. Continue in WDW-3 will be shu- riod. Do not exceed 0-hour falloff period while monitoring fall types from all three w of the WDW-2 even ure tool and conduct	l give pertinent dates, including estimated date npletions: Attach wellbore diagram of D psig and run the test for 30 minutes. Install jection into all three wells. It-in. A constant injection rate will be 1000 psig wellhead pressure. d. WDW-1 and WDW-3 will remain shut-in. loff pressure in all three wells. vells. Tag bottom of fill and come out of hole ry 1000 feet (7000 ft, 6000 ft, 5000 ft, 4000 ft, t temperature survey from the surface to the		
Accepted to NMOC	<i>10 11 11</i> r record D		OCT 07 2011 NMOCD ARTESIA		

Spud Date:

Rig Release Date:

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I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Timothy Jones ype or print name Timothy Jones or State Use Only	TITLE_ Project Engineer E-mail address: <u>Hjones e Subsurfacegoong.com</u>	DATE 10/3/2011 PHONE: 713-380-4640
APPROVED BY:	TITLE	DATE

Conditions of Approval (if any):

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Submit 1 Copy To Appropriate District Office	State of New M	exico		Form C-103
- <u>District </u> - (575) 393-6161-	Energy, Minerals and Nat	ural Resources		Revised August 1, 2011
District II – (575) 748-1283		30-015-20894		
811 S. First St., Artesia, NM 88210	OIL CONSERVATION	5. Indicate Type of I	.ease	
<u>District III</u> – (505) 334-6178 1000 Rio Brazos Rd. Aztec. NM 87410	1220 South St. Fra	STATE 🛛	FEE	
District IV – (505) 476-3460 Santa Fe, NM 87505			6. State Oil & Gas L	ease No. 6852
1220 S. St. Francis Dr., Santa Fe, NM 87505				
SUNDRY NOT	ICES AND REPORTS ON WELL	<u>s</u> .	7. Lease Name or Ur	nit Agreement Name
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PROPOSALS.)	8. Well Number WD	0W-2		
2 Name of Operator		¥ CII	9 OGRID Number	· · · · · · · · · · · · · · · · · · ·
Navajo Refining Company			5. OORD Number	
3. Address of Operator	· · · · · · · · · · · · · · · · · · ·	•	10. Pool name or Wi	ldcat: Navajo Permo-
Post Office Box 159, Artesia, Ner	w Mexico 88211		Penn 96918	
4. Well Location		· · · · · · · · · · · · · · · · · · ·	- <u>A</u>	· · ·
Unit Letter <u>E</u> :	1980 feet from the Nort	<u>h</u> line a	nd <u>660</u> feet fro	om the <u>West</u> line
Section 12	Township 18S	Range 27E	NMPM	County Eddy
	11. Elevation (Show whether Dl 3607' GL, 3623' RKB	R, RKB, RT, GR, etc.		
		- · · · · · · · · · · · · · · · · · · ·	No. and Carlinson	
12. Check	Appropriate Box to Indicate N	Nature of Notice,	Report or Other Da	ita
NOTICE OF IN	ITENTION TO:	SUE	SEQUENT REPO	RT OF:
PERFORM REMEDIAL WORK	PLUG AND ABANDON	REMEDIAL WOR	K 🗌 AL	TERING CASING
TEMPORARILY ABANDON	CHANGE PLANS	COMMENCE DR	ILLING OPNS.	AND A
PULL OR ALTER CASING		CASING/CEMEN	Т ЈОВ 🗌	
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OTHER PERFORM PRESSURE		OTHER	• •	П
PRESSURE TEST		OTTER.		با
13. Describe proposed or comp	pleted operations. (Clearly state all	pertinent details, an	d give pertinent dates, i	ncluding estimated date
proposed completion or rec	completion	C. For Multiple Co	mpletions: Attach well	bore diagram of
October 17, 2011 – Perfor	m an annulus pressure test with an	initial pressure of 60	00 psig and run the test	for 30 minutes. Install
bottomhole gauges into WI	DW-1, WDW-2, and WDW-3 by 1	1:45am. Continue i	njection into all three w	ells.
October 18, 2011 – Contin	ue injection into all three wells.		·	
established for WDW-2 and	d continue for a 30 hour injection r	eriod Do not excee	d 1000 nsig wellhead n	tion fate will be
October 20, 2011 – At 7:0	0pm, WDW-2 will be shut in for a	30-hour falloff perio	d. WDW-1 and WDW	-3 will remain shut-in.
October 21,2011 – All three	e wells will continue to be shut in	while monitoring fa	lloff pressure in all thre	e wells.
October 22, 2011 – At 7:0	0am, acquire downhole pressure ga	uges from all three	wells. Tag bottom of fi	ll and come out of hole
very slowly, making 7-min	ute gradient stops while coming ou	t of the WDW-2 ev	ery 1000 feet (7000 ft, 6	5000 ft, 5000 ft, 4000 ft,
3000 ft, 2000 ft, 1000 ft, su	rface). Run in hole with a tempera	iture tool and condu	ct temperature survey fr	om the surface to the
top of the first. I turn the we	ins back to mavajo personnet.			
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I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Project Engineer 10/3/2011 DATE SIGNATURE TITLE Jones E-mail address: Hones e Subsurface group.com PHONE: 713-580-4640 limothy " "ype or print name_ or State Use Only Chines APPROVED BY: Conditions of Approval (if any): _TITLE _ Environmental Engine __ DATE _ 10/19/2011 E-mil S. hated 10/19/2011 attached to WOW-I.

Chavez, Carl J, EMNRD

rom:Chavez, Carl J, EMNRDJent:Wednesday, October 19, 2011 4:06 PMTo:'Moore, Darrell'Cc:Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRDSubject:Navajo Refining Company UIC Class I (NH) Injection Wells WDWs 1, 2 & 3 (UICI-008) Fall
Off Test Plan (August 2011)

Darrell:

The New Mexico Oil Conservation Division (OCD) is in receipt of your above subject test plan. OCD has already approved the Fall-Off Test (FOT) Plan with conditions on July 28, 2009. The OCD notes that it is also in the process of reviewing C-103s Sundry Notices for the upcoming FOTs.

OCD observes some changes in this FOT Plan submittal that are not acceptable to the OCD. For example, Exhibit 1 is not an acceptable exhibit to the OCD for reasons specified in the 2010 FOT report review and later during the May 2011 meeting in Santa Fe. However, the operator continues to submit exhibits with certain assumptions that have not been accepted or approved by the OCD; i.e., that the injection wells are show interconnection with the injection zone during past FOTs. Perhaps the operator can conduct the 2011 FOT with the information and exhibits needed to prove the interconnection of injection wells with the injection zone? The Certified PE should provide the exhibits in the 2011 FOT Report with the analysis and conclusions supporting any claims for the OCD to review and consider before approving. This is apparently a FOT frequency per well issue that the operator is attempting to prove.

The OCD provides the following comments, observations, and/or recommendations on the above subject plan below.

Comments:

- The OCD approved the original Fall-Off Test (FOT) Plan based on OCD Guidance dated December 3, 2007. There should not be any significant changes to this FOT Plan because it is flexible where needed to allow operators to implement it on each injection well.
- OCD likes to be notified to witness the installation of bottom hole gauges and to be present at least one hour before injection shut-off and commencement of FOT monitoring.
- OCD is concerned about the Section VI No. 1(e) WDW-3 Cement Bond Log quality being poor from 900 ft. to 1200 ft- especially at the depths: 2662 – 2160; 4876 – 5372; and 6750 – 7600 ft. micro annulus scenario.

Observations:

- Section V No. 2: The objective of the FOT is NOT to achieve or limit a 100 psig pressure differential before vs. after FOT injection vs. shut-off, but it is a minimum pressure differential that OCD stipulates in its guidance for a successful FOT and injection zone that may still continue to be utilized for disposal, i.e., not too pressured up and subject to continued fracturing under daily allowed maximum surface injection pressure operational limits.
- Section V No. 7 and Exhibit 1: OCD observes a bottom hole pressure chart for WDWs 1, 2 and 3 at 7660 feet that
 the operator presented in the 2010 FOT and again during a May 2011 meeting in Santa Fe, New Mexico to show
 the interconnection between injection wells and the injection formation. The OCD had commented that there was
 no explanation or conclusion provided from the Certified PE who conducted and completed the 2010 FOT report
 that supports the operator's claim that all injection wells are interconnected based on Exhibit 1.

Furthermore, the OCD requested a statement or information supporting the operator's claim by the Certified PE, but never received one. At the meeting, the OCD explained that based on Exhibit 1, there was no support for the claim. In order to make the interconnection determination, during each FOT at each well and off-set injection wells (WDWs not being FOT'd) before and throughout the FOT would need bottom hole pressures monitored in tandem at each well location to establish the interconnectivity of the injection wells with the receiving injection formation under a uniform time scale. This would be a chart that could be plotted that would show during the test the interconnectivity of the wells for each FOT. The OCD doubts that the operator can make the case for interconnectivity between injection wells and injection formation because of the significant distance between the injection wells and fact that sedimentation in formation would by chance make the injection formation aerially extensive and uniform over a 3 to 5 mile radius from each injection well. Also, even if by chance there was
uniformity over the mileage specified, the distance between injection wells and corresponding pressure would likely not be observed.

• Exhibit 6: OCD observes in Section B a proposed MIT once every 5 years. OCD's UIC Program requires annual MITs and/or after down hole work is performed on a well.

Recommendations:

- Operator is running survey logs to the bottom of fill or below USDW (fresh water) zones, which excludes an
 evaluation of casing in the fresh water zone. Please run logs up to surface.
- Be sure to also record and provide injection flow rate and pressure leading up to shut-off and monitoring throughout the FOT monitoring period. OCD needs to confirm that a pseudo steady-state condition was achieved before shut-off. This data is also needed for software modeling of the FOT.
- Please provide electronic data from the FOTs at each well in order for the OCD to run its software model to confirm the results in the report.
- Section V No. 13: Surface pressure monitoring and Horner Plot during injection should be used to confirm radial flow condition is achieved instead of waiting a set period if operator wishes to reduce the injection period.

Disclaimer: Please be advised that OCD has already approved with conditions Navajo Refining Company's Fall-Off Test (FOT) Plan on July 28, 2009, and is not providing approval of this FOT Plan; however, comments, observations and recommendations herein should help Navajo Refining Company understand the OCD's concerns based on the submittal.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 F-mail: CarlJ.Chavez@state.nm.us ebsite: <u>http://www.emnrd.state.nm.us/ocd/</u>

/hy not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at: http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)



MAP ID NO. 96

NAVAJO REFINING COMPANY WASTE DISPOSAL WELL NO. 3

API NO. 30-015-26575

m 3160-5 Ul ine 1990) DEPARTM BUREAU C SUNDRY NOTICI	NITED STATES ENT OF THE INTERIOR OF LAND MANAGEMENT ES AND REPORTS ON WEL	N.M. C., Cons 811 S. 1st Stre Artesia, NM 88	Division FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 Expires: March 31, 1993 Exp	
o not use this form for proposals to Use "APPLICATION	drill or to deepen or reentry FOR PERMIT-" for such pro	to a different reservoir posals	I.M. C Cons. Division 11 S. 1st Street Budget Bureau No. 1004-0135 Budget Bureau No. 1004-0135 Itesia, NM 882310-21824ion and Serial No. NM-0557371 different reservoir. 8. Well Name and No. Chalk Bluff Federal Comm #1 9. API Well No. 30-015-26575 10. Field and Pool, or Exploratory Are N. Illinois Camp Morrow 11. County or Parish, State Eddy, NM DTICE, REPORT, OR OTHER DATA TYPE OF ACTION Change of Plans New Construction Non-Routine Fracturing Water Shut-Off Conversion to Injection Dibpose Water Nuter Report results of multiple completion on Wet Completion results of multiple completion on Wet Conversion to Injection Dibpose Water Nuter Report results of multiple completion on Wet Conversion to Injection Dispose Water Nut. Standard Zones pertinent to this work.)* Standard Zones pertinent to this work.)*<	
SUBM	IT IN TRIPLICATE		7. If Unit or CA, Agreement Designation	
Type of Well Gas SZ			8 Well Name and No	
Vell Well & Other	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	Chalk Bluff Federal Comm #1	
Mewbourne Oil Com[any	·		9. API Well No.	
Address and Telephone No.			30-015-26575	
PO BOX 5270, HODDS, NM 505-393-5905	Description)	· · · · · · · · · · · · · · · · · · ·	Charles Conversion to Injection Charles Conversion to Injection Charles Shut-Off Change of Plans Change of Plans Charles Shut-Off Conversion to Injection Recompetion or Recompetion Report and Log form.) F starting any proposed work. If well is ork.)*	
			11 County or Parish State	
790' FSL & 2250' FWL, Sec.1 T-18S R-27	Έ.			
·····	· · · · · · · · · · · · · · · · · · ·		Eddy, NM	
2 CHECK APPROPRIATE BOX	((s) TO INDICATE NATURE (OF NOTICE, REPORT,	OR OTHER DATA	
TYPE OF SUBMISSION		TYPE OF ACTION		
Notice of Intent	Abandonmen	t	Change of Plans	
		l	New Construction	
		k	Non-Routine Fracturing	
Final Abandonment Notice	Altering Casil	r	Conversion to Injection	
	2000		(Note: Report results of multiple completion on Well Completion of Recompletion Report and Los from)	
			work,)*	
The above caption well was successfully N The pressure chart is enclosed. If any question, please call.	11T'ed on 10/25/2000. (500 psi fo	r 30 min.)	work.)*	
The above caption well was successfully N The pressure chart is enclosed. If any question, please call.	IIT'ed on 10/25/2000. (500 psi fo ACCEPTI NO 3	D FOR RECORD / 1 5 2000 BLM	RECEIVED OCD - ARTESIA	
The above caption well was successfully N The pressure chart is enclosed. If any question, please call.	ACCEPTI	T 30 min.)	RECEIVED OCD - ARTESIA	
The above caption well was successfully M The pressure chart is enclosed. If any question, please call.	IIT'ed on 10/25/2000. (500 psi fo	T 30 min.)	RECEIVED OCD - ARTESIA OCD - ARTESIA Date 11/01/00	

*See Instruction on Reverse Side



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		RECEIVEL	60
Form 3160-S UN 7 1990) DEPARTME BUREAU OF	VITED STATES ENT OF THE INTERIOR LAND MANAGEMENT	JUN z u 1991	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March JI, 1993 5. Lease Designation and Serial No.
		ARTESIA, OFFICE	NM-0557371
Do not use this form for proposals to Use "APPLICATION F	drill or to deepen or reentry OR PERMIT—" for such pro	to a different reservoir.	6. If Indian, Allottee or Tribe Name
SUBM	IT IN TRIPLICATE	MULINE	7. If Unit or CA, Agreement Designation
Type of Well Oil Oil Well Other Anne of Operator		"AY 24 1981 ■	8. Well Name and No. CHALK BLUFF FED. COM #1
Mewbourne Oil Company	ar s	ST 6 NI	9. API Well No.
3. Address and Telephone No. P. O. Box 7698. Tyler. T	'exas 75711		30-015-20575
4. Location of Well (Footage, Sec., T., R., M., or Survey	Description)	New Mail	No. Illinois Camp Morrow
2250' FWL & 790' FSL of	Sec. 1, T18S-R27E		11. County or Parish, State
	<u></u>		Eddy, New Mexico
12. CHECK APPROPRIATE BO	X(s) TO INDICATE NATUR	E OF NOTICE, REPOR	T, OR OTHER DATA
		TYPE OF ACTION	·
Notice of Intent			Change of Plans
Subsequent Report	Plugging Bac	k.	Non-Routine Practuring
Final Abandonment Notice	Altering Casi	na racture Treat	Conversion to Injection Dispose Water (Note, Report results of multiple completion on Well Conversion to the completion of the destruction
15. Sescribe Proposed or Completed Operations (Clearly star give subsurface locations and measured and true v	te all pertinent details, and give pertinent dat ertical depths for all markers and zones per	es, including estimated date of starting tinent to this work.)*	any proposed work. If well is directionally drilled,
4/24/91 - Western fractu down tubing wi Westfoam carry Screened out w 10,100# with 1 in tubing. Pu sacks in casin 10 mins 7200#, 10:20 AM.	are treated Morrow th 16,000 gals 73 ying 16,000# 20/40 with 545 gals CO ₂ /1 200 gals of 3# sta amped 116 sxs Prop ng and 19 sacks in 15 mins 6800#. A	Sand perfs 9936 downhole slurry mesh ACFRAC Bla V ₂ 2% KCL water. age in formation pant into format tubing. ISDP 8 Vg 10.0 BPM at 8	-46', 9964'67' quality Binary ck Westprop-3. Screened out at and 545 gals flush ion and left 25 300#, 5 mins 7600#, 200#. Job complete
<u> </u>			ACCEPTED FOR RECORD JUN 1 4 1991 STS CARLSBAD, NEW MEXICO
14. I hereby certify that the fufeguing is arth gold dorrect Signed	Tile Engr. O	prns. Secretary	5/21/91
(This space for Poweral or State office use)			
Approved by Conditions of approval, if any:	Title	<u>`</u>	Date
Title 18 U.S.C. Section 1001, makes it a crime for any per	ison knowingly and willfully to make to an	department or agency of the United	States any false, fictifious or fraudulent sustements

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*See Instruction on Reverse Side

orm 3100-5	UNIT	ED STATES	ATTESIA, FORM APPROVED
June 1990)	DEPARTMEN	T OF THE INTERIOR	Budget Bureau No. 1004-0135 Expires: March 31, 1993
	BUREAU OF L	AND MANAGEMENT	5. Lease Designation and Serial No.
SL		AND REPORTS ON WELLS	NM-U55/3/1 6 If Indian, Allettee or Tribe Name
Do not use this form Use	for proposals to dri APPLICATION FOR	I or to deepen or reentry to a different PERMIT—" for such proposals	reservoir.
	SUBMIT		7. If Unit or CA, Agreement Designation
1. Type of Well		FER 2 L H	8. Well Name and No.
2. Name of Operator			Chalk Bluff Fed. Com. #1
Mewbourne 0il	Company		9. API Well No.
3. Address and Telephone No.			30-015-265/5
P.U. BOX 5270 4. Location of Well (Footage Se	HODDS, New Me	(1C0 88241 (505) 393-5905	N. Illinois Camp
22501 ELU 9 70		· · · · · · · · · · · · · · · · · · ·	11. County or Parish, State
Sec. 1-T18S-R2	7E		
		· · · · · · · · · · · · · · · · · · ·	Eddy Co., N.M.
2. CHECK APP	PROPRIATE BOX(S) TO INDICATE NATURE OF NOTIC	E, REPORT, OR OTHER DATA
TYPE OF SUB	MISSION	TYPE O	OF ACTION
Notice of Inter	nt	Abandonment	Change of Plans
. —		Recompletion	New Construction
Subsequent Re	port	Plugging Back	Non-Routine Fracturing
		L Casing Repair	Water Shut-Off
Einal Abandon	ment Notice	Alterine Casing	Conversion to Injection
Final Abandon	ment Notice	Other Shut-In-Status	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well
Final Abandon Final Abandon Describe Proposed or Complete give subsurface locations	d Operations (Clearly state all and measured and true vertical	Dertinent details, and give pertinent dates, including estimated depths for all markers and zones pertinent to this work.)*	Competion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled,
Final Abandon Describe Proposed or Complete give subsurface locations i Mewbourne Oil evaluation of	d Operations (Clearly state all and measured and true vertical Company here f the lease for	Altering Casing Other <u>Shut-In-Status</u> pertinent details, and give pertinent dates, including estimated depths for all markers and zones pertinent to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u> MON ENDING <u>125/95</u>	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90.
Final Abandon Describe Proposed or Complete give subsurface locations Mewbourne Oil evaluation of	d Operations (Clearly state all and measured and true vertical Company here I the lease for	Altering Casing Other <u>Shut-In-Status</u> pertinent details, and give pertinent dates, including estimated depths for all markers and zones pertinent to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u> MON ENDING <u>125/95</u>	Conversion to Injection Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90.
Final Abandon Describe Proposed or Complete give subsurface locations i Mewbourne Oil evaluation of	d Operations (Clearly state all and measured and true vertical Company here f the lease for	Altering Casing Other <u>Shut-In-Status</u> pertinent details, and give pertinent dates, including estimated depths for all markers and zones pertinent to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u> MON ENDING <u>$1/25/95$</u>	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90.
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Final Abandon	d Operations (Clearly state all and measured and true vertical Company here l the lease for	Altering Casing Other <u>Shut-In-Status</u> pertiment details, and give pertiment dates, including estimated depths for all markers and zones pertiment to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u>	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90.
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Final Abandon Describe Proposed or Complete give subsurface locations of Mewbourne Oil evaluation of 4. I hereby certify that if forego Signed	ing is true and correct of FG JOAC STREET	Altering Casing Other <u>Shut-In-Status</u> pertinent details, and give pertinent dates, including estimated depths for all markers and zones pertinent to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u>	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90. TH PERIOD
Final Abandon Describe Proposed or Complete give subsurface locations Mewbourne Oil evaluation of total uation of total uation (This space for Federal or State Approved b ORIG SG Conditions of approval, if any	ing is true and correct of FG 2002 a office tise) D.) JOE G. LAR	Altering Casing Other <u>Shut-In-Status</u> pertinent details, and give pertinent dates, including estimated depths for all markers and zones pertinent to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u>	Conversion to Injection Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90. TH PERIOD Conversion to Injection Date 01/25/94 Date 2/16/94
 Final Abandon Describe Proposed or Complete give subsurface locations in Mewbourne Oil evaluation of 4. I hereby certify that the forego Signed (This space for Federal or State Approved to OFFIG. So Conditions of approval, if my: 	ing is true and correct of the lease for the	Altering Casing Other <u>Shut-In-Status</u> pertiment details, and give pertiment dates, including estimated depths for all markers and zones pertiment to this work.)* by requests temporarily abando the above well. The well was APPROVED FOR <u>12</u>	Conversion to Injection Dispose Water (Note: Report realits of multiple completion on Well Completion or Recompletion Report and Log form.) I date of starting any proposed work. If well is directionally drilled, on status pending further s spudded 12/22/90. TH PERIOD
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-NED	·	Artosia N	
Form 3160-3 - UN	ITED STATES	err CODTOR 1	Budget Bureau No. 1004-0135
June 1990) DEPARTME	NT OF THE INTERIOR		Expires: March 31, 1993
JJ BUREAU OF	LAND MANAGEMENT	5	5. Lease Designation and Serial No.
- 15 11 St CUNDRY NOTIOES	AND DEPORTS ON WELLS		NM-0557371
OCT 13 SUNDRY NOTICES	AND REPURIS ON WELLS	6	5. If Indian, Allottee or Tribe Name
Do not use this form for proposals to d	rill or to deepen or reentry to a differen	t reservoir.	
	JR PERMIT— for such proposals		
SUBMI	T IN TRIPLICATE	• 7	7. If Unit or CA, Agreement Designation
1. Type of Well	NOV 1 7	1663	
V Oil Gas Other	14C7 V II *	8.	. Well Name and No.
2. Name of Operator	0.6.	D,	Chalk Bluff Fed. Comm. #
Mewbourne Oil Company 🖌	- Y-as ber	9.	. API Well No.
3. Address and Telephone No.	······································		30-015-26575
P.O. Box 5270 Hobbs, New Mex	xico 88241 (505) 393-5905	10	3. Field and Pool, or Exploratory Area
4. Location of Well (Footage, Sec., T., R., M., or Survey I	Description)	· ·	N. Illinois Camp
		11	I. County or Parish, State
2250' FWL & 790' FSL of Sec.	1-T18S-R27E		
			Eddy Co., N.M.
	(S) TO INDICATE NATURE OF NOT	CE BEPORT	OR OTHER DATA
TYPE OF SUBMISSION	Түре	OF ACTION	
Notice of Intent	Abandoament		Change of Plans
	Recompletion	•	New Construction
Subsequent Report	Plugging Back		Non-Routine Fracturing
	Casing Repair		Water Shut-Off
Final Abandonment Notice	Altering Casing		Conversion to Injection
	Other		Dispose Water
	· · · · · · · · · · · · · · · · · · ·		(Note: Report results of multiple completion on Well
Describe Proposed or Completed Operations (Clearly state a	all pertinent details, and give pertinent dates, including estimation	ted date of starting any	proposed work. If well is directionally drilled.
give subsurface locations and measured and true verti	ical depths for all markers and zones pertinent to this work.	.)*	
* Verbal from Adam Salameh			
9/10/93 Abandon Morrow formatic	on. Set CIBP @ 9800' & cover	w/35 ¹ cemet	nt.
9/11/93 Perforate Cisco from 7	826'-7830' Test & evaluate	W CO COME	
0/12/03 Squeeze Cisco from 7820	520 = 7050 . Test a evaluate.		
9/12/93 Squeeze Cisco from 7020 9/15/93 Drill out squeeze perfe	s to 7792' Squeeze held 2 (000#	
9/16/03 Perforate Cisco from 7/	676'_7678' Test and evaluate	200".	
9/17/93 Abandon Cisco formation	a set CIBP @ 7600' & cover w	/35' cement	
0/18/03 Perforate Wolfcamp 730	4'_7314' Test & evaluate	oo ocilicitoi	•
9/19/93 Acidize Wolfcamp w/150	0 gal 15% NE-FE from 7304'-73	314'	
9/21/93 Set CIBP @ 7294' & nert	forate Wolfcamp from 7262'-727	78'. Test 8	& evaluate.
9/22/93 Acidize Wolfcamp w/2000	D gal. 15% NE-FF from 7262'-72	278'.	
9/23/93 Set CIBP @ 7208' & peri	forate Wolfcamp from 7050'-710	J2'. Test {	& evaluate.
9/24/93 Acidize Wolfcamp w/2000	0 gal. 15% NE-FE from 7050'-71	102'.	
9/25/93 Set CIBP @ 7010'.	<u>j</u>		
	、 .		
			· · · · · · · · · · · · · · · · · · ·
14. I hereby certify thet the foregoing is true and correct			
Signed Kounce. Jon	Title Petroleum Engineer	P .	Date 10/05/93
(This space for Federal or State office(yec)			
	ACCEPTED FOR	RECORD	Dete
Approved by Conditions of approval, if any:			918.7
	y Jour		
	NOV 15 K	<u>xa</u>	
Title 18 U.S.C. Section 1001, makes it a crime for any person	h knowingly and willfully to make to any department or age	ncy of the United State	es any false, fictitious or fraudulent statements
or representations as as any maner within its jurisdiction.			
	*See Instruction AFEBBADSINEW	/ MEXICO	

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						Up.
316 0-5 19 90)	UNITE DEPARTMENT BUREAU OF LA	D STATES OF THE INTERIOR		10000000000000000000000000000000000000	FORM APPROVED Budget Bureau No. 1004 Expires: March 31, 15 case Designation and Seria) -0135 193 1 No.
	SUNDRY NOTICES A	ND REPORTS ON	WELLS	N	M-0557371	Name
Do not use this fo U	rm for proposals to drill se "APPLICATION FOR	or to deepen or reer PERMIT—" for such	ntry to a different re-	servoir.	Andread Antonice of Thee	VALUE
	SUBMIT II	N TRIPLICATE	<u></u>	7. 1	f Unit or CA, Agreement C	resignation
Oil Oil Well Well Name of Operator	Other		<u> </u>	8. W	ell Name and No.	
Mewbourne Ot	1 Company			9. AI	<u>NAIK BIUTT PEC</u> PI Well No.	<u>1. COM.</u> #
P O Rox 527	o. 70 Hobbs, New Mexi	co 88241 (50	5) 393-5905	<u>3</u>	0-015-26575	ory Area
Location of Well (Footage	e, Sec., T., R., M., or Survey Descr	iption)	<u></u>	N 11. C	. Illinois Car County or Parish, State	<u>np</u>
2250' FWL &	790' FSL of Sec. 1	-T18S-R27E		E	ddy Co., N.M.	
CHECK A	PPROPRIATE BOX(s)	TO INDICATE NAT	FURE OF NOTICE,	REPORT, O	R OTHER DATA	·
	SUBMISSION		TYPE OF	ACTION		
X Notice of	Intent		nment		Change of Plans	
Subsequer	u Report		g Back		Non-Routine Fracturing	
Final Aba	ndonment Notice	Casing Casing	Repair ; Casing		Water Shut-Off Conversion to Injection Dispose Water	
				(Nor Con	te: Report results of multiple con npletion or Recompletion Report	pletion on Well and Log form.)
give subsurface locati	pleted Operations (Clearly state all per ons and measured and true vertical d	rtinent details, and give pertine lepths for all markers and zone	nt dates, including estimated da es pertinent to this work.)*	te of starting any pro	posed work. If well is direc	tionally drilled,
09/08/93 A	Ibandon Morrow Perf	's 9861' - 9967	ı			
-	Set CIBP @ 9800'	- cover w/35'	cement.			
-	Recomplete in Cis	co Formation -	Test & evaluat	e.		
-	If unecomomical r	ecomplete in Wo	olfcamp - Test	& evaluate	· ·	
					SEP Z	
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					043	ĒV
			•		=	'ED
					82° - 23	
I hereby certify that the for Signed	regoing true and correct	- Petro	leum Engineer		09/07/93	
(This space for Federal or	State Affice use)	A	ON STIM ENGIN	ESN	- inlick	
onditions of approval, if	lay:	Tide 19	ENTERIA CIARIA	5 C 447 247	Date7	

rm 3160-5 ne 1990)	UNITED STA DEPARTMENT OF TH	TES IE INTERIOR SEP 2 8 1992	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993
	BUREAU OF LAND M	C. D.	5. Lease Designation and Serial No.
SUNI Do not use this form for Use "Al	DRY NOTICES AND RE proposals to drill or to d PPLICATION FOR PERMI	PORTS ON WELLS A DEBUT	6. If Indian, Allonce or Tribe Name
	SUBMIT IN TRIF	PLICATE	7. If Unit or CA, Agreement Designation
I. Type of Well			B. Well Name and No.
2. Name of Operator	iher	· · · · · · · · · · · · · · · · · · ·	Chalk Bluff Fed.Com.#1
Mewbourne Oil Con	apany		9. API Well No.
3. Address and Telephone No.			30-015-26575
P. O. Box 7698, T	yler, Texas 75711	(903) 561–2900	10. Field and Pool, or Exploratory Area
4. Location of Well (Footage, Sec.,)	T., R., M., or Survey Description)		N.IIIInois Camp-HorGa
2250' FWL & 790'	FSL Sec. 1, T18S-R	27E	Eddy
12. CHECK APPR	OPRIATE BOX(s) TO IN	DICATE NATURE OF NOTICE,	REPORT, OR OTHER DATA
TYPE OF SUBMI	SSION	TYPE OF	ACTION
Notice of Intent			Change of Plans
Subsequent Report	n	Plugging Back	Non-Routine Fracturing
		La Casing Repair	
Final Abandonme	Int Notice	Altering Casing Other <u>Additional per</u>	Conversion to Injection
Final Abandonme	ent Notice Operations (Clearly state all pertinent de measured and true vertical depths for	Altering Casing Other <u>Additional per</u> acidize & frac tails, and give pertinent dates, including estimated du all markers and zones pertinent to this work.)*	Conversion to Injection Conversion to Injection Dispose Water (Nose: Report results of multiple completion on Weth Completion or Recompletion Report and Log form) ale of starting any proposed work. If well is directionally drilled,
Final Abandonme 13. Dewrite Proposed or Completed C give subsurface locations and 8/13/92 - Perf Middl	Int Notice Sperations (Clearly state all pertinent de measured and true vertical depths for Le MOTTOW 9861-9882	Altering Casing Other <u>Additional per</u> acidize & frac tails, and give pertinent dates, including estimated da all markers and zones pertinent to this work.)* 7, 2 SPF, 10° Net, 22 hole	Conversion to Injection Conversion to Injection Dispose Water (None: Report results of multiple completion on Weth Completion or Recompletion Report and Log form) ate of starting any proposed work. If well is directionally drilled,
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Final Abandonme 13. Describe Proposed or Completed C give subsurface locations and 8/13/92 - Perf Middl 8/14/92 - Acidized W sealers. H 10 mins 34 to pit 8/1 8/19/92 - MI swab un Swabbed we 8/20/92 - Swabbed do Tested tbg compression 8/22/92 - RU Western nitrogen 4 15 min 360 No show of 8/23/92 - RU swab. H	ent Notice Pperations (Clearly state all pertinent de I measured and true vertical depths for Le Morrow 9861-9882 #/3500 gals 7½% HCL Flushed w/2% KCL wt: 400#, 15 mins 2800# 15 - 8/18/92. nit. Pressure tested 211 down to 5300'. Swn to 6500'. POOH w 3 to 8000#. 8/21/92 Son. Press annulus to 1 Co. Acidized perfect + 35 ball sealers. I 10#. ATP 5100#, MTP E gas or oil. Recover 7L @ 7000'. Swabbed	Altering Casing Other <u>Additional per</u> <u>acidize & frac</u> tails, and give periment dates, including estimated du r all markers and zones periment to this work.)* 7, 2 SPF, 10' Net, 22 hole + additives + 1000 SCF/bbl r + 1000 SCF/bbl nitrogen. Avg rate 3.7 BPM, AP 500 d tbg to 2000#.Held OK. Re w/tbg & pkr. TIH w/new pkn - Continued testing tbg. o 2000#. Held OK. Started s w/1500 gals 7½% HCL acide Flushed w/2% KCL wtr. ISDI 5400#. RD Western. Opened ering load. dry in 3 runs. Continued	Conversion to Injection Conversion to Injection Dispose Water (Note: Report routh of multiple completion on Well Completion or Recompletion Report and Laglorm) ate of starting any proposed work. If well is directionally drilled, ate of starting any proposed work. If well is directionally drilled, S. D1 nitrogen carrying 80 ball . ISDP 4300f, 5 mins 3800f, D0f, MP 5600f. Blew well down emoved tree. RU BOP. RU swab. r assembly & 200 jts tbg. Set pkr @ 9740.68' w/15 pts swabbing. Had light blow of gas 1 + additives + 1000 scf/bbl P 400f. 5 min 3700f, 10 min 3700 i well to pit on 12/64" choke. swabbing. Recovering load.
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*See Instruction on Reverse Side

STATE OF SEV MUNICU

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P. O. UUX 2500 ENERGY MO MINERALS DEPARTMENT SANTA FE, NEW MEXICO 87501

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL RECEIVED

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3.	3 x	125		440.8	5		$\frac{32}{72}$		190	0			Pkz	{		<u> Hr.</u>
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Q MCF/D

AOF = 2.9 MMCF/D

Laboratory Services

1331 Tasker Drive Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR: SAMPLE Chalk Bluff Mewbourne Oil Co. IDENTIFICATION: Federal #1 Attention: Mr, Greg Milner COMPANY: Mewbourne Oil Co. P. O. Box 5270 LEASE: Hobbs, New Mexico 88241 PLANT: SAMPLE DATA: DATE SAMPLED: GAS (XX) LIQUID () 03-15-91 ANALYSIS DATE: 03-18-91 SAMPLED BY: Gregory Milner **PRESSURE - PSIG** ANALYSIS BY: 460.00 Rolland Perry SAMPLE TEMP. °F 51.00 ATMOS. TEMP. °F

REMARKS:

COMPONENT ANALYSIS

		MOL		
COMPONENT		PERCENT	GPM	
Oxygen	(02)			
Hydrogen Sulfide	(H2S)			
Nitrogen	(N2)	0.42		
Carbon Dioxide	(CO2)	0.43		
Methane	(C1)	87.54		
Ethane	(C2)	7.07	1.885	
Propane	(C3)	2,38	0.654	
I-Butane	(IC4)	0.31	0.100	
N-Butane	(NC4)	0.54	0.169	
I-Pentane	(IC5)	0.20	0.071	
N-Pentane	(NC5)	0.14	0.052	
Hexane	(C6)	0.97	0.399	
Heptanes Plus	(C7+)	0.00	0.000	
		100.00	3.331	
BTU/CU.FT DRY	(1156	MÓLÉCULAR WT	19.0972
AT 14.650 DRY		1153		
AT 14.650 WET		1133	26# GASOLINE -	0.578
AT 15.025 DRY		1182		
AT 15.025 WET		1162		
SPECIFIC GRAVIT	Y -			
CALCULATE	C	0.660		
MEASURE	5	0.000		

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WORK SHEET FOR CALCULATION OF WEL .D PRESSURES (Pr or 5%) Form C-122F Adopted 9-1-65 FROM KNOWN BOTTOM HOLE PRESSURE (Pf or 5) DMPANY Mewbourne Oil LEASE Chalk Bluff Ferd. WELL NO. ____ DATE _____ DCATION: Unit ______ Section _____ Township ______ Range ______ <u>9949</u> H <u>9949</u> L/H <u>1.000</u> G <u>.660</u> % CO2 <u>.43</u> % N2 <u>.42</u> % H2S _____ GH 6566 Pcr 673 Tcr 374 INE 1. 2 3 4 5 6 .7 8 1 Tw(W.H. •R) 532 532 2 $T_{s}(B.H. \circ R)$ 602 608 $3 \quad T=(\frac{T_w + T_s}{T_s})$ 570 570 ,800 .790 4 Z (Est.) TZ 5 456.0 450.4 6 GH/TZ 14.399 14.578 7 e^S(Table XIV) 1.716 1.727 8 Prorte 3249 3249 9. P_1^2 or P_1^2 10556 10556 10 $P_c^2 = P_i^2/e^s$ or $P_c^2 = P_i^2/e^s$ 6151.7 6110.6 11 Pc or 2480.3 2472.0 = Pe

2864.6 2860.5

4.26 4.25

1.52 1.52

.790 .190

12 $P_{\pi}(\frac{P_w + P_s}{2})$ or $(\frac{P_c + P_f}{2})$

13 $P_r = (P/P_{cr})$

14 $T_r = (T/T_{cr})$

15

Z (Table XI)

One copy to be filed in District Office (Work copy acceptable)

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WORK SHEET FOR CALCULATION OF W. EAD PRESSURES (B) or Pw)

Form-C-122 Adopted 9-1-65

FROM KNOWN BO	TTOM HOLE	PRESSURE	🕞 or	Ρ.)
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WELLINO _____Township _______Range ______Z72 Section LOCATION: Unit 9949 н <u>99</u>49 _ L/H _____ G ____ G ____ % CO2 ____ % N2 ____ % N2 ____ % H2S _____ % H2S ___ GH <u>6566</u> Per <u>673</u> Ter <u>374</u>

LINE		1	2	З.	4	5	6	7	8
1	T _w (W.H. ∘R)	532	532	532	532	532	532	532	532
2	T _s (B.H. °R)	608	608	608	608	608	608	603	608
3	$T=(\frac{T_w + T_s}{2})$	570	-570	570	570	570	570	570	570
4	Z (Est.)	.835	. 783	. 783	. 781	. 781	. 780	.780	.792
5	ΤZ	476.0	446.5	446.5	445.)	445.2	444.8	444.6	451.7
6	GH/TZ	13.796	14.704	14.712	14.753	14.749	14.761	14.768	14.537
7	e ^s (Table XIV)	1.678	1.736	1.736	1.739	1.739	1.739	1.740	1.725
8	季 or Ps	2983	2983	2831	2831	2593	2593	2152	2152
9	EF or Ps ²	8898.3	8898.3	8014.6	8014.6	6723.6	6723.6	4631.1	4631.1
10	$P_{f} = P_{f}^{2/e^{s}}$ or $P_{w}^{2} = P_{s}^{2/e^{s}}$	5304.3	5126.6	4616.2	4609.0	3867.2	3865.5	2661.7	2684.9
11	😴 or P _w	2303.1	2264.2	2148.5	2146.9	1966.5	1966.1	1631.5	1638.6
12	$P=(\frac{P_w+P_s}{2}) \text{ or } (\frac{P_c+P_f}{2})$	2643.1	2623.6	2489.8	2488.9	2279.8	2279.5	1891.7	1895.3
13	$P_{r} = (P/P_{cr})$	3.93	3.90	3.70	3.70	3.39	3.39	2.81	2.82
14	$T_r = (T/T_{cr})$	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
15	Z (Table XI)	.783	. 783	.181	.781	. 780	.780	.792	.792

One copy to be filed in District Office (Work copy acceptable)

OMPANY:	PRO WIRELINE
LIENT:	MEWBOURNE OIL
GAUGE NUMBER:	12235
WELL NAME:	CHALK BLUFF
WELL NUMBER:	1
TEST NUMBER:	1
LOCATION:	
TEST OPERATOR:	BURRELL
COMMENTS:	4 POINT FLOW TEST RAN AFTER 72 HOUR BUILD UP

POSITION	GAUGE	SERIAL	NUMBÉR	•	
1					
2		,			
3					
4					

•

.

GAUGE S/N: 12235

AGE START DATE: 3/15/91

DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE PSIA	TEMPERATURE	COMMENTS
9:45: 0	0.0000	3213.00		START RATE 1
10: 0: 0	0.2500	3046.00		•
10:15: 0	0.5000	3003.00		
10:30: 0	0.7500	2983.00		START RATE 2
10:45: 0	1.0000	2894.00		
11: 0: 0	1.2500	2861.00		
11:15: 0	1.5000	2843.00		
11:30: 0	1.7500	2831.00		START RATE 3
11:45: 0	2.0000	2707.00		
12: 0: 0	2.2500	2643.00		
12:15: 0	2.5000	2610.00		
12:30: 0	2.7500	2593.00		START RATE 4
12:45: 0	3.0000	2405.00		
13: 0: 0	3.2500	2276.00		
13:15: 0	3.5000	2210.00		
13:30: 0	3.7500	2152.00		END OF TEST



DELTA TJ - HRS

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Form 3160-4 (November 1983) (formstly 9-330)	DEPAR [*] BU	UN TMEI REAU	ITED) NTOD OFL/#19	i Stia Favtihi Idman	TES E INT ACÉMEI	COMMISS TERIC N 1 210	чілім)R	DUPLIC (Seve strue rever	ATE* other in tions of Se side	F E 5. t.s.a NM	orm a ludget xpires 	Burea Burea Augu	d. 11 No. 1004–013 11 St 31, 1985 11 AND SERIAL NO 71	7 5.
WELL CO	MPLETION	OR	RECON	MPLET	ION F	REPORT	AN	D LO	G*	6. 14 1	NDIAN,	ALLOT	THE OR TRIBB NAM	R
In. TYPE OF WEI	L: OH. WE		GAS WELL		R Y	Other			· · ·	7. PNP	AGILE	EMENT	NAME	
b. TYPE OF COM	b. TYPE OF COMPLETION:													
WELL X OVER LEN L BACK LI RESVEL Other DECLIVED S. PARM OR LEASE NAME Chalk Bluff Federal Com									'n					
Mowhourne	- Oil Com	nanv	\sim			1	<u>[}]</u>) *	1000	9. WEI	L NO.			-
3. ADDRESS OF OPE	BATOB	<u></u>				t_{2}	A . JU	F30	1996	- 1				
P. O. Bo:	x 7698, T	yler	, Tex	as 75	5711	U ·		<u>0. C. (</u>).	10. 11	LD ANI	POOL	OR WILDCAT	
4. LOCATION OF WE At surface	LL (Report locati つつちん! 正知T	on clearly c. 7	yand in a GAI T	ccordance CT.	e with any	y State regi	utremen		REIÜ#	N.	<u>111</u>		S Camp Morn	.cow
			90 F	20						UR	AREA	.,, .		•
At top prod. 101	terval reported be	10W								Se	c. 1	-T18	S-R27	
At total depth	Same								<u>.</u>	- 12-00			1 12 00 00	-
				API	[#30	-015-2	2657	5		13, CO PA	NATI O NSH A	n	N M	
15. DATE SPUDDED	16. DATE T.D. R	EACHED	17. DAT	E COMPL.	(Ready to	o prod.)	18. ELRI	ATIONS (I	DF, #KB.	I EO	<u>ay</u> 	19. E	LEV. CASINGHEAD	-
12/22/90	1/29/9	1 ·	3/0	7/91			KB 3	625',	GM 3	609 '				
20. TOTAL DEPTH. MD	A TVD 21. PLU	0, BACK 1	.D., MD A	TVD 22	LIP MUL HOW M	TIPLE COMP ANY®	PL.,	23. INT. DBH	ERVALS	HOTAR	Y TOO!	. 3 1	CABLE TOOLS	-
10,120°	AVA1.(8). OF THIS	COMPLET	10N- TOP	BOTTOM.	NAME (H	AD AND TYP			<u>→</u>	<u> </u>		1 25.	WAS DIRECTIONAL	-
9936-46'	, 9964-67	· _]	Morro	W			,			•			BURVET MADE	
26 TYPE ELECTRIC	AND OTHER LOGR	RITN	•	<u>.</u>								27. WA	A WELL CORED	-
SDL-DSN,	DLL-MSFL	, DI	LL										No	1
29.			CASI	NG RECO	RD (Rep	ort all striv	ngs set in	n well)				· · ·	·	4
CABINO BIZE	WEIGHT, 1.8./	/FT.	DEPTH SE	T (ND)		I.E SIZE		CES	ENTIN	RECORD		<u> </u>	AMOUNT PULLED	-
13-3/8"	54.50#			001	1/-	1/2"		425	<u>- Ci</u>	.rc	<u>None</u>			-
<u></u>		29#	20	501	12-	$\frac{1}{4}$ "		L025	- <u>Ci</u>	.rc			None	.
		<u> </u>		50		5/4		1330	- 🤖	.rc		-	None	-
29.	_	LINER	RECORD		•	<u> </u>	' <u> </u>	30.		TUBING	RECO	RD		-
BIZE	TOP (ND)	BOTTOM	(MD)	SACKS CI	EMENT*	SCREEN (MD)	SIZE		DEPTH 8	FT (M	»	PACKER ANT (MD)	-
4-1/2"	9051'	_101	19'	17	5			2-3	/8"	980	5		9805'	-
31. PERFORATION BEG	CORD (Interval. si	ze and n	umber)			1								-
9936-46'	9964-67	1				DEPTH I	AC	ID, SHOT	, FRAC	NOPAT AN	MENT	SQUE	EZE, ETC.	-
13', 2 SE	PF, Total	28				9936-	67'		300	0 cals	Mod	-101	acid + 100	- 10 SCTF
									bbl	N2 +	50 b	al1	sealers. Fl	ushed
									w/3	5 bbls	28	KEL	water + 100	0
33 •	·····				PROF	UCTION			SCF	/bbl N	2.		<u> </u>	-
DATE FIRST PRODUCT	ION PRODU	CTION M	ETHOD (F	lowing, ge	as lift, pu	mping—siz	e and th	pe of pur	np)	·	WELL 2 shut	itatus -in)	(Producing dr)	-
DATE OF TRAT	HOURS TESTED	1 680		1 PROD'2	Owing	011		·		111 4 70 80	bat	P	roducingri	-
3/11/91	24 hrs	8/	′64 "	TEST	PERIOD	1	•	886		0	•••	-	886-1 01	
FLOW, TUBING PRESS.	CASING PRESSUR	E CAL	CULATED	0(1,1	881	GAS-	-мст.	000	WATER		Ī.	OIL GR	WITY-API (CORR.)	-
1600#			>	1			886			0	f^	<u> </u>	20	_
34. DIRPOSITION OF 0.	ns (Sold, used for	fuel, ven	ted, etc.)							TEST V	ITNES	ED BT	:	
35. LIST OF ATTACH	u enta			<u>.</u> .				, <u> </u>		IW. #	FFE	11-1	FOR RECOR	Ð
Logs I hereby certify	that the forgatin	g and at	tached in	formation	is compl	ete and con	rrect as	determin	ed from	atl avail	ibl re	corda	S0S	-
SIGNED	fint	tim	fin	<u> </u>	rle <u> </u>	ngr. Of	orns.	Secre	tary		DATE	APK 3/	18/91	_
	*(See	: Instruc	tions an	d Space	es for A	dditional	Data	on Reve	erse Si	de) (ARL	SBAD	, NEW MEXI	ĊO

Fitle 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

FORMATICE I		BOTTOM	DESCRIPTION CONTENTS FRO			
- FORMATING	101	BOILOR	DESCRIPTION, CONTENTS, ETC.	NAME	MEAS. DEPTH	TRUE
ower Morray	9936'	9967'	Sandstone			VERT. DEPTI
iddle Morbow	9861'	9881	Sandstone	Yates	424'	
Sector Contraction Active				Queen	1138'	
				Grayburg	1484'	
		· ·		San Andres	1976'	
				Glorietta	3458*	· · ·
				Tubb	4451'	
, .				Drinkard	5376'	
				Abo	5794	
				Wolfcamp	6420'	
				Cisco	7666'	1
				Canyon	83681	
	•			Strawn	8844	1.
				Morrow	9454'	*
×				Morrow Clastic	s 9770'	
				Barnett .	10016'	
			·			
				· ·		
		.]				



February 05, 1991

Méwbourne Oil Company, Inc. P.O. Box 5270 Hobbs, N.M. 88241

REF: Chalk Bluff Fed Comm #1

Gentlemen:

The following is a Deviation Survey on the above referenced well located in Eddy County, New Mexico.

4001	-		1/4°
905 1			3/4°
13031	-		3/4°
19011	-	1	1/4°
2399'	-	1	3/4°
2600'	-	1	3/4°
30981	-	1	1/2°
3592'		1	1/2°
3682'	-		3/4°
4177	_	19)

 $4674' - 1 1/4^{\circ}$ $5120' - 1 1/2^{\circ}$ $5639' - 1 1/2^{\circ}$ $6077' - 3 1/2^{\circ}$ $6126' - 3 3/4^{\circ}$ $6189' - 3 3/4^{\circ}$ $6250' - 3 3/4^{\circ}$ $6312' - 3 1/2^{\circ}$ $6374' - 3 1/4^{\circ}$ $6467' - 2 3/4^{\circ}$ 6559' - 2 1/2° 6650' - 2 1/4° 7146' - 1 3/4° 7672' - 3/4° 8291' - 1° 8815' - 1° 9313' - 3/4° 9808' - 1 1/4° 10,120' 3/4°

TD

Sincerely,

Arnold Newkirk Vice-President

STATE OF NEW MEXICO)

)

)

COUNTY OF CHAVES

The foregoing was acknowledged before me this 05th day of February 1991 by Arnold Newkirk.

MY COMMISSION EXPIRES

October 07,1992

NOTARY PUBLIC

P. O. DOX 2500 ENERGY AND MINERALS DEPARTMENT SANTA FE, NEW MEXICO 87501

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL REGEIVED

														LIVED
1	/po Tost [v	Juili	nt			ոցյ			ecial	7*** (Jai	• 5 / 0 1			
100	impary (2					onnection	n			03/1.		- Pa	Y 5	7 no 14 101
	Mewbour	ne Oi	LL Cor	nDanv		Tran	swester	n				114		1 40 AN '91
100	ol Unc	lesign	nated		F	ormation			MA	11 - 7	1991	Unit CA		Ξ
No	rth Illi	nois	Camp	Morrow	L_		Morro	W		<u>.</u>	<u> </u>	N'	· L. · · · · · · · · · · · · · · · · · ·	<u> </u>
C°	mpletion Dat	•	}	Total Depth			Find Daci		AR	ESIA O	J. FFICE	r arm or	Lease Nan	12
c.	9. SJ 703/ 91	W1.		,d	5+1 A1		Perforatio	0/5		36(<u>)</u> 9•	Well No.	<u>lk Bluf</u>	f_Federal_
	4 1/2 5 1/2"	11	.6#		10,	120'	From	9936	To	9	967'	1_1		
Th	9.51te	W1.		d .	Set At	0051	Perioratio	n#1	Te			Unit	Sec. 7	lwp. Byes
	2 //8"	le - Dra	denhead	- G.G. pt C	9,	805	1101	Open Pocher E	at A1	<u>F</u>	Ind	N Countr	_1	<u> 185 - 27F</u>
	Singl	e Cae							000	c 1			Fddy	
F'10	ducing Thru		Asserv	oir Temp. *	F Mea	n Annuäl	Temp. *F	Baio. Pr	068	Pa	·	State	·	
	Tbg.		148	• 10,1	20	72	2	l	3.2			Ne	w Mexi	20
{	L	н		Co	× C	°2	* N 2		* H2S	'	Plovet	Meter	Run	Tape
	9949	9	949 FI	0W DAT		.43		.42				13.06		Flg.
ha	Prover		Orifice	Press.		»III.	Temp.	Pres	#.	Temp.	Pre	88.	Temp.	- Ouration ot
	Line		Size	p.s.i.g.	· ·	hier	•F	p.s.i.	.g.	•٢	p	1.9.	• F	Flow
SI	<u>S.I</u>			ļ	·			238	0					72 Hr.
1.	<u>3 X I.</u>	125		426-8	<u> </u>		51	217	5	<u> </u>	Pk	r		<u> </u>
<u>2.</u> 3.	<u>3 x </u>	125		446 8		-11	<u></u>	207	0			r	·	1 Hr
4.	3×1	125		426.8		72	45	160	5	- <u></u>		r		
5.														
			· · · · ·		<u></u> R/	ATE OF	FLOW	CALCUL	ATIO	NS			- <u></u>	
	Coeffic	ient	_	-	- Р	lesente	Flow	Temp.	1	Gravity		Super	Rat	e of Flow
NÖ.	(24 Ha	ur)	1	۷ ⁿ w ^p m		٣		scior Fi.		Fg	Fac	npress. tor, Fpv), Meld
1	6.217		4	1.952		440		.009		.225	1.	048		337
2.	6.217		7	1.134		460	1	.009		.225	1.	051		574
3	6.217		12	1.326		460		009		225		051		980
5	0.21/			/.989		_440_	╶╂╼╾┷	.015	<u> </u>	.225		051		
-				-		Gas	Liguld Hyd	l:ocarbon f	l	D	ry Gas		•	Mc(/bbl.
ND.	רי 	1 omp.		- 4 8 *	<i></i>	A.P.	I. Gruvity	of Liquid 1	lydroca	rbans				Deg.
	.65	ļ	<u>11</u>	1.37	910	Spec	ilic Gravit	Separato	r Gas_		660		XXXX	XXXXX
2.	. 68			1.37	.900	Spec	ilic Gravity	Flowing	Fluid_ 67	2	<u> </u>		<u> </u>	
4.	.65		505	1 35	005	Critic	cal Pressu cal Temper		37	4		P.S.I.X.		P.S.I.A.
5						1								
Pe UCT	2472	<u> <u> </u></u>	ind.	7	02 02	-	Pc 2	·	1.7	84	"۲	₽c ²]_ 1	.967
1	<u> </u>	224		5125	085 7	-1 ''' -	$R_c^2 - R_s^2$				"	$r^2 - R_{\rm s}^2$]	
2		214	7	4609	1501.7		_		-		-	•		
3		196	6	3865	2245.7	AOF	.。 [_	n2	n = .	2.844	ŧ			
		163	9 2	2686	3424.7	·	Ĺ	$p_c^2 - R_r^2$	J					
2					· · ·								1	
Abea	lute Open Fl	ow	2,8	344			Meld e	15.025	Angle	si Slope e	41		Slope, n	1.168
	rka:	Well	made	0 661	fluid	during	, test			· · · · · · · · · · · · · · · · · · ·		······································		
			•								•			
-	wed by Divi	elon		Conduct	ni By:			Culculated	Br:	- <u></u>	TC	hected B	/:	
				Gr	eg Mil	ner		Gree	Mili	ner		Bill P	ierce	
					U					. • Tel danya				لنجيمي



Q MCF/D

AOF = 2.9 MMCF/D

Laboratory Services 1331 Tasker Drive

Hobbs, New Mexico 88240

Telephone: (505) 397-3713

FOR:	Mewbourne Oil Co. Attention: Mr, Greg Milner P. O. Box 5270 Hobbs, New Mexico 88241	SAMPLE IDENTIFICATION COMPANY: LEASE: PLANT:	Chalk Bluff Federal #1 Mewbourne Oil Co.
SAMPLE DA	TA: DATE SAMPLED: 03-15-91 ANALYSIS DATE: 03-18-91 PRESSURE - PSIG 460.00 SAMPLE TEMP. °F 51.00 ATMOS. TEMP. °F	GAS (XX) SAMPLED BY: ANALYSIS BY:	LIQUID() Gregory Milner Rolland Perry

REMARKS:

»L

COMPONENT ANALYSIS

		MOL		
COMPONENT		PERCENT	GPM	
Oxygen	(02)			
Hydrogen Sulfide	(H2S)			
Nitrogen	(N2)	0.42		
Carbon Dioxide	(CO2)	0.43		
Methane	(C1)	87.54		
Ethane	(C2)	7.07	1.885	
Propane	(C3)	2.38	0.654	
I-Butane	(IC4)	0.31	0.100	•
N-Butane	(NC4)	0.54	0.169	
I-Pentane	(IC5)	0.20	0.071	
N-Pentane	(NC5)	0.14	0.052	
Hexane	(C6)	0.97	0.399	
Heptanes Plus	(C7+)	0.00	0.000	
		100.00	3.331	
BTU/CU.FT DRY	r	1156	MOLECULAR WT	19.0972
AT 14.650 DRY		1153		
AT 14.650 WET		1133	26# GASOLINE -	0.578
AT 15.025 DRY		1182		
AT 15.025 WET		1162		
SPECIFIC GRAVIT	Y -			
CALCULATE	D	0.660		
MEASUREI	_ D	0.000		
	-	· · · · ·		

WORK SHEET FOR CALCULATION OF WELL D PRESSURES (Pc or 5)

Form C-122F Adopted 9-1-65

	FROM KNOWN B	OTTOM HOLE PRESSURE (Pf	ors)		
DMPANY Mewbourne Oil	- LEASE Chalk B!	off Fard WELL NO	/		-18-91
DCATION: Unit	Section/	Township85	Range77	<u></u>	-
<u>9949 н 9949</u>	_ L/H _1.000 _G _	.660 % CO2 . 4	<u>3_% N242</u>	% H ₂ S	
	GH <u>6566</u> P _{cr}	673 Tor 374			

INE		1	2	З	4	5	6	7	8
1	T _w (W.H. ∘R)	532	532					÷	
2	T _s (B.H. ∘R)	602	608						
3	$T=(\frac{T_w + T_s}{2})$	570	570						
4	Z (Est.)	.800	.790						
5	ΤZ	456.0	450.4						
6	GH/TZ	14.399	14.578						
7	e ^s (Table XIV)	1.716	1.727		, · · ·				
: 8	Pf or the	3249	3249						
9	Pf ² or	10556	10556						
10	$P_c^2 = P_i^2/e^s$ or $P_c^2 = P_i^2/e^s$	6151.7	6110.6				· .		
11	Pcor	2480.3	2472.0	= P_					
12	$P_{\pi}\left(\frac{P_w + P_s}{2}\right)$ or $\left(\frac{P_c + P_f}{2}\right)$	2864.6	2860.5						
13	$P_{r} = (P/P_{cr})$	4.26	4.25						
14	$T_{r} = (T/T_{cr})$	1.52	1.52						
15	Z (Table XI)	.790	.190						

One copy to be filed in District Office (Work copy acceptable)

WORK SHEET FOR CALCULATION OF W. EAD PRESSURES (B) or Pw)

Adopted 9-1-65 FROM KNOWN BOTTOM HOLE PRESSURE (B) or P.) COMPANY ____ New Dourne LEASE Chalk Bluff Fed. WELL NO. ____ DATE _3-18-91 LOCATION: Unit ______ Section _____ Township _____ 785 Range _____27E L <u>9949</u> H <u>9949</u> L/H <u>1.00</u> G <u>.660</u> % CO₂ <u>.43</u> % N₂ <u>.42</u> % H₂S <u>___</u> GH <u>6566</u> P_{cr} <u>673</u> T_{cr} <u>374</u> LINE 1 2 з 5 6 7 8 4 T_w(W.H. •R) 532 532 532 532 532 532 532 532 T_s(B.H. •R) 602 603 608 608 602 608 2 608 608 $T=(\frac{T_w+T_s}{2})$ 570 570 570 570 570 3 570 570 570 Z (Est.) . 780 . 781 . 780 .4 .835 . 783 . 783 .781 .792 ΤZ 446.5 444.8 444.6 451.7 5 476.0 446.5 445.) 445.2 GH/TZ 6 14.704 14.768 13.7% 14.712 14.753 14.749 14.761 14.537 e^S(Table XIV) 1.740 7 1.736 1.739 1.725 1.736 1.739 1.678 1.739 奪or Ps 8 2983 2983 2831 215Z 2831 2593 2593 2152 EF or Ps2 9 8898.3 8898.3 8014.6 8014.6 6723.6 6723.6 4631.1 4631.1 $P_{\rm H} = P_{\rm f}^2/e^{\rm s}$ or $P_{\rm w}^2 = P_{\rm s}^2/e^{\rm s}$ 10 4609,0 3867.2 3865.5 2661.7 2684.9 5304.3 5126.6 4616.2 Tor Pw 2148.5 2146.9 1966.5 1966.1 1631.5 1638.6 11 2303.1 2264.2 $P_{\pm}(\frac{P_{W}+P_{S}}{2})$ or $(\frac{P_{c}+P_{f}}{2})$ 2279.5 1891.7 1895.3 12 2623.6 2489.8 2488.9 2279.8 2643.1 2.82 2.81 3.93 3.90 3.39 3.39 $P_r = (P/P_{cr})$ 3.70 3.70 13 1.52 1.52 $T_r = (T/T_{cr})$ 1.52 1.52 1.52 14 1.52 1.52 1.52 , 183 . 792 Z (Table XI) .792 .780 15 783 181 .781 . 180

One copy to be filed in District Office (Work copy acceptable)

Form C-122.

TMPANY:	PRO WIRELINE
CLIENT:	MEWBOURNE OIL
GAUGE NUMBER:	12235
WELL NAME:	CHALK BLUFF
WELL NUMBER:	1
TEST NUMBER:	1
LOCATION:	
TEST OPERATOR:	BURRELL
COMMENTS:	4 POINT FLOW TEST RAN AFTER 72 HOUR BUILD UP

FOSITION	GAUGE SERIAL NUMBER	
1		
2		
3		
4		

AGE START DATE: 3/15/91

GAUGE S/N: 12235

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DATA FILE: 3

REAL TIME	DELTA TIME HRS	PRESSURE PSIA	TEMPÉRATURE 'F	COMMENTS
9:45: 0	0.0000	3213.00	و خب ہے ہیں جب کے جب جب جب کے ایک کی کر ایک کر ایک کر ایک کر ایک کر ایک کر ایک کر کر ایک کر کر ایک کر ایک کر ا	START RATE 1
10: 0: 0	0.2500	3046.00		
10:15: 0	0.5000	3003.00		
10:30: 0	0.7500	2983.00		START RATE 2
10:45: 0	1.0000	2894.00		
11: 0: 0	1.2500	2861.00		
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11:45: 0	2.0000	2707.00		
12: 0: 0	2.2500	2643.00	·	
12:15: 0	2.5000	2610.00		•
12:30: 0	2.7500	2593.00		START RATE 4
12:45: 0	3.0000	2405.00		·
13: 0: 0	3.2500	2276.00		
13:15: 0	3.5000	2210.00		
13:30: 0 .	3.7500	2152.00		END OF TEST



DELTA TJ - HRS

	· · · · · ·	· · · · · · · · · · · · · · · · · · ·
	RECEIVED	
rm 3160-5 UNI 1e 1990) DEPARTMEN	TED STATES IT OF THE INTERIOR SEP 2 8 1992	Budget Bureau No. 1004-0135 Expires: March 31, 1993
BUREAU OF	U. C. D.	5. Lease Designation and Serial No. NM-0557371
SUNDRY NOTICES Do not use this form for proposals to dr Use "APPLICATION FO	AND REPORTS ON WELCS a different reserver ill or to deepen or reentry to a different reserver R PERMIT—" for such proposals	6. If Indian, Allonce or Tribe Name DIT.
SUBMIT	IN TRIPLICATE	7. If Unit or CA, Agreement Designation
1. Type of Well		8. Well Name and No.
2. Name of Operator		Chalk Bluff Fed.Com.#1
Mewbourne Oil Company		9. API Well No. 30-015-26575
P. O. Box 7698, Tyler, Texas	75711 (903) 561–2900	10. Field and Puol, or Exploratory Area
4. Location of Well (Footage, Sec.; T., R., M., or Survey D	escription)	N.Illinois Camp-MorGa
2250' FWL & 790' FSL Sec. 1,	T185-R27E	11. County or Parish, State Eddy
12. CHECK APPROPRIATE BOX	s) TO INDICATE NATURE OF NOTICE, RE	PORT, OR OTHER DATA
TYPE OF SUBMISSION	TYPE OF ACT	ION
Notice of Intent	Abandonment Recompletion	Change of Plans
Subsequent Report	Plugging Back	Non-Routine Fracturing
Final Abandonment Notice	Altering Casing	Conversion to Injection
	Other Additional perfs,	Dispose Water
	acidize & frac	(Note. Report results of multiple completion on Well Completion of Arcompletion Report and Log form)
give subsurface locations and measured and true veri 8/13/92 - Perf Middle Morrow 986 8/14/92 - Acidized w/3500 gals 7 sealers. Flushed w/2Z 10 mins 3400#, 15 mins to pit 8/15 - 8/18/92.	cal depths for all markers and zones pertinent to this work.)* 51-9882', 2 SPF, 10' Net, 22 holes. 27 HCL + additives + 1000 SCF/bbl n KCL wtr + 1000 SCF/bbl nitrogen. IS 5 2800#. Avg rate 3.7 BPM, AP 5000#	aitrogen carrying 80 ball SDP 4300#, 5 mins 3800#, , MP 5600#. Blew well down
8/19/92 - MI swab unit. Pressure Swabbed well down to 5	tested tbg to 2000#.Held OK. Removi300'.	ved tree. RU BOP. RU swab.
8/20/92 - Swabbed down to 6500'. Tested tbg to 8000#. 8 compression. Press and	POOH w/tbg & pkr. TIH w/new pkr as //21/92 - Continued testing tbg. Set ulus to 2000#. Held OK. Started swa	ssembly & 200 jts tbg. t pkr @ 9740.68' w/15 pts abbing. Had light blow of gas
3/22/92 - RU Western Co. Acidize nitrogen + 35 ball sea 15 min 3600#. ATP 5100 No show of gas or oil. 8/23/92 - RU swab. FL @ 7000'. S	ed perfs w/1500 gals 7½% HCL acid + lers. Flushed w/2% KCL wtr. ISDP 40 #, MTP 5400#. RD Western. Opened we Recovering load. Wabbed dry in 3 runs. Continued swa	additives + 1000 scf/bbl 00#. 5 min 3700#, 10 min 3700 ell to pit on 12/64" choke. abbing. Recovering load.
	7	
Signer Signer Signer	Work Title Engr. Oprns. Secretary	Date 9/11/92
(This space for rederat or State office use)	A\$5 _	
Approved by Conditions of approval, if any:	Title Ž	Date
Title 18 U.S.C. Section 1001, makes it a crime for any person or representations as to any matter within its jurisdiction.	knowingly and willfully to make to any department or agency of the t	United States any false, fictifious or fraudulent statements

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*See instruction on Reverse Side

Form 3160-4 (November 1983) (formerly 9330)		UNITED MENT OD EAU OF LAN	i Stiati Fawtihie Idgrafiac	ES. IN ⁻ Xemei	COMMISSI TERIO No210	₩N ^{IN} R	DUPLIC/ (Saw strue rever	ATE+ other in tions or se side)	5. 10 N	Form a Budge Expire	approv t Bure s Aug signat 5573	ed. Su No. 1004–0 Just 31, 1985 IGN AND SERIAL)137
WELL CO	MPLETION (OR RECON	MPLETIC	DN F	REPORT	ÂN	D LO	G*	6. 17	INDIAN	, ALLO	TTEL OR TRIBE	NAME
Is. TYPE OF WEL	L: OIL WELL	GAS WELL	DRY		Other		· • •		- 7.70	NIT AGE	EEMENT	T NAME	
b. TYPE OF COM	PLETION:	CT PLUG C		-			1/17	て				·····	
WELL X		Ц влек Ц	L RESVR.		Other	₩ 7	KÇEIVE	D	- ^{8.} 0	halk	Blu	ff Federal	Com
Mewbourne	e Oil Compa	any 🗸			Mo.	X) 0 9 	1002	. D. w	ELL NO.			
3. ADDRESS OF UPE	RATOR				6.0	~ JU	1.50	1336	- 1	-			<u></u> .
P. O. BO2	k 7698, Ty.	ler, Tex	as 151 accordance u	11 ith any	y State regu	ireman).	- 10. V	T T]	1 inor	ie Camp Mc	\ }_}_
At surface	2250' FWL	& 790' F	SL						11.	SEC., T.,	R., M., 0	UN BLUCK AND BU	RVET
At top prod. int	erval reported below	v								Sec.	1– T 1:	85-R27	
At total depth	Same												
			14. PERM	17 NO. # 2 O	-015-2	DATE	ISSUED		12. 0	PARISH	OR	13. STATE	
15. PATE SPUDDED	16. DATE T.D. REA	CHED 17. DATI	APL COMPL. (R	#30 eady to	-015-2	8 81.81				ddy	1 19. 1	ELEV. CASINGHE	D
12/22/90	1/29/91	3/0	7/91			кв 3	625',	GM 3	609'	,			
20. TOTAL DEPTH, MD	A TVD 21. PLUO,	BACK T.D., MD A	TVD 22. 1	# MUL 10W M	TIPLE COMPL	•••	23. INT	CRVALS	nor	ARY TOO	1.8	CABLE TOOL	5
10,120"	LU,	UIS	BOTTOM, NA	ME (N	D AND TVD)	•	<u> </u>	<u>→</u>	1	A	20	. WAS DIRECTIO	NAL
9936-46'	, 9964-67'	- Morro	W								I	BURYEY MADE	
26. TYPE ELECTRIC	AND OTHER LOGS MU	N					· · · · · · · · · · · · · · · · · · ·				27. W	AS WELL COBBD	
SDL-DSN,	DLL-MSFL,	DILL										No	1
~4		CASI	NG RECOR) (Kep	ort all string	a set i	n well)			!			
CASING SIZE	WEIGHT, LB./FT.	DEPTH SE	T (ND)	101	1.8 SIZE	-	CES	ENTING	RECORD	>		AMOUNT PULL	ED
9-5/8"	36#		00	17-	1/2		425	<u>- Ci</u>	<u>rc</u>	<u> </u>		None	
7"	26# & 29	9# 94	50'	8-	3/4	- :	1350	- C1	<u>rc</u>			None	
	-		<u> </u>			-	2000					NONE	
29.	Li	NER RECORD					30.		TUBIN	G REC	DRD		
3122	TOP (MD) B	OTTOM (MD)	SACKS CEM	ENT [®]	SCREEN (1	4D)	\$12E	_	DEPTH	86T (M	(0)	PACKER SST (MD)
4-1/2"	<u>9051'</u>	10119'	175		·		,	<u>/8" </u> _	98	05'		9805	
31. PERFORATION REC	Oup (Interval, size	and number)		1	32.	I	ID, SHOT	FRAC	TURE,	CEMEN	T SQU	EEZE, ETC.	
9936-46",	9964-671	٠			DEPTH IN	TERVA	L (MD)		MOUNT	AND KIN	D OF 1	MATERIAL USED	
13', 2 SP	PF, Total 2	28			9936-	67 '		300	0 qal	s Mod	1-10	l acid + 1	.000 SCF/
						<u>.</u>		bbl	$\frac{N2}{5}$ +	<u>50 k</u>	all	sealers.	Flushed
							i	W/ 3	<u>5 DD1</u> /bb1	<u>5 28</u> N2.	KCL	wager $+1$	000
83.•				PROF	UCTION							2: ::	0
DATE FIRST PRODUCTI	ION PRODUCT	TON METHOD (F	lowing, gas Flow	ving	mpingeise	and f	ype of pun	(p)		WELL, ehu	STATUI 1-in) T	Producing of	· · · · · · · · · · · · · · · · · · ·
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N.	POB RIOD	016-BB6.		0A8	۲.	WAT	ER-BBL		UTOPIL BATIO	<u></u>
J/IL/91	CABING PRESSURE	8/64"	0/1	>			886	W 1 7 1 1		0	· -	886:1 m	
1600#		24-HOUR RATE	" т	•	5	286	1	WALLE	Δ			, ດ ວັ	1. J
34. DISPOSITION OF O	AB (Sold, used for fu	el, vented, etc.)	<u></u>				<u> </u>		TEST	WITNE	SC.	y	
'Sold									W	-0-0	-	-	
35. LIST OF ATTACES	i enta	-			,				·	ALL	- II-		
I hereby certify	that the foregoing	ind attached in	formation is	compl	ete and cor	rect as	determine	d from	atl av	llabl r	ecorde APR	1 1991 /18/91	
	*(See li	nstructions an	d Spaces	fer A	dditional	Data	on Reve	rse Si	de)	CARI	SBA	D, NEW ME	XICO

Fitle 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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Lower Morrer 9936' 9967' Sandstone Middle Morrer 9861' 9881' Sandstone Sandstone Middle Morrer 1138' Sandstone Make Deprint Version Number 1138' Sandstone Name Norrer 1138' San Andres 1976' Glorietta 3458' Tubb 4451' Drinkard 5376' Abo 5794' Wolfcamp 6420' Cisco 7666' Canyon 8368' Strawn 8844' Morrow 9454' Morrow Clastics 9770' Barnett 10016'	FORMATION	TOP	BOTTOM	DESCRIPTION CONTENTS FTC		1	,
Lower Morrow 9936' 9967' Sandstone Yates 424' 9861' 9881' Sandstone Yates 424' Queen 1138' Grayburg 1484' San Andres 1975' Glorietta 3458' Tubb 4451' Drinkard 5376' Abo 5794' Wolfcamp 6420' Cisco 7666' Canyon 8368' Strawn 8844' Morrow 9454' Morrow Clastics 9770' Barnett 10016'				DECEMPTION, CONTENTS, ETC.	NAME	MEAS. DEPTH	TRUE
widdle Morrow 9861' 9881' Sandstone Yates 424' Queen 1138' Grayburg 1484' San Andres 1976' Glorietta 3458' Tubb 4451' Drinkard 5376' Abo 5794' Wolfcamp 6420' Cisco 7666' Canyon 8368' Strawn 8844' Morrow 9454' Morrow Clastics 9770' Barnett 10016'	Lower Morthy	9936'	9967'	Sandstone			VERT. DEPT
Queen 1138' Grayburg 1484' San Andres 1976' Glorietta 3458' Tubb 4451' Drinkard 5376' Abo 5794' Wolfcamp 6420' Cisco 7666' Canyon 8368' Strawn 8844' Morrow 9454' Morrow Clastics 9770' Barnett 10016'	Aiddle Morbow	9861'	9881 '	Sandstone	Yates	424 '	•
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Cisco 7666' Canyon 8368' Strawn 8844' Morrow 9454' Morrow Clastics 9770' Barnett 10016'	<u>.</u>				Wolfcamp	6420	• • •
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Morrow 9454' Morrow Clastics 9770' Barnett 10016'					Strawn	8844'	
Morrow Clastics 9770' Barnett 10016'	: 	· · ·		· · ·	Morrow	9454'	
Barnett 10016'					Morrow Clastic	s 9770'	•
					Barnett .	10016'	
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	E	inergy, M	S linerals	tate of N and Na	lew Mexico tural Resourc	es Departme	nt		Form C Revised See Last at Both	-104
O. Box, 1980, Hobbs, NM 88240	(DIL C	ONS	ERVA P.O. B	ATION I ox 2088	DIVISIO	N			
ISTRICT III		Sar	nta Pe,	New M	lexico 8750	14-2088		_		
	REQU	EST FC	NSPC	LOWA	BLE AND /	AUTHORIZ TURAL GA	LATION IS	1	,	
MEWBOURNE OIL COM	PANY 🗸						Wei 30	-015-26	575	
P. O. Box 7698, T	yler, 7	'exas	757	11				<u>.</u>		
Resson(s) for Filing (Check proper bas) New Well X Recompletion	Oil	Change in :	Transpor Dry Cau	ter of:	[_] Oth	et (Plaase expla	(n)			
Change in Operator	Casinghead		Conden		· · · · ·		·			
ad address of previous operator		SE								
Lesse Name	AT LEA	Well No.	Pool Na	me, lockad	ting Formation		Kin	d of Lesso		Man No. 0557371
	<u></u>		NOL		Linois Can	p Morrow		No. of the second se		
Unit LetterN		50	Feet Fre	m Tho	Vest Lin	nand790	• <u> </u>	Peet From The	Sout	hLine
SectionTownsi	nip 18 Sc	outh_	Range	27	East , N	MPM,		Eddy		County
II. DESIGNATION OF TRA	NSPORTE	R OF OI		D NATU	Address (Gin	e address to wh	ich anntai	ed com of this	form is to be s	ent)
Amoco Pipeline Inter- corporate Trucking	- []				Oil Ten	der Dept.	Box 7	02068,Tu	lsa,OK 7	4170-2068
Name of Authorized Transporter of Cad Transwestern Pipeline	nghead Gas e Company	, 🗆 .	or Dry (Address (Giv P.O.BOX	e address to wh 1188, Ho	<i>ich approv</i> DUStON	ed copy of this, , Texas	form is to be s 77251-11	end) 88
if well produces oil or liquids, ive location of tanks.	Unit	Soc.	Twp.	Rge	la gas actuali	y connected?	Wh	es ? Marci	h 1991	· · · · · ·
this production is commingled with the V. COMPLETION DATA	t from say oth	T lease of p	uol, givi	comming	ting order numi	xer:N	>			
Designate Type of Completion	1 - (X)	Oil Well	0	as Well X	New Well	Workover	Deepen	Plug Back	Same Res'v	Diff Res'v
Date Spudded	Date Comp	Ready to 3/07/9]	Prod.		Total Depth	10,120'		P.B.T.D.	10.079'	- 1
Elevations (DF, RKB, KT, GR, etc.) KB 3625', GR 3609'	Name of Pr	Morrov	mation V		Top Oil/Gas 1	9936 '		Tubing Dep	9,805	
9936-46', 9964-67',	13',2 SI	PF,Tota	1 28		_			Depth Casia	ng Shoe	
HOLE SIZE		UBING, O	CASIN	G AND	CEMENTI	NG RECORI	>		BACKS CEN	ENT
17-1/2"		13-3/	/8 ¹⁹			400'		······································	425	het 10-2
12-1/4"		9-5/	/8"			2604'			1025	5-17-91
<u> </u>		<u> </u>	/2" T	inor		9450		1350 emp + AK		
. TEST DATA AND REQUE	ST FOR A	LLOWA al volume o	BLE [load of	l and must	be equal to or	exceed top allow	vable for t	his depth or be	for full 24 hou	75.)
hate First New Oil Run To Tank	Date of Test				Producing Me	thod (Flow, put	np, gas lift	, etc.)		
	Tubing Pres				Casing Pressu	216		Choke Size		
ctual Prod. During Test	Oil - Bbls.				Water - Bbis.			Gas- MCF		
JAS WELL	Length of T				Bhis Condens	ate A ALICE		Construct of C	ondeneste.	
886		24 hou	irs			1		Clevity of C	580	
sting Method (pitot, back pr.) Back Pressure	Tubing Pres	eure (Shut-i 1600#	n) .		Casing Pressi	re (Shut-ia)		Choke Size	8/64"	
I. OPERATOR CERTIFIC I hereby certify that the rules and regul	ATE OF	COMPI.	IAN	CE	C	DIL CON	SERV	ATION	DIVISIC) N
Division have been complied with and is true and complete to the best of my.	that the inform prowledge and	ution given belief, /	above		Date	Approved	I	MAY 1	6 1991	
Signature	mfr	m	<u> </u>		Bv_	ORIG	INAL S	IGNED BY		
Gaylon Thompson, Engin	neering	Operat	ions fille		 	MIKE	RVISO	AMS R. DISTRIC	Ť If	
March 11, 1991 (Date	<u>903) 561</u>	-2900 Telepi	none No.		itte_					
INSTRUCTIONS: This for	m is to be fi	led in co	mplian	ce with 1	Rule 1104	· · · · · · · · ·			in the second second	
 Request for allowable for with Rule 111 	newly drille	d or deep	vened v	well mus	t be accompa	anied by tabu	hani			
2) All sections of this form r	nust be fille	d out for	allowa	ble on n	ew and recor	mpleted the				
of the out only sections I, II	, III, and V	sor chan	ges of	operator	, well name					•

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Fill out only Sections I, II, III, and VI for changes of operator, well name or at
 Separate Form C-104 must be filed for each pool in multiply completed wells.

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orm 3160-5 June 1990)	UNIT DEPARTMENT BUREAU OF L	ED STATES OF THE INTERIOR AND MANAGEMENT	OIL CONS DIE DD FORMAPROVED DIE 18, March 31, 1993 Arte 18, Lesse Designation and Serial No. NM OFF7277
Do not use this for U	SUNDRY NOTICES A rm for proposals to drill se "APPLICATION FOR	ND REPORTS ON WELLS or to deepen or reentry to a differ PERMIT—" for such proposals	ent reservoir.
Tree of Wall	SUBMIT	N TRIPLICATE	7. If Unit or CA, Agreement Designation
Oil Gas Well Well	Other		8. Well Name and No.
Name of Operator Mewbourne 011	Company	· · · · · · · · · · · · · · · · · · ·	Chalk Bluff Fed. Comm. 9. API Well No.
Address and Telephone No	Now Maxi	co 99241 (EOE) 202 5005	30-015-26575
P.U. BOX 5270 Location of Well (Footage	Sec., T., R., M., or Survey Desc	ription)	N. Illinois Camp Morrow
2250' FWL & 7 Sec. 1-T18S-R	90' FSL 27E		11. County or Parish, State
	·	UNITA	I Eddy Co., N.M.
CHECK A	PPROPRIATE BOX(s)	TO INDICATE NATURE OF NO	TICE, REPORT, OR OTHER DATA
TYPE OF S	UBMISSION	TYI	PE OF ACTION
Notice of I	BIER	Abandoament	Change of Plans
Subsequent	Report	Recompletion	New Construction
, co		Casing Repair	Water Shut-Off
Final Aban	domment Notice	Altering Casing	Dispose Water
			(Note: Report results of multiple completion on WeB Completion or Recompletion Record and Log (arm.)
Jescribe Proposed or Comp give subsurface locatio	leted Operations (Clearly state all pension and measured and true vertical (rtinent details, and give pertinent dates, including esti- lenths for all markers and zones pertinent to this wo	mated date of starting any proposed work. If well is directionally drilled,
 Spot 8 sx. (with plug mu Spot 17 sx. Spot 17 sx. Cut off and Spot 8 sx. (Install cup Clean location 	50') cement plug d. (100') cement plug (100') cement plug remove wellhead. 50') surface plug and dry hole marke	on top of existing CIBP @ g @ 2650'. g @ 450'. er.	7010'. Circulate hole
		REC	
		AUG	; 1 8 1995
	1		CON. DIV.
I hereby costly that the first	soins it true and correct	Tide Engineer	Date 5/25/95
This space for Foderal or Se Approved by <u>Orige Sector</u> Conditions of approval, if an	ate office use)	PETROLEUM ENGINEER	Dute8/14/95
·			

Jmm 3160-5 L. FED STATES une 1990) DEPARTMENT OF THE INTERIOR		ES INTERIOR	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993
E	5. Lease Designation and Serial No. NM-0557371		
SUNDF Do not use this form for pro Use "APPL	6. If Indian, Allottee or Tribe Name		
	SUBMIT IN TRIPL	ICATE	7. If Unit or CA, Agreement Designation
1. Type of Well Oil Gas Well Well X Other 2. Name of Operator	······································		8. Well Name and No. Chalk Bluff Federal Comm #1
Mewbourne Oil Com[any 3. Address and Telephone No.			9. API Well No. 30-015-26575
PO Box 5270, Hobbs, NM 503 4. Location of Well (Footage, Sec., T., R	10. Field and Pool, or Exploratory Area N. Illinois Camp Morrow		
790' FSL & 2250' FWL, Sec.1	11. County or Parish, State		
			Eddy, NM
	RIATE BOX(s) TO INDIC	ATE NATURE OF NOTICE, REPORT, 4	OR OTHER DATA
			····
TYPE OF SUBMISS	ION	TYPE OF ACTION	
TYPE OF SUBMISS	ION	TYPE OF ACTION	Change of Plans
TYPE OF SUBMISS	ION	TYPE OF ACTION Abandonment Recompletion	Change of Plans
TYPE OF SUBMISS	ION	TYPE OF ACTION Abandonment Recompletion Plugging Back	Change of Plans Change of Plans New Construction Non-Routine Fracturing
TYPE OF SUBMISS	ION	TYPE OF ACTION Abandonment Recompletion Plugging Back Casing Repair	Change of Plans New Construction Non-Routine Fracturing Water Shut-Off
TYPE OF SUBMISS	Iotice	TYPE OF ACTION Abandonment Recompletion Plugging Back Casing Repair Altering Casing	Change of Plans New Construction Non-Routine Fracturing Water Shut-Off Conversion to Injection
TYPE OF SUBMISS TYPE OF SUBMISS Subsequent Report Final Abandonment N	lon	TYPE OF ACTION Abandonment Recompletion Plugging Back Casing Repair Altering Casing Other Extend T/ A & CIT.	Change of Plans New Construction Non-Routine Fracturing Water Shut-Off Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)
	Iotice	TYPE OF ACTION Abandonment Recompletion Plugging Back Casing Repair Altering Casing Other Extend T/ A & CIT. Details, and give pertinent dates, including estimated date ertical depths for all markders and zones pertinent to this	Change of Plans New Construction Non-Routine Fracturing Water Shut-Off Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) of starting any proposed work. If well is work.)*

23456789707 23456789707 MOV 2000 RECEIVED RECEIVED CD - ARTE	SIA TH	Approvat 1 2 Encline 10	<u>12</u> 125/20	ki onaite Period 201	GUREAU OF LAND MGM Carlsbad Resource Af	RECEIVED	
14. I hereby certify that the for	egoing is true and correct				A A	E	
Signed		Title N.M	. Young	District Manager	Date _	10/06/00	
(This space for Federal or Sta Approved by Conditions of approval, if any	NOO.) MIE G. LAMA	Title	20	anti-terrest freedman	Date	11/10/2	1000

18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictilious or fraudulent nents or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

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Form 3160-5 (June 1990) Do not use this form	UNITED DEPARTMENT O BUREAU OF LAN SUNDRY NOTICES AN for proposals to drill or "APPLICATION FOR I	STATES OF THE INTERIOR ID MANAGEMENT D REPORTS ON WELLS to deepen or reentry to PERMIT-" for such pror	N.M. C., Cons. 811 S. 1st Stre Artesia, NM 88 a different reservoir.	Division FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 214-228-24 tion and Serial No. NM-0557371 6. If Indian, Allottee or Tribe Name
1 Type of Well	SUBMIT IN	TRIPLICATE		7. If Unit or CA, Agreement Designation
Oil Gas Well Welt 2. Name of Operator	X Other			8. Well Name and No. Chalk Bluff Federal Comm #1
Mewbourne Oil Com 3. Address and Telephone N PO Box 5270, Hobbs 4. Location of Well (Footage,	any o. 5, NM 505-393-5905 Sec., T., R., M., or Survey Descript	on)		9. API Well No. 30-015-26575 10. Field and Pool, or Exploratory Area N. Illinois Camp Morrow
790' FSL & 2250' FW	/L, Sec.1 T-18S R-27E			11. County or Parish, State Edd y, NM
12. CHECK A	PPROPRIATE BOX(s) TO	INDICATE NATURE O	F NOTICE, REPORT, C	R OTHER DATA
TYPE OF S	SUBMISSION		TYPE OF ACTION	
Notice of	Intent			Change of Plans
	nt Report	Plugging Back		Non-Routine Fracturing Water Shut-Off
🗍 Final Aba	ndonment Notice	Altering Casing		Conversion to Injection Dispose Water Nate: Record results of multiple crumpleton on Web
	:			Completion or Recompletion Report and Log form.)

3. Describe Proposed or Completed Operations (Clearly state all pertinet details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markders and zones pertinent to this work.)*

The above caption well was successfully MIT'ed on 10/25/2000. (500 psi for 30 min.) The pressure chart is enclosed. If any question, please call.

AC	CEPTED FOR RECORD	
	NOV 1 5 2000	
	BLM	



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14. I hereby certify that the foregoing is true and correct Signed	Title	N.M. Young	District Manager	Date	11/01/00				
(This space for Federal or State office use)		. <u></u>							
Approved by Record Oaly Conditions of approval, if any:	Title			Date					
tie 18 U.S.C. Section 1001, makes it a crime for any person knowingly and wilifully to make to any department or agency of the United States any false, fictilious or fraudulent atements or representations as to any matter within its jurisdiction.									


···			Drawer DD
urm 3160-5	UNITED	STATES	Artesia, NM 88210 CP
ine 1990)	DEPARTMENT OF	F THE INTERIOR	Budget Bureau No. 1004-0135 Expire: March 31 1093
	BUREAU OF LANI	D MANAGEMENT	5. Lease Designation and Serial No.
	CUNDRY NOTICES AND	PEROPTS ON WELLS	NM-0557371
Do not use this fo	orm for proposals to drill or se "APPLICATION FOR PER	to deepen or reentry to a different reserv RMIT—" for such proposals	6. If Indian, Allonce or Tribe Name VOIT.
	SUBMIT IN 1	TRIPLICATE	7. If Unit or CA, Agreement Designation
. Type of Well Oil Gas Well Well	Other	FER 2 1 1994	8. Well Name and No.
Name of Operator Mewbourne Of	il Company		Chalk Bluff Fed. Com. #
P.O. Box 52	™. 70 Hobbs. New Mexico	a 88241 (505) 393-5905	3U-UID-205/5 10. Field and Pool, or Exploratory Area
. Location of Well (Footage	e, Sec., T., R., M., or Survey Descriptio	on)	N. Illinois Camp
2250' FWL & Sec. 1-T18S-	790' FSL -R27E		11. County or Parish, State
CHECK /	APPROPRIATE BOX(s) TO	DINDICATE NATURE OF NOTICE. RE	EPORT, OR OTHER DATA
TYPE OF \$	SUBMISSION	TYPE OF ACT	rion
Notice of	f Intent		Change of Plans
-		Recompletion	New Construction
	nt Report	Plugging Back	Non-Routine Fracturing
Final Ahr	andonment Notice		Conversion to Injection
		Other Shut-In-Status	Dispose Water
•			(Note: Report results of multiple completion on Well
. Describe Proposed or Com give subsurface locati	npleted Operations (Clearly state all pertine ions and measured and true vertical depth	ent details, and give pertinent dates, including estimated date of a hs for all markers and zones pertinent to this work.)*	starting any proposed work. If well is directionally drilled,
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Form 3160-3 EWEU (June 1990) DEPARTME	ITED STATES NT OF THE INTERIOR	Artosia	NEL CONTROL APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993
JJ BUREAU OF	LAND MANAGEMENT		5. Lease Designation and Serial No.
Do not use this form for proposals to contract Use "APPLICATION FO	S AND REPORTS ON WELL Irill or to deepen or reentry to DR PERMIT—" for such proper	LS a different reservoir. osals	6. If Indian, Allottee or Tribe Name
SUBMI	T IN TRIPLICATE		7. If Unit or CA, Agreement Designation
1. Type of Well	· · ·	NOV 1 7 1953	8. Well Name and No.
2. Name of Operator	······································	Q. C. D,	Chalk Bluff Fed. Comm. #]
Mewbourne Oil Company 🖌			9. API Well No.
3. Address and Telephone No. D D Pox 5270 Hobbe Now Ma	vica 88211 (505) 303	-5005	30-015-26575
4. Location of Well (Footage, Sec., T., R., M., or Survey	Description)	- 5 5 6 5	N. Illinois Camp
			11. County or Parish, State
2250' FWL & 790' FSL of Sec.	1-T18S-R27E		
			Eddy LO., N.M.
		OF NOTICE, REPOR	I, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTION	
Notice of Intent			Change of Plans
(27)	Recompletion		New Construction
LAJ Subsequent Report			Water Shut-Off
Final Abandonment Notice	Altering Casing		Conversion to Injection
	Other		Dispose Water
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14. I hereby certify that the foregoing is true and correct Signed	<u>Tide</u> Petroleum	Engineer	Date10/05/93
Appmyed by		TED FOR RECORD	Date
Conditions of approval, if any:		y four	
ritle 18 U.S.C. Section 1001, makes it a crime for any perso or representations as to any matter within its jurisdiction.	n knowingly and willfully to make to any dep	partment or agency of the United S	tates any false, fictitious or fraudulent statements
	*See Instruction AT PLOS	BADSINEW MEXICO	

Mew bourna Oil Company Chulk Bluff Factoral #1 2250' FULT 740' FSL Sec. 1- T186-R27E 133/8"@ 400' 9 5/8"@ 7600' 7050 17102' CIBPE 7208' 7262 97276 CIBPQ 7294' 730 4 CIBRE How w/ 35' cemint 2 7676 2 7648' 7826' Squeeze w/ 600 SX. Test to 2000* Top of 4"@ 9051' 7" @ 9450' CIBPE 9800' W/35' cement 9861 9967' 4" e 10119" Q. HILLS OF

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3160-5	UNITED STATES	n na serie da companya da Na serie da companya da comp	FORM APPROVED
1990) DEPA	RTMENT OF THE INTERIOR		Expires: March 31, 1993
BUREA	AU OF LAND MANAGEMENT	·· •	5. Lease Designation and Serial No.
			NM-0557371
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		KenetiveD	7. If Unit or CA, Agreement Designation
Type of Well		<u>- CCT 1 9 1993</u>	
Oil Gas Other		C.C.D.	8. Well Name and No.
Name of Operator	/	North States	Chalk Bluff Fed. Com.
Mewbourne Oil Company	·		9. API Well No.
P.O. Box 5270 Hobbs, I	New Mexico 88241 (505)) 393-5905	10. Field and Pool, or Exploratory Area
Location of Well (Footage, Sec., T., R., M., or	r Survey Description)	<u></u>	N. Illinois Camp
			11. County or Parish, State
2250' FWL & 790' FSL of	f Sec. 1-T18S-R27E		
			Eddy Co., N.M.
CHECK APPROPRIATE	E BOX(s) TO INDICATE NAT	URE OF NOTICE, REPO	ORT, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTIO	N
Notice of Intent	Abandonn	nent	Change of Plans
		tion	New Construction
Subsequent Report		Back	Non-Routine Fracturing
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	Other		Dispose Water (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)
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30-015-96575

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> 3 - 19-91 DrAL LAT. 9353 - 9444 9330 - 11/2 Dual SpaceD Neutron

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3 - 19 - 91

DUAL LAT. 2575-94440 9380-10112 DUAT SPACED NEUTRON

10-1- 9417 8500-10121

NC Tops	Dem	5/14/91
Queen		1140
Greyburg		1630
San Andres		1975
Glorieta		3548
Abo		>
wolfcamp		6860
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Atoka		9435
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NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON Governor **Betty Rivera Cabinet Secretary**

Lori Wrotenbery Director **Oil Conservation Division**

31 January 2003

Navajo Refining Co. P. O. Box 159 Artesia, New Mexico 88211

RE: Chalk Bluff Federal Com # 1 N-1-18-27

API 30-015-26575

Violation of Rule 201: Idle Well

Dear Sirs:

This second directive is to notify you that this well is still in violation of Rule 201.

On 12 December, 2002 a letter was sent notifying you on the violation of Rule 201. On 3 January, 2003 the form C-104 was faxed to you indicating Navajo Refining was the operator of this well. To date no action has been taken.

Rule 201 of the New Mexico Oil Conservation Division provides as follows:

201 WELLS TO BE PROPERLY ABANDONED

201.A. The operator of any well drilled for oil, gas or injection; for seismic, core or other exploration, or for a service well, whether cased or uncased, shall be responsible for the plugging thereof. [7-12-90...2-1-96] 201.B. A well shall be either properly plugged and abandoned or temporarily abandoned in accordance with these rules within ninety (90) days after:

(1) A sixty (60) day period following suspension of drilling operations, or

(2) A determination that a well is no longer usable for beneficial purposes, or

(3) A period of one (1) year in which a well has been continuously inactive. [7-12-90...2-1-96]

In the event that a satisfactory response is not received to this letter of direction by 15 March, 2003, further enforcement will occur. Such enforcement may include this office applying to the Division for an order summoning you to a hearing before a Division Examiner in Santa Fe to show cause why you should not be ordered to permanently plug and abandon this well. Such a hearing may result in imposition of CIVIL PENALTIES for your violation of OCD rules.

Sincerely,

Van Barton Field Rep. II 01/03/2003 FRI 08:25 FAX 505 746 5283 NAVAJO D/O DEPT

TO Shirley Jones - CRUDE OIL SUPPLY CLERK LEASE RECORDS Navajo Refining Company P.O. Box 159 Artesia, NM 88211-0159 phone (505) 746-5325 fax (505) 746-5283

shirley/@navalo-refining.com (please note the "j' after shirley)

TO: District II

FAX: 505-748-9720

RE: Chalk Bluff Federal Com #1

API No. 30-015-26575

MESSAGE:

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We have received the enclosed letter from you showing that Navajo Refining Company is the operator for the above referenced lease.

COMPANY:

PHONE:

Oil Conservation Division

505-748-1283

Navajo Refining Company is neither the operator, transporter or purchaser on this lease. Your Internet site shows Mewbourne Oil Company to be the operator.

We do have them as an operator on some of the leases that we transport. But this lease is not one of them.

We have contact information for them of: PO Box 7698, Tyler, TX 75711, with a New Mexico phone for Jerry Elgin of 505-393-5905.

If you have other information that shows Navajo Refining Company as the operator, would you please forward a copy to me so that I may research it further.

Thank you.

-Shirley Jones

Shirley - Please note the attached document-Signed by Darrell Moore.

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District I 1625 N. French Dr., Hobbs, NM 88240 Muth First, Artesia, NM 88210 Control III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources

Oil Conservation Division 2040 South Pacheco Santa Fe, NM 87505

Change of Operator

Form C-104A August 11. 2000

Sub-diff copy of the final affected wells had blog with 2 copies of this form per number of wells on that list to appropriate District Office

Prev	ious Operator Information:	Ne	ew Operator Information:
		Effective Date:	5 October, 2000
OGRID:	14744	New Ogrid:	15694
Name:	Mewbourne Oil Company	New Name:	Navaja Refining Company
Address:	P. O. Box 7698	Address:	100 C cont Court, Gee 1600
Address:		Address:	P.O. B. 159
City, State, Zip:	Tyler, TX 75711	City, State, Zip:	Dallas, PX 75201
			Artesia, NM 88211

I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information on this form and the attached list of wells is true and complete to the best of my knowledge and belief.

New Operator Signature:	Darull Moore
rinted name:	Darrell Moore
Title:	Env. Mgr. For Water and Waste
Date:	12/5/00 Phone: 505-748-3311

Previous operator complete below:	NMOCD Approval
Previous	A
Operator: Mewbourne Oil Company	Signature: Whi Sterm
Previous	Printed
OGRID: 14744	Name: 7 +
Signature: Mosty Whithfore Printed Name:	District: NOV 2 7 2000
Monty Whetstone	Date:
27021 - Property code 30-015-26575 - API	- Uhalk Bluff Fideral Com # 1 Humber 1-185-27E

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Form 3160-5 (September 2001)	UNITED STAT DEPARTMENT OF THE BUREAU OF LAND MA	TES E INTERIOI NAGEMEN'	N 1301	0il .M. [W. (Cons. DIV-Dist Grand A	t. 2 Venue	FORM AF OMB No. Expires: Janu	PROVED 1004-0135 1, 2004
SUNDI Do not use ti abandoned w	NOTICES AND REP his form for proposals t rell. Use Form 3160-3 (Al	ORTS ON to drill or to PD) for such	WELLS o re-enter h proposa	esia, r an ds.	NM 88	6. If Indi	serial No. an, Allottee or	Tribe Name
1. Type of Well					E a l	7. lf Unit	t or CA/Agreen	nent, Name and/or No
Oil Well Gas Well	Other TEMPORARILY	ABANDONE	D	1234		8. Well 1	Name and No. $\mathcal{A} \rightarrow \mathcal{A}$	
2. Name of Operator NAVAJO REFINING COMPA	NY 15694		15	k	ر ^{ن.}	9. API V	<u>3 7.5</u> Vell No.	23542
3a. Address		3b. Phon	e Non (inclu	de ared	Sale)	30-015-	26575	······
PO BOX 159, ARTESIA, NM	88211	505-748	-3119	100	NEUSIA	10. Field	and Pool, or E	ploratory Area
4. Location of Well (Footage, Sec.	, T, R., M., or Survey Description	on) ·	12	RES	ARIS	NAVA	IO INJECTIC	N; PERMO-PENN
790' FSL, 2250' FWL, 1-18S-2	7E	· ·	123	000 		EDDY		······
12. CHECK AP	PROPRIATE BOX(ES)	TO INDICA	TE NATU	RE OF	NOTICE,	REPORT, (OR OTHER	DATA
TYPE OF SUBMISSION			T	YPE OF	ACTION		·	·
	Acidize	Desper	1		Production (St	ert/Resume)	Water	Shut-Off
Notice of Intent	Alter Casing	Fractur	re Treat		Reclamation	•.	Well In	ntegrity
Subsequent Report	Casing Repair		onstruction		Recomplete	15 •	Other	RECOMPLETE AS
Final Abandonment Notice	Convert to Injection	Ping B	ack		i emporaruy A Water Disposal	osucion	WEI	I INJECTION
Original well name was CHALK DRILL OUT BRIDGE PLUG A' INJECTION-TEST PERFORAT DRILL OUT BRIDGE PLUGS A SQUEEZE-CEMENT PERFORA DRILL OUT BRIDGE PLUG A' RUN CBL/VDL AND CALIPER PERFORATE 8540' - 8620' ANI RUN INJECTIVITY TEST, ANI RUN INJECTION/FALLOFF TH RUN DIFFERENTIAL TEMPER RUN RADIOACTIVE TRACER INSTALL INJECTION TUBING INSTALL WELL ANNULUS M	CUUA BLUFF FEDERAL COM. N IONS AT 7050' - 7102', 7262 AT 7208' AND 7294'. CLEA ATIONS AT 7050' - 7102', 72 T 7600' AND CLEAN OUT FROM 9051' TO SURFACE O 7660' - 8450'. ACIDIZE IF NECESSARY ST. ATURE SURVEY. SURVEY. AND PACKER TO APPRO ONITORING EQUIPMENT	NO. 1 TO 7208'. 2' - 7278' TO N OUT HOL 262' - 7278', A TO TOP OF 1 E. (.)X. 7600'. , AND PREP	PLAN SQU E THROUG AND 7304' LÍNER AT	JEEZE-(GH PER - 7314'. 9051'.	CEMENT JO IFS AT 7304" NJECTION.		SEP 2 LES BA	VAL VAL 2003 BYAK ENGINEER
14. 1 hereby certify that the foregoin Name (Printed)Typed)	g is true and correct	· · · · ·	Title	F.,	M	£. 11	I Arry 1	46.4.
Signature David	1 Mine 0		Date	9/17	103	ier vo	<u>~~!!!~ \</u>	MASI C
Approved by (Signature)			N. (Pi	une isted/Typed	0		Title	
Cr ions of approval, if any, are co that the applicant holds lega action would entitle the applicant to c	attached. Approval of this noti 1 or equitable title to those right onduct operations thereon.	ce does not wa	errant or O	ffice			Dat	
18 U.S.C. Section 1001 and Tit States any false, fictitious or fraudule	le 43 U.S.C. Section 1212, make at statements or representations	e it a crime for as to any matte	any person i within its it	knowingt irisdiction	y and willfully	to make to an	iy department o	r agency of the United
(Continued on next page)						A.RE	eptid for n	cord - NMOCD
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District I 1625 N. French Dr., Ho <u>strict II</u> 01 W. Grand Avenue, <u>rict III</u> d0 Rio Brazos Rd., A <u>District IV</u> 1220 S. St. Francis Dr.,	bbs, NM 88240 , Artesia, NM 882 stee, NM 87410 Santa Fe, NM 874 V	En 19 RES VELL LO	ergy, Min OIL C 12 CATION	State of Ne erals & Natur ONSERVA' 20 South St Santa Fe, N N AND ACI	w Mexico al Resources Depa FION DIVISIO Francis Dr. IM 87505 REAGE DEDIC	rtment N Sub	Revise	Form C-102 ed June 10, 2003 te District Office Lease - 4 Copies Lease - 3 Copies
API N	fumber		¹ Pool Code		· · ·	Pool Name		
30 - 015 'Property Code 2 3 5 6	26575		·	⁸ Property WD	Nav Name W	ajo Injection; P	'ermo-Penn 'w	'eli Number 3
¹ OGRID No. 15694			N	[*] Operator avajo Refinir	Name ng Company	••••••••••••••••••••••••••••••••••••••	36	Elevation 09' GL; 25' KB
L				¹⁰ Surface	Location	· · · · · · · · · · · · · · · · · · ·		
UL or lot no. S N	ection Township 1 18S	Range 27E	Lot Idn	Feet from the 790	North/South line South	Feet from the 2250	East/West line WeSt	County Eddy
		¹¹ Bot	tom Hol	e Location I	f Different From	n Surface	-	
UL or lot no. S	ection Township	Range	Let Ida	Feet from the	North/South line	Feet from the	East/West line	County
NO ALLOWABI	LE WILL BE	Consolidation (ASSIGNED NON-STA	TO THIS	COMPLETIO	N UNTIL ALL IN EN APPROVED B	FERESTS HAVE	BEEN CONSOI	LIDATED OR A
•					3456789731	Printed Name Title and E-mail A Wester Date 18 SURVE I hereby certify to plotted from field	ATOR CERT that the information con- the best of my knowled and Market Arcell Mark Arcell Ma	IFICATION tained herein is true ge and belief.
· · · · · · · · · · · · · · · · · · ·						plotted from field my supervision, best of my belief	l notes of actual surveys and that the same is true :	made by me or under

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Accepted for record - NMOCD

REENTRY PROCEDURE

NAVAJO REFINING COMPANY'S WDW-3 (PROPOSED)

790'FSL and 2250' FWL, Section 1, T18S, R27E Eddy County, New Mexico Chalk Bluff Federal Com. No. 1, API No. 30-015-26575

All depths are in feet below well's original kelly bushing height (RKB) of 16 feet above ground level. The original KB elevation is 3625 feet above mean sea level. The ground level elevation is 3609 feet above mean sea level.

Tops of Geologic Formations (from RKB)

The base of the lowermost USDW is at 420 feet.

San Andres	1976 feet	Lower Wolfcamp	7303 feet
Yeso	4030 feet	Cisco	7650 feet
Abo	5380 feet	Canyon	8390 feet
Wolfcamp	6745 feet	Strawn	8894 feet

Depth of Plugs

7010 feet in 7-inch casing above perforations 7050 feet to 7102 feet
7208 feet in 7-inch casing above perforations 7262 feet to 7278 feet
7294 feet in 7-inch casing above perforations 7304 feet to 7314 feet
7600 feet in 7-inch casing above perforations 7676 feet to 7678 and
7826 feet to 7830 feet

9800 feet in 4-1/2-inch liner above perforations 9861 feet to 9967 feet

Anticipated Formation Pressure

The expected bottom-hole pressure is 3448 pounds per square inch absolute (psia) at 9000 feet, for a gradient of 0.383 pounds per square inch (psi) per foot, or an equivalent

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Navajo/60D5497_Permit/Reentry Procedure

mud weight of 7.36 pounds per gallon (ppg). The bottom-hole pressure was determined from the pressure measured in Navajo's WDW-2, or 2813 psia, at 7570 feet. Navajo's WDW-2 is completed in the same interval proposed for WDW-3 and is located in 12-T18S-R27E, 3200 feet southwest of proposed WDW-3. The average specific gravity of the fluid in the Cisco and Canyon Formations is expected to be 1.025, which is the specific gravity of the fluid swabbed from WDW-2 in June 1999 from the interval between 7826 feet and 8399 feet. The expected bottom-hole pressure at 9000 feet in proposed WDW-3 is calculated below:

BHP (9000 feet) = $2813 \text{ psia} + (9000 \text{ feet} - 7570 \text{ feet}) \times 0.433 \text{ psi/ft} \times 1.025$ = 3448 psia

Reentry Procedure

- 1. Level location to accommodate a workover rig, pump, tanks, and ancillary equipment. Build a small working pit approximately 30 feet square and 3 feet deep with a plastic lining. Move in the rig, tank, shale shaker, and work string.
- 2. Install a 7-1/16-inch, 3000-psi double hydraulic blowout preventer (BOP) and a 7-1/16-inch, 3000-psi annular BOP (see Exhibit A for schematic). Pressure test the BOP stack and casing to 1500 psi for 30 minutes. Pick up a 6-1/8-inch bit, and sufficient 4-3/4-inch drill collars to drill out the cement plugs, on a 2-7/8-inch work string. Mix a tank of 8.5-ppg sodium chloride brine water for circulating fluid.
- 3. Run the bit to 7000 feet and circulate the wellbore fluid out of the casing into a frac tank for disposal. Drill out the cast iron bridge plug (CIBP), cement at 7010 feet, and clean out to the CIBP at 7208 feet. Circulate the hole clean and pump into the perforations from 7050 feet to 7102 feet to establish a rate and pressure for a pending squeeze cement job.
- 4. Drill out the CIBP at 7208 feet and clean out past the perforations from 7262 feet to 7278 feet and drill out the third CIBP at 7294 feet. Clean out below the perforations from 7304 feet to 7314 feet. Run a second injection test for injection rate and pressure comparison.

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- 5. Pull the bit and run a retrievable squeeze packer on the work string. Set the packer at 7150 feet and test for communication between the perforations. Squeeze the perforations from 7262 feet to 7278 feet and 7304 feet to 7314 feet with approximately 100 sacks of neat cement (actual squeeze cement volume to be determined by the injection rate established previously), attempting to reach 1500 psi to 2000 psi squeeze pressure. Release the packer and reverse out any excess cement, then re-test the perforations to the squeeze pressure.
- 6. Re-set the packer at 6900 feet and squeeze the perforations from 7050 feet to 7102 feet as before.
- 7. Lay down the squeeze packer and drill out the cement to the CIBP at 7600 feet. Conduct a pressure test to 500 psi for 12 hours to confirm the squeeze cement will contain the annular fluid pressure required during injection operations.
- 8. Drill out the CIBP at 7600 feet and circulate to the top of the liner at 9051 feet. Circulate the casing clean with 8.5-ppg brine water. Pull the bit and lay down the drill collars.
- 9. Run a cement bond log with variable density (CBL/VDL) from the liner top to the surface, followed by a baseline multi-finger caliper log from the liner top to the surface.
- 10. Perforate the intervals 8540 feet to 8620 feet and 7660 feet to 8450 feet with 2 JSPF, using hollow steel carrier perforating guns.
- 11. Run the work string and retrievable packer to 7600 feet. Swab, or backflow, the perforated interval to recover a representative sample of the formation water for laboratory analysis. Monitor the recovered fluid for hydrogen sulfide.
- 12. Conduct a short injectivity test with 8.5-ppg brine water to determine the need for stimulation. If required, stimulate the perforations with acid (type and amount to be determined from injectivity results), followed by 500 barrels of 8.5-ppg brine water.

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Navajo/60D5497_Permit/Reentry Procedure

- 13. Pull the work string and lay it down. Run a surface readout pressure gauge, with memory backup, to 7600 feet. Conduct an injection test down the casing at 420 gallons per minute for 12 hours (7200 barrels). Shut the well in and record the pressure falloff for a minimum of 12 hours.
- 14. Pull the gauges and run a differential temperature survey from surface to 9100 feet. Run a radioactive tracer survey to demonstrate mechanical integrity.
- 15. Run a tubing conveyed injection packer on 4-1/2-inch, 11.60 lb/ft, K-55, LT&C, 8rd injection tubing. Set the packer at approximately 7600 feet. Fill the annular space with 8.5-ppg brine water containing oxygen scavenger and corrosion inhibitor. Land the injection tubing in the wellhead and install the upper section.

16. Pressure test the annulus as required by New Mexico regulations.

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17. Install well annulus monitoring equipment and prepare the well for injection.

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Navajo/60D5497_Permit/Reentry Procedure



A = ANNULAR BLOWOUT PREVENTER 7-1/16", 3000 psi working pressure

R = RAM TYPE BLOWOUT PREVENTER 7-1/16", 3000 psi working pressure

S = DRILLING SPOOL WITH SIDE OUTLETS 7-1/16", 3000 psi working pressure

Manual Choke Manifold 2", 3000 psi working pressure

Source: API RP 53, Recommended Practices for Blowout Prevention EquipmentSystems

Exhibit A Blowout Preventer M Requirements	linimum
ATED: 07/24/03 APPROVED BY:	208 NO. 60d5
NAWN BY: JDB CHECKED BY:	SCALEMAN



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SURFACE USE PLAN

NAVAJO REFINING COMPANY PROPOSED WDW-3 790' FSL, 2250' FWL, 1-T 18S-R27E EDDY COUNTY, NEW MEXICO

- 1. <u>Existing Roads</u>: Existing roads that lead to the proposed drillsite are shown on Exhibit A.
- 2. Access Roads To Be Constructed: No new access road is proposed.
- 3. <u>Location of Existing Wells</u>: Existing wells within one mile of proposed WDW-3 are shown on Exhibit B.
- 4. <u>Location of Proposed Facilities If Well Is Completed</u>: The well will be shut in after completion and testing.
- 5. <u>Location and Type of Water Supply</u>: Water for reentry, testing, and completion operations will be purchased from a commercial water hauler.
- 6. Source of Construction Materials: No construction materials will be required.

7. Methods of Handling Waste Disposal:

- A. Drill cuttings will be disposed of in the drilling pits.
- B. Drilling fluids will be allowed to evaporate in the drilling pits until the pits are dry.

- C. Water produced during tests will be disposed of in the drilling pits.
- D. Trash, waste paper, garbage, and junk will be buried in a trash pit and covered with a minimum of 24 inches of dirt. All waste material will be contained to prevent scattering by the wind.
- E. All trash and debris will be buried or removed from the wellsite after finishing drilling and/or completion operations.

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8. Ancillary Facilities: None anticipated.

9. <u>Wellsite Layout</u>:

A. The existing well pad will be leveled to accommodate a workover rig, pump, tanks, and ancillary equipment.

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- B. Existing topsoil to a depth of 6 inches will be lifted and stockpiled at the uphill end of the well pad. The stockpiled topsoil will be located uphill to avoid mixing with subsurface materials.
- C. The well pad will be surfaced with material found in place.
- D. A small working pit will be constructed to hold drilling fluids and cuttings. The approximate dimensions of the pit will be 30 feet x 30 feet x 3 feet.
- E. The working pit for drilling fluids and cuttings will be lined with 6-mil plastic.

10. Plans for Restoration of Surface:

- A. After completion of drilling and/or completion operations, all equipment and other material not needed for operations will be removed. Pits will be filled and the location cleaned of all trash and junk.
- B. Any unguarded pits containing fluids will be fenced until they are filled.
- C. After abandonment, all equipment, trash, and junk will be removed and the location cleaned.
- D. The stockpiled topsoil will be spread over the surface of the location.
- 11. Surface Ownership: U.S. Department of Interior, Bureau of Land Management.
- 12. <u>Archaeological Survey</u>: Navajo Refining Company is conducting an archeological survey. The report of the survey will be submitted by Navajo under separate cover.
- 13. <u>Operator's Representatives</u>: Representatives responsible for assuring compliance with the approved Surface Use Plan:

Accepted for record - NMOCD

Mr. Darrell Moore Navajo Refining Company Post Office Box 159 Artesia, New Mexico 88211 505/748-3311 Mr. Jim Bundy Subsurface Technology, Inc. 7020 Portwest Drive, Suite 100 Houston, Texas 77024 713/880-4640

Exhibits

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A. Topographic Map

B. Oil and Gas Map

14. Certification:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions that exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Navajo Refining Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

Date

Signature

Navajo Refining Company Company

Accepted for record - NMOCD

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		OCD-AR	TESIA	,	
Form 3160-5 (February 2005)	UNITED STATES DEPARTMENT OF THE	S INTERIOR		FC ON Exp	ORM APPROVED M B No. 1004-0137 pires: March 31, 2007
I	BUREAU OF LAND MAN	AGEMENT		5. Lease Serial No).
SUNDRY Do not use th	NOTICES AND REI	PORTS ON WEL	.LS nter an	6. If Indian, All	lottee or Tribe Name
abandoned we	ell. Use Form 3160-3 ()	APD) for such proj	oosals.		· .
SUBMIT IN TR	IPLICATE- Other insti	ructions on revers	se side.	7. If Unit or CA	VAgreement, Name and/or No.
I. Type of Well	Gas Well 🖌 Other		-	8 Well Name a	md No
2. Name of Operator NAVAJO RE	EFINING COMPANY	<u></u>		WDW-3	· · · · · ·
3a Address		3b. Phone No finalule	(Accept)	30-015-265	575
4. Location of Well (Footage, Sec.	T. R. M. or Survey Description)	505-746-5201	7 2006	10. Field and Po NAVAJO	ool, or Exploratory Area INJECTION; PERMO-PEN
790' FSL, 2250' FWL, 1-18S -	27E	jul I Chine ri		11. County or P	Parish, State
		Garan Maria M		EDDY, NN	1
12. CHECK AI	PPROPRIATE BOX(ES) TO	INDICATE NATURI	E OF NOTICE,	REPORT, OR O	THER DATA
TYPE OF SUBMISSION	· · · · · · · · · · · · · · · · · · ·	TYP	E OF ACTION		
Notice of Intent	Acidize	Deepen	Production (S	itart/Resume)	_JWater Shut-Off Well Integrity
Subsequent Report	Casing Repair	New Construction	Recomplete		Other RECOMPLETE AS
Final Abandonment Notice	Change Plans	Plug and Abandon	Temporarily A	\bandon	CLASS I
13. Describe Proposed or Complete If the proposal is to deepen dire Attach the Bond under which the following completion of the invitesting has been completed. Find determined that the site is ready ORIGINAL WELL NAM	ed Operation (clearly state all perti- sctionally or recomplete horizontall he work will be performed or provi volved operations. If the operation nal Abandonment Notices must be for final inspection.)	nent details, including estin ly, give subsurface location ide the Bond No. on file w results in a multiple comple filed only after all requiren	nated starting date of s and measured and t ith BLM/BLA. Requ etion or recompletion nents, including recla	any proposed work a nue vertical depths of ired subsequent repoi in a new interval, a l mation, have been cc	and approximate duration thereof. f all pertinent markers and zones. rts must be filed within 30 days Form 3160-4 must be filed once mpleted, and the operator has
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<u>Image 1</u>: Facing west. Christmas Tree with 500-barrel tanks in background. Far left tank was the only tank providing salt water. Truck on left is the pump truck pumping brine water only. Right truck is the rig truck (Wood Group Logging Service).



<u>Image 2</u>: Radioactive tool set up. Tracer, Iodine 131 (half-life ~ 8 days).



<u>Image 3</u>: Rig truck with view of data logger compartment (Wood Group Logging Services).



<u>Image 4</u>: Petroplex workers prepping wellhead for wire line tool entry.



<u>Image 5</u>: Petroplex employees laying pipe from pump truck to well head.



<u>Image 6</u>: Pump truck, Petroplex, for Brine water pumping only. <u>No</u> HCL used throughout process.



<u>Image 7</u>: Securing of the wire line to the wellhead.



Image 8: Wood Group employee securing wellhead for tool entry.



<u>Image 9</u>: Configuration at the top end of the boom.

Image 12:

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Image 10:







Image 13:



Image 14:



Image 15:







Image 17:



Image 18:



Image 19:



Image 20:





GST Time (hr;min:sec)

District I 1625 N. French Dr., Hobbs, NM 88240 District II					State nergy Mincr	State of New Mexico Minerals and Natural Resources				Form C-101 May 27, 2004		
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		NAVAJO II	Proposed Pool 1 NECTION; PERM	10-PENN					Propo	Proposed Pool 2		
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Hole S	20	Cas	ang Size	Casing weight/lool		<u> </u>	elting De	-pun	Sacks of Cer	ment	Estimated TOC	
12.1/	<u>/"</u> /"	L	5/07		26#		400	,	425 - CI	RC -	····	{
8-3/4	»		7»	26#	26# and $29#$		9450	,	1350 - CI			
17-1/2" 13.3/8" 54.50# 400" 425 - CIRC 12-1/4" 9.5/8" 36# 2604' 1025 - CIRC 8-3/4" 7" 26# and 29# 94.50' 1350 - CIRC ** Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary. ORGINAL WELL NAME WAS CHALK BLUFF FEDERAL COM. NO. 1 WELL WILL BE PLUGGED BACK AND COMPLETED AS A CLASS INDECTION WELL AS FOLLOWS: ORILL OUT BRIDGE PLUG AT 7010' AND CLEAN OUT TO 7208; NIECTION-TEST PERFORATIONS AT 7050-7102, 7262-7278 TO PLAN SQUEEZE CEMENT FIOB; DRILL OUT BRIDGE PLUG AT 7000' AND CLEAN OUT TO TORO FLINE TRROUGH PERFS AT 7304-7314; SQUEEZE-CEMENT FERFORATIONS AT 7050-7102, 7262-7278, TO PLAN SQUEEZE CEMENT FORMATION AND AD SOLT TO SURFACE; PERFORATION SAT 7050-7102, 7262-7278, TO PLAN SQUEEZE CEMENT FORMATION AND AD SOLT 705 URFACE; PERFORATE ESOL SASON AND 7600-3450; RUN NUECTION/TALLOFF TEST; RUN NUECTION/TALLOFF TEST; RUN NUECTION/TUBING AND PACKER TO APPROX. 7600; AND NISTALL WELL ANNULS MONTORING EOUIPMENT. AND PREPARE FOR WELL INJECTION. ** Therby certify that the information given above is ince and complete to the constructed according to NMOCD guidelines [], a general permit [], or an (attached) alternative OCD-approved plan []. OIL CONSERVATION DIVISION <td>2010c.</td>							2010c.					
Date: 6/24	106		Phone: Sos	744-	5241	Conditio	ns of Ap	proval Attach	ed & Dis	SIRIC	SURE MUS	7
	-								BAP	ROVÊ GRAM	CASING 1	

District I 1625 N. French Dr., Hobbs, NM 88240 Istrict II 301 W. Grand Avenue, Artesia, NM 88210 Fict III 301 Rio Brazos Rd., Aztec, NM 87410 District IV

1220 S. St. Francis Dr., Santa Fo, NM 87505

State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505 Form C-102 Revised June 10, 2003 Submit to Appropriate District Office State Lease - 4 Copies Fee Lease - 3 Copics

AMENDED REPORT

TRANST T	100.00	ALT	1000.00	DODTOLOOVAL	1
WHELL	1 / 11 / 1/2/1	$() \land () \land ())$		- 1 16 1 17 7 4 7 1 76 10	
	LUCAI		NORDOL	DUDUCTION	11201

API Number 30 - 015 -26575			* Pool Code		Pool Name Navaio Injection: Permo-Penn					
* Property Code		Property Naine WDW					* Well Number 3			
OGRID No.			¹ Operator Name Navajo Refining Company 3609' GI 3625' KJ						Blayntian 09' GL; 25' KB	
L			<u></u>	<u> </u>	¹⁰ Surface	Location		II		
UL or lot no. N	Section 1	Township 18S	Range 27E	Lot Idn	Feet from the 790	North/South line South	Feel from the 2250	East/West line West	County	
I	<u></u>	L	^{II} Bot	tom Hol	e Location If	Different From	1 Surface			
UL or lot no.	Section	Township	Range	Lot Ida	Feet from the	North/South line	Feet from the	East/West line	County	
¹² Dedicated Acre	Joint o	r InOU ¹⁴ C	onsolidation (Code · 15 Ori	lér No.			-----		

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

u			¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.
			some Daniel Moore
			Minud Nume Darrell Maare
			The and Bernall Address Env. Mar. For Water a Waste Jarrell@navejo-retining-cour 9/17/03
		-	¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field noises of actual surveys mode by me or under ny supervision, and that the same is true and carrect to the best of my belief.
			Date of Survey Stemature and Seal of Professional Surveyor:
← 2250 −	→		
	790 ↓		Certificute Number

REENTRY PROCEDURE

NAVAJO REFINING COMPANY'S WDW-3 (PROPOSED)

790'FSL and 2250' FWL, Section 1, T18S, R27E Eddy County, New Mexico Chalk Bluff Federal Com. No. 1, API No. 30-015-26575

All depths are in feet below well's original kelly bushing height (RKB) of 16 feet above ground level. The original KB elevation is 3625 feet above mean sea level. The ground level elevation is 3609 feet above mean sea level.

Tops of Geologic Formations (from RKB)

The base of the lowermost USDW is at 420 feet.

San Andres	1976 feet	Lower Wolfcamp	7303 feet
Yeso `	4030 feet	Cisco	7650 feet
Abo	5380 feet	Canyon	8390 feet
Wolfcamp	6745 feet	Strawn	8894 feet

Depth of Plugs

7010 feet in 7-inch casing above perforations 7050 feet to 7102 feet
7208 feet in 7-inch casing above perforations 7262 feet to 7278 feet
7294 feet in 7-inch casing above perforations 7304 feet to 7314 feet
7600 feet in 7-inch casing above perforations 7676 feet to 7678 and
7826 feet to 7830 feet

9800 feet in 4-1/2-inch liner above perforations 9861 feet to 9967 feet

Anticipated Formation Pressure

The expected bottom-hole pressure is 3448 pounds per square inch absolute (psia) at 9000 feet, for a gradient of 0.383 pounds per square inch (psi) per foot, or an equivalent

vaio/60D5497 Penn

mud weight of 7.36 pounds per gallon (ppg). The bottom-hole pressure was determined from the pressure measured in Navajo's WDW-2, or 2813 psia, at 7570 feet. Navajo's WDW-2 is completed in the same interval proposed for WDW-3 and is located in 12-T18S-R27E, 3200 feet southwest of proposed WDW-3. The average specific gravity of the fluid in the Cisco and Canyon Formations is expected to be 1.025, which is the specific gravity of the fluid swabbed from WDW-2 in June 1999 from the interval between 7826 feet and 8399 feet. The expected bottom-hole pressure at 9000 feet in proposed WDW-3 is calculated below:

BHP (9000 feet) = $2813 \text{ psia} + (9000 \text{ feet} - 7570 \text{ feet}) \times 0.433 \text{ psi/ft} \times 1.025$ = 3448 psia

Reentry Procedure

- 1. Level location to accommodate a workover rig, pump, tanks, and ancillary equipment. Build a small working pit approximately 30 feet square and 3 feet deep with a plastic lining. Move in the rig, tank, shale shaker, and work string.
- 2. Install a 7-1/16-inch, 3000-psi double hydraulic blowout preventer (BOP) and a 7-1/16-inch, 3000-psi annular BOP (see Exhibit A for schematic). Pressure test the BOP stack and casing to 1500 psi for 30 minutes. Pick up a 6-1/8-inch bit, and sufficient 4-3/4-inch drill collars to drill out the cement plugs, on a 2-7/8-inch work string. Mix a tank of 8.5-ppg sodium chloride brine water for circulating fluid.
- 3. Run the bit to 7000 feet and circulate the wellbore fluid out of the casing into a frac tank for disposal. Drill out the cast iron bridge plug (CIBP), cement at 7010 feet, and clean out to the CIBP at 7208 feet. Circulate the hole clean and pump into the perforations from 7050 feet to 7102 feet to establish a rate and pressure for a pending squeeze cement job.
- 4. Drill out the CIBP at 7208 feet and clean out past the perforations from 7262 feet to 7278 feet and drill out the third CIBP at 7294 feet. Clean out below the perforations from 7304 feet to 7314 feet. Run a second injection test for injection rate and pressure comparison.

- 5. Pull the bit and run a retrievable squeeze packer on the work string. Set the packer at 7150 feet and test for communication between the perforations. Squeeze the perforations from 7262 feet to 7278 feet and 7304 feet to 7314 feet with approximately 100 sacks of neat cement (actual squeeze cement volume to be determined by the injection rate established previously), attempting to reach 1500 psi to 2000 psi squeeze pressure. Release the packer and reverse out any excess cement, then re-test the perforations to the squeeze pressure.
- 6. Re-set the packer at 6900 feet and squeeze the perforations from 7050 feet to 7102 feet as before.
- 7. Lay down the squeeze packer and drill out the cement to the CIBP at 7600 feet. Conduct a pressure test to 500 psi for 12 hours to confirm the squeeze cement will contain the annular fluid pressure required during injection operations.
- 8. Drill out the CIBP at 7600 feet and circulate to the top of the liner at 9051 feet. Circulate the casing clean with 8.5-ppg brine water. Pull the bit and lay down the drill collars.
- 9. Run a cement bond log with variable density (CBL/VDL) from the liner top to the surface, followed by a baseline multi-finger caliper log from the liner top to the surface.
- 10. Perforate the intervals 8540 feet to 8620 feet and 7660 feet to 8450 feet with 2 JSPF, using hollow steel carrier perforating guns.
- 11. Run the work string and retrievable packer to 7600 feet. Swab, or backflow, the perforated interval to recover a representative sample of the formation water for laboratory analysis. Monitor the recovered fluid for hydrogen sulfide.
- 12. Conduct a short injectivity test with 8.5-ppg brine water to determine the need for stimulation. If required, stimulate the perforations with acid (type and amount to be determined from injectivity results), followed by 500 barrels of 8.5-ppg brine water.

Navajo/60103497_Permis/Recentry Procedure

- 13. Pull the work string and lay it down. Run a surface readout pressure gauge, with memory backup, to 7600 feet. Conduct an injection test down the casing at 420 gallons per minute for 12 hours (7200 barrels). Shut the well in and record the pressure falloff for a minimum of 12 hours.
- 14. Pull the gauges and run a differential temperature survey from surface to 9100 feet. Run a radioactive tracer survey to demonstrate mechanical integrity.
- 15. Run a tubing conveyed injection packer on 4-1/2-inch, 11.60 lb/ft, K-55, LT&C, 8rd injection tubing. Set the packer at approximately 7600 feet. Fill the annular space with 8.5-ppg brine water containing oxygen scavenger and corrosion inhibitor. Land the injection tubing in the wellhead and install the upper section.

0/60D5497 Pc

- 16. Pressure test the annulus as required by New Mexico regulations.
- 17. Install well annulus monitoring equipment and prepare the well for injection.

	 A = ANNULAR BLOWOUT PREVENTER 7-1/16", 3000 psi working pressure R = RAM TYPE BLOWOUT PREVENTER 7-1/16", 3000 psi working pressure S = DRILLING SPOOL WITH SIDE OUTLETS 7-1/16", 3000 psi working pressure Manual Choke Manifold 2", 3000 psi working pressure
Source: API RP 53, Recommended Practices for Blowout Prevention EquipmentSystems	SUBSURFACE SOUTH BERD, IN SOUTH BERD, IN SATON ROUGE, LA Exhibit A Blowout Preventer Minimum Requirements DATEOL 0772403 APPROVED BY DRAWN BY: 3DS CHECKED BY SCALE N/A

~


SURFACE USE PLAN

NAVAJO REFINING COMPANY PROPOSED WDW-3 790' FSL, 2250' FWL, 1-T 18S-R27E EDDY COUNTY, NEW MEXICO

- 1. <u>Existing Roads</u>: Existing roads that lead to the proposed drillsite are shown on Exhibit A.
- 2. Access Roads To Be Constructed: No new access road is proposed.
- 3. <u>Location of Existing Wells</u>: Existing wells within one mile of proposed WDW-3 are shown on Exhibit B.
- 4. <u>Location of Proposed Facilities If Well Is Completed</u>: The well will be shut in after completion and testing.
- 5. <u>Location and Type of Water Supply</u>: Water for reentry, testing, and completion operations will be purchased from a commercial water hauler.
- 6. Source of Construction Materials: No construction materials will be required.
- 7. Methods of Handling Waste Disposal:
 - A. Drill cuttings will be disposed of in the drilling pits.
 - B. Drilling fluids will be allowed to evaporate in the drilling pits until the pits are dry.
 - C. Water produced during tests will be disposed of in the drilling pits.
 - D. Trash, waste paper, garbage, and junk will be buried in a trash pit and covered with a minimum of 24 inches of dirt. All waste material will be contained to prevent scattering by the wind.
 - E. All trash and debris will be buried or removed from the wellsite after finishing drilling and/or completion operations.

10105497 P

8: Ancillary Facilities: None anticipated.

9. Wellsite Layout:

- A. The existing well pad will be leveled to accommodate a workover rig, pump, tanks, and ancillary equipment.
- B. Existing topsoil to a depth of 6 inches will be lifted and stockpiled at the uphill end of the well pad. The stockpiled topsoil will be located uphill to avoid mixing with subsurface materials.
- C. The well pad will be surfaced with material found in place.
- D. A small working pit will be constructed to hold drilling fluids and cuttings. The approximate dimensions of the pit will be 30 feet x 30 feet x 3 feet.
- E. The working pit for drilling fluids and cuttings will be lined with 6-mil plastic.

10. Plans for Restoration of Surface:

- A. After completion of drilling and/or completion operations, all equipment and other material not needed for operations will be removed. Pits will be filled and the location cleaned of all trash and junk.
- B. Any unguarded pits containing fluids will be fenced until they are filled.
- C. After abandonment, all equipment, trash, and junk will be removed and the location cleaned.
- D. The stockpiled topsoil will be spread over the surface of the location.
- 11. Surface Ownership: U.S. Department of Interior, Bureau of Land Management.
- 12. <u>Archaeological Survey</u>: Navajo Refining Company is conducting an archeological survey. The report of the survey will be submitted by Navajo under separate cover.
- 13. <u>Operator's Representatives</u>: Representatives responsible for assuring compliance with the approved Surface Use Plan:

Navaio/60D5497 Pennit Surface Use Pl

Mr. Darrell Moore Navajo Refining Company Post Office Box 159 Artesia, New Mexico 88211 505/748-3311 Mr. Jim Bundy Subsurface Technology, Inc. 7020 Portwest Drive, Suite 100 Houston, Texas 77024 713/880-4640

Exhibits

A. Topographic Map

B. Oil and Gas Map

14. Certification:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions that exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Navajo Refining Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

9/17/03 Date

Signa Natora Waite EAU. M

Navajo Refining Company Company

3





Submit 3 Copies To Appropriate District State	of New Mexico	Form C-103
-District Energy,-Minera	als and Natural Resources	May 27, 2004
1625 N. French Dr., Hobbs, NM 88240		WELL API NO.
1301 W. Grand Ave., Artesia, NM 88210 OIL CONSE	RVATION DIVISION	5 Indicate Type of Lease
istrict III 1220 Sou	uth St. Francis Dr.	STATE X FEE
Jistrict IV Santa	Fe, NM 87505	6. State Oil & Gas Lease No.
1220 S. St. Francis Dr., Santa Fe, NM	0.34501091011	NM-0557371
SUNDRY NOTICES AND REPORTS	ON WELLS	7. Lease Name or Unit Agreement Name
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO D	EFEN OR PLUCHACK TO A	WDW - 3
DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (F PROPOSALS.)	M DA CCE	
1. Type of Well: Oil Well Gas Well X Other	APYED 6	8. Well Number 3
2. Name of Operator	ESIA ST	9. OGRID Number
NAVAJO REFINING COMPANY		
3. Address of Operator POREAY 159 ARTESIA NM 88211	SZ #ZEZZZV200	10. Pool name or wildcat
A. W. H. L		· · · · · · · · · · · · · · · · · · ·
4. Well Location	UTIL line and 2250 feet from	the WEST Has
Unit Letter : <u>790</u> leet from the <u>SO</u>	<u>UTH</u> line and <u>2250</u> leet from	the <u>WESI</u> line
Section 1 Township 18 south Range 27	whathar DR RKR RT CR ato	
GR 3609', RKB 362	5'	
Pit or Below-grade Tank Application 🗌 or Closure 🗌		
Pit type <u>N/A</u> Depth to Groundwater <u>100 FT</u> Distance from	nearest fresh water well <u>1 MILE</u> I	Distance from nearest surface water <u>6 MILES</u>
Pit Liner Thickness: N/A mil Below-Grade Tan	k: Volume <u>N/A</u> bbls; Co	onstruction Material <u>N/A</u>
12 Check Appropriate Box to	Indicate Nature of Notice	Report or Other Data
12. Check Appropriate Box to	multate Mature of Motice,	Report of Other Data
NOTICE OF INTENTION TO:	SUB	SEQUENT REPORT OF:
PERFORM REMEDIAL WORK 🔲 🛛 PLUG AND ABANDO	ON 🔲 🛛 REMEDIAL WOR	K 🔲 ALTERING CASING 🗌
PULL OR ALTER CASING U MULTIPLE COMPL		ТЈОВ
JTHER: To complete a Class 1 non-hazardous waste we		mpletion report to follow X
13. Describe proposed or completed operations. (Clear	rly state all pertinent details, an	d give pertinent dates, including estimated date
of starting any proposed work). SEE RULE 1103.	For Multiple Completions: At	tach wellbore diagram of proposed completion
or recompletion.		
See attached well summary document and well schematic		
See and they would build any bootanion and would bolionante.		
NIT WHUSSED by CARI CHOUEZ		· · ·
Mit Witnessed by Carl Chavez		
Mit Witnessed by Carl Chavez No Chart Submitted		
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Mit Witnessed by Carl Chavez No Chart Submitted	lete to the best of my knowledge	e and belief. I further certify that any pit or below-
Mit Witnessed by Carl Chavez No Chart Submitt Ed. J.	lete to the best of my knowledg D guidelines □, a general permit □	e and belief. I further certify that any pit or below- or an (attached) alternative OCD-approved plan].
Mit Witnessed by Carl Chavez No Chart Submitt Ed.	lete to the best of my knowledg D guidelines □, a general permit □	e and belief. I further certify that any pit or below- or an (attached) alternative OCD-approved plan [].
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Mit Witnessed by Carl Chavez No Chart Submitt Ed. I hereby certify that the information above is true and comp grade tank has been/will be constructed or closed according to NMOC SIGNATURE Caul Mare	lete to the best of my knowledg D guidelines , a general permit TITLE Ew. Mer. Sr E-mail address:	e and belief. I further certify that any pit or below- or an (attached) alternative OCD-approved plan []. Water & Wask DATE 1/48/07 Telephone No
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State Lease - 6 copie	es		- Da	S1	tate of New I	Mexi					_	7	Form C-10:
Fee Lease - 5 copies District 1			En	ergy, M	inerais and in	atural	Resources	ŀ	WELL A	PI NO.			Kevised June 10, 200.
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21. Type Electric a	and Oth BL/V	er Logs Run DL, Temp	erature, Calip	oer, Radi	oactive Tracer,	Press	sure		22. Was W	ell Cored		No	
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28					PRO	DU	CTION						
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1450 PSI	130 P		0 DEM		N/A		IN/A		N/A				N/A
29. Disposition of NO GAS	Gas (Sol	ld, used for fu	el, vented, etc.)							Test W	itnesse	d By	
30. List Attachmen WELL SUMMAR	its Y OF F	VENTS. WE	LL WAS CONV	ERTED 7	O A CLASS I NO	N-HA	ZARDOUS WA	TER	WASTE DIS	POSAL	WELI	A FUI	L REPORT WILL
FOLLOW AT A L	ATER I	DATE.	tion chown on	hoth aida	a of this form as	10000	nd complete to	14-01				hallat	
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Well Summary

Navajo Refining Company (Navajo) contracted Subsurface Technology, Inc. (Subsurface), to prepare an application for permit and to reenter a plugged and abandoned (P&A) oil and gas well. The Application for Permit to Drill or Reenter and the Sundry Notices and Reports on Wells was submitted to the Department of the Interior, Bureau of Land Management (BLM), on June 29, 2006 and approved. The Application for Permit to Drill, Re-enter, Deepen, Plug Back, or add a Zone was submitted to the State of New Mexico Oil Conservation Commission (OCD) on June 29, 2006 and approved.

Subsurface prepared an engineering plan to reenter the P&A'ed oil and gas well formally owned by Mewbourne Oil Company. The original well name was Caulk Bluff Federal #1 (API number 30-015-26575), and a Change of Operator application was submitted to the OCD on December 5, 2000 and approved under the well name of WDW-3. Under contract to Navajo, Subsurface commenced field operations on September 25, 2006. The existing location was cleared and prepared for reentry operations. An earthen lined reserve pit was dug to catch returns. All depths unless stated are referenced to rig floor at six feet to seven feet above ground level. The rig floor was moved from six feet to seven feet after drilling out the cast iron bridge plugs.

A workover rig and reverse unit was placed on location and the existing wellhead was removed. The first cast iron bridge plug (CIBP) at 7010 feet was drilled and the perforated interval from 7050 feet to 7102 feet was squeezed off with neat cement and successfully pressured tested to six hundred eighty pounds per square inch gauge pressure (680 psig). The second and third CIBP at 7190 feet and 7279 feet was drilled. There appeared to be ten feet of cement on top of the third CIBP. The perforated interval from 7262 feet to 7278 feet and from 7304 feet to 7314 feet was squeezed with neat cement. The squeezed interval was pressure tested to 920 psig and would not hold. A second cement squeeze was performed across the perforated interval from 7262 feet to 7278 feet and from 7304. The interval was pressured tested to 630 psig and continued to lose pressure at a rate of two pounds per square inch every thirty minutes (2 psi/30 min). The fourth CIBP at 7595 feet was drilled and at 7838 feet a cement plug was encountered and drilled through. Cement was tagged twenty nine (29) feet above the top of the liner at 9022 feet. The hole was circulated clean and prepared for logging.

A Cement Bond Log (CBL), Variable Density Log (VDL), caliper log, and temperature survey were performed. The CBL/VDL showed that the top of the cement (TOC) behind the 7-inch casing was located 900 feet from the surface. The OCD was notified and approved the existing well condition. The casing was perforated from 7660 feet to 8450 feet and from 8540 feet to 8620 feet at 2-JSPF on sixty degree (60°) phasing.

A packer was set at 7546 feet with 2 7/8-inch PH-6 tubing, the well was swabbed back and samples of the formation fluid were recovered. It was estimated that two hundred twenty six barrels (226 bbls) of formation fluid was returned to the surface. A pressure test on the annulus between the 7-inch and 2 7/8-inch was performed at 660 psig with the annulus losing pressure at a rate of 8 psi/hr.



An injection test was performed on the well down the 2 7/8-inch tubing with the annulus open to the bottom of the well. The open annulus will allow for the calculation of the bottom hole pressure while pumping down the 2 7/8-inch tubing with out the influence of tubing friction pressure on the bottom hole calculations. The injection rates were from two barrels per minute (2 bpm) to ten barrels per minute (10 bpm). From the data collected during the injection test it appears that the well will be able to accept an injection rate up to 10 bpm at the permitted pressure of 1550 psig with 4 1/2-inch, 11.6 pound per foot (11.6 lb/ft) tubing in the wellbore.

At the request of the OCD, Subsurface went back into the wellbore with a retrievable bridge plug (RBP) to test the casing and isolate any leaks to within 1000 feet. The RBP was set at 7550 feet and the packer was set at 6985 feet to isolate the squeezed interval from 7050 feet to 7314 feet. The squeezed interval was pressure tested to 490 psig and the annulus to 632 psig. The squeezed interval was losing pressure at a rate of 6 psi/hr and the annulus was gaining pressure due to thermal affects. The RBP was moved up the wellbore to 1255 feet and casing pressure tested to 569 psig. The casing above 1255 feet was losing pressure at a rate of 2 psi/hr. The casing leaks were isolated to the squeezed interval from 7050 feet to 7314 feet and in the interval from surface to 1255 feet. The OCD was called and approved the 300PSI sealing application to stop the casing leaks across the two intervals.

The 4 1/2-inch tubing was run into the wellbore and the Arrow X-1 packer was set at 7575.73 feet with 37,000 lbs of tension. Prior to running the 4 1/2-inch tubing a new Superior hanging spool was installed. Prior to setting the tubing packer, the annulus between the 4 1/2-inch tubing and the 7-inch casing was filled with inhibited brine, with the 300psi sealant across the squeezed perforations and across the upper section of the 7-inch casing. Once the packer was set and casing hung off in the spool a new Superior wellhead was installed and the P-seals were pressure tested to 3000 psig. After the wellhead was assembled the annulus was squeezed at 545 psig for four hours (4 hrs) as specified by the sealant manufacture representative on site. The annulus was then pressure tested to 480 psig overnight with no pressure loss. Workover rig was disassembled and moved off location with all associated equipment.

A 12 hr pump in and falloff test was performed down the 4 1/2-inch tubing. To maintain a surface injection pressure that was below the permitted pressure of 1550 psi the injection rate was lowered to 9 bpm at the end of the pump in procedure. The BHP gauge was placed at 8630 feet for 14 hrs to monitor BHP, when the gauge was pulled five minute (5 min) gradient stops were made every 1000 feet with the first stop at 7000 feet. The analysis of the data showed interference from the adjacent injection wells, which skewed the results for determination of the skin and possibly the permeability. The equipment used to perform the falloff testing was moved off location to prepare for mechanical integrity testing (MIT).

The MIT was performed and witnessed by the OCD. The MIT consisted of an annulus pressure test, and a radioactive tracer survey. The temperature survey was performed during the CBL/VDL logging event and will be used as a baseline for any future temperature surveys. The annulus pressure test was performed at 530 psia and lost 2.5 psi over a one hour period, which was within the OCD requirements of five percent (5%)

over a 30 min time interval. The radioactive tracer survey showed no signs of fluid flow out of the permitted interval above 7650 feet. The OCD witnessed the annular pressure test and the first half of the radioactive tracer survey.

The annulus monitoring system was installed and tested. The well was turned over to Navajo for injection.

	• •	
District I 1625 N. French Dr., Hobbs, NM 88240	tate of New Mexico	Form C-144
District II 1301 W. Grand Ayenue, Artesia, NM 88210	linerals and Natural Resources	June 1, 2004
District III 1000 Rio Brazos Road, Aztec, NM 87410	Conservation Division	For drilling and production facilities, submit to appropriate NMOCD District Office.
<u>rict IV</u> S. St. Francis Dr., Santa Fe, NM 87505	0 South St. Francis Dr. Santa Fe, NM 87505	For downstream facilities, submitter Senta Fe office
Pit or Below-Gr	ade Tank Registration or (Closure FFR : - War
Is pit or below-grade ta Type of action: Registration of a pit	nk covered by a "general plan"? Yes or below-grade tank 🗌 Closure of a pit or l	below-grade tank
Operator: Reven a REPINING COMMENTELEPHON	ne: (505)748-3.311 e-mail addr	ess:
Address: SOIEAST Mary Street. Art	ESTA NM 88210	
Facility or well name: WOW =3 API #: 3	30-015-26575 U/LorQu/Q	0r Sec T <u>185 R 27E</u>
County: EddyLatitude	Longitude	NAD: 1927 🗍 1983 🗍
Surface Owner: Federal A State Private I Indian		
	Below-grade tank	
Type: Drilling Production Disposal	Volume:bbl Type of fluid:	
Workover [] Emergency []	Construction material:	
	Double-walled, with leak detection? Yes	If not, explain why not.
Liner type: Synthetic L Thickness A mil Clay		
	Long them 60 feet	
Depth to ground water (vertical distance from bottom of pit to seasonal	Less than 30 feet	(20 points)
high water elevation of ground water.)	100 feet or more	(10 points)
· · · · · · · · · · · · · · · · · · ·		(0 points)
Wellhead protection area: (Less than 200 feet from a private domestic	Yes	(20 points)
water source, or less than 1000 feet from all other water sources.)	(No)	(0 points)
ance to surface water: (horizontal distance to all water do player	Less than 200 feet	(20 points)
tion could ditable and personial ord measured watercauses	200 feet or more, but less than 1000 feet	(10 points)
	1000 feet or more	(0 points)
·	Ranking Score (Total Points)	10
If this is a pit closure: (1) Attach a diagram of the facility showing the pit	s relationship to other equipment and tanks.	(2) Indicate disposal location: (check the onsite box if
your are burying in place) onsite 🔲 offsite 🕱 If offsite, name of facility_(RI. (3) Attach a	general description of remedial action taken including
remediation start date and end date. (4) Groundwater encountered: No	Yes 🔲 If yes, show depth below ground sur	faceft. and attach sample results.
(5) Attach soil sample results and a diagram of sample locations and excavations	tions.	
Additional Comments: NAURIO REFINING COM	DANI PLANS to Clos	E Drilling Dit on the
WDW #3 ASper New MERICO OIL	CONSETURTION Divisio	N FULE SO IN the PIL
AND BELOW GRADE FANK Guide In	NES, NAURIO PLANS to	remove all fluids and
Drill cuttings, All cuttings will	be taken to a N.M.	O.C.D. Approved site for
Disposal and Backfill with ensite	tockpiled soils. WE W	ill Notify O.C.D 48 hours
Prior to BEGINING WORK,		
I berehv certify that the information above is true and complete to the best	of my knowledge and halief. I further cart	fu that the shows described oit or below grade tank
has been/will be constructed or closed according to NMOCD guideline	s A, a general permit D, or an (attached)) alternative OCD-approved plan [].
Date: 2/14/06		
Printed Name Title Chart Milliand Prosent	SignatureSignature	fil.
Your certification and NMOCD approval of this application/closure does n otherwise endanger public health or the environment. Nor does it relieve th regulations.	ot relieve the operator of liability should the ne operator of its responsibility for compliance	contents of the pit or tank contaminate ground water or ce with any other federal, state, or local laws and/or
Toval An Ilas las		, ,
ed Name/Tile	Signature	Date: 2/12/67
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Form H004 UNITED STATES DEPARTMENT OF THE INTERIOR FORM APPROVED BUREAU OF LAND MANAGEMENT OMBINO. 1007-037 Exploret. March 31, 2007 Is. Ore of Well COMPLETION OR RECOMPLETION REPORT AND LOG 5. Lesse Serial No. NM- 6857371 Main Allottee or Tribe Nam Pype of Completion New Well Work Over Deepen 2. Name of Operator NAVAJO REFINING COMPANY 8. Lesse Name and Well Na. 3. Address P.O. BOX 159, ARTESIA, NM 58211 3a. Phone No. (include area code) 9. AFT Well Na. 3. Address P.O. BOX 159, ARTESIA, NM 58211 3a. Phone No. (include area code) 9. AFT Well Na. 4. Location of Well (Report location clearly and in accordance with Federal requirements)* 10. Field and Pool, or Exploratory At top prod. interval reported below 7656* AT THE SAME LOCATION AS ABOVE 11. Sec., T., R. M., on Block and Survey or Area SI - THES - RZ 4. Lotat depth PLUG BACK 18,119* AT THE SAME LOCATION AS ABOVE 12. County or Patish 13. State EDDY 14. Date Spudded 15. Date T.D. Reached 16. Date Completed 17. Elevations (DF, RKB, RT, GLY 14. Total depth PLUG BACK 18,119* AT THE SAME LOCATION AS ABOVE 20. Depth Bridge Ping Set MD 15. Total Lopith: 19. Pin
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It is a straight of the strai
2. Type Electric & Other Mechanical Logs Kun (Submit copy of cacu)
Was DST run? // No Yes (Submit report)
CBL/VDL, MULI-ARM CALIFER, TEMP, RADIOACTIVE TRACER (2006) Directional Survey? 7 No Yes (Submit copy)
23. Casing and Liner Record (Report all strings set in well)
Hole Size Grade Wt (#/it.) Top (MD) Bottom (MD) Depth Type of Cament (BBL) Cement Top* Amount Pt
17 1/2" 13 3/8" 54.5 SURF 400" 400" 425 CLASS C SURF NONE
12 1/4" 9 5/8" 36 SURF 2004 2004 10/25 "C" SURF PONE 8 3/4" 7" 29 & 26 SURF 9450' 9450' 1350 "H" 960' NONE
6 1/4" 4 1/2" 9051' 10,119' 10,119' 175 CLASS H 9051'-TOL NONE
A Tubiag Record Size Denth Set (MD) Packer Denth (MD) Size Denth Set (MD) Packer Denth (MD) Size Denth Set (MD) Packer Dent
4 1/2" 7567' 7567'
25. Producing Intervals 26. Perforation Record
Formation Top Bottom Performed Interval Size No. Holes Perf. Status
CANYON 8546 ³ 8626 ³ 8546 ³ 8626 ³ 8546 ³ 8626 ³ 65 ³⁰ 140 2 1898 ³ 400 ³
C) D) C7. Acid, Fracture, Treatment, Cement Squeeze, etc. Depth Interval Amount and Type of Material
C) Composition D) 27. Acid, Fracture, Treatment, Cement Squeeze, etc. Depth Interval Amount and Type of Material 70569' - 7162' 89 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION
C) D) 27. Acid, Fracture, Treatment, Cement Squeeze, etc. Depth Interval 7056 ⁹ - 716 ⁹ 89 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION 7262 ⁹ - 7278 ⁹ 100 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION 7262 ⁹ - 7278 ⁹ 100 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION 7262 ⁹ - 7278 ⁹
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C) Dim Dim Dim D) 27. Acid, Fracture, Treatment, Cement Squeeze, etc. Depth Interval Amount and Type of Material 7058' - 7182' 89 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION 7263' - 7278' 100 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION 7364' - 7314' 89 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATION 7364' - 7314' 80 SKS PREM 14.8 PPG NEAT CMT FOR PERF SQZ ON PREVIOUS PERFORATIONS 28. Production - Interval A Date First Date First Test Producted Date Date Test Production Oil BBL MCF BBL Oil Gravity Car. APT Gravity NON-BAZAROUS CLASS I WELL
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*(See instructions and spaces for additional data on page 2)

28b. Proda	action - Inte	rval C					<u> </u>		
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke - Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	
28c. Prod	uction - Int	crvai D							
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	G21 MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rair	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

31. Formation (Log) Markers

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

N/A (NON-HAZARDOUS CLASS I WELL)

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

Formation	Tap	Bottom	Descriptions, Contents, etc.	Name	Тор
TURNALIOU					Meas. Depth
	· ·				
	1				
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	1				

32. Additional remarks (include plugging procedure):

THE PLUGGED AND ABONDONED WELL WAS AQUIRED FROM MEWBOURNE OIL COMPANY BY NAVAJO REFINING. NAVAJO RECOMPLETED THE WELL FOR INJECTING NON-HAZARDOUS WASTE WATER FROM THEIR REFINERY IN ARTESIA, NM. THE EXISTING PLUGS WERE DRILLED OUT TO THE TOP OF THE LINER PLUG AT 9022' AND THE EXISTING PERFORATIONS WERE SQUEEZED OFF WITH CEMENT AT 7059' TO 7162', 7262' TO 7278', AND FROM 7364' TO 7314'. A 4 1/2" 11.6 #/FT TUBING STRING WAS SET WITH A TENSION PACKER AT 7564' AND BOTTOM OF PACKER AT 7575'. MIT WAS WITNESSED BY OCD.

(SEE ATTACHED WELL SUMMARY FOR MORE DETAILS)

33. Indicate which itmes have been attached by placing a cl	heck in the appropriate	boxes:	
Electrical/Mechanical Logs (1 full set req'd.)	Geologic Report	DST Report	Directional Survey
Sundry Notice for plugging and cement verification	Core Analysis	Other:	

34. Thereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

for Watern Waste W Title Name (pleas Signature Date

Tide 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or franchulent statements or representations as to any matter within its jurisdiction.

(Form 3160-4, page 2)

	037									•				
Form Hoo (Aperiod)		345	DEPAI BUREA	UNI RTME U OI	TED STAT	ES E INTE ANAGE	RIOR MENT					Ē	FORM AI OMBNO. Xpires: Ma	PROVED 1004-0137 rch 31, 2007
Ş.S.	WELL		ETION (or r	ECOMPLE	TION	REPOR	IT AND	D LOG			5. Lease	Serial No.	
	crw-n F							- <u></u>	.		-	NM ·	- 0557371 im. Allottee	or Tribe Name
	f Completion			۳ لکا	Work Over	 Deepen	Phu	ıg Back	Пи	ff. Resvr, .		N/A		
191 ci +/	ELL	Od	 her								1	Unit o	er CA Agree	ment Name and I
2 Name	of Operator	NAVAJO	REFINING	G CON	IPANY							Lease	Name and	Well No.
2 Addres				0001	•		3a Pho	ne No (include	men code)			W-3 Vell Na	
J. Addit:	S P.O. BU	X 159, AK	I ESIA, NV	1 8821								30 - (015 - 2657	5
4. Locati	on of Well (F	Report locatio	on clearly an	d in acc	cordance with	Federal n	equiremen	13)*			10) Field (and Pool, or	Exploratory
At sur	face 790	FROM T	HE SOUT	H LIN	E AND 2250	FROM	THE WE	ST LIN	ie			Sec 1	TRMO	n Block and
At top	prod. interva	i reported be	elow 7650°	ATT	HE SAME LA	DCATIO	ON AS AB	OVE				Surve	y or Area	81 - T188 - R27E
	e danah PT	UG BACS	7 18 11 9' A'	г тне	SAME LOC	ATION	AS ARO	VE				Count	ly or Parish	11 State
At tota	nudded ·		15. Date T.D.	Reach	ed		16. Date C	ompleted	1			EDDY Eleva	tions (DF. F	UKB. RT. GL)*
12/22	/1990		01/29/	1991		ľ			Read	y to Prod.		3609*	• • • • • •	_,,,
18. Total I	Depth: MD	10,119		19, Pl	ug Back T.D.:	MD 9	022'		20. D	pth Bridge	Plug Se	t MD) (CMT 9051'-902
	TV	D 10,119				TVD 9	922'					TV	D	CMT 9051'-902
21 Type I	Electric & O	ther Mecha	nical Logs R	un (Su	bmit copy of e	ach)			22. W	as well com	xn [∕ " [∕		Yes (Sub	mit analysis) mit renort)
CBL/	VDL, MUL	J-ARM CA	ALIPER, T	emp, I	RADIOACT	IVE TRA	ACER (20	06)	D	rectional St	arvey?		Tres (S	Submit copy)
23 Casin	g and Liner	Record (R	eport all str	ings s	et in well)	I Carros	Constant							
Hole Size	Size/Grade	e WL (#/1	ft.) Top (!	(D)	Bottom (MD)	De	cementer pth	No. d Type d	r Sks. & 1 Cemer	t (E	Vol. EL)	Comen	t Top*	Amount Pulle
17 1/2*	13 3/8"	54.5	SUR	F	400'	406'		425 C	LASS	:		SURF		NONE
12 1/4"	9 5/8"	36	SUR	F R	2604	2664		1025	"C"			SURF	, 	NONE
61/4"	4 1/2"		9051		10,119'	10,11	9'	175 C	LASS I	1		9051'-	TOL	NONE
										<u> </u>				
24 Tubin	Record					<u> </u>				·		<u> </u>		
Size	Depth S	et (MD) Pa	icker Depth (MD)	Size	Depth	Set (MD)	Packer I	Depth (M	D) 5	Size	Depth	Set (MD)	Packer Depth (
4 1/2"	7567	7	567		······································									
25. Produc	Formation		Тор		Bottom	26.	Perforation Perforated 1	n Record	T	Size	No. 1	loles	<u> </u>	Perf. Status
A) CISC	0		7658'		8450'	7668*	- 8450'			1.5"	1580		2 JSPF	/ 60°
B) CAN	YON		8549'	1	8628'	8540'	- 8620'			0.5"	160		2 JSPF	/ 68°
<u>D)</u>		· · · · ·					-						<u> </u>	
27. Acid, F	racture, Trea	tment, Ceme	nt Squeeze, e	tc						l			L	
E	epth Interval		OF SWO	000			A	mount at	nd Type	f Material				
1050 - 7	278'		100 SK	S PRE	M 14.8 PPG	NEAT C	MT FOR	PERF	SQZ O	N PREVI	OUS PE	ERFOR	ATION	
7262' - 7	214		80 SKS	PREN	4 14.8 PPG N	EAT C	IT FOR	PERF S	QZ ON	PREVIC	US PE	RFORA	TIONS	
<u>7262' - 7</u> 7304' - 7	514		1				<u></u>			·			<u>.</u>	,
<u>7262' - 7</u> 7304' - 7 28. Pmdu	tion - Interv	al A	. I				Lord	ity	Gas	P		Minhad		· · · · · · · · · · · · · · · · · · ·
7262' - 7 7304' - 7 28. Produc Date First Produced	tion - Interva Test I Date 1	al A Hours To Fested Pri	st Oil		Gas V MCF F	later BL	Corr Al	ñ'	Gree	iatv I		CARECTION .		
7262' - 7 7304' - 7 28. Produc Date First Produced	tion - Interve Test Date	al A Hours To Fosted Pri	st oduction BB	L	Gas V MCF E	Vator IBL	Car. Al	ä'	Gran	ity 1	NON-HA	ZAROUS C	LASS I WE	L
7262' - 7 7304' - 7 28. Produc Date First Produced Choke Size	Test I Date I Tbg. Press. F Flwg. I	al A Hours Tc Fested Print Cag. 24 Press. Rg	st Oil oduction Hr. BB	L	Gas V MCF E Gas V MCF E	Vator IBL Vator IBL	Gas/Oil Ratio	ă' 	Grav Weff	isty 1 Status	NON-EA:	ZAROUS C	CLASS I WE	L
7262' - 7 7304' - 7 28. Produced Date First Produced Choke Siza	tion - Interva Test I Date 1 Tbg. Press. I Flwg. Si Ction - Interva	al A fours Tested Pross. Cag. Press. Re Pross. Re Pross. Re Pross.	st Oil BB Hr. Oil te	L	Gas V MCF E Gas V MCF E	Vator IBL Vater IBL	Gan/Oil Ratio	ă' 	Grav Weff	ity Status	WAITING	CAROUS C	ILASS I WE	LL AL TO INJECT
7262' - 7 7304' - 7 28. Produ Date First Produced Choke Size 28a. Produ Date First Date First	tion - Interve Test I Date T Tbg. Press. I Flwg. Sl Ction - Interv Test F Parts	al A Hours Te Case 24 Press. Re ral B Hours Tees	st Ovid bolaction: BB Hr. Ovid BB Hr. BB BB BB BB BB BB BB BB BB BB BB BB BB	L	Gas V MCF E Gas V MCF E	Vator BL Vator BL BL	Oil Grav Carr. Al Ges/Oil Ratio		Gran Weff	ity 1 Status Pi	WAITING	AROUS C	CLASS I WE	L. AL TO INJECT
7262' - 7 7304' - 7 28. Produced Date First Produced Choke Size 28a. Produ Date First Produced	tion - Interva Test I Date I Flwg. Si Si Ction - Interv Test F Date I	al A Hours Te- fested Pr Cage 24 Press. 24 Press. 24 Ra ral B Hours Tes fested Pro	at Oil BB	L	Gas V MCF E MCF E MCF E Gas W MCF B	Vatur IBL Vater BBL ater BL	Oil Grav Gas/Oil Ratio Oil Grav Corr. AP	й 	Grav Well Gras Gravity	ity 1 Status , P	WAITING	AROUS C CON STAT	CLASS I WEI TE APPROVA	L.
7262' - 7 7304' - 7 28. Produ Date First Produced Choke Size 28a. Produ Date First Produced	tion - Interve Test I Date 1 Flwg. 1 Si Ction - Interv Test I Date 1 Tbg. Press. (Flwg. 1	al A lours Tcc lours Tcc Press. 24 Press. Ra ral B lours Tccs Prosted Pro- Press. Ra	st Oil bonction BB Hr. Oil BB tac tac tac tac tac baction BB Hr. Oil BB Hr. Oil BB	L L L	Gas V MCF E MCF E MCF B Gas W MCF B Gas V MCF B	Vator IBL Vator IBL Attor BL	Oil Grav/Oil Ratio Oil Grav/Coll Corr. AP Corr. AP Gam/Oil Ratio		Grav Well Gas Gravity Well S	inty 1 Status Pa Latus	WAITING WAITING Dduction	AROUS C CON STAT Method RAZOUS C	CLASS I WEI	L.

sinicions and spaces for additional and on page 2

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28b. Prod	action - Inte	rval C						•	
Date First Produced	Test. Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke / Sizz	Tbg. Press. Flwg. SJ	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gan/Oil Ratio	Well Status	
28c. Prod	laction - Int	erval D				··· — — —			
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Presa.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

N/A (NON-HAZARDOUS CLASS I WELL)

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Ecomotion	Top	Bottom	Descriptions, Contents, etc.	Name	Тор
romation					Meas. Depth
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32. Additional remarks (include plugging procedure):

THE PLUGGED AND ABONDONED WELL WAS AQUIRED FROM MEWBOURNE OIL COMPANY BY NAVAJO REFINING. NAVAJO RECOMPLETED THE WELL FOR INJECTING NON-HAZARDOUS WASTE WATER FROM THEIR REFINERY IN ARTESIA, NM. THE EXISTING PLUGS WERE DRILLED OUT TO THE TOP OF THE LINER PLUG AT 9022' AND THE EXISTING PERFORATIONS WERE SQUEEZED OFF WITH CEMENT AT 7059' TO 7102', 7262' TO 7278', AND FROM 7304' TO 7314'. A 4 1/2" 11.6 #/FT TUBING STRING WAS SET WITH A TENSION PACKER AT 7566' AND BOTTOM OF PACKER AT 7575'. MIT WAS WITNESSED BY OCD.

(SEE ATTACHED WELL SUMMARY FOR MORE DETAILS)

33. Indicate which itmes have been attached by placing a c	heck in the appropriate	boxes:	·····	······	
 Electrical/Mechanical Logs (1 full set req'd.) Sundry Notice for plugging and cement verification 	Geologic Report	DST Report	Directional Survey		-
34. I hereby certify that the foregoing and attached informat	tion is complete and cor	rect as determined	from all available records (s	ee attached instructi	ions)*

Tile Env. Mar for Watern Waste Name (please Date Signature

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Form 3160-4, page 2)

(April 2004)	UNITED STATE DEPARTMENT OF THE	ES E INTERIOR			FORM APPROVED OM B No. 1004-0137 Expires: March 31, 2007
Jack	BUREAU OF LAND MAN	NAGEMENT		5. Lease Seria	al No.
5 2007 Do not use the abandoned w	NOTICES AND RE his form for proposals rell. Use Form 3160-3 (PORTS ON WE to drill or to re-e (APD) for such pro	LLS enter an oposals.	6. If Indian	a, Allottee or Tribe Name
	IPLICATE- Other inst	tructions on rever	rse side.	7. If Unit or	r CA/Agreement, Name and/or No.
1. Type of Well Oil Well	Gas Well 🔽 Other			8. Well Nar	me and No.
2. Name of Operator NAVAJO R	EFINIG COMPANY			WDW-	3
3a Address P.O. BOX 159, ARTESIA, NN	4 88211	3b. Phone No. (include	e area code)	30 - 01:	5 - 26575 d Pool or Exploratory Area
4. Location of Well (Footage, Sec.,	T., R., M., or Survey Description)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
S1 - T18S - R27E ; 790' FRO!	M THE SOUTH LINE AND 2	2250' FROM THE WES	ST LINE	11. County EDDY	or Parish, State
12. CHECK A	PPROPRIATE BOX(ES) TO	D INDICATE NATUR	E OF NOTICE, R	EPORT, OR	OTHER DATA
TYPE OF SUBMISSION		TYI	PE OF ACTION	· _	
Notice of Intent	Acidize		Production (St	art/Resume)	Water Shut-Off
Subsequent Report	Casing Repair	New Construction	Recomplete		✓ Other
Final Ahandonment Notice	Change Plans	Plug and Abandon	Temporarily Al	bandon	NON-HAZARDOU
	I V I Contant to Intection	L Plug Back	Water Disposal		CLASS I WELL
 Describe Proposed or Complete If the proposal is to deepen dim Attach the Bond under which the following completion of the im testing has been completed. Filling the second s	ted Operation (clearly state all pert ectionally or recomplete horizonta the work will be performed or pro- volved operations. If the operation inal Abandonment Notices shall be	tinent details, including esti- illy, give subsurface location vide the Bond No. on file v n results in a multiple comp e filed only after all required	mated starting date of a ns and measured and tro with BLM/BIA. Requir sletion or recompletion ments, including reclan	ny proposed wo ne vertical depth ed subsequent n in a new interva- nation, have been	wick and approximate duration thereous is of all pertinent markers and zones eports shall be filed within 30 days il, a Form 3160-4 shall be filed once in completed, and the operator has
13. Describe Proposed or Complete If the proposal is to deepen dim Attach the Bond under which is following completion of the in testing has been completed. Fit determined that the site is read THE PLUGGED AND AI	ted Operation (clearly state all pert ectionally or recomplete horizonta the work will be performed or pro- wolved operations. If the operation inal Abandonment Notices shall be y for final inspection.) BONDONED WELL WAS AN	tinent details, including esti- illy, give subsurface location vide the Bond No. on file v n results in a multiple comp e filed only after all requires QUIRED FROM MEW	mated starting date of a ns and measured and the with BLM/BLA. Require section or recompletion ments, including reclare (BOURNE OIL CON	ny proposed wo ac vertical depth ed subsequent n in a new interva nation, have been MPANY BY N	ork and approximate duration thereous of all pertiment markers and zones eports shall be filed within 30 days i, a Form 3160-4 shall be filed once in completed, and the operator has NAVAJO REFINING. NAVAJ
13. Describe Proposed or Complete If the proposal is to deepen dim Attach the Bond under which it following completion of the im testing has been completed. Fit determined that the site is read THE PLUGGED AND AI RECOMPLETED THE V 10/1/66 -THE EXISTING PERFORATIONS WERE 10/12/66 BAN CEL 4/000	ted Operation (clearly state all pert ectionally or recomplete horizonta the work will be performed or pro- wolved operations. If the operation inal Abandonment Notices shall be y for final inspection.) BONDONED WELL WAS AN WELL FOR INJECTING NO E PLUGS WERE DRILLED OF E SQUEEZED OFF WITH NO	timent details, including esti- illy, give subsurface location vide the Bond No. on file v in results in a multiple comp e filed only after all requires QUIRED FROM MEW IN-HAZARDOUS WAS DUT TO THE TOP OF EAT CEMENT AT 795	mated starting date of a ns and measured and in with BLM/BIA. Requir yletion or recompletion ments, including reclar /BOURNE OIL CON THE WATER FROM THE LINER PLUG 60' TO 7102', 7262' 1	ny proposed wo ne vertical depth ed subsequent n in a new interva tation, have been MPANY BY N THEIR REF AT 9022' AN YO 7278', ANI	which and approximate duration thereous of all pertiment markers and zones eports shall be filed within 30 days i, a Form 3160-4 shall be filed once in completed, and the operator has MAVAJO REFINING. NAVAJ TINERY IN ARTESIA, NM. 10 THE EXISTING D FROM 7304' TO 7314'.
 13. Describe Proposed or Complete If the proposal is to deepen dim Attach the Bond under which 1 following completion of the im testing has been completed. Findetermined that the site is ready THE PLUGGED AND AI RECOMPLETED THE V 10/11/06 - THE EXISTING PERFORATIONS WERE 10/13/06 - RAN CBL/VDI 8620°. 	ted Operation (clearly state all pert ectionally or recomplete horizonta the work will be performed or pro- wolved operations. If the operation inal Abandonment Notices shall be y for final inspection.) BONDONED WELL WAS AN WELL FOR INJECTING NO E PLUGS WERE DRILLED OF E SQUEEZED OFF WITH NO L AND TEMPERATURE SUI	timent details, including esti- illy, give subsurface location vide the Bond No. on file v in results in a multiple comp e filed only after all required QUIRED FROM MEW IN-HAZARDOUS WAS DUT TO THE TOP OF EAT CEMENT AT 795 RVEY, PERFORATED	mated starting date of a os and measured and in with BLM/BLA. Requir sletion or recompletion i ments, including reclam /BOURNE OIL CON THE WATER FROM THE LINER PLUG 60' TO 7102', 7262' T INTERVAL FROM	ny proposed wo ne vertical depth ed subsequent m in a new interva aation, have been VPANY BY N THEIR REF AT 9022' AN 'O 7278', ANI 1 7650' TO 84	which and approximate duration thereous of all pertiment markers and zones eports shall be filed within 30 days i, a Form 3160-4 shall be filed once in completed, and the operator has NAVAJO REFINING. NAVAJOREFINING. NAVAJOREFINING, NAVAJ
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 13. Describe Proposed or Complete If the proposal is to deepen dim Attach the Bond under which I following completion of the in testing has been completed. Findetermined that the site is ready THE PLUGGED AND AI RECOMPLETED THE V 10/1/06 - THE EXISTING PERFORATIONS WERE 10/13/06 - RAN CBL/VDI 8620°. 10/24/06 - A 4 1/2" 11.6 #/ 11/4/06 - PERFROMED A 	ted Operation (clearly state all pert ectionally or recomplete horizonta the work will be performed or pro- wolved operations. If the operation inal Abandonment Notices shall be y for final inspection.) BONDONED WELL WAS AN WELL FOR INJECTING NO E PLUGS WERE DRILLED OF E SQUEEZED OFF WITH NI L AND TEMPERATURE SUN FT TUBING STRING WAS :	timent details, including esti- illy, give subsurface location vide the Bond No. on file v in results in a multiple comp e filed only after all required QUIRED FROM MEW IN-HAZARDOUS WAS DUT TO THE TOP OF EAT CEMENT AT 795 RVEY, PERFORATED SET WITH A TENSION DEST ON THE WELL A	mated starting date of a os and measured and in with BLM/BIA. Requir sletion or recompletion i ments, including reclam /BOURNE OIL CON THE MATER FROM THE LINER PLUG 60' TO 7102', 7262' T INTERVAL FROM N PACKER AT 756 AT 9 TO 10 BPML	ny proposed wo ne vertical depth ed subsequent n in a new interva attion, have been VIPANY BY N THEIR REF AT 9022' AN O 7278', ANII 1 7650' TO 84 8' AND BOTT	which approximate duration thereous of all pertiment markers and zones eports shall be filed within 30 days i, a Form 3160-4 shall be filed once in completed, and the operator has MAVAJO REFINING. NAVAJ TINERY IN ARTESIA, NM. ID THE EXISTING D FROM 7304' TO 7314'. IS9' AND FROM 8540' TO TO TOM OF PACKER AT 7575'.
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CONDITIONS OF APPROVAL

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations, and reports of such operations when completed, as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this

form and the number of copies to be submitted, particularly with regard to local area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13 - Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones, or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to top of any left in the hole; method of closing top of well and date well site conditioned for final inspection looking to approval of the abandonment.

NOTICE

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.

PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c) and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.

ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.

EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:

This information is being collected to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

Response to this request is mandatory.

BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT

Public reporting burden for this form is estimated to average 25 minutes per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer, (WO-630), Mail Stop 401 LS, 1849 C St., N.W., Washington D.C. 20240

(Form 3160-5, page 2)

SUNDRY NOTICE SPECIAL STIPULATIONS

1. <u>Approval is granted for the water disposal method presented in the sundry</u> subject to the following conditions:

2. The operator must provide a water analysis of the water to be injected, together with a copy of the disposal permit granted by the state.

**** Approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Engineering

can be reached at 505-706-2779 for any variances that might be necessary.

F Wright 2/28/07

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4 Due Spekied 15 Det T.D. Reached 16 Det A. Reached 17 Environ (07, REG, RT, GL)* 1222/1599 0.1/39/1591 Det A. Ready to Prod. 3669* 1222/1599 TVD 10,119 10. Pring Back T.D.: NUD 9922* 70. Depth Bridge Ting Set. MD ChT 9651-9622* 1 Type Electric & Other Mechanical Logs Run (Sobmit copy of seek) 22. Wie will const? [No] Vice (Sobmit analysis) 2 CRL/VDB, MULL-ARM CALTERER TXDR, RADROACCTIVE TRACER (2009) [No] Vice (Sobmit analysis) 3 Casing and Liner Record (Report all strings set in veli) Insige Canantin No. of Sits. & SURF No Vice (Sobmit analysis) 112/214 958* 368* SURF A000* 400* 442* CLASS C SURF NoNRE 214/4 945* 368* SURF 9459* 1350*13* SURF NONRE 324* 7* 128. ds SURF 9459* 9459* 1350*13* SURF NONRE 324* 78 368* Depth Sci (MD) None Keekeekeekeekeekeekeekeekeekeekeekeekeek	. At tot	al depth PL	UG BACK	10,119° A	T THE SAME	LOC/	NTIO	N AS ABO	VE			. "	EDDY EDDY	NM
1222217979 012071791 LD 2.A Ready to Prod. 36697 8. Total Depth: MD 10,1197 19. Plug Back T.D.: MD 9022 20. Depth Bridge Prog. Set: MD C.NCT 9631-9621 17 TVD 10,1197 TVD 9022 22. War will correl? Z/No. Prog. Ghanin analysis) War will correl? Z/No. Prog. Ghanin analysis) 17 Type Electric & Other Mechanical Lags Run (Submit copy of each) 22. War will correl? Z/No. Prog. Ghanin analysis) War SDT mai? Yee Ghanin analysis) 3. Caring and Liner Record (Report all strings set in well) Boluen (MD) Darge Franceint No. of Siz, & SURP Amount Pelled 17 1/2 13 307 54.5 SURP 600° 400° 425 CLASS C SURP NONR 21 1/47 29.865 SURP 600° 426 1425 °C* SURP NONR 51/47 4 1/27* 29.851 SURP 600° 1025 °C* SURP NONR 51/47 12 1/47* 29.861 186.197 136.0 Sure NONR 51/47 12 2.87 0507 1506 Sure NONR Sure NONR 51/47 13 567 1360 <td< td=""><td>14. Date S</td><td>Spudded</td><td>l l</td><td>5. Date T.D</td><td>. Reached</td><td></td><td></td><td>16. Date C</td><td>omplete</td><td>4</td><td></td><td>r</td><td>Elevations (DF</td><td>, RKB, RT, GL)*</td></td<>	14. Date S	Spudded	l l	5. Date T.D	. Reached			16. Date C	omplete	4		r	Elevations (DF	, RKB, RT, GL)*
b. Iotal Logan Juny Jing	12/22	2/1990		01/29/	1991			D&	ŁA	Ready	to Pro	d.	3609	
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	<u>)</u>	Electric & Of	' 10,119"	ical Love P	un (Enhmit con	v of an	$\frac{1}{1}$	9022"		12 W.				CMT 9051'-9022'
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S Canage and Later Record (Report all strings set in well) Stage Canceter Depth (No of Size & Sharry Vol. (Cancet Top) Amount Public (Cancet Top) Amount Public (Cancet Top) Hole Size (Size) (Size) SURP Surp (Mu) Botton (Mo) Size (Cancet Top) Amount Public (Cancet Top) Amount Public (Cancet Top) 12 1/2" 33 98" 44.5 SURP 2664" 1055 "C" SURP NONE 12 1/4" 9 58" 36.5 SURP 9460" 9450" 1356 "E" SURP NONE 3 1/4" 4 1/2" 9 951" 10.119" 10 19" 175 CLASS II 960" NONE 4 1/2" 9 951" 10.119" 10 19" 175 CLASS II 9051" NOL NONE 4 1/2" 7567" 7567" 7567" 7567" 1558 2 159" / 69" 9 CLAYVON 8549" 769" 9459" 158" 158" 158" 9 CLAYVON 8549" 769" 9549" 6.5" 1589 2 159" / 69" 7. Add, Fractum, Tradition Top basits PREM 14.8 PPG NEAT CMT POR PERP SQ2 ON PREVIOUS PER		VDL, MUL		2.11° E.16, 3.	EMF, RAUIO	AL II				Dire	ctional	l Survey?	✓No Ya	(Submit copy)
Hate Saze V (WT.J.) 100 (NU.J.) Solution (MU.J.) Type of Conson Open (Eds.) Cancel Top* Allowink Fulled 17 1/2" 13 3/8" 54.5 SURP 400" 440" 423 CLASS C SURP NONE 21/4" 95" 36 SURP NONE SURP NONE 33/4" 7" 29 & 26 SURP 9450" 9450" 1350 "18" 990" NONE 31/4" 7" 29 & 26 SURP 9450" 9450" 1350 "18" 990" NONE 31/4" 41/2" 9951' 10,119" 10,219" 175 CLASS B 990" NONE 4 1/2" 7567" 7567 2.5 Depth Set (MD) Size Depth Set (MD) Size No Holes Perf. Status 9 CLSCO 7659" 8459" 7669"- 8459" 0.5" 1500 2.35PP / 69" 9 CLSCO 7659" 8459" 7669"- 8459" 0.5" 160 2.5PP / 69"	Zi Casia	g and Liner	Kecord (Re	port all str	rings set in wel	<u>1)</u>	Stage	Comenter	No	f Ska A	Sh			Amount Dulled
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Line Job Job Job Job Low Low Low Low NUTL S147 *** 26 SURP 103.5 *** 966 NUNE S147 *** 26 SURP 104.55 *** 966* NUNE S147 *** 9651* 10,119* 10,119* 10,119* 175 CLASS H 965**** NUNE A Tubing Record Size Depth Sci (MD) Pecker Depth (MD) Size Depth Sci (MD) Size Size Size (MD) Size Size (MD) Size Size (MD) Size (MD) <td< td=""><td>17 1/2"</td><td>13 3/8"</td><td>54.5</td><td>SUR</td><td>F 400^o</td><td></td><td>400</td><td> -</td><td>425 (</td><td>LASS C</td><td> </td><td></td><td>SURF</td><td>NONE</td></td<>	17 1/2"	13 3/8"	54.5	SUR	F 400 ^o		400	 -	425 (LASS C	 		SURF	NONE
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(See instructions and spaces for additional data on page 2) FEB 2 8 FREDERICK V FREDERICK V	28a. Produ Date First Produced Choke Size	SI Test H Date To Tbg. Press. C Flwg. P	al B ours Test Prod reg. 241 ress. Rate	ir. Oil BB	L Gas MCF L Gas L MCF	Wat BBI Wat BBI	ter L	Oil Grav Corr. AP Gas/Oil Ratio	¶	Gravity Well State	8	NON-FLAS	LAZOUS CLASS I W	
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IROLLOW

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Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press-	24 Hr. Rate	OI BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Stams	· · · ·
28c. Prod	uction - Int	aval D							
Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Cor. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas/Oil Ratio	Well Status	

31. Formation (Log) Markers

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

N/A (NON-HAZARDOUS CLASS I WELL)

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contexts thereof: Cored intervals and all drill-stern tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

 Formation
 Top
 Bottom
 Descriptions, Contents, etc.
 Name
 Top Meas. Depth

 Image: Content state stat

32. Additional remarks (include plugging procedure):

THE PLUGGED AND ABONDONED WELL WAS AQUIRED FROM MEWBOURNE OIL COMPANY BY NAVAJO REFINING, NAVAJO RECOMPLETED THE WELL FOR INJECTING NON-HAZARDOUS WASTE WATER FROM THEIR REFINERY IN ARTESIA, NM. THE EXISTING PLUGS WERE DRILLED OUT TO THE TOP OF THE LINER PLUG AT 9022' AND THE EXISTING PERFORATIONS WERE SQUEEZED OFF WITH CEMENT AT 7650' TO 7102', 7262' TO 7278', AND FROM 7304' TO 7314'. A 4 1/2" 11.6 #/FT TUBING STRING WAS SET WITH A TENSION PACKER AT 7565' AND BOTTOM OF PACKER AT 7575', MIT WAS WITNESSED BY OCD.

(SEE ATTACHED WELL SUMMARY FOR MORE DETAILS)

33. Indicate which itmes have been attached by placing a check in the appropriate boxes:

Electrical/Mechanical Logs (1 full set req'd.)	Geologic Report	DST Report	Directional Survey
Sundry Notice for plugging and cement verification	Core Analysis	Other:	

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

or Watern Waste Name (please pl Signature Date

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictutions or frandulent statements or representations as to any matter within its jurisdiction.

(Form 3160-4, page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting a complete and correct well completion/recompletion report and log on all types of wells on Federal and Indian leases to a Federal agency, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal office.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, and all types electric), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal laws and regulations. All attachments should be listed on this form, see item 33.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal office for specific instructions.

ITEM 17: Indicate which reported elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

ITEM 23: Show how reported top(s) of cement were determined, i.e. circulated (CIR), or calculated (CAL), or cement bondlog (CBL), or temperature survey (TS).

PRIVACY ACT

The Privacy Act of 1974 and the regulation in 43 CFR 2.48 (d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. et seq.; 43 CFR 3160.

PRINCIPAL PURPOSE: The information is to be used to evaluate the actual operations performed in the drilling, completing and testing of a well on a Federal or Indian lease.

ROUTINE USES: (1) Evaluate the equipment and procedures used during the drilling and completing/recompleting of a well. (2) The review of geologic zones and formation encountered during drilling. (3) Analyze future applications to drill in light of data obtained and methods used. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this report and disclosure of the information is mandatory once a well drilled on a Federal or Indian lease is completed/recompleted.

The Paperwork Reduction Act of 1995 requires us to inform you that:

This information is being collected to allow evaluation of the technical, safety, and environmental factors involved with drilling and completing/recompleting wells on Federal and Indian oil and gas leases.

This information will be used to analyze operations and to compare equipment and procedures actually used with those proposed and approved.

Response to this request is mandatory only if the operator elects to initiate drilling and completing/recompleting operations on an oil and gas lease.

BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT

Public reporting burden for this form is estimated to average 60 minutes per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer, (WO-630), MS 401 LS, 1849 C Street, N.W., Washington, D.C. 20240.

(Form 3160-4, page 3)

Well Summary

Navajo Refining Company (Navajo) contracted Subsurface Technology, Inc. (Subsurface), to prepare an application for permit and to reenter a plugged and abandoned (P&A) oil and gas well. The Application for Permit to Drill or Reenter and the Sundry Notices and Reports on Wells was submitted to the Department of the Interior, Bureau of Land Management (BLM), on June 29, 2006 and approved. The Application for Permit to Drill, Re-enter, Deepen, Plug Back, or add a Zone was submitted to the State of New Mexico Oil Conservation Commission (OCD) on June 29, 2006 and approved.

Subsurface prepared an engineering plan to reenter the P&A'ed oil and gas well formally owned by Mewbourne Oil Company. The original well name was Caulk Bluff Federal #1 (API number 30-015-26575), and a Change of Operator application was submitted to the OCD on December 5, 2000 and approved under the well name of WDW-3. Under contract to Navajo, Subsurface commenced field operations on September 25, 2006. The existing location was cleared and prepared for reentry operations. An earthen lined reserve pit was dug to catch returns. All depths unless stated are referenced to rig floor at six feet to seven feet above ground level. The rig floor was moved from six feet to seven feet after drilling out the cast iron bridge plugs.

A workover rig and reverse unit was placed on location and the existing wellhead was removed. The first cast iron bridge plug (CIBP) at 7010 feet was drilled and the perforated interval from 7050 feet to 7102 feet was squeezed off with neat cement and successfully pressured tested to six hundred eighty pounds per square inch gauge pressure (680 psig). The second and third CIBP at 7190 feet and 7279 feet was drilled. There appeared to be ten feet of cement on top of the third CIBP. The perforated interval from 7262 feet to 7278 feet and from 7304 feet to 7314 feet was squeezed with neat cement. The squeezed interval was pressure tested to 920 psig and would not hold. A second cement squeeze was performed across the perforated interval from 7262 feet to 7278 feet at a rate of two pounds per square inch every thirty minutes (2 psi/30 min). The fourth CIBP at 7595 feet was drilled and at 7838 feet a cement plug was encountered and drilled through. Cement was tagged twenty nine (29) feet above the top of the liner at 9022 feet. The hole was circulated clean and prepared for logging.

A Cement Bond Log (CBL), Variable Density Log (VDL), caliper log, and temperature survey were performed. The CBL/VDL showed that the top of the cement (TOC) behind the 7-inch casing was located 900 feet from the surface. The OCD was notified and approved the existing well condition. The casing was perforated from 7660 feet to 8450 feet and from 8540 feet to 8620 feet at 2-JSPF on sixty degree (60°) phasing.

A packer was set at 7546 feet with 2 7/8-inch PH-6 tubing, the well was swabbed back and samples of the formation fluid were recovered. It was estimated that two hundred twenty six barrels (226 bbls) of formation fluid was returned to the surface. A pressure test on the annulus between the 7-inch and 2 7/8-inch was performed at 660 psig with the annulus losing pressure at a rate of 8 psi/hr. An injection test was performed on the well down the 2 7/8-inch tubing with the annulus open to the bottom of the well. The open annulus will allow for the calculation of the bottom hole pressure while pumping down the 2 7/8-inch tubing with out the influence of tubing friction pressure on the bottom hole calculations. The injection rates were from two barrels per minute (2 bpm) to ten barrels per minute (10 bpm). From the data collected during the injection test it appears that the well will be able to accept an injection rate up to 10 bpm at the permitted pressure of 1550 psig with 4 1/2-inch, 11.6 pound per foot (11.6 lb/ft) tubing in the wellbore.

At the request of the OCD, Subsurface went back into the wellbore with a retrievable bridge plug (RBP) to test the casing and isolate any leaks to within 1000 feet. The RBP was set at 7550 feet and the packer was set at 6985 feet to isolate the squeezed interval from 7050 feet to 7314 feet. The squeezed interval was pressure tested to 490 psig and the annulus to 632 psig. The squeezed interval was losing pressure at a rate of 6 psi/hr and the annulus was gaining pressure due to thermal affects. The RBP was moved up the wellbore to 1255 feet and casing pressure tested to 569 psig. The casing above 1255 feet was losing pressure at a rate of 2 psi/hr. The casing leaks were isolated to the squeezed interval from 7050 feet to 7314 feet and in the interval from surface to 1255 feet. The OCD was called and approved the 300PSI sealing application to stop the casing leaks across the two intervals.

The 4 1/2-inch tubing was run into the wellbore and the Arrow X-1 packer was set at 7575.73 feet with 37,000 lbs of tension. Prior to running the 4 1/2-inch tubing a new Superior hanging spool was installed. Prior to setting the tubing packer, the annulus between the 4 1/2-inch tubing and the 7-inch casing was filled with inhibited brine, with the 300psi sealant across the squeezed perforations and across the upper section of the 7-inch casing. Once the packer was set and casing hung off in the spool a new Superior wellhead was installed and the P-seals were pressure tested to 3000 psig. After the wellhead was assembled the annulus was squeezed at 545 psig for four hours (4 hrs) as specified by the sealant manufacture representative on site. The annulus was then pressure tested to 480 psig overnight with no pressure loss. Workover rig was disassembled and moved off location with all associated equipment.

A 12 hr pump in and falloff test was performed down the 4 1/2-inch tubing. To maintain a surface injection pressure that was below the permitted pressure of 1550 psi the injection rate was lowered to 9 bpm at the end of the pump in procedure. The BHP gauge was placed at 8630 feet for 14 hrs to monitor BHP, when the gauge was pulled five minute (5 min) gradient stops were made every 1000 feet with the first stop at 7000 feet. The analysis of the data showed interference from the adjacent injection wells, which skewed the results for determination of the skin and possibly the permeability. The equipment used to perform the falloff testing was moved off location to prepare for mechanical integrity testing (MIT).

The MIT was performed and witnessed by the OCD. The MIT consisted of an annulus pressure test, and a radioactive tracer survey. The temperature survey was performed during the CBL/VDL logging event and will be used as a baseline for any future temperature surveys. The annulus pressure test was performed at 530 psia and lost 2.5 psi over a one hour period, which was within the OCD requirements of five percent (5%)

over a 30 min time interval. The radioactive tracer survey showed no signs of fluid flow out of the permitted interval above 7650 feet. The OCD witnessed the annular pressure test and the first half of the radioactive tracer survey.

The annulus monitoring system was installed and tested. The well was turned over to Navajo for injection.

R/A TRACER LOG INTERPRETATION

11/27/2006

LOGGING Services

PLANT: NAVAJO REFINING CO. C/O: SUBSURFACE TECHNOLOGY WELL NAME: CHALK BLUFF FEDERAL # 1 WDW # 3

RE: Radioactive Tubing & Packer Survey ran on 11/18/2006

A Pre Base Log was run from 9020' to 7350' to detect and record background gamma counts.

Iodine 131 was then ejected at a depth of 7375' and pumped down the tubing and into the permitted interval. Overlapping logging passes tracked the R/A tracer material as it moved down in the wellbore. The R/A material was seen traveling down the tubing, past the packer, and exiting the permitted injection interval.

The flow profile log was then repeated and this survey also showed R/A material going out into the permitted interval.

Two Stationary Time Drive surveys were run with the tool at 7640'. No indications of upward migration were recorded.

A Post Base log was then run from 9016' to 7342' and noted that all R/A material was flushed out of the wellbore into the permitted interval.

la Croce

John Croce





Oil Conservation Division, Environmental Bureau C/O: Carl Chavez 1220 South St. Francis Drive Santa Fe, New Mexico 87505

BRADENHEAD TEST REPORT

(Submit 2 copies to above address)

Date of T	est_June_30	, 2010 (Operator_N	avajo Refining	API #30-0_15-2	6575
Property I Well State	Name <u>WDW</u> Injec us (Shut-In or	Well ting Producing) Tub	No. <u>3</u> ing 1	Location: Unit_0_S	Section <u>1</u> Towns	hip <u>185</u> Range <u>27e</u>
OPEN I	BRADENHEAT	AND INTERME	DIATE TO	ATMOSPHERE INDI	VIDUALLY FOR 1	5 MINUTES FACH
TIME	BRADENHEAD	PRESSURES:	CASING		BRADENHEAD	INTERMEDIATE FLOWED
5 minutes_	0	0		Steady Flow	N/A	N/A
10 minutes	N/A	N/A		Surges	N/A	N/A
15 minutes_	N/A	N/A		Down to Nothin	g immediately	immediately
20 minutes	N/A	N/A		Nothing	X	xx
25 minutes_	N/A	N/A		Gas	<u>N/A</u>	N/A
30 minutes_	N/A	N/A		Gas & Water	N/A	N/A
				Water	N/A	N/A
If bradenh	ad flowed wate	r, check all of the de	scriptions (that apply below:		
CL	EAR FI	RESH SAL	TY	SULFUR BLAC	K	
5 MINUTE	SHUT-IN B	RADENHEAD 0		INTERMEDIATE_0		
REMARKS	: Both the s	urface and int	ermediat	e bradenheads wer	e opened one at	a time. Both
	had a puff	of air upon o	pening t	the vgalve (from h	eat build-up) a	nd then nothing.
	No flow.	No pressure.	·		·	
ByDar	rell Moore	Treull	Moore	Witness		
Env (P	. Mgr. for V osition)	Nater & Waste	Navajo	Refining		
E-mail addr	essdarrell.mo	pore@hollycorp	. COm			



Chavez, Carl J, EMNRD

From: Sent: To: Subject: Moore, Darrell [Darrell.Moore@holiycorp.com] Friday, March 05, 2010 8:51 AM Chavez, Carl J, EMNRD WDW-3 Qtrl MIT

Carl

Attached, please find the chart for the MIT we did on our WDW-3 on February 24, 2010. We also opened the did a bradenhead test and there was no sustained pressure. There was a slight puff but it dissipated quickly and can be attributed to temperature changes.

If there are any questions concerning this submission, please call me at 575-746-5281.

Darrell Moore

Environmental Manager for Water and Waste

Navajo Refining Company, LLC

Phone Number 575-746-5281

Cell Number 575-703-5058

Fax Number 575-746-5451

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Chavez, Carl J, EMNRD

rom: Sent: To: Subject: Chavez, Carl J, EMNRD Tuesday, July 06, 2010 9:04 AM 'Moore, Darrell' RE: Sewer Testing

Darrell:

Thanks for the notification.

Also, the OCD needs Navajo to complete the quarterly Bradenhead information on the form provided to you last week for our records. Let me know if you have any questions. Staff in Artesia questioned the 30 minutes in the form, and I determine that Navajo just needs to use the form to document compliance with our quarterly Bradenhead testing requirement for WDW-3. The MITs for Class I Wells need to be completed by 9/30/2010 along with Annual Fall-Off Test. OCD can use the MIT pressure chart for WDW-3 to satisfy the MIT requirement this season.

Please contact me if you have questions. Thanks.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

rom: Moore, Darrell [mailto:Darrell.Moore@hollycorp.com] Sent: Tuesday, July 06, 2010 7:24 AM To: Chavez, Carl J, EMNRD Subject: Sewer Testing

Carl

We will be testing sewers in the Vacuum Unit at the Artesia Refinery on Friday July 9, 2010 starting at 8 am. If OCD would like to witness let me know.

Darrell Moore Environmental Manager for Water and Waste Navajo Refining Company, LLC Phone Number 575-746-5281 Cell Number 575-703-5058 Fax Number 575-746-5451

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Oil Conservation Division, Environmental Bureau C/O: Carl Chavez 1220 South St. Francis Drive Santa Fe, New Mexico 87505

BRADENHEAD TEST REPORT

(Submit 2 copies to above address)

 Date of Test
 June 30, 2010
 Operator Navajo Refining
 API #30-015-26575

 Property Name__WDW_____Well No.__3
 Location: Unit_0 Section 1 Township185 Range27e

 Injecting

 Well Status (Shut-In or Producing)
 Tubing ______Intermediate ______ Casing ______Bradenhead ______

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH

		PRESSURES:			BRADENHEAD	INTERMEDIATE
TIME	BRADENHEAD	INTERMEDIATE	CASING		FLOWED	FLOWED
5 minutes_	0	0		Steady Flow	N/A	N/A
10 minutes	N/A	N/A	·	Surges	N/A	N/A
15 minutes	N/A	N/A		Down to Nothir	g immediately	immediately
20 minutes	N/A	N/A	·	Nothing	X	x
25 minutes	N/A	N/A		Gas	N/A	N/A
30 minutes	N/A	N/A		Gas & Water_	N/A	N/A
				Water	N/A	N/A
<u>If bradenh</u>	ead flowed wate	r, check all of the de	scriptions that	apply below:		
CI	EAR F	RESH SAL	TY SU	LFUR BLAC	K	

5 MINUTE SHUT-IN BRADENHEAD 0 INTERMEDIATE 0

REMARKS:

Both the surface and intermediate bradenheads were opened one at a time. Both

had a puff of air upon opening the vgalve (from heat build-up) and then nothing.

No flow. No pressure.

Darrell Moore boll By Witness

Env. Mgr. for Water & Waste Navajo Refining (Position)

E-mail address darrell.moore@hollycorp.com
Chavez, Carl J, EMNRD

From: Sent: To: Subject: Attachments: Moore, Darrell [Darrell.Moore@hollycorp.com] Wednesday, June 30, 2010 1:47 PM Chavez, Carl J, EMNRD; Dade, Randy, EMNRD FW: WDW-3.pdf

Gentlemen,

Attached, please find the quarterly MIT for Navajo's WDW-3 Injection well located in Sec 1, 18 south 27 east. If there are any questions concerning this submission, please call me at 575-746-5281.

From: Hernandez, Carrie Sent: Wednesday, June 30, 2010 1:44 PM To: Moore, Darrell Subject:

Carrie Hernandez Environmental Administrative Assistant Navajo Refining Co. LLC Direct Line 575-748-6733 Direct Fax 575-746-5451 Life is a Journey. Roll down the Windows and Enjoy the Breeze

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	State of New Me	xico	Form C-103
<u>District 1</u> – (575) 393=6161	- Energy, Minerals and Natu	ral Resources	Revised August 1, 2011
1625 N. French Dr., Hobbs, NM 88240			WELL API NO:
811 S. First St., Artesia, NM 88210	OIL CONSERVATION	DIVISION -	5 Indicate Type of Lease
<u>Vistrict III</u> - (505) 334-6178	1220 South St. Fran	icis Dr.	STATE STATE
<u>District IV – (505) 476-3460</u>	Santa Fe, NM 87505		6. State Oil & Gas Lease No.
1220 S. St. Francis Dr., Santa Fe, NM 87505			NM-0557371
SUNDRY NOT (DO NOT USE THIS FORM FOR PROP DIFFERENT RESERVOIR. USE "APPL	FICES AND REPORTS ON WELLS DSALS TO DRILL OR TO DEEPEN OR PLU ICATION FOR PERMIT" (FORM C-101) FO	JG BACK TO A DR SUCH	7. Lease Name or Unit Agreement Name Gaines WDW-3
PROPOSALS.)	Gas Well 🗍 Other Injection W	ell ·	8. Well Number WDW-3
2. Name of Operator			9. OGRID Number
Navajo Refining Company			10 D. 1
3. Address of Operator Post Office Box 159 Artesia Na	W Mavico 88711		10. Pool name or Wildcat: Navajo Permo-
A Well Location		l	
4. Well Location	700 feet from the South	ine and 2250	fact from the West line
Section 01	Township 18S	Range 27F	NMPM County Eddy
	11 Elevation (Show whether DR	RKR RT GR etc.)	
	3609' GL, ' RKB		
	,		
12. Check	Appropriate Box to Indicate N	ature of Notice, R	eport or Other Data
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I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Project Engineer DATE 10/3/2011 man TITLE SIGNATURE E-mail address: Hones E Subsuy Frequency Con PHONE: 713-880-4640 imothy Jones vpe or print name or State Use Only TITLE Environmentel Engineer DATE 10/19/2011 APPROVED BY: ______. Conditions of Approval (if any). Chaver E-mil conditions det d 10/1912011 attached to WDW-L. Su

Chavez, Carl J, EMNRD

om:Chavez, Carl J, EMNRDent:Wednesday, October 19, 2011 4:06 PMTo:'Moore, Darrell'Cc:Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRDSubject:Navajo Refining Company UIC Class I (NH) Injection Wells WDWs 1, 2 & 3 (UICI-008) Fall
Off Test Plan (August 2011)

Darrell:

The New Mexico Oil Conservation Division (OCD) is in receipt of your above subject test plan. OCD has already approved the Fall-Off Test (FOT) Plan with conditions on July 28, 2009. The OCD notes that it is also in the process of reviewing C-103s Sundry Notices for the upcoming FOTs.

OCD observes some changes in this FOT Plan submittal that are not acceptable to the OCD. For example, Exhibit 1 is not an acceptable exhibit to the OCD for reasons specified in the 2010 FOT report review and later during the May 2011 meeting in Santa Fe. However, the operator continues to submit exhibits with certain assumptions that have not been accepted or approved by the OCD, i.e., that the injection wells are show interconnection with the injection zone during past FOTs. Perhaps the operator can conduct the 2011 FOT with the information and exhibits needed to prove the interconnection of injection wells with the injection zone? The Certified PE should provide the exhibits in the 2011 FOT Report with the analysis and conclusions supporting any claims for the OCD to review and consider before approving. This is apparently a FOT frequency per well issue that the operator is attempting to prove.

The OCD provides the following comments, observations, and/or recommendations on the above subject plan below.

Comments:

- The OCD approved the original Fall-Off Test (FOT) Plan based on OCD Guidance dated December 3, 2007. There should not be any significant changes to this FOT Plan because it is flexible where needed to allow operators to implement it on each injection well.
- OCD likes to be notified to witness the installation of bottom hole gauges and to be present at least one hour before injection shut-off and commencement of FOT monitoring.
- OCD is concerned about the Section VI No. 1(e) WDW-3 Cement Bond Log quality being poor from 900 ft. to 1200 ft- especially at the depths: 2662 – 2160; 4876 – 5372; and 6750 – 7600 ft. micro annulus scenario.

Observations:

l

- Section V No. 2: The objective of the FOT is NOT to achieve or limit a 100 psig pressure differential before vs. after FOT injection vs. shut-off, but it is a minimum pressure differential that OCD stipulates in its guidance for a successful FOT and injection zone that may still continue to be utilized for disposal, i.e., not too pressured up and subject to continued fracturing under daily allowed maximum surface injection pressure operational limits.
- Section V No. 7 and Exhibit 1: OCD observes a bottom hole pressure chart for WDWs 1, 2 and 3 at 7660 feet that
 the operator presented in the 2010 FOT and again during a May 2011 meeting in Santa Fe, New Mexico to show
 the interconnection between injection wells and the injection formation. The OCD had commented that there was
 no explanation or conclusion provided from the Certified PE who conducted and completed the 2010 FOT report
 that supports the operator's claim that all injection wells are interconnected based on Exhibit 1.

Furthermore, the OCD requested a statement or information supporting the operator's claim by the Certified PE, but never received one. At the meeting, the OCD explained that based on Exhibit 1, there was no support for the claim. In order to make the interconnection determination, during each FOT at each well and off-set injection wells (WDWs not being FOT'd) before and throughout the FOT would need bottom hole pressures monitored in tandem at each well location to establish the interconnectivity of the injection wells with the receiving injection formation under a uniform time scale. This would be a chart that could be plotted that would show during the test the interconnectivity of the wells for each FOT. The OCD doubts that the operator can make the case for interconnectivity between injection wells and injection formation because of the significant distance between the injection wells and fact that sedimentation in formation varies laterally and uniformity in sedimentation, saturated porosity and permeability due to variation in sedimentation would by chance make the injection formation aerially extensive and uniform over a 3 to 5 mile radius from each injection well. Also, even if by chance there was

- uniformity over the mileage specified, the distance between injection wells and corresponding pressure would likely not be observed.
- Exhibit 6: OCD observes in Section B a proposed MIT once every 5 years. OCD's UIC Program requires annual MITs and/or after down hole work is performed on a well.

.<ecommendations:</pre>

- Operator is running survey logs to the bottom of fill or below USDW (fresh water) zones, which excludes an
 evaluation of casing in the fresh water zone. Please run logs up to surface.
- Be sure to also record and provide injection flow rate and pressure leading up to shut-off and monitoring throughout the FOT monitoring period. OCD needs to confirm that a pseudo steady-state condition was achieved before shut-off. This data is also needed for software modeling of the FOT.
- Please provide electronic data from the FOTs at each well in order for the OCD to run its software model to confirm the results in the report.
- Section V No. 13: Surface pressure monitoring and Horner Plot during injection should be used to confirm radial flow condition is achieved instead of waiting a set period if operator wishes to reduce the injection period.

Disclaimer: Please be advised that OCD has already approved with conditions Navajo Refining Company's Fall-Off Test (FOT) Plan on July 28, 2009, and is not providing approval of this FOT Plan; however, comments, observations and recommendations herein should help Navajo Refining Company understand the OCD's concerns based on the submittal.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: CarlJ.Chavez@state.nm.us

'ebsite: http://www.emnrd.state.nm.us/ocd/

/hy not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at: http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

Submit 1 Copy To Appropriate District State of New Me	xico	Form C-103
District 1 – (575) 393-6161 Energy, Minerals and Natu	ral_Resources	Revised August 1, 2011
$\frac{\text{District II} - (575) 748-1283}{\text{OIL CONSERVATION}}$	DIVISION	30-015-26575
811 S First St, Artesia, NM 88210 District III – (505) 334-6178 1220 South St. Fran	ncis Dr.	5. Indicate Type of Lease
000 Rio Brazos Rd, Aztec, NM 87410 District IV = (505) 476-3460 Santa Fe, NM 87	205 Rd , Aztec, NM 87410 (505) 476-3460 Santa Fe, NM 87505 ancis Dr., Santa Fe, NM	
1220 S St. Francis Dr., Santa Fe, NM 87505	NM-0557371	
SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLU DIFFERENT RESERVOIR USE "APPLICATION FOR PERMIT" (FORM C-101) FO	JG BACK TO A DR SUCH	7. Lease Name or Unit Agreement Name Gaines WDW-3
1. Type of Well: Oil Well Gas Well Other Injection W	ell	8. Well Number WDW-3
2. Name of Operator	•	9. OGRID Number
Navajo Refining Company		10. Deal serve as Wildest Newsie Dealer
Post Office Box 159, Artesia, New Mexico 88211		Penn
4. Well Location		
Unit Letter <u>N</u> : <u>790</u> feet from the <u>South</u>	line and <u>2250</u>	feet from the <u>West</u> line
Section 01 Iownship 18S	Range 27E	NMPM County Eddy
3609' GL, ' RKB	, KKD, KI, GK, Elc.)	
12. Check Appropriate Box to Indicate N	ature of Notice,	Report or Other Data
NOTICE OF INTENTION TO:	SUB	SEQUENT REPORT OF:
	CASING/CEMENT	
OTHER: PERFORM PRESSURE FALLOFF TEST	OTHER:	
12 Describe proposed of completed energings (Clearly state all	artinent details and	
of starting any proposed work). SEE RULE 19.15.7.14 NMAC proposed completion or recompletion.	C. For Multiple Cor	npletions. Attach wellbore diagram of
December 12, 2011 Install bottomhole gauges into WDW-1,	WDW-2, and WDV	V-3 by 11:45am. Continue injection into all
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December 15, 2011 – At 7:00pm, WDW-3 will be shut in for a	a 30-hour falloff per	riod. WDW-1 and WDW-2 will remain shut-
December 16, 2011 – All three wells will continue to be shut i	n while monitoring	falloff pressure in all three wells.
December 17, 2011 – At 7:00am, acquire downhole pressure g	gauges from all three	e wells. Tag bottom of fill and come out of
ft, 3000 ft, 2000 ft, 1000 ft, surface). Run in hole with a tempe	rature tool and cond	duct temperature survey from the surface to the
top of the fill. Turn the wells back to Navajo personnel.		
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I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Triggethy	Jonen TITLE Project	Engineer DATE 10/3/2011	_
pe or print name Timothy or State Use Only	Jones E-mail address: Honese	Subsurfacegroup. con PHONE: 7/3-880-46	40
APPROVED BY: Conditions of Approval (if any):	TITLE	DATÉ	



MAP ID NO. 97

MEWBOURNE OIL CO. CHALK BLUFF FEDERAL COM NO. 002

API NO. 30-015-26741



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12. CERTIFICATION:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Mewbourne Oil Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

April 2, 1991

Date

W.H. Cravey / Production Superintendent Mewbourne Oil Company

10. OTHER INFORMATION:

- A. The geologic surface formation is hard clay interspersed with sand and chert outcroppings. Vegetative cover is generally sparse and consist mostly of greasewood and bear grass.
- B. The estimated tops of geologic markers are as follows:

Queen	1260'	Cisco	7740 '
San Andres	2100 🗸	Canyon	8350 '
Glorieta	3720'	Strawn	8900'
Tubb	4930	Atoka	,9500 '
Abo	5900 V /	Morrow	9600'
Wolfcamp	6900 ✔	Mississippian	10100'

C. The estimated depths at which anticipated water, oil or gas are expected to be encountered:

Water: Possible surface water between 100'-300'.

Oil: Penrose @ 1520'. Gas: Wolfcamp @ 6900'.

D. Proposed Casing Program: See Form 9-331C.

E. Pressure Control Equipment: See Form 9-331C and Exhibit "D".

F. Mud Program: See Form 9-331C.

G. Auxiliary Equipment: Mud-gas seperator and PVT system from 6,000'-T.D.

H. Testing and Coring Program: Possibility of 4 DST's in the following zones: Wolfcamp, Cisco, Strawn, Morrow. No cores are planned at this time.

Logging: Gamma Ray - Spectral Density - Dual Spaced Neutron Log; T.D. to surface Gamma Ray - Dual Latero Log Microguard Log; T.D. to Intermediate casing.

 No abnormal pressures or temperatures are anticipated. In the event abnormal pressures are encountered the proposed mud program will be modified to increase the weight.

J. Anticipated Starting Date: As soon as possible after BLM approval.

11. OPERATOR'S REPRESENTATIVE:

The field representatives responsible for assuring compliance with the approved surface use and operations plan are as follows:

W.H. Cravey	(505) 393–5905	701 S. Cecil
Erick W. Nelson	24 Hrs. Svc.	Hobbs, N.M.

5. SOURCE OF CONSTRUCTION MATERIALS:

A. Caliche will be taken from a BLM pit located in the NE4/NW4 of Section 12-T18S-R27E which would be BLM pit # 18271203. This pit also extends into the SE4/SW4 of Section 1-T18S-R27E which would be BLM pit # 18270114. An alternate pit which may be used in the event BLM pit # 18271203 contains unsuitable material would be a BLM pit located in the SW4/NE4 of Section 1-T18S-R27E which would be BLM pit # 18270107.

6. METHODS OF HANDLING WASTE DISPOSAL:

- A. Drill cuttings will be disposed of in the drilling pits.
- B. Drilling fluids will be allowed to evaporate in the drilling pits until pits are dry.
- C. Water produced during tests will be disposed of in the drilling pits. Oil produced during tests will stored in test tanks until sold.
- D. Current laws and regulations pertaining to the disposal of human water will be complied with.
- E. All trash, junk and other waste material will be contained to prevent scattering and will be removed and deposited in an approved sanitary landfill.
- F. All trash and debris will be buried or removed from the wellsite within 30 days after finishing drilling and/or completion operations.

7. ANCILLIARY FACILITIES:

A. None required.

- 8. WELLSITE LAYOUT:
 - A. Exhibit "C" shows the relative location and dimensions of the well pad, mud pits, reserve pit, trash pit and location of major rig components.
 - B. The pad and pit area has been staked and flagged.
- 9. PLANS AND RESTORATION OF THE SURFACE
 - A. After completion of drilling and/or completion operations all equipment and other material not needed for operations will be removed. Pits will be filled and location cleaned of all trash and junk to leave the wellsite in an aesthetically pleasing condition as possible.

MULTI-POINT SURFACE USE AND OPERATING PLAN <u>MEWBOURNE OIL COMPANY</u> <u>CHALK BLUFF FEDERAL WELL NO. 2</u> <u>1350' FWL & 1650' FNL OF SEC. 1-T18S-R27E</u> <u>EDDY COUNTY, NEW MEXICO</u> NEW MEXICO LEASE NO. NM-0557371

This plan is submitted with the Application for Permit to Drill (APD) the above described well. The purpose of the plan is to describe the location of the proposed well, the proposed construction activities and operations plan and the magnitude of necessary surface disturbance involved, so that a complete appraisal can be made of the environmental effects associated with the operation. The surface to be disturbed is privately owned and a surface use agreement has been signed with the land owner.

1. EXISTING ROADS:

- A. From the junction of U.S. 82 and U.S. 285 Highways in Artesia, proceed east on U.S. 82 for 12 miles. Turn right (South) on Eddy County #206 (Illinois Camp Road) and proceed south for 1.75 miles. Turn right on Eddy County Road #204 and proceed northwest for .75 miles. Turn left (West) and proceed for 1 mile. Turn left (south) and proceed for 1/4 mile. Turn right (west) and proceed for 1/3 mile. Turn right (north) and proceed for 1/4 mile. Turn right into location.
- B. Culverts: None Required.
- C. Cuts and Fills: A three and half to four foot cut will be required for construction of the location.
- D. Turn-Outs: None required.
- E. Gates and Cattleguards: None required.
- 2. LOCATION OF EXISTING WELLS:
 - A. Existing wells in a 1 mile radius are shown on Exhibit "B".
- 3. LOCATION OF PROPOSED FACILITIES:
 - A. If the well is productive, all production facilities will be constructed on the existing pad and no additional surface disturbance will occur.
- 4. LOCATION AND TYPE OF WATER SUPPLY:
 - A. Water will be purchased and trucked to the wellsite over the existing and proposed roads shown on Exhibits "A" and "AA".



Exhibit "D"

Mewbourne Oil Company Chalk Bluff Federal #2 Lease # NM-0557371 1350' FWL & 1650' FNL Sec. 1-T18S-R27E Eddy County, New Mexico State Page 1

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DISTRICT I 4 88210

of New Mexico 5 Inergy, Minerals and Natural Resources Depan.

Perm C-141 Reviewd 1-1-8

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OIL CONSERVATION DIVISION P.O. Box 2088

Sama Fe, New Mexico 87504-2088

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NELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

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orm 3160-5 1990) DEPA	UNITED STATES	ILIN 2 0 1001	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 11 1993
BURE	AU OF LAND MANAGEMENT	JON & V 1991	5. Lease Designation and Serial No.
SUNDRY NO	DTICES AND REPORTS ON V	O. C. D. NELARTESIA, OFFICE	NM-U55/3/1 6. If Indian, Allottee or Tribe Name
Do not use this form for propos Use "APPLICAT	als to drill or to deepen or reen NON FOR PERMIT—" for such	try to a different reservoi	r.
L True of Mell	SUBMIT IN TRIPLICATE	& RELLIVED	7. If Unit or CA, Agreement Designation
Oil Gas Well Well Other		MAY 24 1991	8. Well Name and No. Chalk Bluff Federal Com #2
Mewbourne Oil Compan	iy d	DIST. 6 MIL	9. API Well No.
3. Address and Telephone No. P. O. Box 7698. Tv1c	er. Texas 75711	Sto	30-015-20/41 10. Field and Pool, or Exploratory Area
4. Location of Well (Footage, Sec., T., R., M.,	or Survey Description)	New Mex	North Illinois Camp Morrow
1350' FWL & 1650' FN	IL of Sec. 1, T18S-R	27E	11. County or Parish, State
			Eddy, New Mexico
12. CHECK APPROPRIAT	TE BOX(s) TO INDICATE NAT	URE OF NOTICE, REP	ORT, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTIO)N
Notice of Intent	Abando	nment	Change of Plans
Subsequent Report	Recomp	letion Brok	New Construction
Sunsequent Report		g back Repair	Water Shut-Off
Final Abandonment Notice		Casing Spurd & cot Dine	Conversion to Injection
	[] Other_	spuu q set ripe	(Note: Report results of multiple completion on Well
13. Describe Proposed or Completed Operations (C	Tearly state all pertinent details, and aive pertine	nt dates, including estimated date of sta	Completion or Recompletion Report and Log form)
	rearry since an beament neuros' wire Rive bearing		and be and be also a set at the set of a set of
give subsurface locations and measured a	ind true vertical depths for all markers and zon	es pertinent to this work.)*	and a set to a set a set of a
give subsurface locations and measured i	PM 5/13/91.	es pertinent to this work.)*	
give subsurface locations and measured (5/13/91 - Spud @ 8:00 5/15/91 - Ran 13 jts 1 100 sxs Class 100 sxs Class "C" w/3% CaC Tagged with CaCl. Job C Pressure tes	PM 5/13/91. PM 5/13/91. 13-3/8" 61# ST&C sur ss "C" thixset $w/\frac{1}{2}$ # ss "C" w/6% gel, $\frac{1}{2}$ # C1. Plug down @ 9:4 1" at 82'. At 3:00 complete 3:15 PM. C sted to 1000# - held	face casing set flocele, 5# Gils flocele, 5# Gils 5 AM. Did not of PM cemented w/ irculated est. 5 okay.	at 416'. Cemented with sonite & 3% CaCl and sonite and 250 sxs Class circulate. WOC 6 hrs. 100 sxs Class "C" w/3% 25 sxs to pit. WOC 11 hr
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	ED STATES	HIN 2 5 1991	FORM APPROVED Budget Burtau No. 1004-0135
21 11 25 AN '91 BUREAU OF L	T OF THE INTERIOR AND MANAGEMENT	0. C. D.	Expires: March 31, 1993 5. Lease Designation and Serial No.
SUNDRY NOTICES A	AND REPORTS ON WELLS	ARTESIA, OFFICE a different reservoir.	NM-USS/S/L 6. If Indian, Allonee or Tribe Name
Use "APPLICATION FOR SUBMIT	IN TRIPLICATE	iais 	7. If Unit or CA, Agreement Designation
ne of Well			
Well Well Other	<u></u>		8. Well Name and No. Chalk Bluff Federal Com
wbourne Oil Company			9. API Well No.
Iress and Telephone No. O. Box 7698, Tyler, Tel	xas 75711	•	10. Field and Pool, or Exploratory Area
tation of Well (Footage, Sec., T., R., M., or Survey Des	scription)	· · ·	North Illinois Camp Mor
50' FWL & 1650' FNL of S	Sec. 1, T18S-R27E		Eddy, New Mexico
CHECK APPROPRIATE BOX(s) TO INDICATE NATURE	OF NOTICE, REPOP	IT, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTION	· · · · · · · · · · · · · · · · · · ·
Notice of Intent			Change of Plans
Subsequent Report	Plugging Back		Non-Routine Fracturing
	Casing Repair		Water Shut-Off
] Final Abandonment Notice	Altering Casing	5-1/2" casing	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completions of Well
Final Abandonment Notice Scribe Proposed of Completed Operations (Clearly state all give subsurface locations and measured and true vertice 6/91 - Ram 5-1/211 17# 8 20# N	Attering Casing Other <u>Run</u> I pertiment details, and give pertiment dates, i at depths for all markers and zones pertime	5-1/2" Casing netuding estimated date of starting nt to this work.)*	Conversion to Injection Dispose Water (Note. Report retails of multiply completion on Well Completion or Recompletion Report and Log form) any proposed work. If well is directionally drilled 6! if Circulated 30 mins.
Final Abandonment Notice Excepte Proposed on Completed Operations (Clearly state all give subsurface locations and measured and true vertice 6/91 - Ran 5-1/2" 17#, & 20# N Cemented 1st stage witt + 3/10% CFR-3. Tailed CFR-3 + 3# Gilsonite 1000#. Held OK. Drop	Attering Casing Other <u>Run</u> Pertinent details, and give pertinent dates, i al depths for all markers and zones pertine N-80 casing set at 10, th 260 sacks Hal-Lite 1 in with 300 sacks Pr + 5# KCL. Plug down v bomb open DVT. Circu	5-1/2" casing netuding estimated date of starting nt to this work.)* 148'. DVT. ! 760 Class "H" w/5# G remium containing vith full returns alated 6 hr*s.	Conversion to Injection Dispose Water (Note. Report returks of multiple completion on Well Completion or Recompletion Report and Log form) any proposed work. If well is directionally drilled 6! if Circulated 30 mins. ilsonite, + 1/4# Flocele 5/10% Halad-22A + 3/10% Pressure tested to
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	BUREAU OF I	AND MANAGEMENT	O. C. D. ARTESIA, OFFICE	S. Lease NM-	Designation and Seri - 0557371	nt No.
o not use this	SUNDRY NOTICES form for proposals to dr Use "APPLICATION FOI	AND REPORTS ON WE Il or to deepen or reentry R PERMIT—" for such pro	LLS to a different reservoir. posals	6. If Indi	an, Allonee or Tribe	Name
	SUBMIT	IN TRIPLICATE		7. If Uni	t or CA, Agreement	Designation
1 ype of Well	••	······································	·····	8. Well N	ame and No.	
Name of Operator	cli Lund Other	······		Chalk	Bluff Fede	ral Com
Mewbourne	0il Company 📈		· · ·	9. API W	ell No.	1
Address and Telepho	meNu. 7698 Tvler Te	xas 75711	•	10 Field	- U15-20/4	
Lucation of Well (Fe	bulage, Sec., T., R., M., or Survey D	escription)		North	Illinois (amp Mörre
3501 601	& 1650' FNL of	Sec. 1. T18S-R27	E	11. Count	y or Parish, State	
220 1.07	4 1000 1111 01		•	Ede	ly, New M	exico
CHEC	K APPROPRIATE BOX(s) TO INDICATE NATUR	RE OF NOTICE, REPO	ORT, OR	OTHER DAT	A
TYPE (OF SUBMISSION		TYPE OF ACTION	N		
· · · · · · · · · · · · · · · · · · ·						
	ice of Intent	Abandonmen	t,		ange of Plans	
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Form 3160-5 UN 1990) DEPARTME	ITED STATES NT OF THE INTERIOR	SEP 1 1 1991	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993
BUREAU OF	LAND MANAGEMENT	ARTESIA OFFICT	5. Lease Designation and Serial No.
SUNDRY NOTICES	AND REPORTS ON WEL	LS	NM= U 3 3 / 3 / 1
Do not use this form for proposals to d	rill or to deepen or reentry to	a different reservoir.	
	DR PERMIT—" for such prop	osals	
SUBMI	T IN TRIPLICATE		7. If Unit of CA, Agreement Designation
1. Type of Well			8. Well Name and No.
2. Name of Operator			Chalk Bluff Federal Com #
Mewbourne Oil Company /			9. API Well No.
), Address and Telephone No. D O Box 7698 Tyler To	exas 75711	•	10. Field and Poul, or Exploratory Area
4. Lancelium of Well (Footage, Sec., T., R., M., or Survey	Description)	· · ·	North Illinois Camo Morrow
1350' FWI & 1650' FNL of	Sec. 1. T18S-R27E	ð.	11. County or Parish, State
			Eddy, New Mexico
12. CHECK APPROPRIATE BOX	(s) TO INDICATE NATURI	E OF NOTICE, REPO	RT, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTION	
Notice of Intent	Abandonment		Change of Plans
	Recompletion		New Construction
Subsequent Report	Plugging Back	· • •	Non-Routine Fracturing
Final Abandonment Notice	Altering Casin	2	Conversion to Injection
	Other		Dispose Water
			(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form 5
1.3. Describe Proposed or Completed Operations (Clearly state give subsurface locations and measured and true ver	all pertinent details, and give pertinent date tical depths for all markers and zones pert	s, including estimated date of startis ment to this work.)*	ng any proposed work. If well is directionally drilled,
8/17/91 - Rigged up Western to with 10,000 gals CO ₂ 2 gal Nine-40, 6 gal as follows:	acidize perfs 9999-10 containing 2 gal I-22 Acigel & 5 gal citric	,243' using 10,00 , 1 gal Clay Mast acid liquid per	0 gals gelled 15% HCL er 4, 1 gal FS-2, 1000 gals acid. Pumped
20,000 Gals Acid/CO ₂ 6 Bbls Foam.	6 BPM - total rate @	9200#, Spotting	5 Ball Sealers;
60 Bbls 2% KCL water/	CO2 flush 6 BPM - Tot	al rate @ 9150#.	an an ann an Anna Anna 1944 Anna 1944
Tubing loaded with 38 no noticeable break i Avg Press: 9200#. Av 15 Min=6150#). Rigge	bbls pumped away. H n treating pressures. g Rate: 6 BPM. ISDP: d down Western. Star	ad good ball acti Min Press: 8500 6600# (5 Min=640 ted flowing well	on throughout but swabbed)#. Max Press: 9500#. 00#; 10 Min=6200#; to pit on 24/64" choke.
an a		يوريغا بيروي دير ديرو دير ديروي رويا يو يوني الارد اليور التي ا	az adetszt nacionalista († 1930) Alexandria
	· ·		
14. I hereby certify that the bigguing is true and currect signed them the many	m Engr. Opr	ns. Secretary	p., 9/03/91
(This space for redecal or State uffice user			ACCOPIENT
Approved by	Title		Date SJS
unultions of approval, if any:			SEP 1 991
Tute 18 U.S.C. Section 1007, makes it a crime for any person or representations as to any matter within its inrisdiction.	in knowingly and willfully to make to any i	lepartment or agency of the United	States any false, fictilities of foundaless statements
	*See Instruction on Re-	arsa Side	
			· · · · · · · · · · · · · · · · · · ·



June 18, 1991

Mewbourne Oil Company P.O. Box 5270 Hobbs, N.M. 88241

REF: Chalk Bluff Federal Comm #2

Gentlemen:

The following is a Deviation Survey on the above referenced well located in Eddy County, New Mexico.

4161		1/20	47151	_	1 1/40
			~ • • • •		1 1 100
917	-	10	51821	-	1 1/20
1423'	-	10	5222'	-	2 1/4°.
1791	-	3/40	5306'	-	3 1/4°
20931	-	1/2°	5398'	-	40
2610	-	10	5459'	-	40
30881		10	5521'	-	40
3564'	-	10	5583'		3 3/4°
3905'	-	1/2°	5645'	-	4 1/2°
4231'	-	1 1/2°	5705'	-	4 1/2°

5766' - 4 1/2°	6944' - 2 1/2°
5829' - 4 1/4°	7441' - 2°
5891' - 4 1/2°	7939' - 2°
5951' - 3 3/4°	8435' - 1 3/4°
5013' - 3 3/4°	8623' - 1°
5075' - 3 3/4°	9093' - 1°
6136' - 3 1/2°	9570' - 1 1/4°
5197' - 3°	9638' - 3/4°
5253' - 3°	10140' - 3/4° TD
5443' - 2 1/4°	

Sincerely, kik

Arnold Newkirk Vice-President

STATE OF NEW MEXICO)

COUNTY OF CHAVES)

The foregoing was acknowledged before me this 18th day of June 1991 by Arnold Newkirk.

MY COMMISSION EXPIRES

October 07,1992

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NOTARY PUBLIC

Form 3160-4 (November 1983) (formerly 9-330)	DEPAR ⁻ BUI	UNITED TMENT O REAU OF LAI	STAT F THE	TES E IN ⁻ Gemei	NM OIL Drawer Artomin TERIOF NT	CON DD ET, IN D	S. CO	TE • The In- thous out se side)	On Form Budge Expire 3. LEASE DR NM-05	approv t Bure s Aug stanat 5737	ed. BU No. 1004-0137 ust 31, 1985
WELL CO	MPI FTION	OR RECO	MPLETI	ONF	REPORT	AN		G *	6. IF INDIAN	I, ALLO	THE OR TRIBE NAME
14. TYPE OF WEL									7		N & A & M
b. TYPE OF COM	WEI PLETION: WORK DEE OVER EN	11. [] WELL ■ 30. [] PEPG BACK []	DIFF DIFF EESV		Other	ίη.	ALL4	<u> </u>	S. FARM OR	LEASE	NAME F Fodoral Com
2. NAME OF OPERAT	rom e Oil Com	nany				$\langle l \rangle$	V		9. WELL NO.	<u></u>	
3. ADDRESS OF OPE	BATOR				## <u>}</u>	7	<u>.</u>		2		
P. O. Bo	x 7698, I	Tyler, Te	xas 75	5711	NEC	EiVE	<u>þ</u>		10, FIELD AL	D POOL	. OR WILDCAT
4. LOCATION OF WE	I.L. (Report locatio	on clearly and in	accurdance	with any	y State requir	ementi	•)*		N. III	inoi	s Camp Morrow
At surface 1	350' FWL	& 1650'	FNL		ent 1	. 6 1	992		11. SEC., T., OR AREA	R., M., с	IR BLOCK AND BURVEY
At top prod. int	erval reported be	low			0	C. D)_		Sec.	1, 1	185-R27E
At total depth	Same				APTES	4 . 7F	er e		_	•	
	Dame		14. PER	MIT NO.		DATE I	831.ED		12. COUNTY PARISH	()B	13. STATE
· · · · · · · · · · · · · · · · · · ·			API #	30-01	5-26741				Eddy		<u>N.M.</u>
15. DATE SPUDDED	10. DATE T.D. A	BACHED 17. DAT	» сомрі. (Q /7/	iceaily to 1/91	prod.) 18. KP	ELEV.	ATIONS (D	и, вкв. я 7 - 361 7	IT, GB, ETC.)*	99"	LEY. CASINGHEAD
20. TOTAL DEPTH, MD	4 TVD 21. PLU	IQ, BACK T.D., MD &	TVD 22.	18 MUL	TIPLE COMPL.	101	23. INT	CRYALS	ROTARY TOO	1	CABLE TOOLS
10,140'	1	.0,125'		110 <u>,</u> W M	4NY*		DEH		X	1	
24. PRODUCING INTER 9,999"-10	,024" - Mor	COMPLETION- TO	, BOTTOM,	NAME (1	AD AND TVD)*			·	<u></u>	25	WAS DIRECTIONAL SURVEY MADE Yes
26. TYPE ELECTRIC	AND OTHER LOGS	RIIN						<u>.</u>		 27. ₩	AS WELL COBED
Dual Space	ed Neutron/	CBL								I	No
		CAS	ING RECO	RD (Rep	ort all strings	act in	well)				
CASING SIZE	WRIGHT, LB./	FT. DEPTH 81	T (MD)	HO	I.E SIZE		CEN	IENTING	RECORD		AMOUNT PULLED
$\frac{13-3/8''}{0.5/9''}$	<u> </u>		410'	1/-	-1/2"	4	$\frac{50 - 0}{25 - 0}$	lircul	ated		None
<u> </u>	<u> </u>	<u>+ 10</u>	1481		-1/4 -3/4"	10	$\frac{23}{20} = 0$	ircul	ated		None
		<u>, </u>	1 - 10		5/1						<u>INAL</u>
29.		LINER RECORD					30.	"	UBING REC	ORI)	
61Z.B .	TOP (MD)	BOTTOM (MD)	SACKS CE	MENT*	SCREEN (MI	<u>» </u>	8121	'	DEPTH SET (M	(D)	PACKER SHT (MD)
		<u> </u>		·	·	-	2-7/8	<u>}"_ </u>	9939		9939
31. PERFORATION REC	CORD (Interval, siz	ze and number)	I	·[82.	ACI	D. SHOT.	FRACT	URE CEMEN	T SOU	EZE ETC.
					DEPTH INT	ERVAL	(MD)	A.M	OUNT AND KIN	ID OF N	ATERIAL USED
9999'-10,02	$4^{\circ} - 4$ SPF	, 101 hole	5		9999-10),024	4'	Acidi	.zed w/50	00 g	als 758 HCL.
					· · ·			Acidi	zed w/20	,000	gals acid/002
										.	
33.*		······		PROD	UCTION	··	<u>_</u>		- · · · · ·		
8/26/91	ION PRODU	CTION METHOD (Flowing, ga Flc	• lijt, pu wing	imping—eize (and ty	pe of pun	1p)	WELL	STATUS	(Producing or roducing
8/29/91	24 hre	16/64"	PROD'N	FUR BRIOD		1	טוע-—8אוי פרך	∵⊮. ≹	WATER-BBI	-	GAS-OIL BATIO
FLOW. TUBING PRESS.	CASING PRESSUR	E CALCULATED	011B		GAS-1	4CF.		WATER-	U	011 0	AVITY-API (CORP.)
410#		24-HOUN BAT	0)]	18	1	0		-14 98	
34. DISPOSITION OF 0	AB (Sold, used for	fuel, vented, etc.)	!		<u> </u>			Ī	TEST WITNE	BSED BI	
Sold					·				Bill	Pie	rce.
35. LIST OF ATTACH	15NT8										
I hereby certify	that the foregoin	g and attached in	formation	te compl	ete and corre	ct as	determine	d from	all available :	ecords	\$15
SIGNED	ylnDT	hampo	N TIT	LE <u> </u>	ngr.Oprr	<u>ns. (</u>	Secret	ary	DAT	نجين 1	9/03/91
	*(See	Instructions a	nd Space	s fer A	dditional C)ata (on Reve	rse Side	e)	-	

fitle 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.		TOP		
Middle Morrow	9752'	9785'	Sandstone	NAME	MEAS. DEPTH	TRUE VERT. DEPTH	
Lower Morrow	9808'	9878'	Sandstone	Yates	370 [•]		
Basal Morrow	99991	10024'	Detrital Limestone	Queen .	1,034'		
	, ,			Grayburg	1,346'		
				San Andres	1,833'		
				Glorietta	3,178		
·				Tubb	4,130'		
				Drinkard	5,076'		
				Abo	5,380'		
	•			Wolfcamp	6,644'		
				Cisco	7,602'		
				Canyon	8,326'	an Na Na	
	-			Strawn	8,808'		
				Morrow	9,496'	- ,	
		·		Morrow Clastics	9,696'		
				Chester	10,056'	_	
•							
-		1		-			

37. SUMMARY OF POROUS ZONES: (Show all important zones of porosity and contents thereof; cored intervals; and all

Ξ

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Form C-122 Provised 4-1-91

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State of New Textion Energy An accus of state of Personal's Department

Submit in duplicate to

MEWBOURNE OIL COMPANY Chalk Bluff Fed., Well 2 1-18-27 Eddy County, New Mexico 2-25-92



Q MCF/DAY

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			State of N	lew Mexico		••		F 0	
Submit 5 Copies Appropriate District Office	En	ergy, Mine	rais and Na	tural Resourc	xes Departm	ent	*********	Revised	104 (1-1-89
P.O. Box 1980, Hobbs, NM 88240	0		VCFDV	ATTON T	NIVIGIO	NI Y	SEP - 51	991 Botton	n of Page
DISTRICT II P.O. Drawer DD. Antesia, NM 88210	U		P.O. B	lox 2088	111010		000		
DISTRICT III	_	Santa	Fe, New M	lexico 8750	04-2088	A	RTESIA OFF	ICE	
1000 Rio Brizos Rd., Aztec, NM 8741	REQUE	ST FOR	ALLOWA	BLE AND	AUTHORI	ZATION			
I. Operator	T(D TRANS	PORT OI	LAND NA	TURAL G	AS T Well 7	UPI No.		
MEWBOURNE OI	L COMPANY	x /			2	3	0-015-2	26741.	
Address P. O. Box 76	98, Tylei	r, Texa	as 7571	1					
Resson(s) for Filing (Check proper box)				t (Please expl	in)	· ·		
Recompletion	Cii Ci	hange in Tran	aporter of: Gaa	1 1 1					
Change in Operator	Casinghead (Jaa 🗌 Con	deanate	,S			<u>-</u>		
If change of operator give name and address of previous operator	·			>					
II. DESCRIPTION OF WEL	L AND LEAS	E							
CHALK BLUFF FEDEI	RAL	2 No. Poo	i Name, laciud Illinois	ing Formation Camp-Moi	rrow Gas	Kind c State, i	of Lease Federal or Fee	NM-05	100 No. 57371
Location	, ,				**************************************	······			
Unit LetterF	: <u>135(</u>) Fee	From The	West_um	and	<u>50 </u> Fo	et From The	North	Liı
Section 1 Town	nip <u>28 Sc</u>	outh Rem	<u>ge_27_</u> E	ast N	(PM,		Edd	ly	County
III. DESIGNATION OF TRA	NSPORTER	OF OIL A	ND NATU	RAL GAS					
Name of Authorized Transporter of Oil	•	Condensate		Address (Giw	address to wi	ich approved	copy of this for	m is to be see	1)
Amoco Pipeline Interd Name of Authorized Transporter of Car	corporate	<u>Truckin</u>	g DrvGas[⊽]	Oil Tend	er Dept	BOX 70	2068 Tul	<u>sa,0k.7</u>	<u>4170-2</u>
Transwestern Pipeline	<u>e Company</u>			P.O.Box	1188, H	ouston,	Texas 77	<u>251–118</u>	<u> </u>
If well produces oil or liquids, give location of tanks.	Um≟ S IF	nc⊷ 11wp 1 10	Rga. C 27F	is gas actually Yes	consected?	When	⁷ 8/13	/91	
if this production is commingled with th	at from any other	lease or pool,	give comming	ling order numb	xer: <u>N</u> k	2			
IV. COMPLETION DATA		Oil Well	Gas Well	New Well	Workower	Deenen	Plue Back 15	ame Res'v	Diff Rea's
Designate Type of Completio	m - (X) j		X	X		i		· · · · ·	<u> </u>
5/13/91	8/2	4/91	1.	TONE Deput	10,140'		P.B.T.D.	10.12	51
Elevations (DF, RKB, KT, GR, etc.)	Name of Prod	lucing Format	ios	Top Oil/Gas I	hay 1001		Tubing Depth	0.03	
VB_3015", DF_3013", GL ~ Performing		JOI LOW		1		· · · · · · · · · · · · · · · · · · ·		5,33	
				·····			Depth Casing	3000	
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9999'-10,024 HOLE SIZE 17-1/2"	TU CASIN	BING, CA	SING AND G SIZE	CEMENTIN	NG RECOR DEPTH SET	D	SA 450 -	CKS CEME	NT ated
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9999 '-10, 024 HOLE SIZE 17-1/2" 12-1/4" 8-3/4" V. TEST DATA AND REQUI DIL WELL (Test must be after Date First New Oil Run To Tank Length of Test	EST FOR ALL Date of Test Tubing Pressu	BING, CA IG & TUBIN 13-3/8 9-5/8 5-1/2 LOWABL wolume of loc	SING AND G SIZE } " 	CEMENTIP	NG RECOR DEPTH SET 416 2,610 10,148 10,148 secced top allo thod (Flow, put	D wable for this mp, gas lift, e	Depth Casing SA 450 1025 1025 1020	CKS CEME Circul Circul Circul full 24 hours Port 5-	NT ated ated ated J J J J J J - <u>72</u> p + A
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9999 '-10, 024 HOLE SIZE 17-1/2" 12-1/4" 8-3/4" V. TEST DATA AND REQUI DIL WELL (Test must be after Date First New Oil Run To Tank Length of Test Actual Prod. During Test Actual Prod. During Test GAS WELL Actual Prod. Test - MCF/D 118 Sesting Method (pics, back pr.) Back PTessure VI. OPERATOR CERTIFIC I hereby certify that the rules and reg Division have been completed with and as the rules and reg Division have been completed to the best of m	TU CASIN CAS	BING, CA IG & TUBIN 13-3/E 9-5/E 5-1/2 LOWABL wolume of loc 10 10 175 10 175 10 175 10 175 10 175 175 10 175 10 175 10 175 10 175 10 175 10 10 10 10 10 10 10 10 10 10	SING AND G SIZE 3 " 3 " E E d oil and must ANCE howe /	CEMENTIN be equal to or Producing Me Casing Pressu Water - Bbla Data	NG RECOR DEPTH SET 416 ' 2,610 ' 10,148 ' exceed top allo exceed top allo thod (Flow, put be unter/AdMCP 0 to (Shut-In) DIL CON	D wable for this mp, gas lift, et ISERV/	Depth Casing SA 450 - 1025 - 1020 - depth or be for Choke Size Gaviny of Cost Choke Size Choke Size Choke Size ATION D PR 2 3 1	ACKS CEME Circul Circul Circul Circul Circul Circul Solor Post Solor Sol	NT ated ated ated <i>ID-22</i> <i>P + A</i>
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9999'-10,024 HOLE SIZE 17-1/2" 12-1/4" 8-3/4" V. TEST DATA AND REQUI DIL WELL (Test rouse be after Date First New Oil Run To Tank Length of Test Actual Prod. During Test GAS WELL Actual Prod. During Test GAS WELL Actual Prod. During Test II8 resting Method (picot, back pr.) Back Pressure VI. OPERATOR CERTIFIC I hereby certify that the rules and reg Division have been compiled with an is true and pomplete to the best of m Signature Gaylow Thompson, Enc Printed Name	TU CASIN CASIN EST FOR ALL recovery of total Date of Test Date of Test Date of Test Oil - Bbla. Oil - Bbla. CATE OF C Utations of the Oil at the informa y incovidege und I	BING, CA IG & TUBIN 13-3/f 9-5/f 5-1/2 LOWABL wolume of loc To IOUITS Tro (Shut-In) # COMPLIA Conservation tion given ab belief. Secret: Table	SING AND G SIZE	CEMENTIN be equal to or Producing Me Casing Pressu Water - Bbls Dbls. Condess Casing Pressu Date By	NG RECOR DEPTH SET 416 ' 2,610 ' 10,148 ' 10,148 ' exceed top allo thod (Flow, put thod (Flow, put thod (Flow, put thod (Flow, put thod (Flow, put thod (Flow, put thought) thod (Flow, put thought) though) thoug	D wable for this mp, gas lift, e ISERV/ d A RIGINAL NKE WILL UPERVISI	Choke Size Choke	ACKS CEME Circul Circul Circul Circul Full 24 hours Port 5- Corcul Boot 902 992 Y	NT ated ated ated <i>I-22</i> <i>P + I</i>

5: T INSTRUCT IOL ктр with F 1104

Request for allowable for newly drilled or deepened well must be accompanied by tabulation of deviation tests taken in accordance with Rule 111.
 All sections of this form must be filled out for allowable on new and recompleted wells.
 Fill out only Sections I, II, III, and VI for changes of operator, well name or number, mansporter, or other such changes.
 Separate Form C-104 must be filled for each pool in multiply completed wells.

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n 3166-5 : 1990)	UNITED STATE DEPARTMENT OF THE BUREAU OF LAND MAN	S INTERIOR AGEMENT	COT 1 6 1992 O. C. D. ARTEGIA DESC	F S.	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 Lease Designation and Seriat No. M-0557371
SUN Do not use this form for Use "A	DRY NOTICES AND REPO proposals to drill or to deep PPLICATION FOR PERMIT—	ORTS ON WEI ben or reentry f " for such prop	LS to a different re- posals	servolr.	If Indian, Allonce or Tribe Name
	SUBMIT IN TRIPLIC	CATE		7.	If Unit or CA, Agreement Designation
I. Type of Well Oil Well Gas Well O O O O O O O O O O O O O O O O O O	thef			8.	Well Name and No.
Mewbourne Oil Compa	any			9.	API Well No. 0-015-26741
P. O. Box 7698, Ty	Ler, Texas 75711 (9	03) 561-290	00	10. N	Field and Poul, or Exploratory Area
1350' FWL & 1650' 1	FNL of Sec. 1, T18S-R2	27E		11. E	County or Parish, State ddy, New Mexico
12. CHECK APPR	OPRIATE BOX(S) TO INDI	CATE NATUR	E OF NOTICE	, REPORT,	OR OTHER DATA
TYPE OF SUBMI	SSION		TYPE OF	ACTION	
Notice of Intent					Change of Plans
Subsequent Report	n .	Plugging Bac	k 🟅	[Non-Routine Fracturing
Final Abandonme	ant Notice	Altering Casi	ng		Conversion to Injection Dispose Water Note. Report results of multiple completion on Well
 13. Describe Proposed or Completed C give subsurface locations and 9/10/92 - Killed we top. PBTD @ 9935". 9/11/92 - RIH w/tbg annulus to 2000#. H 0/12/02 Parts Large 	Derations (Clearly state all pertinent details, measured and true vertical depths for all r 11. Pulled tbg & pkr. & pkr set at 9731'. T eld OK. Tested tbg to	and give periment dat markers and zones per Ran in hold Cested to 80 2500 # . Held (2 CDF 221	es, including estimated d tinent to this work.)* e w/CIBP set 000≇. Set pk 1 OK. Swabbe	at 9970' at 9970' r w/15 pt d well do	proposed work. If well is directionally drilled, . Dumped 35 cement on s compression. Tested wn.
9/12/92 - Ferr Lowe 9/13/92 - Acidized p + 60 ball sealers. to 1500# and pumped	perfs w/2800 gals 7½% Plushed w/2% KCL conta acid.	HCL acid + Aining 1000	additives c SCF/bbl nit	ontaining rogen. Pr	1000 SCF/Bb1 nitrogen essure tested annulus
9/17/92 - Frac perf: 4600#, 10 mins 4350 left flowing to pit	s w/40,000 gals Binary #, 15 mins 4150#. AR 1	y foam + 30 L2 BPM. AP (,000# 20/40 3100#. MR 12	Interprop BPM. MP	. ISDP 5400#, 5 mins 8400#. Opened well and
9/19/92 - Well flow:	ing thru test unit. Pu	it well down	n sales line	@ 5:00 P	M 9/19/92.
		·	A	R-	
	- P I			5	997
14. 1 hereby welly that the furgeoing Signed LUMAD	is Take en Contract	_Engr.Oprn:	s.Secretary		Date9/30/92
(This space by Federal or State o Approved by Cunditions of appraval, if any:	(fice use) Title	······································			Date
Title 18 U.S.C. Section 1001, makes in or representations as to any matter wi	it a crime for any person knowingly and wi thin its jurisdiction.	illfully to make to any	department or agency o	f the United States	any talse, fictitious or fraudulent statements

*See Instruction on Reverse Side

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rm 3160-5 UNITED STATE		
		FORM APPROVED Budget Bureau No. 1004-0135
BUPPARTMENT OF THE		Expires: March 31, 1993
BOREAU OF LAND MAN	Aug 6 9 58 AM '92	NM_0557371
SUNDRY NOTICES AND REPO Do not use this form for proposals to drill or to deep Use "APPLICATION FOR PERMIT-	DRTS ON WELLS pen & Algentry to a different reservoir. " to Asten proposals - 615	6. If Indian, Allottee or Tribe Name
SUBMIT IN TRIPLI	CATE	7. If Unit or CA, Agreement Designation
Type of Well		8. Well Name and No.
Name of Operator		Chalk Bluff Fed. Com.
Mewbourne Oil Company		9. API Well No.
Address and Telephone No.	· · · · · · · · · · · · · · · · · · ·	2
r. U. DUX J210 HODDS, New Mexico 8 . Location of Well (Footage, Sec., T., R., M., or Survey Description)	0241	North Linois
1350' FUL & 1650' FNI		11. County or Parish, State
Sec. 1-T18S-R27E		
		Eddy County, N.M.
	UATE NATURE OF NOTICE, REPO	HI, OH OTHER DATA
X Notice of Intent	Abandonment	
Subsequent Report	X Plugging Back	Non-Routine Fracturing
	Casing Repair	Water Shut-Off
Final Abandonment Notice	Altering Casing	Conversion to Injection
		(Note: Report results of multiple completion on Well
 Well is currently producing from Bas has reached it's economical limit. 1. Set CIBP at 9950'. Cap with 50' 2. Perforate Lower Morrow (9850'-98 9778'-9785') 3. Stimulate well as necessary and e 4. Restore well to production. 	al Morrow perforations at 99 Plans are to recomplete into cement. 360'; 9864'-9878'; 9752'-9762 evaluate.	999' - 10,024' and b lower Morrow Sands. 2'; 9764'-9774';
		12 - 24 - 5-
· · · · · · · · · · · · · · · · · · ·	Al	JG 1 2 1992
Will commence operations upon BLM ap	proval.	
		MAL AFRE
I hereby certify that the forigoing is true and correct	Engineer	Det August 3, 1997
(This space for Foderal or State office use)	· · · · · · · · · · · · · · · · · · ·	
Approved by Title		Date <u>8/11/92</u>
Conditions of approvis, if any:	•	. : · ·
ide 18 U.S.C. Section 1001, makes it a crime for any person knowingly and wi	ilifully to make to any department or agency of the Unite	d States any false, fictitious or fraudulent statements

		<u> </u>	151
	. <u>.</u> · · · ·	REC	
Form 3160-5 UNI June 1990) DEPARTMEN BUREAU OF	TED STATES NT OF THE INTERIOR LAND MANAGEMENT	NOV 1 8 1992	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 5. Lease Designation and Serial No.
SUNDRY NOTICES Do not use this form for proposals to di Use "APPLICATION FO	AND REPORTS ON WELL ill or to deepen or reentry to R PERMIT—" for such propo	S a different reservoir. sals	NM-0557371 6. If Indian, Allottee or Tribe Name
SUBMIT	IN TRIPLICATE		7. If Unit or CA, Agreement Designation
Type of Well Oil Oil Well Well Well Other			8. Well Name and No.
Mewbourne Oil Company 3. Address and Telephone No.		,	9. API Well No.
P.O. Box 5270 Hobbs, New Mex 4. Location of Well (Footage, Sec., T., R., M., or Survey D	(ico 88241 (505) 393	-5905	10. Field and Pool, or Exploratory Area N. Illinois Camp Morrow
Ut.F. 1550'FWL?	1630'FNL		11. County or Parish, State Eddy Co., N.M.
12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE	OF NOTICE, REPOR	T, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTION	
Notice of Intent			Change of Plans
Subsequent Report	Plugging Back		New Construction
Final Abandonment Notice	Altering Casing		Conversion to Injection Dispose Water (New Party of California (New York))
	Il pertinent details, and give pertinent dates, i	ncluding estimated date of starting	Completion or Recompletion Report and Log form.) any proposed work. If well is directionally drilled,
9-09-92 Set CIBP @ 9970'. D	mped 35' cement on Cl	BP.	
9-11-92 Perforated Morrow for of 46 holes.	rmation (9850'-9860' 8	9864'-9876') wi	th 2 SPF for a total
9-12-92 Acidized Morrow perf	orations with 2800 gal	. 7 1/2% HCL and	1000 SCF/bb1. N2.
9-16-92 Fraced Morrow perform 20/40 sand.	ations with 40,000 gal	. binary foam can	rrying 30,000# සුදු ලි
	Ass	2 1992	9 23 M 9
	1	ALCO ALCINE ALC'NIDA	
14. I hereby certify that the strengting it true and correct Signed	Title District St	ipt.	Date Oct. 27, 1992
(This space for Federal or State office use)			
Approved by Conditions of approval, if any:	Title	· · · · · · · · · · · · · · · · · · ·	Date
Title 18 U.S.C. Section 1001, makes it a crime for any person or representations as to any matter within its jurisdiction.	knowingly and willfully to make to any dep	artment or agency of the United S	tates any false, fictitious or fraudulent statements
	*See instruction on Rever	se Side	
S	Laboratory 1331 Taske Hohf, Now Mo	Services or Drive	
----------	--	---	---
S	Telephone: (50	5) 397-3713	
FOR:	Pro Well Testing & Wireline Attention: Mr. Ray Gallagher P. O. Box 791 Hobbs, New Mexico 88240	SAMPLE IDENTIFICATIO COMPANY: LEASE: PLANT:	N: Chaulk Bluff Fed. #2 Mewbourne Oil Co.
SAMPLE D	ATA: DATE SAMPLED: 11/5/92 3:15PM ANALYSIS DATE: 11-05-92 PRESSURE - PSIG 540.00 SAMPLE TEMP. °F 78.00 ATMOS. TEMP. °F 48.00	GAS (XX) SAMPLED BY: ANALYSIS BY:	LIQUID () Gallagher-Pro Well Rolland Perry

COMPONENT	ANALYSIS

		MOL		
COMPONENT		PERCENT	GPM	
Oxygen	(02)			
Hydrogen Sulfide	(H2S)			
Nitrogen	(N2)	0.40		
Carbon Dioxide	(CO2)	0.59		
Methane	(C1)	88.27		
Ethane	(C2)	7.05	1.881	•
Propane	(C3)	2.37	0.652	
I-Butane	(IC4)	0.29	0.095	
N-Butane	(NC4)	0.52	0.164	
I-Pentane	(IC5)	0.15	0.055	
N-Pentane	(NC5)	0.10	0.035	
Hexane	(C6+)	0.26	0.107	
Heptanes Plus	(07)	0.00	0.000	
		100,00	2.990	
BTU/CU.FT DRY	Y	1125	MOLECULAR WT	18.5705
AT 14.650 DRY		1121		
AT 14.650 WET		1102	26# GASOLINE -	0.253
AT 15.025 DRY		1150	· · · · · · · · · · · · · · · · · · ·	•••••
AT 15.025 WET		1130	·	
SPECIFIC GRAVIT	Y -			
CALCULATE	D	0.641		
MEASURE	, P	0.000		

		SUGGESTE	FIELD I	DATA S	HEET (Not Requir	ed To Fi	1e}			
1 Test	œ	IRÍ FIAL] ANNUAL			<u> </u>	[m: 11-	Date 5-92	Lease No. or Serial No.	
	MEWBOU	IRNE OIL	COMPANY	· · · · · · · · · · · · · · · · · · ·	Cunnecl	ion				Allattee	····
Field		Res	MORROW			Localic	n		· .	Unit	
Campietia	in Dare	Total	Depin		19935	TO		leva lion		Farm or Lease Name Chalk Bluff	
Ciq,Size	5 ¹ 2	W1.	d	Ş	835	Perfore	lian fro	9850	r. 9876	Well Na. 2	
64.5ize	2 7/8	wi. 6.5	2,44	1 50	9731	Perlora	tiam, Fri	T me	•	Sec. Twp-dik 1 18	Rge.
Type Comp	single	Describe)						Pacter 97	Set At	County or Parish Eddy	
Pro ducing	tbg	Raser	YOR IAMP.	F	Mean Ar	inual Temp 60	5. F	aro. Pres 1	3.2	State New Mexico	
<u>-</u> -	9731	н 973	1 .6	41	^{% C0} ,	9 % Ng	.40	% H S	Pro	rer Meter Run 3 068 Fla	
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MEWBOURNE OIL COMPANY Chalk Bluff Well #2 1-18-27 Eddy County, New Mexico 11-5-92



Q MCF/DAY

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Continued:

The proposed operation is described in detail on the attached diagrams.

A map is enclosed showing the lease numbers and location of all leases and wells that will contribute production to the proposed commingling/common storage facility. All unitized/communitized areas, producing zones/pools are also clearly illustrated.

A schematic diagram is also attached which clearly identifies all equipment that will be utilized.

The storage and measuring facility is located at $\frac{NH}{-1/4}$, Sec.], T <u>18</u>S, R<u>27</u>E, on lease No.0557371, <u>Eddy</u> County, New Mexico. BLM will be notified if there is any future change in the facility location.

Details of the proposed method for allocating production to contributing sources is as follows:

Gas will be measured at the individual leases and a percentage of contribution will be calculated and applied to the integrated sales volume. There is Currently 6 wells producing into the system.

The working interest owners have been notified of the proposal.

The proposed commingling of production is in the interest of conservation and will not result in reduced royalty or improper measurement of production.

The proposed commingling is necessary for continued operation of the above referenced Federal leases.

We understand that the requested approval will not constitute the granting of any right-of-way or construction rights not granted by the lease instrument. And, we will submit within 30 days an application for right-of-way approval to the BLM's Realty Section in your office if we have not already done so.

Additional wells require additional commingling approvals.

Signature:
Name: Gregory Hilner
Title: Engineer
Date:6/06/95

CRA BLM FORMAT

APPLICATION FOR SURFACE COMMINGLING, OFF LEASE STORAGE AND MEASUREMENT APPROVAL

This Format Should Be Attached To A Sundry Notice

To: Bureau of Land Management P. O. Box 1778 Carlsbad, New Mexico 88221-1778

<u>Mewbourne Oil Company</u> (Operator's Name) is requesting approval for surface commingling and off-lease storage and measurement of hydrocarbon production from the following formation(s) and well(s) on Federal Lease No. <u>NM-0557371</u>; Lease Name: Chalk Bluff Federal

Well No.	Loc.	Sec.	Twp.	Rng.	Formation
<u>#2</u> 	F		<u>185</u> 185	27E 27E	Marrow
				<u> </u>	

with hydrocarbon production from the following formation(s) and E-7179 ; Lease Name: Chalk Bluff "6" well(s) on State lease No. E-647 Illinois Camp 17 E-1313 Illinois Camp 20 Well No. Loc. Twp. Rng. Formation Sec. Chalk Bluff 6 St. #1 28E Morrów 18S Illinois Camp 17 St. #1 28E Morrow 18S

11	noi	s Camp s Camp	0 17 St. 0 20 St.	<u>#2</u> 		20	<u>185</u> 185	28E 28E	Morrow	<u> </u>
	• .	Prod	uction	from	the	wells	involved	is as	follows:	A.W.

Well Name and No.	BOPD	<u>Oil Gravity</u>	MCFPD	E
Chalk Bluff Fed. #2	~N/A	N/A	80	
Chalk Bluff Fed. #3	N/A	N/A	54	-
Chalk Bluff 6 St. #1	N/A	N/A	166	
Illinois Camp 17-St. #1	NZA	N/A	1200	62) 643
Illinois Camp 17 St. #2	N∕A	<u>N/A</u>	744	-
Illinois Camp 20 St. #1	N/A	N/A	118	

* Only gas will be comingled off lease

Continued ...

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rm 3160-5	UNITED STATES	NM OIL CONS COMMISSION Drawer DD FORM APPROVED
ne 1990) DE	EPARTMENT OF THE INTERIOR	Artesia, NExpire March 31, 1993
BU	REAU OF LAND MANAGEMENT	5. Lease Designation and Serial No.
CUNUDA	NOTICES AND DEDODTS ON WELLS	NM-0557371
Do not use this form for prop Use "APPLIC	osals to drill or to deepen or reentry to a differ CATION FOR PERMIT—" for such proposals	ent reservoir.
Type of Well	SUBMIT IN TRIPLICATE	7. If Unit or CA, Agreement Designation
Oil Gas Other		8. Well Name and No.
Name of Operator	······································	Chalk Bluff Fed. Com.
Mewbourne Oil Company	<u>y</u>	9. API Well No.
P.O. Box 5270 Hobbs	, New Mexico 88241 (505) 393-5905	30-015-26741 10. Field and Pool, or Exploratory Area
1350' FWL & 1650' FNI Sec. 1-T18S-R27E	M., or survey Description)	N. Illinois Camp Morrow
AI - BALL - ABAB		Eddy Co., N.M.
CHECK APPROPRI	ALE BOX(S) TO INDICATE NATURE OF NO	DIICE, REPORT, OR OTHER DATA
TYPE OF SUBMISSION	יד יד	PE OF ACTION
Notice of Intent	Abandonment	Change of Plans
		New Construction
L_J Subsequent Report	Plugging Back	Non-Routine Fracturing
Final Abandonment Notice		Conversion to Injection
Final Abandonment Notice	e Altering Casing Other Applicati	On for Dispose Water
Final Abandonment Notice rescribe Proposed or Completed Operations give subsurface locations and measure	e Altering Casing Outer <u>Applicati</u> Measureme s (Clearly state all pertinent details, and give pertinent dates, including est ad and true vertical depths for all markers and zones pertinent to this w	On for On specific conversion to Injection On for Dispose Water Int Approval Completion or Recompletion Report and Log form.) timated date of starting any proposed work. If well is directionally drilled, rork.)*
Final Abandonment Notice escribe Proposed or Completed Operations give subsurface locations and measure See Attached Forms &	e Altering Casing Other <u>Applicati</u> Measureme as (Clearly state all pertinent details, and give pertinent dates, including est ed and true vertical depths for all markers and zones pertinent to this w Diagrams.	Water Shut-Off Conversion to Injection nt Approval Dispose Water (Note: Report results of multiple completion as Well Completion or Recompletion Report and Log form.) timated date of starting any proposed work. If well is directionally drilled, fork.)*
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Final Abandonment Notice escribe Proposed or Completed Operation give subsurface locations and measure See Attached Forms & See Attached Forms & I hereby certify that the foregoing is true a Signed (This space for Federal or State office use) Approved by <u>Criz, Signum by Acta</u> Conditions of approval, if any:	classing repeat Altering Casing Other <u>Applicati</u> Measureme a (Clearly state all pertinent details, and give pertinent dates, including est and true vertical depths for all markers and zones pertinent to this w Diagrams. Diagrams. Tide <u>Engineer</u> Tide <u>Patroloum Engine</u>	$\frac{\left \begin{array}{c} Water Shut-Off \\ Conversion to Injection \\ Dispose Water \\ (Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.) winnated date of starting any proposed work. If well is directionally drilled, nork.)*$

Form 3160-5 June 1990)		NITED STATES ENT OF THE INTERIOR	~~ k ·	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993
	BUREAU O			5. Lease Designation and Serial No. NM-0557371
Do not use this	SUNDRY NOTICE s form for proposals to o Use "APPLICATION F	S AND REPORTS ON WELLS drill or to deepen or reentry to FOR PERMIT-" for such prope	a different reservoir osals	6. If Indian, Allottee or Tribe Name
	SUBMI	T IN TRIPLICATE	45678970,	7. If Unit or CA, Agreement Designation
1. Type of Well	Gas	NE		
Well 🛛	Well Other		- Jul	5. Well Name and No.
2. Name of Operator			10 1990 B	
Matuhauma Of	O	121		
Mewbourne Oil 3. Address and Telep	Company		RECEIVED 5	9. API Well No. 30-015-26741
Mewbourne Oil 3. Address and Telep P. O. Box 5270 4. Location of Well (F	Company hone No. , Hobbs, NM 88241 (505 cotage, Sec., T., R., M., or Survey I)393-5905 Description)	RECEIVED 5 D ARTESIA V	9. API Well No. 30-015-26741 10. Field and Pool, or Exploratory Area North Illinois Camp Morrow
Mewbourne Oil Address and Telep P. O. Box 5270 Location of Well (F. 1650' FNL & 13	Company hone No. Hobbs, NM 88241 (505 cotage, Sec., T., R., M., or Survey I 850' FWL of Section 1, T185	00 ()393-5905 Description) S, R27E, Eddy County, NM	RECEIVED 6	9. API Well No. 30-015-26741 10. Field and Pool, or Exploratory Area North Illinois Camp Morrow 11. County or Parish, State
Mewbourne Oil Address and Telep P. O. Box 5270 Location of Well (F 1650' FNL & 13	Company hone No. , Hobbs, NM 88241 (505 ootage, Sec., T., R., M., or Survey (350' FWL of Section 1, T185)393-5905 Description) S, R27E, Eddy County, NM	RECEIVED 6	9. API Well No. 30-015-26741 10. Field and Pool, or Exploratory Area North Illinois Camp Morrow 11. County or Parish, State Eddy, NM
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14. I hereby certify that the foregoing is true and correct				
Signed JELLy Lelin	Title	District Manager	Date	01/11/99
(This space for rederator State office use) Approved by	Title	PETROLEUM ENGINEE	Date	JAN 29 1999
Conditions of approval, if any:				

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... C.) :

8 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent nents or representations as to any matter within its jurisdiction.

"See Instruction on Reverse Side



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON Governor Joanna Prukop Cabinet Secretary Mark E. Fesmire, P.E. Director Oil Conservation Division

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29-Jul-05

MEWBOURNE OIL CO PO Box 5270 Hobbs NM 88241

NOTICE OF VIOLATION - Inspection

Dear Operator:

The following inspection(s) indicate that the well, equipment, location or operational status of the well(s) failed to meet standards of the New Mexico Oil Conservation Division as described in the detail section below. To comply with standards imposed by Rules and Regulations of the Division, corrective action must be taken immediately and the situation brought into compliance. The detail section indicates preliminary findings and/or probable nature of the violation. This determination is based on an inspection of your well or facility by an inspector employed by the Oil Conservation Division on the date(s) indicated.

Please notify the proper district office of the Division, in writing, of the date corrective actions are scheduled to be made so that arrangements can be made to reinspect the well and/or facility.

			INSPECTIO	ON DETAIL	SECTION			
CHALK BLUFF FEDERAL COM No.002					F-1-18S-27E *Significant	30-015-26741-00- Corrective	00	
Date Type Inspectio		n Inspector		Violation?	Non-Compliance?	Action Due By:	Inspection No.	
07/29/2005	Routine/Periodic		Chris Beadle	Yes	No	8/29/2005	iCLB0521034161	
	Violations							
	Absent Well Ide	ntification Signs (R	ule 103)					
Comments on Inspection: Well sign not v around the sign		sible for distance n	equired by Rul	e 103. Well sign is h	idden inside bush gro	wn up		

In the event that a satisfactory response is not received to this letter of direction by the "Corrective Action Due By;" date shown above, further enforcement will occur. Such enforcement may include this office applying to the Division for an order summoning you to a hearing before a Divison Examiner in Santa Fe to show cause why you should not be ordered to permanently plug and abandon this well. Such a hearing may result in imposition of CIVIL PENALTIES for your violation of OCD rules.

Sincerely,

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Artesia OCD District Office

Note: Information in Detail Section comes directly from field inspector data entries - not all blanks will contain data. *Significant Non-Compliance events are reported directly to the EPA, Region VI, Dallas, Texas.

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Oil Conservation Division * 1301 W. Grand * Artesia, New Mexico 88210 Phone: 505-748-1283 * Fax: 505-748-9720 * http://www.emmrd.state.nm.ius

OPERATORApache CorpSTATUSActiveLEASEFederal TLOCATIONSec. 12 - T /8s-R27/EWELL NUMBERCOIMUD FILLED BOREHOLENADRILLED9 [13]90TOP INJECTION ZONE-3731'PLUGGEDNAAPI NO.30-015-26404	SUBSURFACE	-NAVAJO-REFINING-COMPANY, L.L.C Map ID No. 95 Artificial Penetration Review
EMARKS:	OPERATOR Apache Corp LEASE Federal T WELL NUMBER COI DRILLED 9/13/90 PLUGGED NA	STATUS <u>ACTIVE</u> LOCATION <u>sec. 12 - T 85-R 27E</u> MUD FILLED BOREHOLE <u>NA</u> TOP INJECTION ZONE <u>-3731'</u> API NO. <u>30-015-26404</u>
	EMARKS:	

23.44

MAP ID NO. 95

APACHE CORPORATION FEDERAL T NO. 001

API NO. 30-015-26404



EXHIBIT "C"

MEWBOURNE OIL COMPANY FEDERAL "T" # 1 LEASE # NM-42410 990' FEL & 660' FNL SEC. 12-T18S-R27E EDDY COUNTY, NEW MEXICO

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Existing Roads .





ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87504 (505) 827-5800

May 3, 1990

Mewbourne Oil Company c/c Hinkle, Cox, Eaton, Coffield & Hensley 500 Marquette, NW Suite 800 Albuquerque, NM 87102-2121

Attention: James Bruce

Administrative Order NSL-2785

Dear Mr. Bruce:

Reference is made to your application on behalf of Mewbourne Oil Company dated April 12, 1990 for a non-standard gas well location for your Federal "T" Well No. 1 to be located 660 feet from the North line and 990 feet from the East line (Unit A) of Section 12, Township 18 South, Range 27 East, NMPM, Undesignated North Illinois Camp Morrow Gas Pool, Eddy County, New Mexico. The N/2 of said Section 12 shall be dedicated to the well forming a standard 320-acre gas spacing and proration unit for said pool.

By the authority granted me under the provisions of General Rule 104 (II) the abovedescribed unorthodox gas well location is hereby approved.

Sincerely,

William J. LeMa

Director

WJL/MES/ag

cc: Oil Conservation Division - Artesia US Bureau of Land Management - Carlsbad

12. CERTIN ATION:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by Mewbourne Oil Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

May 18, 1990

Date

For W.H. Cravey A

W.H. Cravey Production Superintendent Mewbourne Oil Company

10. OTHER 1. ORMATION:

A. The geologic surface formation is hard clay interspersed with sand and chert outcroppings. Vegetative cover is generally sparse and consist mostly of greasewood and bear grass.

B. The estimated tops of geologic markers are as follows:

Queen	1260'	Cisco	7740'
San Anres	2100'	Canyon	8350'
Glorieta	3720'	Strawn	8900'
Tubb	4930'	Atoka	9500'
Аро	5900'	Morrow	9600'
Wolfcamp	6900'	Mississippian	10,100'

C. The estimated depths at which anticipated water, oil, or gas are expected to be encountered:

Water: Possible surface water between 100-300'.

Oil: Penrose @ 1520'.

Gas: Wolfcamp @ 6900'.

D. Proposed Casing Program: See Form 9-331C.

E. Pressure Control Equipment: See Form 9-331C and Exhibit "D".

F. Mud Program: See Form 9-331C.

G. Auxiliary Equipment: Mud-gas seperator and PVT aystem from 6,000' - T.D.

H. Testing and Coring Program: Possibility of 6 DST's in the following zones; Wolfcamp, Cisco, Canyon, Strawn, Atoka, and Morrow. No cores are planned at this time.

Logging: Gamma Ray - Spectral Density - Dual Spaced Neutron Log; T.D. to surface. Gamma Ray - Dual Latero Log Microguard Log; T.D. to Intermediate casing.

- I. No abnormal pressures or temperatures are anticipated. In the event abnormal pressures are encountered the proposed mud program will be modified to increase the weight.
- J. Anticipated Starting Date: As soon as possible after BLM approval.

11. OPERATOR'S REPRESENTATIVE

The field representatives responsible for assuring compliance with the approved surface use and operations plan are as follows:

W.H. Cravey Erick W. Nelson Bill Pierce 701 South Cecil Street Hobbs, New Mexico Phone: (505) 393-5905

- 5. SOURCE OF CONSTRUCTION MATERIALS:
 - A. Caliche for surfacing the road and location hopefully will come from the construction site. In the event that unsuitable material is encountered, caliche will be taken from a BLM pit located in the NE4/NW4 of section 12-T18S-R27E, which would be BLM pit # 18271203. This pit also extends into the SE4/SW4 of section 1-T18S-R27E which would be BLM pit # 18270114. An alternate pit which may be used in the event BLM pit # 18271203 contains unsuitable material would be a BLM pit # 10cated in the SW4/NE4 of section 1-T18S-R27E, which would be BLM pit # 18270107.

6. METHODS OF HANDLING WASTE DISPOSAL:

- A. Drill cuttings will be disposed of in the drilling pits.
- B. Drilling fluids will be allowed to evaporate in the drilling pits until pits are dry.
- C. Water produced during tests will be disposed of in the drilling pits. Oil produced during tests will be stored in test tanks until sold.
- D. Current laws and regulations pertaining to the disposal of human water will be complied with.
- E. All trash, junk and other waste material will be contained to prevent scattering and will be removed and deposited in an approved sanitary landfill.
- F. All trash and debris will be buried or removed from the wellsite within 30 days after finishing drilling and/or completion operations.

7. ANCILLIARY FACILITIES:

A. None required.

- 8. WELLSITE LAYOUT:
 - A. Exhibit "C" shows the relative location and dimensions of the well pad, mud pits, reserve pit, trash pit, and location of major rig components.
 - B. The pad and pit area has been staked and flagged.
- 9. PLANS AND RESTORATION OF THE SURFACE:
 - A. After completion of drilling and/or completion operations all equipment and other material not needed for operations will be removed. Pits will be filled and location cleaned of all trash and junk to leave the wellsite in an aesthetically pleasing condition as possible.

MULTI-POINT SURFACE USE AND OPERATING PLAN MEWBOURNE OIL COMPANY FEDERAL "T" WELL NO. 1 990' FEL & 660' FNL OF SEC. 12-T18S-R27E EDDY COUNTY, NEW MEXICO NEW MEXICO LEASE NO. NM-42410

This plan is submitted with the Application for Permit to Drill (APD) the above described well. The purpose of the plan is to describe the location of the proposed well, the proposed construction activities and operations plan and the magnitude of necessary surface disturbance involved, so that a complete appraisal can be made of the environmental effects associated with the operation. The surface to be disturbed is privately owned and a surface use agreement has been signed with the land owner.

- 1. EXISTING ROADS:
 - A. Exhibit "A" is a portion of a BLM map, 30 x 60 minute quadrangle; Artesia, New Mexico, showing the location of the proposed well as staked. From the junction of U.S. 82 and U.S. 285 Highways in Artesia, proceed east on U.S. 82 for 12 miles. Turn right (south) on Eddy County Road #206 (Illinois Camp Road) and proceed south for 1 3/4 miles. Turn right (west) on Eddy County Road #204 and proceed west for 3/10 of a mile. Turn left (south) on an existing caliche lease road and follow southwest for 7/8 of a mile. Turn left (south) and proceed 1/4 mile, turn left (east) into location.
 - B. Culverts: None required.
 - C. Cuts and Fills: A three foot cut will be required for construction of the location.
 - D. Turn-Outs: None required.
 - E. Gates and Cattleguards: None required.
- 2. LOCATION OF EXISTING WELLS:
 - A. Existing wells in a 1 mile radius are shown of Exhibit "B".
- 3. LOCATION OF PROPOSED FACILITIES:
 - A. If the well is productive, all production facilities will be constructed on the existing pad and no additional surface disturbance will occur.
- 4. LOCATION AND TYPE OF WATER SUPPLY:
 - A. Water will be purchased and trucked to the wellsite over the existing and proposed roads shown on Exhibits "A" and "AA".



EXHIBIT "D"

MEWBOURNE OIL COMPANY FEDERAL "T" # 1 LEASE # NM-42410 990' FEL & 660' FNL SEC.12-T18S-R27E EDDY COUNTY, NEW MEXICO

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INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and leases for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable State or Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on this reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal or State agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective production zone.

ITEM 22: Consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

NOTICE

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR Part 3160.

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PRINCIPAL PURPOSE: The information is to be used to process and evaluate your application for permit to drill, deepen, or plug back an oil or gas well.

ROUTINE USES: (1) The analysis of the applicant's proposal to discover and extract the Federal or Indian resources encountered. (2) The review of procedures and equipment and the projected impact on the land involved. (3) The evaluation of the effects of proposed operation on surface and subsurface water and other environmental impacts. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions, as well as routine regulatory responsibility.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if the lessee elects to initiate drilling operation on an oil and gas lease.

The Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq) requires us to inform you that:

This information is being collected to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases.

This information will be used to analyze and approve applications.

Response to this request is mandatory only if the lessee elects to initiate drilling operations on an oil and gas lesse.

Fi rin 3160-5 -(Nivemilier 1983) (Formerity 9-331) DEPARTMENT OF THE INTERIOR verse side)	Furm approved. CIST Budget Barcan No. 1004-1-1- Expires August 31, 1985 5. LEASE DENIGNATION AND BERTAL SU
BUREAU OF LAND MANAGEMENT SUNDRY NOTICES AND REPORTS ON WELLS (but nut user this form for proposals to drill or to deepen or plug back to a different BCC VED	NM-42410 8. IF INDIAN, ALLOTTEE ON TRIBE NAME
Use "APPLICATION FOR PERMIT" for such proposals.)	7. UNIT ADBREMENT NAME
Mewbourne Oil Company	". PARM OR LEASE NAME FEDERAL "T"
3. ADDREAS OF OPERATOR O. C. D. P. O. Box 7698, Tyler, Texas 75711 ARTESIA, OFFICE 4. LOCATION OF WELL, (Report location clearly and in accordance with any State requirements.*	D. WBLL NO. 1 10. FIELD AND POOL, DE WILDCAT
660' FNL & 990' FEL	N. Illinois Camp Morrow 11. SEC. T., B., M., OR BLE. AND BURNEY OF ARMA 12-18S-27E
14. FERSURE NO. 16. ELEVATIONS (Show whether UP, NT, GR. etc.) API #30-015-26404 3618.9' FR	12. COUNTY ON PARISH 13. NTATE Eddy N.M.
 16. Check Appropriate Box To Indicate Nature of Notice, Report, or Constitute of INTERTION TO: TENT WATER SHUT-OFF PRACTURE THEAT NILCIPLE COMPLETE /ul>	Other Data ENT REPORT OF: ALTERING WELL ALTERING CASING ABANDONMENT* of multiple completion on Well etion Report and Log form.) Including estimated date of starting any 1 depths for all markers and zones perif. 7#, LT&C Used ASS "H" + .7 CF-14 + without bumping plug. at 9055'. Pumped h water. Spaced and Liner wiper plug
MEP 1 : 1990	RECEIVED Sep IJ IJ 34 M '90
IN. I hereby certify that the forefulling to true and chreet SHENED UILLAND MARK TITLE Engr. Oprns. Secretary	<u>DATE 9/06/90</u>
(This space for Federal or State office use) APPROVED BY	DATE

*See Instructions on Reverse Side

Title 15 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter with the statement of the United States any false.

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9/14/90 - Pen To 7/15/90 - Ha con win cas 458 3.5 9/26/90 - Ha + 8 to min 211	rforated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#,In 10 7 BPM. Av lliburton 37 tons o 2000#. ns 4850#. bbls 10	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL v 000#, Had mins, 43(g 5850#, A frac'd Mo f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 vn perfs Bbl N ₂ ca vater con good bal 00#, In 1 Nyg Rate prrow per ying 11 . In 5 . Avg rate over.	with 2000 with 2000 arrying 90 ntaining 1 11 action. 15 mins, 4 3.4 BPM. rfs with 8 ,500# 20/4 mins 5080 ate 6 BPM.	Additional for the second seco	8-054', 3 A Morflo alers and Bb1 N ₂ . 50#.In 5 r x 6000#. N load to ro gelled 29 mins 4950 0#. Max ra	5 holes. B.C. acid flushed Pressured nins., Max Rate ecover. KCL water ssured annulu D#, in 15 ate 6.7 BPM.
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9/14/90 - Pei To 9/15/90 - Ha cot wit cas 450 3. 9/26/90 - Ha to mir 211	rforated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#, In 10 7 BPM. Av lliburton 37 tons o 2000#. ns 4850#. bbls 10	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL w 000#. Had mins, 430 g 5850#. A frac'd Mc f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 on perfs bl N ₂ can vater con good bal 00#, In 1 Avg Rate prrow per ying 11 . In 5 . Avg rate over.	with 2000 with 2000 arrying 90 ntaining 1 11 action. 15 mins, 4 3.4 BPM. rfs with 8 500# 20/4 mins 5080 ate 6 BPM.	A (ref vertical es; 10,03 ball se ball se looo SCF/ ISDP 50 li30#. Ma 71 Bbls 3900 gals 0 Interp 0#, in 10 Max 980	8-054', 3 Morflo 1 alers and Bbl N ₂ . 50#.In 5 r x 6000#. N load to re gelled 2 rop. Pres mins 495 0#. Max ra	5 holes. 3.C. acid flushed Pressured nins., Max Rate ecover. & KCL water ssured annulu D#, in 15 ate 6.7 BPM.
9/14/90 - Pei To 9/15/90 - Hai cot win cas 458 3. 9/26/90 - Hai + 8 to mir 211	rforated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#, In 10 7 BPM. Av lliburton 37 tons o 2000#. hs 4850#. bbls 10 bbls 10	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL w 000#. Had mins, 430 g 5850#. A frac'd Mc f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 vn perfs Sbl N ₂ ca vater cor good bal 00#, In 1 Avg Rate prrow per ying 11 . In 5 . Avg ra over.	<pre>ns and measured a y, 12 hole with 2000 arrying 90 ntaining 1 1 action. 15 mins, 4 3.4 BPM. rfs with 8 ,500# 20/4 mins 5080 ate 6 BPM. c. Oprns.</pre>	Secretar	8-054', 3 Morflo J alers and Bbl N ₂ . 50#.In 5 r x 6000#. N load to re gelled 2 rop. Pres mins 4950 0#. Max ra	5 holes. 6 holes. 8.C. acid flushed Pressured nins., Max Rate ecover. 8 KCL water ssured annulu 0#, in 15 ate 6.7 BPM. 0/02/90
	rforated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#, In 10 7 BPM. Av lliburton 37 tons o 2000#. ns 4850#. bbls 10	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL v 000#. Had mins, 430 g 5850#. A frac'd Mc f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 vn perfs Sbl N ₂ ca vater con good bal 00#, In 1 vg Rate prrow per ying 11 . In 5 . Avg rate over.	<pre>ns and measured a y, 12 hole with 2000 arrying 90 ntaining 1 l1 action. l5 mins, 4 3.4 BPM. rfs with 8 ,500# 20/4 mins 5080 ate 6 BPM. c. Oprns.</pre>	es; 10,03) gals 7½) ball se 1000 SCF/ ISDP 50 130#. Ma 71 Bbls 3900 gals 10 Interp)#, in 10 Max 980 Asc Secretar	Worflo J alers and Bbl N ₂ . 50#.In 5 r x 6000#. N load to re gelled 29 mins 4950 0#. Max ra	6 holes. 8.C. acid flushed Pressured nins., Max Rate ecover. 8 KCL water ssured annulu 0#, in 15 ate 6.7 BPM.
A space for Feder	rforated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#, In 10 7 BPM. Av lliburton 37 tons o 2000#. 15 4850#. bbls 10 bbls 10	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL v 000#. Had mins, 430 g 5850#. A frac'd Mc f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 vn perfs Sbl N ₂ ca vater cor good bal 00#, In 1 vg Rate prrow per ying 11 . In 5 . Avg ra over.	<pre>ns and measured a y, 12 hole with 2000 arrying 90 ntaining 1 11 action. 15 mins, 4 3.4 BPM. rfs with 8 ,500# 20/4 mins 5080 ate 6 BPM. c. Oprns.</pre>	es; 10,03) gals 7 ¹ / ₂ 5 ball se 1000 SCF/ ISDP 50 1130#. Ma 71 Bbls 3900 gals 10 Interp)#, in 10 Max 980 Acc Secretar	8-054', 3 8 Morflo 1 alers and Bb1 N ₂ . 50#.In 5 r x 6000#. 1 load to ro gelled 29 mins 4950 0#. Max ra	6 holes. 8.C. acid flushed Pressured nins., Max Rate ecover. 8 KCL water ssured annulu 0#, in 15 ate 6.7 BPM.
Approved BY	rforated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#, In 10 7 BPM. Av lliburton 37 tons o 2000#. ns 4850#. bbls 10 bbls 10	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL w 000#. Had mins, 430 g 5850#. A frac'd Mc f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 vn perfs Sbl N ₂ ca vater cor good bal 00#, In 1 Avg Rate prow per ying 11 . In 5 . Avg ra over.	<pre>ns and measured a y, 12 hole with 2000 arrying 90 ntaining 1 l1 action. l5 mins, 4 3.4 BPM. rfs with 8 ,500# 20/4 mins 5080 ate 6 BPM. c. Oprns.</pre>	A (ref vertical es; 10,03) gals 7 ¹ / ₂ 5 ball se 1000 SCF/ ISDP 50 1130#. Ma 71 Bbls 3900 gals 10 Interp 0#, in 10 Max 980 Ac- Secretar	8-054', 3 8 Morflo 1 alers and Bb1 N ₂ . 50#.In 5 r x 6000#. N load to re gelled 2 rop. Pres mins 495 0#. Max ra Y DATE	5 holes. 3.C. acid flushed Pressured nins., Max Rate ecover. & KCL water ssured annulu D#, in 15 ate 6.7 BPM.
Approved BY	r forated tal 48 ho lliburton ntaining th 23 bbl sing to 1 30#, In 10 7 BPM. Av lliburton 37 tons o 2000#. hs 4850#. bbls 10 bbls 10 hor State offer PROVAL, IF AND	Morrow 10, les 24'. broke dow 1000 SCF/F s 2% KCL w 000#. Had mins, 430 g 5850#. A frac'd Mc f CO ₂ carr ISDP 5340# Avg 9500# ad to reco	,008-014 vn perfs Sbl N ₂ ca vater cor good bal 00#, In J Nyg Rate prow per ying 11 . In 5 . Avg ra over.	<pre>ns and measured a y, 12 hole with 2000 arrying 90 ntaining 1 l1 action. l5 mins, 4 3.4 BPM. rfs with 8 ,500# 20/4 mins 5080 ate 6 BPM. c. Oprns.</pre>	A (ref vertical es; 10,03 ball se looo SCF/ ISDP 50 li30#. Ma 71 Bbls 3900 gals 0 Interp 0#, in 10 Max 980 Acc	8-054', 3 8 Morflo 1 alers and Bb1 N ₂ . 50#.In 5 r x 6000#. N load to re gelled 2 rop. Pres mins 4950 0#. Max ra y DATE	6 holes. 8.C. acid flushed Pressured nins., Max Rate ecover. 8 KCL water ssured annulu 0#, in 15 ate 6.7 BPM.

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

		<u>مر</u> . د			~~ [~]	Form approve	ed.
Form 31605 (November 1983)	DEDADT	UI ED S	TATES	SUBMIT IN	TRI CATE.	Expires Aug	1st 31, 1985 CD
(Formerly 9=331)	DEPART		MANAGEMENT	. UL verse side)	FOENEN	NM-42410)
CU						6. IP INDIAN, ALLOT	TEE OR TRIBE NAME
Uo not use th	is form for prope	INCES AIND	n despen or plug b	ack to a different	reservoir.	ļ	
	Use "APPLIC	ATION FOR PER	MII- IOF SUCh Pr	UCT	10 41 AM	DUNIT AGREEMENT	HAME
OIL GAB WELL WELL	X OTHER	./		CARL		05	
2. NAME OF OPERATOR				AREA	HELA WALATE	RS FARM OR LEADE N	11-11-11
Mewbourne	011 Comp	any			T 17 '90	PEDERAL 9. WELL NO.	
P. O. Box	7698, Ty	ler, Texa	as 75711			1	
4. LOCATION OF WELL See also space 17 b	(Report location elow.)	clearly and in acc	ordance with any S	State requirements	D. C. D.	10. FIBLD AND POOL	OR WILDCAT
At surface 64	SOF ENT &	0001 551	F	AR		N. IIIInois	Lamp Morrow
00	ли пица	550 I.H	L4		,	SURVET OR AN	#A
					· · · ·	12-185-27	E
14. PERMIT NO. API #30-01	L5-26404	15. ELEVATION:	Show whether Dr. 3618.9	RT, GR. etc.) GR		12. COUNTY OR PART Eddy	SU 13. STATE N.M.
16.	Check A	opropriate Bo	. To Indicate N	ature of Notice	, Report, or C)ther Data	·
	NOTICE OF INTE	NTION TO :			BUBBRQO	ENT ESPORT OF :	
TEST WATER SHUT	-077	PULL OR ALTER O	ASING	WATER SHU	17-077	BEPAIRSN	a wall
PRACTURE TREAT		MULTIPLE COMPL	ETE	PRACTUBE 1	BRATMENT	ALTERING	CASING
NHOOT OR ACIDIZE		ABANDON" CHANGE PLANS		SHOOTING ((Other)	DR ACIDIZING	ABANDON:	4ENT*
(Wher)	b			(Nori Comp	: Report results letion or Recompt	of multiple completion the state of the stat	n on Well form.)
17. DESCRIBE PROPOSED proposed work. nent to this work	OR COMPLETED OF If well is direct .) *	SRATIONS (Clearly ionally drilled, give	state all pertinent se subsurface location	details, and give ions and measured	pertinent dates, and true vertica	including estimated (il depths for all mark	late of starting any ters and gones perti-
9/14/90 - Po To	erforated otal 48 h	Morrow oles 24'	10,008-014 •	', 12 ho	les; 10,0	38-054', 30	5 holes.
€ 9/15/90 - Ha co w ca 4 3	alliburto ontaining ith 23 bl asing to 580#,In 1 .7 BPM. A	n broke 1000 SC 1s 2% KC 1000#. H 0 mins, vg 5850#	down perfs F/Bbl N ₂ c L water ² c ad good ba 4300#, In . Avg Rate	with 200 carrying 9 ontaining 11 action 15 mins, 2 3.4 BPM	00 gals 7 96 ball s 1000 SCF 1. ISDP 5 4130#. M 71 Bbls	½%Morfloealersand/Bb1N2.050#.In5ax6000#.000dtoredto	3.C. acid flushed Pressured nins., Max Rate ecover.
9/26/90 - Ha + to m 22	alliburtc 87 tons o 2000#. ins 4850# 11 bbls 1	n frac'd of CO c ISDP ² 53 . Avg 95 oad to r	Morrow pe arrying 11 40#. In 5 00#. Avg n ecover.	erfs with 1,500# 20, 5 mins 508 rate 6 BPN	8900 gal /40 Inter 80#, in 1 4. Max 98	s gelled 29 prop. Pres 0 mins 4950 00#. Max ra	KCL water ssured annulus)#, in 15 ate 6.7 BPM.
					Ac	· · ·	
\wedge	· /	\sim				· · ·	
18. I hereb certify tha	t the foregular -	true and forree	t				
SIGNED LLL	la h	mpro	TITLE _Eng	r. Oprns.	. Secreta	TY DATE 10)/02/90
(This space for Fed	leral or State off	te yte)					
	7					5 mar 4 mara	
CONDITIONS OF A	APPROVAL, IF	NY :	······		······································		
						-	
		\$	P 1		_		

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

KEN REYNOLOS-PRESIDENT ARNIE NEWKIRK-VICE-PRESIDENT

DRILLING CO., INC. - OIL WELL DRILLING CONTRACTORS

P. D. BOX 1498 ROSWELL, NEW MEXICO 88202-1498 505/623-5070 505/746-2719 ROBWELL, NM

JAN 31 1991

August 29, 1990

O. C. D. ARTEBIA, OFFICE

Mewbourne Oil Co., Inc. P.O. Box 5270 Hobbs, NM 88241

Ref: Federal "T" #1

Gentlement:

The following is a Deviation Survey on the above referenced well located in Eddy County, New Mexico.

 $472' - \frac{1}{4}^{\circ}$ $840' - 1^{\circ}$ $1380' - \frac{1}{2}^{\circ}$ $1759' - \frac{1}{4}^{\circ}$ $2253' - \frac{3}{4}^{\circ}$ $2589' - \frac{1}{4}^{\circ}$ $3068' - \frac{1}{2}^{\circ}$ $3567' - \frac{1}{4}^{\circ}$

004T.	- 34°
6934'	- 3½°
7026'	- 2 3/4°
7148'	- 2 3/4°
7272'	<u>- 2°</u>
8137'	- 2 °
8815'	- 2 °
9470'	$-13/4^{\circ}$
10141'	- TD

210

Sincerely s.k

Arnold Newkirk Vice-President

STATE OF NEW MEXICO)

COUNTY OF CHAVES

The foregoing was acknowledged before me on this 29th day of August 1990 by Arnold Newkirk.

My Commission Expires:

1

10-07-1992

Public

N. 1	開催にして								
Form 3160-4 P. (November 1968) (formerly 9-330)	D. GOX 11 33 D <mark>CS, New Mex</mark>	UNITED	GONED	ENTSHALL	TIN DUPLIC	ATE*	Form a Budge Expire	ipprov t Bur s Au	ved. eau No. 1004–0137– gust 31, 1985
	DEPARTI	MENT OF	THE INT D MANAGEMEI		strui reve	tiona on (se side)	5. LEASE DE NM-42	816NA 410	TION AND MERIAL NO.
		DE DECON		FPOPT	TND-LO	G *	6. IF INDIAN	, ALLO	TTRE OR TRIBE NAME
I. TYPE OF WEL	MPLETION (L: 086 WELL			Omen BLAU		Ž-	7. CNIT AGE	EDMEN	TNAME
NEW WELL	PLETION: WORK DEEP- OVER ES		DIPP.	Other	UL/VED		S. FARM OR	1.EA38	NAMB
2. NAME OF OPERAT Mewbourn	e Oil Comp	any V			30 1390	_≝↓	FEDER. 9. WELL NO.	<u>AL</u>	<u></u>
P. O. BO	x 7698, Ty	ler, Tex	as 75711	C DVET. 8	metrikl *	_/	10. FIELD AN North	р го о 111	inois Camp Morr
At surface 6	601 ENT &	0001 EFL	RECEIVED	Nev San			11. SEC., T.,	R., M.,	ON BLOCK AND BURVEY
At top prod. int	terval reported below	• •	SEP 2 4 19	91 N	W Mex	r	12-18	s-2	7 E
At total depth	Same		<u>O. C. D.</u>				12 COUNTY (0.8	13 9TATE
			ARTESTA OTTA	5-26404	AIB 1990 80		Fddy		NM
5. DATE SPUDDED	16. DATE T.D. REA 8/25/90	CHED 17. DATE	COMPL. (Ready to 9/13/90	prod.) 18. KB	ELEVATIONS (DF 3	ат, ов, етс.)* 5632*, G	19. L 3	ELEV. CASINGHBAD
0. TOTAL DEPTH, MD	A TVD 21. PLUQ,	BACK T.D., MD & T	VD 22. IF MCL/ HOW M	TIPLE COMPL.,	23. INT	ERVALS	ROTARY TOO	1.8	CABLE TOOLS
4. PRODUCING INTER	BVAL(S), OF THIS CO	DMULETION-TOP.	BOTTOM, NAME (M	(D AND TYD)*				2	5. WAS DIBECTIONAL SUBVEY MADE
10,008-0	54' Morrow	1			Ah		·		Yes
DLL-MGRD	, SDL-DSN	N	· · ·	•	-			27. 1	NO
l,		CASI	NG RECORD (Rep	ort all strings	set in well)				
1 2 2 / 0 11	6.9.#		A721 17	-1/211	450 ca	cke	- Circ		NODO
8-5/8"		2	589' 12	-1/4"	900 sa	icks	- Circ		None
5-1/2"	17#	9	4731 7	-7/8"	430 sa	icks	- Circ		None
.	LI	INER RECORD		<u> </u>	30.		TUBING RECO	DRD	<u> </u>
812R	TOP (ND)	OTTON (MD)	SACKS CEMENT*	SCREEN (MD) SIZE		08978 887 (M	D)	PACKER SET (MD)
4**	9055' 1	0,141'	80		2-3/	'8''	9842'		8888'
PERFORATION REC	coap (Interval, size	and number)		1 82.	ACID, SHOT	FRAC	TURE, CEMEN'	r squ	IEEZE, ETC.
10 008-0	141 12 ho	les)		DEPTH INT	RVAL (MD)	A1	HOUNT AND KIN	D OF	MATERIAL USED
10,038-0	54', 36 ho	les} 24'		10,008-	054'	2000	gals 71/28	ac	id. Frac'd w/
·		-				8900 CO ₂	gals 2% + 11,500#	KCL 20/	wtr + 87 tons 40 Interprop.
<u>.</u>			PROT	PICTION		1 -			
9/15/90	ION PRODUCT	TION METHOD (F	Flowing	imping—elze a	nd type of pu	mp)	well shu Shu	BTATU (-in) † = i	n WOPL
0/03/90	HOURS TESTED	CHOK# 8128	PROD'N, FOR TEST PERIOD	oil-BBL.	923	<u>ск.</u> 5	WATER-BBL		GAS-ULL RATIO
OW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUE RATE	011BB1	GAS	ICF.	WATER	BBL.	OIL O	SZS; 1 BRAVITY-API (CORR.)
160#	0 # An (Sold, used for fu	el, vented, etc.)	1 BC	92	3	2	TRAT WITNES	5	8.0
Vented	MENTA						Eric	Ne1	son
ogs			_1 .						
6. I hereby certify	that the foregoing	and attached inf	ormation is compl	lete and corre	et as determin	ed from	all available r	ecord	10/25/90
			_ TITLE				DATI	<u> </u>	
U	*(See d	instructions an	d Spaces for A	dditional D	lata on Rev	erse Sid	de)		

Fitle 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

37.	SUMMARY OF POROUS ZONES: (Show all important zones of porosity and contents thereof; cored intervals; and all	
	drill-stem, tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and	38
	recoveries);	Í

GEOLOGIC MARKERS

1

Penrose 1522' 1556' Sandstone	NAME	MEAS. DEPTH	TRUE VERT. DEPTH
Atoka 9566' 9575' Sandstone	Yates	4761	
Middle 9902' 9928' Sandstone	Queen	1218'	
Morrow	Grayburg	1572'	
Lower 10008' 10054' Sandstone	San Andres	2072'	
	Tubb	4824 '	•
DST .#1	Аро	6016'	
Drinkard 5749' 5850' No cushion. Tool op	en 30 mins. Wolfcamp	6716'	1
IFP 88-45#, ISIP 29 FFP 88-50#, FSIP 43	64. 62 mins. Cisco	76821	
Recovered 30' drill	ing fluid. Strawn	8912'	
DST #2 6475' 6499' No cushion. Tool or	Atoka	9513'	• }
Abo IFP 72-37#. ISIP 19	53#. 60 mins. Morrow	96281	
FFP 59-59# 60 mins. 120 mins. Recovered 122' drilling fluid	FSIP 1894#. 2' free oil, Clastics	9828'	-
	Lower Morrow	99651	_4
	Barnett	10104'	-
			:
	:		
			•
			i

Submit 5 Copies Appropriate District Office <u>DISTRICT 1</u> P.O. Box 1980, Hobbs, NM 88240		Energy,	Minerals	s and Nat	ural Resourc	es Departme	nt		Form C Revised See Inst at Botto	I-I-89 ructions to of Pag
DISTRICT II P.O. Drawer DD. Asteria, NM \$2210	•	OIL	CONS	ERVA P.O. B	ATION E ox 2088	DIVISIO	N		Y	-
DISTRICT III		S	anta Fe,	New M	exico 8750	4-2088			1001	
1000 Rio Brazos Rd., Artec, NM 87410		IECT						JUN 91	ויכו	
I.		TOTR	ANSPO		AND NAT	URAL GA	S	0. C.	D	
Operator		. /					Weil7	UNITED A		
Mewbourne 011	Compa	ny 🗸						015-264	04	
Address P. O. Box 7698	3. Tv1	er. T	exas	75711	ι.					
Reason(s) for Filing (Check proper box)	y - 7 -	,			Othe	t (Please expla	in)	······································		
New Well		Change i	a Transpo	nter of:						
	Oil		J Dry Ga Constan							
Change of operator give patros	Changina		j Conoca					<u>.</u>		
and address of provious operator					·				<u></u>	
II. DESCRIPTION OF WELL	AND LE	ASE								
Lease Name		Well No.	Pool Na	ime, lactudi	ing Formation		Kind (of Lesse Redenit or Res		200 No.
FEDERAL "I"			INOTT	<u>n 1111</u>	nois Lam	MOTTOW	1777			-2410
Kink Later A	.' 6	60	East Em		North	99	0		East	
			_ rea m		to 1 the Line	and	<u> </u>	et Prom The		<u> </u>
Sections 12 Townshi	ip 18:	<u>s</u>	Range	27E	, NA	(PM,		Edd	ly	Count
III DESIGNATION OF TO AN	NCPODTE	ר <u>י</u> ם מיים בי	NT. A NT	n NATU	DAT. CAR					
Name of Authorized Transporter of Oil		or Conde	ANI ANI	<u>ט גארו ש</u> רער	Address (Giw	address to whe	ich approved	copy of this fo	rm is to be se	nt)
Amoco ripeline inter-				لما	0il Tend	ler Dept.	Box 702	2068, Tuls	sa, OK 74	170-2
Name of Authorized Transporter of Casin	ighead Gas		or Dry	Gas 🔟	Address (Give	address to whi	ich approved	copy of this for	rm is to be se	N)
Iranswestern Pipeline	<u>Compan</u>	V Ser-	Tur	P~	IP. U. BO	X 1188	Houston	n. Texas	//251-1	188
give location of tanks.	A	12	185	27E	No		1 44969	Februz	rv. 199	1
V. COMPLETION DATA		1	r pool, giv	e comming	ling order numb	er: <u>No</u>				
IV. COMPLETION DATA Designate Type of Completion Data Spudded	- (X)	Oil We	III	e comming Das Well X	New Well X Total Depth	er: <u>No</u> Warkover	Deepen	Plug Back	Same Res'v	Diff Re
IV. COMPLETION DATA Designate Type of Completion Date Spudded 6/28/90	- (X) Date Com	Oil We pl. Ready /13/90	in Prod.	e comming Das Well X	New Well X Total Depth	ver: <u>No</u> Warkover 10,14	Deepen	Piug Back	Same Res'v 10,100'	Diff Re
IV. COMPLETION DATA Designate Type of Completion Date Spudded 6/28/90 Elevations (DP, RKB, RT, GR, etc.) DE 36321 CT 26191	- (X) Date Com 9 Name of P	Oil We pl. Ready I /13/90 roducing F	II G	as Well X	New Well X Total Depth	warkover 10,14	Deepen	Piug Back	Same Res'v	Diff Re
IV. COMPLETION DATA Designate Type of Completion Date Spudded 6/28/90 Elevations (DF, RKB, RT, GR, etc.) DF 3632 ¹ , GL 3618 ¹ Performinos	- (X) Date Com 9 Name of P Morr	Oil We pl. Ready I /13/90 roducing F OW	ii C	as Weli X	New Well X Total Depth Top Oil/Gas F	ver: <u>No</u> Warkover 10,14 Tay 10,00	Deepen 1 *	Plug Back P.B.T.D. Tubing Depth Depth Casing	Sime Res'v 10,100' 9,842' Shoe	Diff Re
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I) Nequest for anowable for newly office of the presence with must be accompanied by tabilation of deviation tests taken in a with Rule 111.
 All sections of this form must be filled out for allowable on new and recompleted wells.
 Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
 Separate Form C-104 must be filled for each pool in multiply completed wells.

OIL CONSERVATION DIVIJON

STATE OF NEW MEXICO ENERGY IND MINERALS DEPARTMENT

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P. O. 10X 2088 SANTA FE, NEW MEXICO 87501

C151 | e Forn C-122 - Fi | e Revised 10-1-78

RECEIVED

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

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Mewbourne 0il Company Federal T, Well #1 Eddy County, New Mexico 12 - 185 - 27E 10-11-90



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1000 Rio Brazos Rd., Aziec, NM 87-	REQL	JEST F				AUTHOR				۴
Operator			NINOFU			TURAL	Well	API No.		
Mewbourne Oil	Company				<u>.</u>			30-01	<u>15-26404</u>	
P.O. Box 5270	Hobbs. N	lew Mer	rico							
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New Well LA	Oil	Change in	Dry Gas							
Change in Operator	Casinghea	d Gas 🔲	Condens	ate 🚺						
If change of operator give name and address of previous operator						•	<u>.</u>			
II. DESCRIPTION OF WE	LL AND LE	ASE					<u></u>		······	
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Amoco Pipeline Inter corporate Trucking					Oil Te	nder Der	ot. Box	702068 T	ulsa, O	k 74
Name of Authorized Transporter of C	aninghead Gas		or Dry G	as [X]	Address (Gin	e address to v	which approved	l copy of this f	form is to be se	ent)
If well produces oil or liquide,	Unit	Sec.	Twp.	Rge.	le gas actuali	y connected?	Houston When	, lexas	//251-1.	138_
give location of tanks.		12	185	27E	<u>`</u>	les		02/07/91		
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Kequest for allowable for hewly white or deeparter with mark or decomplance of methods and with Rule 111.
 All sections of this form must be filled out for allowable on new and recompleted wells.
 Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
 Separate Form C-104 must be filed for each pool in multiply completed wells.


STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

BRUCE KING

OIL CONSERVATION DIVISION ARTESIA DISTRICT OFFICE

P.O. DRAWER OD ARTESIA, NEW MEXICO 88211 (505) 748-1283

Date: August 9, 1991

Mew bourne Oil Co. P.O. Box 5270 Hobbs, N.M. 88241

Re: Wells placed in pools

Gentlemen:

As the result of Division Order $\cancel{k-9545}$ the following described well (s) (hers have) been placed in the pool (s) shown below. This change in nomenclature has been made in our files. Please change your records to reflect the proper pool name. All subsequent reports must show this nomenclature until further notice.

North Illino	is Camp-	Morrow Gas	Pool-78890
Federal	T #1	A-12-18-27	
Chalk Bluff Fee	d. Com. #1	N-1-18-27	

Transporters are advised, by copy of this letter, to change their records to reflect the pool name as established by this order, effective <u>July 1, 1991</u>.

Sincerely,

Danell Moore

Darrell Moore District Geologist

cc: Each Transporter Amoco Pipeline, Transwestern Santa Fe Mae Well File Joe Chism BLM

Forn. 316 -2	UNITED STA	TES A STATE OF	FURM APPROVED
(June 1942)	DEPARTMENT OF TH	L INTERIOR	Expires: March 31, 1953
	ECKEAU OF LAND M.		for Least Designation and Sena' No.
S	UNDRY NOTICES AND RE	PORTS ON WELLS	NM-42410
Do not use this form	for proposals to drill or to d	eepen or reentry to a different res	ervoir.
Use	"APPLICATION FOR PERMIT	—" for such proposals	
	SUBMIT IN TRIP	LICATE	7. If Unit or CA, Agreement Designation
1. Type of Well	<u></u>	AUG - 2 1993	3
X Well Gas	Other	A	8. Well Name and No.
2. Name of Operator		A standard a feature of the standard and t	Federal "T" No. 1
Mewbourne 011 3. Address and Telephone No.	<u>Company</u>		
Ρ Ο Βοχ 5270	Hobbs New Merica	3824] (505) 303-5005	10. Field and Pool, or Exploratory Area
4. Location of Well (Footage, Se	c., T., R., M., or Survey Description)	<u>10241 (2027 222=2300</u>	Canyon
660' ENI 8 00	טי בבו		11. County or Parish, State
Sec. 12-T185-	R27E		
			Lady Co., N.M.
	TOPRIATE BUX(S) TO INI	DICATE NATURE OF NUTICE, I	TEPONI, UN UTHEN DATA
TYPE OF SUE	MISSION		CTION
Notice of Inte	int _		Change of Plans
		Recompletion	New Construction
L_ Subsequent R	eport	LAI Plugging Back	Non-Routine Fracturing
Final Abanda	oment Notice	Abering Casing	Conversion to Injection
		Other	Dispose Water
	, I.		(Note: Report results of multiple completion on Well Completion or Recommission Report and Los form)
 Describe Proposed or Complete give subsurface locations 	ed Operations (Clearly state all pertinent deta and measured and true vertical depths for a	ls, and give pertinent dates, including estimated date Il markers and zones pertinent to this work.)*	of starting any proposed work. If well is directionally drilled
l. Plug back ex Cap both plu	isting perforations (1 gs with 50' cement.	0,008'-10,054') with a CI	BP @ 9950' and 9040'.
2. Perforate th	e Cisco formation @ 77	700'-8050'.	
			OF LAND ALL
3. Stimulate if	necessary.		at all of CALING
			/ S ACLEINCO SI
			I JUL TR 1983
			G DIST. 6 N.M. 3/
			Stablers Marth
Procedure per co	onversation with Adam	S. on June 23, 1993.	
Procedure per co	onversation with Adam	S. on June 23, 1993.	
Procedure per co	onversation with Adam	S. on June 23, 1993.	
Procedure per co 14. I hereby certify that the forego Signed	onversation with Adam	S. on June 23, 1993. <u>District Supt</u>	Date_July_14,_1993
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Procedure per co 14. I hereby certify that the forger Signed (This space for Federal & Stat Approved by Conditions of approval, if any: Title 18 U.S.C. Section 1001, make or representations as to any matter	Onversation with Adam ing is price and correct t office (e) SD.) DAVID R. GLASS Ti es it a crime for any person knowingly and within its jurisdiction.	S. on June 23, 1993. the <u>District Supt</u> the <u>Petroloum Engineer</u> willfully to make to any department or agency of the	Date

Form 3160.5	HN OTE CONS. WANISSION	FORM APPROVED
(June 1990) REGEIVED DEPARTME	NT OF THE INTERIOR testa. NM 88210	Budget Bureau No. 1004-0135 Expires: March 31, 1993
BUREAU OF	LAND MANAGEMENT	5. Lease Designation and Serial No.
See UNDRY NOTICES	AND REPORTS ON WELLS	NM-42410
Do not use this form for proposals to d CALL Use "APPLICATION FO	irill or to deepen or reentry to a different reservoir. DR PERMIT—" for such proposals	o. If indian, Allouce of Tribe Name
SUBMI	T IN TRIPLICATE	7. If Unit or CA, Agreement Designation
I. Type of Well	061 - 6 1993	8 Well Name and No
2. Name of Operator	0. (+ D.	Federal "T" #]
Mewbourne Oil Company		9. API Well No.
3. Address and Telephone No. D. D. Day 5270 Habbe Now Ma	vico 992/1	30~015~26404
4. Location of Well (Footage, Sec., T., R., M., or Survey J	Description)	North Illinois Camp Morre
660' ENI & 990' EFI		11. County or Parish, State
	(e) TO INDICATE MATURE OF NOTICE BED	I Eddy LO. New Mexico
	(a) TO INDICATE NATURE OF NOTICE, REPU	INI, UN UINEN DAIA
		l
Notice of Intent	Abandonment	Change of Plans
Subsequent Report	Plugging Back	Non-Routine Fracturing
	Casing Repair	Water Shut-Off
Final Abandonment Notice	Attering Casing	Conversion to Injection
		(Note: Report results of multiple completion on Well
08/14/93 Well pumping 1442 B MIRU well service r	W. O BO, O MCF from attempted complet	tion in Cisco formation.
08/15/93 Set CIBP @ 7595' ov Wolfcamp formation 08/16/93 Swabbed well down w 08/17/93 Acidized Wolfcamp f oil or gas. 08/18/93 Set CIBP @ 7300' ov Perf'd Wolfcamp for 08/19/93 Acidized Wolfcamp for 08/20/93 Swabbed well w/no s 08/21/93 Set CIBP @ 7078' ov 08/22/93 Acidized Wolfcamp for 08/24/93 Swabbing water w/tr 08/26/93 Acid frac'd Wolfcamp See attached page.	1g. er Eisco Perfs (7685'-7695'). Dump 4 (7330'-7360') (44 H) /no entry. ormation w/3000 gal 15% FE acid. Swal er Wolfcamp formation (7330'-7360'). mation (7092'-7146') (62H). Swabbed w ormation (7092'-7146') (62H). Swabbed w ormation (7092'-7146') w/3000 gal. 15% how of oil or gas. er Perfs (7092'-7146'). Perf'd Wolfca ormation (6868'-7038') w/3000 gal. 15% ace of oil. p (6868'-7038') w/3000 gal. 20% FE aci	<pre>sx. cmt. on plug. Perf. bbed water w/no show of Dump 4 sx. cmt. on plug. well down. No entry. % RE acid. amp (6868'-7038') (80H) % FE acid. id & 15,000 gal. gel water.</pre>
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08/27/93 RIH w/pump & started pumping well. 08/28/93 0 B0 276 BW 8 MCF 09/03/93 5 B0 30 BW 5 MCF 09/05/93 2 B0 25 BW 4 MCF

				c151
Form 31602 (June 1990) CEIVED	UNITED DEPARTMENT O	STATES NI OIL CO	13. (J. 1881 93	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993
CO1 44	BUREAU OF LAN	D MANAGEMENT	er easte	5. Lease Designation and Serial No.
AUG 24 11 03 AUSUNT Do not use this form for CARL Use "AP	DRY NOTICES AN proposals to drill of PLICATION FOR PE	D REPORTS ON WELLS r to deepen or reentry to a ERMIT—" for such propos	S a different reservoir. als	NM-42410 6. If Indian, Allottee or Tribe Name
	SUBMIT IN	TRIPLICATE RELE	IVED	7. If Unit or CA, Agreement Designation
1. Type of Well		SEP -	8 1993	· · · · ·
Well X Well Oth	er		- D.	8. Well Name and No.
<u>Mewbourne_Oil_Con</u>	ipany		C ANALY	
3. Address and Telephone No.		(1001) (rec) 000	5005	<u>30-015-26404</u>
4. Location of Well (Footage, Sec., T.) <u>bbs</u> , <u>New Mex1c</u> , R., M., or Survey Descript	<u>0 88241 (505) 393-</u> ion)	5905	Nowth Illipois Comp
660' ENI & 990' E	FI Sec 12-T1	85-027F		11. County or Parish, State Morrow
				Eddy Co. N.M.
12. CHECK APPRC	PRIATE BOX(s) T	O INDICATE NATURE C	OF NOTICE, REPOR	F, OR OTHER DATA
TYPE OF SUBMIS	SION	······	TYPE OF ACTION	
Notice of Intent		Abandonment		Change of Plans
		Recompletion		New Construction
LAJ Subsequent Report		Casing Back		Water Shut-Off
Final Abandonment	Notice	Altering Casing		Conversion to Injection
		Other		Dispose Water
				Completion or Recompletion Report and Log form.)
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4. I hereby certify that the forgeoing is Signed	und correct	Title Engineer	• •	Date August 20, 1993
(This space for Federal or State offi	ce use)			
Approved by		Tule		Date
Conditions of approval, if any:				J. Japa
Title 18 U.S.C. Section 1001, makes it a	crime for any person knowin	igly and willfully to make to any depar	tment or agency of the United Sa	nes any false, fictitious or fraudulent statements
r representations as to any matter within	n its jurisdiction.	*See Instruction on Revers	e Side	

Submit 5 Conies		State of N	ew Mexico				P .	~ • • • •
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INSTRUCTIONS: This form is to be filed in compliance with Rule 1104 1) Request for allowable for newly drilled or deepened well must be accompanied by tabulation of deviation tests taken in accordance with Rule 111.

All sections of this form must be filled out for allowable on new and recompleted wells.
 Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
 Separate Form C-104 must be filed for each pool in multiply completed wells.

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					i	NM-42410	
	SUNDRY NOTICES	ND REPOI	RTS ON WELLS	lifferent co.		6. If Indian, Allottee or Tribe	Name
Do not use this is	Use "APPLICATION FOR	PERMIT-"	for such proposal	s	servoir.		
	SUBMIT	IN TRIPLIC	ATE RENE	VEL		7. If Unit or CA, Agreement I	Designation
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Oil X Gas Well X Well	Other		······································			8. Well Name and No.	
Name of Operator				₽. ≻~~,	ļ	Federal "T" #1	- <u>,</u>
Address and Telephone	No.		· · · · · · · · · · · · · · · · · · ·			20.015.26Å0A	
P.O. Box 527	70 Hobbs, New Mexi	co 88241	(505) 393-5	905	ŀ	10. Field and Pool, or Explorate	ory Area
. Location of Well (Foota	ge, Sec., T., R., M., or Survey Des	cription)	······			North Illinois	Camp Mor
660' FNL & 9	990' FEL					11. County or Parish, State	-
Sec. 12-1183)-KZ/F					Eddy Co N M	
CHECK		TO INDIC	ATE NATURE OF	NOTICE	REPORT	OR OTHER DATA	
TYPE OF	SUBMISSION			TYPE OF /	ACTION	, on other para	
X Novice of	of Intent	·	Abandonment			Change of Plans	
			Recompletion			New Construction	
Subsequ	ent Report		Plugging Back			Non-Routine Fracturing	
			Casing Repair			Water Shut-Off	
LJ Final Al	bandonment Notice		Altering Casing	.Status		Disnose Water	
					·	(Note: Report results of multiple comp	pletion on Well
. Describe Proposed or Co give subsurface loca	mpleted Operations (Clearly state all g ations and measured and true vertical	ertinent details, an depths for all mar	d give pertinent dates, includi kers and zones pertinent to t	ng estimated dat his work.)*	te of starting an	y proposed work. If well is direct	ionally drilled,
Mewbourne	Ail Commany here b	v request	s "shut-in" st	atus per	nding fi	urther evaluation	1
of the lea	se for the above w	ell. The	well was spuc	Ided 06/2	28/90.	Attached is a	
copy of th	e stimulation repo	rt which	charts the anr	nulus pre	essure d	tuning a break	
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I hereby certify that the	foregoing is true and correct		<u>i i na seconda de la composición de la</u>				<u>.</u>
Signed	Kurme	Title	Production Eng	ineer		Date09/21/93	
(This space for Federal of	or State office use)					1 1	<u></u>
Approved by Conditions of approval, i	ie (oli oli oli <u>oli tate Calemen</u> if any: o	Title	Petroleum	Engleper	•		
le 18 U.S.C. Section 1001	, makes it a crime for any person kn	owingly and willfu	lly to make to any department	at or agency of t	the United Stat	es any false, fictitious or fraudule	nt statements
representations as to any r	matter within its jurisdiction.	*Sac 100	nuction on Reverse S	ide .			
	• •						

*See Instruction on Reverse Side

HALLIBURTON SERVICES ACQUIRE Version 1.52

CUSTOMER AND JOB INFORMATION

CustomerMEWBOURNE OILContractorX-PERTLeaseFEO-TLocationARTESIAFormationJob TypeJob TypeACIDCountryUSAStateNM

Date 21-Aug-1993 County EDDY Town Section Range Permit No Well No 1 Field Name

Customer Representative BRENT THURMAP

Halliburton Operator TOMMY VAUGHN

Ticket No. 498331NO

STAGE DESCRIPTIONS

WELL CONFIGURATION INFORMATION

ST ACID ST FLUSH Packer Type COMP Depth 6765 ft Bottom Hole Temp. 120.0 Deg F

PIPE CONFIGURATION

Wellbore	Measured		Casing	Casing	Tubing	Tubing
Segnent	Depth	TVD	ID	OD	10	0D
Number	(ft)	(ft)	(inch)	(inch)	(inch)	(inch)
1	6868	6868	4.950	5.500	2.441	2.875

PERFORATIONS

Perforation	Тор	Bottom	Shots per
Interval	(ft)	(ft)	(ft)
1	6868	7038	2

REMARKS ABOUT JOB

TREAT AS INST

ACE: THIS REPORT IS BASED ON SOUND ENGINEERING PRACTICES, BUT BECAUSE OF VARIABLE WELL CONDITIONS AND OTHER INFORMATION WHICH MUST BE RELIED UPON, HALLIBURTON MAKES NO WARRANTY, EXPRESSED OR IMPLIED, AS TO THE ACCURACY OF THE DATA OR OF ANY CALCULATIONS OR OPINIONS EXPRESSED HEREIN. YOU AGREE THAT HALLIBURTON SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, WHETHER DUE TO NEGLIGENCE

- 1. Tubing Press (psi)
- 2. Annulus Press (psi)
- 3. Clean Rate

(bpm)

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Artesia, NM 882002: March 31, 1993 3. Lease Designation and Serial No. NM 42410 6. If Indian, Alloone or Tribe Nume 7. If Unit or CA, Agreement Designation 8. Well Name and No. Federal T #1 9. API Well No. 30~015-26404
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05 10. Field and Pool, or Exploratory Area N. Illinois Camp Morrow
11. County or Parish, State
Eddy Co., N.M.
NOTICE, REPORT, OR OTHER DATA
TYPE OF ACTION
Change of Plans
New Construction
Non-Routine Fracturing
ntegrity Test Dispose Water
estimated date of starting any proposed work. If well is directionally drilled,
0#. Lost 10# in 30 minutes. representating ECEIVED
OR RECORD OIL COM. DIV. 7 1995 IEW MEXICO
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Date 5/24/95
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	NM OIL CONS COMMISSION	CIST
	Artesia, NM 88210	0200
*orm 3160-5 UN	ITED STATES	FORM APPROVED
ne 1990) DEPARTME	NT OF THE INTERIOR	Budget Bureau No. 1004-0135
	1 AND MANAGEMENT	Expires: March 31, 1993
BUREAU OF	LAND MANAGEMENT	5. Lease Designation and Serial No.
SUNDRY NOTICES Do not use this form for proposals to d Use "APPLICATION FC	AND REPORTS ON WELLS will or to deepen or reentry to a different reservoir. DR PERMIT—" for such proposals	6. If Indian, Allottee or Tribe Name
SUBMI	T IN TRIPLICATE	7. If Unit or CA, Agreement Designation
1. Type of Well		
Weil Weil Other		8. Well Name and No.
2. Name of Operator	V V	Federal "T" #1
Mewbourne Oil Company		9. API Well No.
3. Address and Telephone No.		30-015-26404
P.O. Box 5270 Hobbs, New Me	x1co 88241 (505) 393-5905	10. Field and Pool, or Exploratory Area
4. Location of Well (Footage, Sec., T., R., M., or Survey]	Description)	N. Illinois Camp Morrow
660' FNL & 990' FEL		11. County or Parish, State
Sec. 12-T18S-R27E		
	UALT A	Eddy Co. N.M.
12. CHECK APPROPRIATE BOX	(s) TO INDICATE NATURE OF NOTICE, REPOR	RT, OR OTHER DATA
TYPE OF SUBMISSION	TYPE OF ACTION	· · · · · · · · · · · · · · · · · · ·
Notice of Intent	Abandonment	Change of Plans
	Recompletion	
Subsequent Report	Plugging Back	Non-Routine Fracturing
		Water Shut-Off
Final Abandonment Notice		
	Temporary Abandonment	
		(Note: Report results of multiple completion on Well
 13. Describe Proposed or Completed Operations (Clearly state in give subsurface locations and measured and true vertices and	all pertinent details, and give pertinent dates, including estimated date of starting ical depths for all markers and zones pertinent to this work.)* wary abandonment status for the above g further behind pipe potential. This ed on the attached sundry notice.	any proposed work. If well is directionally drilled, referenced well well passed the
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7.	APPROVED FOR 12 MO DE ENDING	
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_	OIL CO	dn. div.
14. I handby confile that the developings is true and comment	<u> </u>	87. 2
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Signed 7 11. Pol	TiteEngineer	Date <u>Aug. 3, 1995</u>
(THR SPACE FOR FOREIN ON RIGE POD) 101	G LARA DETROISUM ENGINEER	0/28/65
Approved by Conditions of approval, if any:	1 HIC	
Tale 18 U.S.C. Section 1001, makes it a crime for any person or representations as to any matter within its jurisdiction.	a knowingly and willfully to make to any department or agency of the United S	States any false, fictitious or fraudulent statements

form. 3160-5 June 1990)	DEPARTMENT	D STATES OF THE INTERIOR			FORM APPROVED Butget Bureau No KG4-0155
	BUREAU OF LA!	ND MANAGEMENT	N.M. Oil Cons.	. Divisi o i	Expires March 31, 1993 5. Lease Designation and Sens' No.
\$	UNDRY NOTICES AN	ID REPORTS ON W	11 S. 1st Street	10-283	NN 42410
Do not use this form Use	for proposals to drill c "APPLICATION FOR P	or to deepen or reentry ERMIT—" for such pro	posals	servõir.	
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Type of Well]		DEC 05 '96		Well New and N
Name of Operator				<u> </u>	Pederal T #1
Mewbourne 0il (Company		0. C. D.	9	API Well No
Address and Telephone No			ARTESIA. Crite		30-015-26404
P.O. Box 5270.	Hobbs, NM 88241	(505) 393-5905		10	Field and Pool or Evolution Ant
Location of Well (Footige St	et., T., R., M. or Survey Descrip	tion)		N.	Illinois Camp Morr
660' FNL & 990'	FEL	,		1	Count or Parich State
Sec. 12-T18S-R2	27E				Eddy Co., NM
CHECK API	PROPRIATE BOX(s) T	O INDICATE NATUR	RE OF NOTICE, I	REPORT,	OR OTHER DATA
TYPE OF SUE	BMISSION		TYPE OF A	CTION	
Notice of Inte	ent	Abandonment	I	[Change of Plans
Subsequent R	eport	Plugging Bacl	k	Č	Non-Routine Fracturing
	· [Casing Repair	r	[Water Shut-Off
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Final Abandor	nment Notice	Altering Casis	ng mporary Abandi	onment (Conversion to Injection Dispose Water Note Repertresults of sublight completion on W ompletion or Recompletion Repert and Log form proposed work. If well is dissectionally data
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Form 3160-5 (June 1990) DEPAR DLIDEA1	UNITED STATES TMENT OF THE INTERIOR	Artesia, NM 8	821000000000000000000000000000000000000
		•	5. Lease Designation and Serial No. NM-42410
Do not use this form for proposals Use "APPLICATIO	to drill or to deepen or reentry N FOR PERMIT-" for such pro	s to a different reservoir. posals	6. If Indian, Allottee or Tribe Name
SUE	BMIT IN TRIPLICATE		7. If Unit or CA, Agreement Designation
1. Type of Well Oil Gas Well Well X Other 2. Name of Operator	· · ·	· · ·	8. Well Name and No. Federal T #1
Mewbourne Oil Com[any 3. Address and Telephone No.			9. API Well No. 30-015-26404
PO Box 5270, Hobbs, NM 505-393-59 4. Location of Well (Footage, Sec., T., R., M., or Sur	05 vey Description)		10. Field and Pool, or Exploratory Area N. Illinois Camp Morrow
660' FNL & 990' FEL, Sec.12 T-18S R-	27E		11. County or Parish, State Eddy, NM
12. CHECK APPROPRIATE B	OX(s) TO INDICATE NATURE C	F NOTICE, REPORT, C	OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACTION	
Notice of Intent	Abandonment		Change of Plans
X Subsequent Report	Plugging Back		Non-Routine Fracturing Water Shut-Off
Final Abandonment Notice	Altering Casim	9	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Weil Completion or Recommertion Report and Log form.)

The above caption well was successfully MIT ed on 10/25/2000. (520 psi for 30 mins.) The pressure chart is enclosed. If any question, please call.

1215161	N TRAY	°C	87) 1971 1971	
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14. I hereby certify that the foregoing is true and correct					
Signed Aller The	Title	N.M. Young	District Manager	Date	11/01/00
(This space for Federal or State office use)		Andrea 2			
Approved by Renarcel On ly Conditions of approval, if any:	Title			Date	
Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent					
Statements of representations as to any matter within its junistic				<u></u>	
*See Instruction on Reverse Side					

	TED STATES	FORM APPROVED
Ine 1990) DEPARTMEN	NT OF THE INTERIOR	Expires: March 31, 1993
BUREAU OF	LAND MANAGEMENT	5. Lease Designation and Serial No. NM-42410
SUNDRY NOTICES o not use this form for proposals to dri Use "APPLICATION FC	6. If Indian, Allottee or Tribe Name Ir.	
SUBMIT	IN TRIPLICATE	7. If Unit or CA, Agreement Designation
Type of Well		
Well Well X Other		8. Well Name and No.
Name of Operator Mewhourne Oil Comfany		
Address and Telephone No.	· · · · · · · · · · · · · · · · · · ·	30-015-26404
PO Box 5270, Hobbs, NM 505-393-5905		10. Field and Pool, or Exploratory Area
Location of Well (Footage, Sec., T., R., M., or Survey De	scription)	N. Illinois Camp Morrow
660' FNL & 990' FEL, Sec.12 T-18S R-27E		11. County or Parish, State
	·	Eddy, NM
2. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT	, OR OTHER DATA
TYPE OF SUBMISSION	TYPE OF ACTIO	N
X Notice of Intent	Abandonment	Change of Plans
		New Construction
L_ Subsequent Report	Plugging Back	Non-Routine Fracturing
Final Abandonment Notice	Li Casing Repair	Water Shut-Off
	X Other CIT & Extend T/A.	
		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)
I. Describe Proposed or Completed Operations (Clearly s	tate all pertinet details, and give pertinent dates, including estimated d	ate of starting any proposed work. If well is
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*See Instruction on Reverse Side

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DIFF 3160-5 DEPARTM BUREAU C	TED STATES	OCO-An	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 5. Lease Designation and Serial No.
SUNDRY NOTICE a not use this form for proposals to a Use "APPLICATION F	ES AND REPORTS ON WE drill or to deepen or reent FOR PERMIT-" for such p	LLS ry to a different rese proposals	6. If Indian, Allottee or Tribe Name
SUBMI	IT IN TRIPLICATE	131415167	7. If Unit or CA, Agreement Designation
Type of Well Gas		² k	R Wall Name and No
Well Well X Other			Federal T #1
Mame of Operator Mewbourne Oil Comfany		LIVED	
Address and Telephone No.		RECEIVESIA	30-015-26404
PO Box 5270, Hobbs, NM 505-393-5905		0CD - MILL	10. Field and Pool, or Exploratory Area
Location of Well (Footage, Sec., T., R., M., or Survey I	Description)	, C.	N. Illinois Camp Morrow
660' FNL & 990' FEL, Sec.12 T-18S R-27E	E	60E 62 82 129°	11. County or Parish, State
	·		
2. CHECK APPROPRIATE BOX	(s) TO INDICATE NATURE	OF NOTICE, REPO	RT, OR OTHER DATA
TYPE OF SUBMISSION		TYPE OF ACT	
X Notice of Intent	Abandonm	ent	Change of Plans
		ion	
Subsequent Report	Plugging B	ack	Non-Routine Fracturing
	Casing Rep	Jar	
		IT & Extend T/ A.	
			(Note: Report results of multiple completion on Well
The above caption well is currently under TA a 5 1/2" CIBP above all perfs @ 6800". We schelude a CIT (500 psi) & after passing, extend T/A	'/A status. Mewbourne Oil Com are considering converting this A status for an additional time.	pany would like to exten s well into a SWD. At thi	d this status. The well has is time, Mewbourne would like to
If any question, please call.			
T	Approved For <u>12</u> Entire <u>10/25/2</u>	Month Period	
Note to Operato Alease submit a	f: Rec'd	a (204)	EIVE 10 P
of pressure test	- Chart, or 1119	act city	
the receiption of the receipti	Title N.M. Young	District Manager	Date 10/06/00
This space for Federal or State office use)	Pate	Cloury Zanta and	
pproved by <u>Jana</u> onditions of approval, if any:	Title		Date _11/16/2000
itle 18 U.S.C. Section 1001, makes it a crime for any pe alements or representations as to any matter within its j	rson knowingly and willfully to make to jurisdiction.	any department or agency of	the United States any false, fictitious or fraudulent

*See Instruction on Reverse Side

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BILL RICHARDSON Governor Joanna Prukop Cabinet Secretary

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

Lori Wrotenbery Director Oil Conservation Division

Field Inspection Program "Preserving the Integrity of Our Environment"

05-Dec-03

MEWBOURNE OIL CO PO BOX 7698 TYLER, TX 75711-0000

NOTICE OF VIOLATION - Inspection

Dear Operator:

The following inspection(s) indicate that the well, equipment, location or operational status of the well(s) failed to meet standards of the New Mexico Oil Conservation Division as described in the detail section below. To comply with standards imposed by Rules and Regulations of the Division, corrective action must be taken immediately and the situation brought into compliance. The detail section indicates preliminary findings and/or probable nature of the violation. This determination is based on an inspection of your well or facility by an inspector employed by the Oil Conservation Division on the date(s) indicated.

Please notify the proper district office of the Division, in writing, of the date corrective actions are scheduled to be made so that arrangements can be made to reinspect the well and/or facility.

INSPECTION DETAIL SECTION

FEDERAL	Г 001		A-12-18S-27E	30-015-26404-00-	-00 Corrective	
Date	Type Inspection	Inspector	Violation?	Non-Compliance?	Action Due By:	Inspection No.
12/05/2003	Routine/Perio	lic Mike Brate	cher Yes	No	3/9/2004	iMLB0333931134
Comments of	n Inspection:	TA status for this well expired Rule 201. (Idle Well)	1 10/25/01. Last pro	oduction reported was 7	7/93. Well is in viola	tion of

In the event that a satisfactory response is not received to this letter of direction by the "Corrective Action Due By:" date shown above, further enforcement will occur. Such enforcement may include this office applying to the Division for an order summoning you to a hearing before a Divison Examiner in Santa Fe to show cause why you should not be ordered to permanently plug and abandon this well. Such a hearing may result in imposition of CIVIL PENALTIES for your violation of OCD rules.

Sincerely,

Beall

Artesia OCD District Office

Note:nformation in Detail Section comes directly from field inspector data entries - not all blanks will contain data. *Significant Non-Compliance events are reported directly to the EPA, Region VI, Dallas, Texas.

> Oil Conservation Division * 1301 W. Grand * Artesia, New Mexico 88210 Phone: 505-748-1283 * Fax: 505-748-9720 * http://www.emnrd.state.nm.us



BILL RICHARDSON Governor Joanna Prukop Cabinet Secretary

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

Lori Wrotenbery Director Oil Conservation Division

Field Inspection Program "Preserving the Integrity of Our Environment"

05-Dec-03

MEWBOURNE OIL CO

PO BOX 7698 TYLER, TX 75711-0000

NOTICE OF VIOLATION - Inspection

Dear Operator:

The following inspection(s) indicate that the well, equipment, location or operational status of the well(s) failed to meet standards of the New Mexico Oil Conservation Division as described in the detail section below. To comply with standards imposed by Rules and Regulations of the Division, corrective action must be taken immediately and the situation brought into compliance. The detail section indicates preliminary findings and/or probable nature of the violation. This determination is based on an inspection of your well or facility by an inspector employed by the Oil Conservation Division on the date(s) indicated.

Please notify the proper district office of the Division, in writing, of the date corrective actions are scheduled to be made so that arrangements can be made to reinspect the well and/or facility.

		INSPECTIO	N DETAIL	SECTION		
FEDERAL Inspection	T 001	A-12	-18S-27E	30-015-26404-00-0 *Significant)0 Corrective	
Date	I ype inspection	Inspector	Violation?	Non-Compliance?	Action Due By:	inspection (No.
12/04/2003	Routine/Periodic	Mike Bratcher	Yes	No	3/9/2004	iMLB0333840462
Comments	on Inspection: Well sign i	s illegible and is not stan	ding. Violatio	n Rule 103.		

In the event that a satisfactory response is not received to this letter of direction by the "Corrective Action Due By:" date shown above, further enforcement will occur. Such enforcement may include this office applying to the Division for an order summoning you to a hearing before a Divison Examiner in Santa Fe to show cause why you should not be ordered to permanently plug and abandon this well. Such a hearing may result in imposition of CIVIL PENALTIES for your violation of OCD rules.

Sincerely Mitchent

Artesia OCD District Office

Note:nformation in Detail Section comes directly from field inspector data entries - not all blanks will contain data. *Significant Non-Compliance events are reported directly to the EPA, Region VI, Dallas, Texas.

> Oil Conservation Division * 1301 W. Grand * Artesia, New Mexico 88210 Phone: 505-748-1283 * Fax: 505-748-9720 * http://www.emnrd.state.nm.us



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON Governor Joanna Prukop Cabinet Secretary Lori Wrotenbery Director Oil Conservation Division

9 January 2004

MEWBOURNE OIL CO PO Box 7698 Tyler TX 75711

RE: Federal T 001

A-12-18s-27e

API 30-015-26404 Violation of Rule 103: Well sign violation

Dear Sirs:

This second directive is to notify you that these wells are still in violation of Rule 103

On December 4,2003 a letter was sent notifying you on the violation of Rule 103. An inspection of the wells on January 6, 2004 found no action had been taken.

Rule 103 of the New Mexico Oil Conservation Division provides as follows: 103 SIGN ON WELLS

All wells and related facilities by the Division shall be identified by a sign, which sign shall remain in place until the well is plugged and abandoned and the related facilities are closed. For drilling wells, the sign shall be posted on the derrick or not more than 20 feet from the well. The sign shall be of durable construction and the lettering shall be legible and large enough to be read under normal conditions at a distance of 50 feet. The wells on each lease or property shall be numbered in non-repetitive, logical and distinctive sequence. An operator will have 90 days from the effective date of an operator name change to change the operator name on the well sign unless an extension of time, for good cause shown along with a schedule for making the changes, is granted. Each sign shall show the:

1. number of well;

2. name of property;

3. name of operator;

4. location by footage, quarter-quarter section, township and range (or Unit Letter can be substituted for the quarter-quarter section), and

5. API number.

In the event that a satisfactory response is not received to this letter of direction by February 6,2004 further enforcement will occur. Such enforcement may include this office applying to the Division for an order summoning you to a hearing before a Division Examiner in Santa Fe to show cause why you should not be ordered to permanently plug and abandon this well. Such a hearing may result in imposition of CIVIL PENALTIES for your violation of OCD rules.

Sincerely,

he Scall

Mike Bratcher, Compliance Officer

Oil Conservation Division * 1301 West Grand Ave. * Artesia, New Mexico 88210 Phone: (505) 748-1283* Fax (505) 748-9720 * <u>http://www.emnrd.state.nm.us</u>

					• •
Form 3160-5 (September 2001)	UNITED STATES DEPARTMENT OF THE IN BUREAU OF LAND MANA	TTERIOR	ARTESIA	FC —ON Expir	DRM APPROVED AB No1004-0135 es: January 31, 2004
SUNDR			-ARILUM	5. Lease Serial 1	No.
Do not use th	is form for proposals to c	frill or to re-enter	r an	NM-42410	attee or Tribe Name
abandoned we	abandoned well. Use Form 3160-3 (APD) for such proposals.			o. it mulan, And	dee of The Name
SUBMIT IN TR	IPEICATE - Other instru	clionsion revers	es/de	7. If Unit or CA/	Agreement, Name and/or No.
Oil Well Gas Well	1 Other			8. Well Name a	nd No.
2. Name of Operator		······		Federal T #1	
Mewbourne Oil Company 147	44			9. API Well No	
		3D. Phone No. (<i>inclu</i>	BECEIVED	30-015-26404	ol. or Exploratory Area
4. Location of Well (Footage Sec.	<u>Z40</u> T.R. M. or Survey Description	505-393-5905	HECCIVED	N Illinois Can	np Morrow
			APR 2 2 2004	11. County or Pa	urish, State
660' FNL & 990' FEL, Sec 12-1	118S-R27E		900-ARTESIA	Eddy Co NM	
12. CHECK AP	PROPRIATE BOX(ES) TO	INDICATE NATU	JRE OF NOTICE, RE	SPORT, OR O	THER DATA
TYPE OF SUBMISSION		Т	YPE OF ACTION		
	Acidize [Deepen	Production (Start/	(Resume)	Water Shut-Off
Notice of Intent	Alter Casing	Fracture Treat	Reclamation	ā	Well Integrity
Subsequent Report	Casing Repair	New Construction	Recomplete	\square	Other MIT Test
D Winel About Station	Change Plans	Plug and Abandon	Temporarily Aba	ndon	
Final Abandonment Nouce	Convert to Injection	Plug Back	Water Disposal	· · · · · · · · · · · · · · · · · · ·	
If the proposal is to deepen direc Attach the Bond under which the following completion of the inv testing has been completed. Fin 'etermined that the site is ready	tionally or recomplete horizontally work will be performed or provioured operations. If the operation real Abandonment Notices shall be for final inspection.)	, give subsurface locat ide the Bond No. on fil esults in a multiple cor filed only after all requ	ions and measured and true e with BLM/BIA. Require npletion or recompletion in irrements, including reclarr	vertical depths of d subsequent repo a new interval, a nation, have been	all pertinent markers and zones. rts shall be filed within 30 days Form 3160-4 shall be filed once completed, and the operator has
The above caption well was suc The pressure chart is enclosed.	cessfully MITed on 01/26/04. ((Pressured casing to	570#, held OK for 30 mi	ins)	
Requesting extension of tempor 5 1/2" CIBP set @ 6800'. No ty	ary abandon status. pe of hardware in hole.			2	
· .		-	TA APPROVED F	OR 12 MON 1126105	NTH PERIOD
Accepted for record - NMOCD					
14. 1 hereby certify that the foregoin Name (Printed/Typed)	g is true and correct				······································
NM Young		Title	Hobbs District Manager		······
Signature Allelin		Date	01/27/04		
	CRATHISISPACE TO	RHEDERALOR:	STATEOFICEUSE		
Approved by (Signature)	/s/ Joe G. L	_ara	Name Printed/Typedy/ Joe G. 1	Lara _{Titl}	· Pet, Engr.
Conditions of approval, if any, are certify that the applicant holds lega which would entitle the applicant to c	attached. Approval of this notice all or equitable title to those rights conduct operations thereon.	does not warrant or in the subject lease	CARLSBAD I	FIELD OF	FICTE: 4120104
8 U.S.C. Section 1001 and Tit ny false, fictitious or fraudule	le 43 U.S.C. Section 1212, make it int statements or representations as	t a crime for any person to any matter within its	n knowingly and willfully t jurisdiction.	o make to any dep	artment or agency of the United
mued on next page)					



C104AReport

District II 101 W. Grand Ave., Artesia, NM 88210 me:(505) 748-1283 Fax:(505) 748-9720

State of New Mexico Energy, Minerals and Natural Resources Oil Conservation Division 1220 S. St Francis Dr. Santa Fe, NM 87505

Change of Operator

Previous Operator Information		New Operator 1	New Operator Information		
		Effective Date:	4/1/2008		
OGRID:	14744	OGRID:	6137		
Name:	MEWBOURNE OIL CO	Name:	DEVON ENERGY PRODUCTION COMPANY, LP		
Address:	PO BOX 5270	Address:	20 N Broadway		
Address:		Address:	······································		
City, State, Zip:	HOBBS , NM 88241	City, State, Zip:	Oklahoma City , OK 73102		

I hereby certify that the rules of the Oil Conservation Division have been complied with and that the formation on this form and the certified list of wells is true to the best of my knowledge and belief.

Previous Operator		New Operator		
Signature: Printed	Most Litte	Signature: Printed	Har ful	
Name:	idincy be whetbeone	Iname:	Gregg Jacob	
Title:	Vice-President Operations	Title:	Western Operations Manager	
Date:	4/4/08 Phone: (903) 561-2900	Date:	<u>4/07/08</u> Phone: (405) 552-4591	

NMOCD Approv	<u>ral</u>
Electronic Signature:	Carmen Reno, District 2
Date: April 07, 2008	

http://www.emnrd.state.nm.us/OCD/OCDPermitting/Report/C104A/C104AReport.aspx?PermitID=38,128,... 4/4/2008 04/04/2008 11:18AM (GMT-05:00)

Page 1 of 1

Form C-145 Permit 72521

- Form-3160-5- (August 1999)		UNI	TED STATES	FRIOR	U -					FOR OMB-I	lM∙AF NΩ⊶	ROVED			
(August 1999)	B	UREAU OF	LAND MANAG	EMENT		Forn /	ART	TESIA		RESCA	VÖVI	MBER 3	0, 2000	<u></u>	
	SUNDR	Y NOTICES	AND REPORT	S ON WELL	.S	000-1			5. Lease S	erial No.					
	Do not use t	his form for	proposals to dri m 3160-3 (APU	Il or to re-ente) for such pro	ter an posais				6 It Indian	Allottee o	NM-4	2410 e Name			
2		SUBMIT	IN TRIPLICAT	Έ		<u></u>		<u> </u>							
、									7. Unit or (CA Agreen	nent	Name an	l No.		
1a Type of Well	🗌 Oil Well	✓ Gas Wel	I Other		J	<u>JI 2 1</u> 2(308		8 Weil Nar	ne and No) .				
2. Name of Operate	Dr				OC	DART	581	A	1	Fe	eder	al T 1			
DEVON	ENERGY PRO	DUCTION	COMPANY, LP						9. API We	l No					
3. Address and Tel	ephone No.									30	-015	26404			
20 Nort	h Broadway, ()klahoma C	ity, OK 73102	····		405-552-819	98		10. Field a	nd Pool, o	or Exp	loratory			
4. Location of Well	(Report locatio	n clearly and Fi	I in accordance	with Federal	l requirem	ents)*			12 Count	V or Parish	Nolfo	amp State	·		
Sec	tion 12 T189 I	 2276 Init /							E	ldv		. 01415	NM		
	CH	ECK APPR	OPRIATE BOX	(s) TO INDIC	CATE NAT	URE OF NO	TICE,	REPORT	, OR OTHE	R DATA			14181		
TYPE OS S	UBMISSION					TYF	PEOP	ACTION							
✓ Notice of Int	ent		Acidize	l	Deeper	a Troat	H	Productio	in (Start/Res	ume)	H'	Vater Shu	it-Off		
Subsequent	Report			ir [Instruction		Recomple	ete)ther	iny		
Final Abando	onment Notice		Change Plan	s [🔲 Plug ar	id Abandon		Tempora	rily Abandon						
12 Desethe Present	or Completed Oper			njection	Plug Ba	ick		Water Di	sposal	and operation	mate	in colors that	of Ifing a	manal	
deepen directionally or red the Bond No on file with E interval, a Form 3160-4 sh	complete honzontali LM/BIA Required all be filed once tes	y, give subsurfa subsequent repo ting has been of	to be an perturbing det to location and measures onts shall be filed with ompleted Final Aba	sured and true ve nin 30 days follow ndonment Notice	entical depths wing completion as shall be file	of all pertinent many of the involved d only after all red	arkers a operati quireme	and zones A ions If the opent, including	it proposed war littach the Bond peration results reclamation, ha	under which thin a multiple c	he wor comple pleted,	k will be peri tion or recon and the ope	ormed or pr opletion in a rator has	ovide new	
determined that the site is	ready for final inspe	cuon)	· .							2					
		~	n. IDiam	enarina D	form C1	08 Anni	inato	n for A	uthoriza	tion to T	Inia	at that	will be		
Devon Energy	Production) ('omnai				oo, Appi	ican	M IOL M	rutionza		uije	si mai			
Devon Energy	Production	i Compai	ily, LF is pr				5	· · · · ·		A		4. 1	1 17		
Devon Energy filed with the	Production Dil Conserv	a Company Company ation Di	vision, San	ta Fe, Nev	w Mexc	io office.	De	von is p	proposing	g to con	vert	the Fe	deral 7	7 #1	
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Submit 3 Copies To Appropriate District	State of New N	fevico	Form C-103
Office	Energy Mineralstand No	tural Pesourooo	May 27, 2004
L625 N French Dr. Hobbs NM 88740	Energy,-Minierais-and-ina	urai-Resources	WELL API NO.
District II	OIL CONSERVATIO		30-015-26404
1301 W Grand Ave., Artesia, NM 88210	OIL CONSERVATIO	N DIVISION	5. Indicate Type of Lease
OOO Rio Brazos Rd - Aztec, NM 87410	1220 South St. Fr	ancis Dr.	STATE 🗍 FEE 🗍
District IV	Santa Fe, NM	87505	6. State Oil & Gas Lease No.
1220 S St Francis Dr., Santa Fe, NM			
87505	TE AND DEDODTE ON WELL		7 Loss Maria an Maria Association Nation
(DO NOT USE THIS FORM FOR PROPOSA DIFFERENT RESERVOIR USE "APPLICA PROPOSALS)	LS AND REPORTS ON WELL LS TO DRILL OR TO DEEPEN OR P TION FOR PERMIT" (FORM C-101)	LUG BACK TO A FOR SUCH	Federal T
1. Type of Well: Oil Well	as Well 🔲 Other -Convert to	SWD	8. Well Number
2. Name of Operator		·····	9. OGRID Number
DEVON ENERGY	PRODUCTION COMPANY.	LP	6137
3. Address of Operator			10. Pool name or Wildcat
20 North Broadway, Oklahoma Ci	v. OK 73102 405-55	2-8198	L. Wolfcamp and Cisco Q/ala
A Well Location			<u></u>
4. Wen Location			
Unit Letter_A:_	_660'feet from the _NORT	H line and _990'	feet from theEASTline
Section 12	Township 18S	Range 27E	NMPM County Eddy
	11. Elevation (Show whether D	R, RKB, RT, GR, etc.)	
	3709' KB; 3697' GL		
Pit or Below-grade Tank Application] or (losure 🗌		
Pit typeDepth to Groundwate	rDistance from nearest fresh	water well Dista	nce from nearest surface water
Pit Liner Thickness: mil	Below-Grade Tank: Volume	hbls: Con	struction Material
I2. Check Ap	propriate Box to Indicate	Nature of Notice, R	Report or Other Data
NUTICE OF INT	ENTION TO:	SOBS	EQUENT REPORT OF:
		REMEDIAL WORK	
	CHANGE PLANS	COMMENCE DRIL	
PULL OR ALTER CASING		CASING/CEMENT	JOB []
			the OWD Adusta Order OWD (400
			n to SwD, Admin. Order SwD-1135
13. Describe proposed or complete	SEE DUIE 1102 For Multi	pertinent details, and	give pertinent dates, including estimated date
or recompletion). SEE RULE 1103. FOR MUM	ple Completions: Atta	ich wendore diagram of proposed completion
$\frac{9}{04}$	LI DOD TILL with hit and drill	allara	
8/05/08 Drill CIBD at 6800' and 7078	OBOF. THE WILL BILL AND UTILLY	Jonars.	
8/06/08 Drilled through coment at 752	5' CIPD at 7200' and coment a	t 7560' and CIBD at 7	5057
8/07/08 Ban step rate test: numped 50	bhle at $\frac{1}{2}$ bhl $\frac{1}{2}$ and $\frac{1}{2}$ bhl $\frac{1}{2}$ and $\frac{1}{2}$ bhl \frac{1}{2} bhl $\frac{1}{2}$ bhl \frac{1}{2} bhl bhl bhl \frac{1}{2} bhl bhl bhl \frac{1}{2} bhl bhl b	1.7500 and $CIDI at 7.$	in -20# nei numned 50 bble at 2 bble/min
75# psi_pumped 50 bbls at 3 bbls/min	-170 m psi, pumped 50 bbls at 4	bbls/min - 250 psi	nii -20# psi, puniped 50 5013 at 2 6013/1111 -
8/08/08 Trucked in and established init	ection in the Wolfcamp at 150	BWPD at 170 psi.	
8/11/08 Drilled cement retainers at 77	45', and 7780'.		
8/12/08 Drilled cement retainer at 782	0' and 8000'. Circulate hole an	d TOH with tubing and	d bit.
8/13/08 Perforate Cisco from 7893' -	8060'; total 140 holes. TIH and	set packer at 7688'. I	Frac with 5,040 gals 15% HCl + 120,372 gals
Spectra Star 2500 + 167,552 # 20/40 V	/hite sand.	•	
8/14/08 TIH with retrievable tool and	latch onto packer. Release pac	ker and TOOH with p	acker and tubing. RU wireline and perforate
Cisco from 7758'-7840'; 228 total hole	S.		
8/15/08 TIH with packer and set at 75	32'. NU frac valve.		
8/16/08 Frac 7758'-8060' with 4500 g	als 15% Spearhead acid + 119,2	55 gals Spectra 2500 -	+ 106,750 # 20/40 100% White sand. RD.
8/18/08 Release packer. TOOH with	acker and tubing.		
8/20/08 TIH with bailer and bailed sam	d. Bailed sand to 8460'. TOO	H with tubing. ND BC	OP and NU flange. Waiting on tubing.
9/15/08 TIH with packer and tubing.	Set packer at 6789'. ND BOP a	nd NU tree. Ran MIT	test to 500 # for 30 minutes – ok, notified
Mike Bratcher with OCD. TOOH with	tubing. RIH with 3 1/2" IPC tub	oing and set at 6789'.	Injection line installation in progress.
I hereby certify that the information ab	ove is true and complete to the b	est of my knowledge	and belief. I further certify that any pit or below-
grade tank has been will be constructed or clo	sed according to NMOCD guidelines	L], a general permit 🗋 or	r an (attached) alternative OCD-approved plan 🗋.
	(义)	QQ4_6010	
UNATURE		Sr. Statt Engineer	ing rechnician DATE 9/1//08
pe or prim name Norvella Adams	E-mail address:	norvella.adams@dv	vn.com i elepnone No. 405-552-8198
ADDROVED BY	ሚካቲቲ ም		DATE:
Conditions of Americal (if and)		epted for record	DAIE
Conditions of Approval (if any):		NMOCD	

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Administrative Order SWD-1135 July 16, 2008

APPLICATION OF DEVON ENERGY PRODUCTION COMPANY, L.P. FOR PRODUCED WATER DISPOSAL, EDDY COUNTY, NEW MEXICO

ADMINISTRATIVE ORDER OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 701(B), Devon Energy Production Company, L.P. (OGRID No. 6137) made application to the New Mexico Oil Conservation Division for permission to utilize for produced water disposal its Federal T Well No. 1 (API No. 30-015-26404) located 660 feet from the North line and 990 feet from the East line of Section 12, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico.

THE DIVISION DIRECTOR FINDS THAT:

The application has been duly filed under the provisions of Rule 701(B) of the Division Rules. Satisfactory information has been provided that all offset operators and surface owners have been duly notified. The applicant has presented satisfactory evidence that all requirements prescribed in Rule 701 will be met and no objections have been received within the waiting period prescribed by said rule. The applicant is in compliance with Rule 40.

IT IS THEREFORE ORDERED THAT:

Devon Energy Production Company, L.P. ("operator") is hereby authorized to utilize its Federal T Well No. 1 (API No. 30-015-26404) located 660 feet from the North line and 990 feet from the East line of Section 12, Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico, in such manner as to permit the injection of produced water for disposal purposes into the Lower Wolfcamp formation and the Cisco formation through perforations from 7,400 feet to 8,200 feet and through plastic-lined tubing set in a packer located within 100 feet of the top of the injection interval.

IT IS FURTHER ORDERED THAT:

Oil Conservation Division * 1220 South St. Francis Drive * Santa Fe, New Mexico 87505 * Phone: (505) 476-3440 * Fax (505) 476-3462* <u>http://www.emnrd.state.nm.us</u> The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

After installing injection tubing, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or an approved *leak detection device* in order to determine leakage in the casing, tubing, or packer.

The injection well or system shall be equipped with a *pressure limiting device* in workable condition which shall, at all times, limit surface injection pressure to the maximum allowable pressure for this well. The wellhead injection pressure on the well shall be limited to <u>no more than 1480 psi</u>.

The Director of the Division may authorize an increase in the maximum injection pressure upon a proper showing by the operator that such higher pressure would not result in migration of the injected fluid from the injection formation. Such proper showing should be supported by a valid step rate test run in accordance with procedures acceptable to the Division.

The operator shall notify the supervisor of the Artesia district office of the Division of the date and time of the installation of disposal equipment and of any mechanical integrity test so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Artesia district office of the Division of the failure of the tubing, casing, or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

<u>PROVIDED FURTHER THAT</u>, jurisdiction is retained by the Division for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh water or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing, or without notice and hearing in event of an emergency subject to NMSA 1978 Section 70-2-23, terminate the injection authority granted herein.

The operator shall provide written notice of the date of commencement of injection and the initial reservoir pressure to the Artesia district office of the Division.

The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Division Rules 706 and 1120.

The injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject well, provided however, the Division, upon written request by the operator Administrative Order SWD-1135 Devon Energy Production Company, L.P. July 16, 2008 Page 3 of 3

mailed prior to the expiration date, may grant an extension thereof for good cause shown.

This order does not relieve the operator of responsibility should its operations cause any actual damage or threat of damage to protectable fresh water, human health or the environment; nor does it relieve the operator of responsibility for complying with applicable Division rules or other state, federal, or local laws or regulations.

2.

MARK E. FESMIRE, P.E. Director

MEF/wvjj

cc: Oil Conservation Division – Artesia Bureau of Land Management – Carlsbad



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Submit to Appropriate District C State Lease - 6 copies	Diffice	State	a of New Mexico		OCI)-AR	TES		Forr	n C-105 0, 2003	G
Per Lease - 3 copies	•	Ener	rgy, Minerals and	Natur	al Resources		Well API	No.			-
rench Ur , Hobbs, NK	88240	0.1.0						30-0	15-26404	۱	-
arand Avenue, Artesu، أن	, NM 85210	1220	Conservation Divis	sion ie Dr			5. Indica	ate Type of Lea 1 STATE	Se I FF	F	
1000 Rio Brazos Rd, Aztec, NN Distinct IV	. 87410	Sant	a Fe. NM 87505	5 DI.			State Oil	& oas Lease N	10		-
1220 S St Francis Dr , Santa F	e, NM 87505										-
NELL COMPLETIC	ON OR RECO	MPLETION	REPORT AND LO	OG		-					
	[/D· Arti	min Order SWD-113	15	/ Lease	e Name and Ur	nt Agreer	nent Name	
Type of Completion	Gas Well		Plug Back	Diff. Res	svr., D Other			Fed	erai T 1		
Name of Operator							8. Well I	No.	_		•
Address of Operator	DEVON	ENERGY PROL	DUCTION COMPANY	, LP			9 Pool	name or Wildca	.t		101
	20 North	Broadway, Ok	lahoma City, OK 73	102				L. Wolfca	mp and (cisco 44	150
Well Location											-
Unit Letter	A 56	0' feet from t	the NORTH line	and	990' feet fro	om the	EAST	ine			
Section	12	Township	18S Range		27E NMPM		(County Ede	iv		
0. Date Spudded	11. Date T D	Reached 12	2 Date Completed	13 E	evations (DR, RKB,	RT, GL)*	14	Elev Casinghe	ad		-
6/		c	Drig 9/13/90 SWD								
6/28/1990	8/25/1	1990	9/15/08		3634' KB; 3618'	GL	J. Taali	· ^	la Taal-		-
3. 101at Ueptri MU 4/144	In Fug Back	. GM [17 15* 7-	a multuple Compl. How	и мапу	Dolled BY	r ota	≖y ≀ools v	Cat	he loois		
9 Producing Intervals	s), of this comple	tion - Top, Botto	om, Name			l	$-\hat{r}$	20 Was Direct	onal Sur	vey Made	-
. Wolfcamp; 6,868' - 7,	360' and Cisco;	7,758' - 8,060'	(Salt Water Disposa	l Only)				10 \A/a= \#/-# @	No		
ILL-MGRD, SDL-DSN (ner Logs Run original logs)	3						22 was well 0	No		-
3		<u> </u>	ASING RECORD (Re	port all	strings set in well	l					٦
Casing Size	VVeigh	1 L8 /FT.	Depth Set		Hole Size		Cement	ng Record	Ar	nount Pulled	4 .
8-5/8"		32#	2589'	. <u> </u>	17-1/2		40 90	0 SX			1
5-1/2"	1	17#	9473'		7-7/8"		43	0 sx ·			1
	· ·]
- <u></u>	Itop	Bottom	Sacks Cement		Screen	Size		Depth Set	;ora	acker Set	.
4"	9055'	10141'	80 sx		1.	3-1/2	2" (IPC)	6789		6789'	I
~·=			•								
6 Perforation record (inter	val, size, and numb	er)			27. Acid, Shot, Fr	acture, C	ement, S	Squeeze, ETC.	Matorial	licod	- 1
Volfcamp; 6868'-7038' Volfcamp; 7092'-7097' Volfcamp; 7330'-7340' Visco; 7893'-8060'; (14	(8/21/93) ; 7120 [.] -7146' (8/ ; 7350 [.] -7360' (8/ 0 hol es)	(18/93) (16/93)			7893'-8060'	Frac—50 Star 250	40 gals 10 + 167,	15% HCl acid 552 # 100% Wi	and 120, hite 20/4	372 gals Spectra 0 Sand.	
;1sco; 7758'-7840'; (22 Norrow; 10008'-10054';	8 holes) (still under ClE	IP)			7758'-7840'	Frac45 Spectra	i00 gals Star 250	15% Spearhea 10 + 108,750 #	d acid a 100% Wi	nd 119,255 gals hite 20/40 Sand.	
		•				ļ	····				
8			PRODUCTION		L	L]
ale First Production	Production Met	hod (Flowing, G	Sas lift, pumping - Size	and ty	pe pump)		Well Stat	us (Prod Or St	nut-In)]
NA	ted Choke S	Size Prr	od'n For Test Oil -	BbL	Gas - MCF	·}	Water - Bb	9/16/08-Cor	Gas - Oil F	Ratio	1
,	4	Da	nod							#DIV/01	
Flowing Tubing Press	Casing Pressu	re Calculated 2	24- Oil - Bbi	***	Gas - MCF	Water - B	bl	Oil Gravity - A	Pl (Corr)		1
	<u> </u>	Hour Rate									I .
J. Disposition of Gas (S	old, used for fuel	, vented, etc)					Test	witnessed By			l
AConverted to SWD 1 0. List Attachments	9/16/08				·						
/ellbore schematic	e information sho	own on both sid	les of this form as true	and co	omplete to the best of	of my know	wledge al	nd belief		<u> </u>]
IGNATURE Q			inted me Norve	lla Adar	nsTitle	Sr Staff	Engineer	ing Technician	DATI	<u>≘ 9/17/2</u> 008	
-mail Address	norvella a	dams@dvn /						,	. –		-
											-

Accepted for record NMOCD This Form is to be filed with the appropriate Distinct Office of the Division not later than 20 days after the completion of any newly dulled or deepened well. It shall be ppanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including dnll stem test. All depths ed shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, items 25 through 29 be reported for each zone The form is to be filed in quintuplicate except on state land, where six copies are required. See Rula 1105

INDICATE FORMATIONS TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

TT NEW MEXICO			Northwestern New Mexico	
Yates	476	T. Canyon	T Ojo Alamo	T. Penn "B"
Queen	1218	T Strawn	T. Kirtland-Fruitland	T. Penn "C"
Grayburg	1572	T Atoka	T. Pictured Cliffs	T Penn "D"
San Andres	2072	T Miss	T Cliff House	T. Leadville
Tubb	4824'	T. Devonian	T. Menefee	T. Madison
Abo	6016	T Silunan	T. Point Lookout	T Elbert
Wolfcamp	7682	T Montoya	T Mancos	T. McCracken
Cisco	8912	T. Simpson	T. Gallup	T Ignacio Otzte
Strawn	9513	T McKee	Base Greenhorn	T Granite
Atoka	9628	T. Ellenburger	T. Dakota	T .
Morrow	9828'	T Gr Wash	T. Morrison	T
Morrow Clastics	9965	T Delaware Sand	T. Todito	Τ
Lower Morrow	10104	T. Bone Springs	T Entrada	T
Barnett		T	T Wingate	Τ
T. Wolfcamp		T ·	T Chinle	
T Penn		Τ.	T Permian	
T Cisco (Bough C)		Т.	T. Penn "A"	Τ.

OIL OR GAS

... SANDS OR ZONES

No. 1, from No 2, from to to IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole

No 1, from		to .	 	 feet .	
No 2, from .	·	to	 	 feet	 • • • • • • • • • • •
No. 3, from		. to	 	 feet	

LITHOLOGY RECORD (Attach additional sheet if necessary)

•	From	То	Thicknes in Feet	Lithology	From	то	Thickness in Feet	L theleav
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Form 3160 (February 2	2005)		UN DEPARTME BUREAU OF	ITED STATES NT OF THE II LAND MANA	S NTERIOR GEMENT		t 062 D-Art	ior Esia	D-A <u>Å</u>	CTE So EXP Lease Se	FORM / MB NO. IRES. M rial No	APROVED . 1004-0137 March 31, 20	, 007
,pe o	f Well	Oil Well	Gas Wel		Other	SWD- (Order 1135		6	If Indian, A	liottee d	NM-42410 or Tribe Nar	ne
Type of	Completion	New Well	Work Ov	er 🗌 Deepe	n 🗹 Plug E	lack 🗌 Diff.	Resvr.,		-	Unit or C4	Acree	ment Name	and No.
Name o	f Operator			PODUCTION	COMPANY	1.0						Mall No.	
Address	3			CODUCTION	J3a Pl	none No (incl	ude area c	ode)		Lease Nar	F	ederal T 1	
	20 Oklahoma	City, OK 73	way 102-8260			405-552	-8198		9	API Well I	NO. 30	0-015-26404	0052
Location At Surf	n of Well (Rep ace	ort location cl	early and in acc	ordance with I	Federal req	uirements)*			10.	Field and	Pool, c	or Explorato camp and (visco 9613
At top p	orod Interval i	eported below	660 v	FNL 990 FEL	•				11.	Sec, T , Surve	R, M, c ey or An	on Block and ea	3
At total	Depth				·		•		12.	County o	1 r Parish	2 18S 27E	e
		·	· · ·				0/15/08	SWD	_	Edd	у		NM
Date S	pudded		15 Date T D	Reached	16. Da	ate Completed	i 9/13/90	orig cmpl	17	Elevation	ns (DR, I	RKB, RT, G	L)*
	6/28/1990		8/2	5/1990		🗌 D 8	🛦 A 🗹 Rea	dy to Prod.			3634'	' KB; 3618'	GL
Total D	Pepth: MD T∨	′D	7600'	19. Plug Ba	ack TD.	MD TVI	6142'	20	Dept	n Bridge P	lug Set:	MD TVI	6177
Type E	lectric & Othe	r Mechanical	Logs Run (Sub	mit copy of eac	ch)	······································		22 Was w	vell core	ed? ?	√ No	Yes (S	Submit analysis)
.L-MGRD	, SDL_DSN (original logs) .					Directi	onal Su	irvey?	マ No マ No	Yes (S	iubmit report)
Casing	and Liner Re	cord (Report a	all strings set in	well)	Stane (Cementer				Slurry	Vol		
Die Size	Size/Grade	Wt (#/ft)	Top (MD)	Bottom (MD)	De	epth N	lo of Sks	& Type Cen	nent	(BBL	, (Cement Top	o* Amount Pulled
12 1/4"	8-5/8"/L1&	32	<u>├</u>	2589'	- <u> -</u> -	<u> </u>	45	0 Sx 0 Sx				Surf	- · · · ·
7-7/8"	5-1/2"/LT&C	2 17		9473'			43	0 Sx				Surf	
3/4"	4"/180	10.46	┟──┊──┽╸	10,141'			8	0 Sx				9055'	
· bing	Record		·····			//							
,ze	Dept	ih Set (MD)	Packer Depth	(MD) Size	Dept	n Set (MD)	Packer [Depth (MD)		Size	Depth S	Set (MD) F	Packer Depth (MD
• 1/2" IF Produci	PC	6789'	6789'		26 Pe	foration Reco	ord						
·	Formation		Тор	Bottom		Perforated Inte	erval	Size		lo. Holes	<u> </u>	Perf	Status
lfcamp	. <u> </u>		6868'	7360'	6868'-7	360'				140	Open	for SWD	
00			7893'	7840'	7893-7	B40'				228	Open	for SWD	
row			10.008'	10.054'	10.008-	10.054'			1		Арал	doned	
	·····												
_													
Acid, Fi	Depth Interva	nent, Cement	Squeeze, Etc.	· <u> </u>		An	nount and	vpe of Mat	erial				
	7803.9000		Erac - 5040			372 main F-	Gotes Cha-	2500 + 40	1 557 4	1009/ 140-1	+0 20145		
·	1033-6000		1-140 92	us 15% HGI a	uand 120	,srz gals Sp	ecua Staf	2000 + 167	,332 #	100% 9901	10 20/40	, sano.	
	7758-7840'	<u> </u>	Frac - 4500 ga	us 15% Spear	head acid	and 119,255	gals Spect	ra Star 250	00 + 106	5,750 # 10	0% Whi	te 20/40 sa	nd.
<u></u>	<u> </u>						<u> </u>						
Producti	ion - Interval A									·			
te First	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gr Corr.	avity API	Gas Gra	avity-		Production	Method
NA		24	>			_ _ _	1		AC	CÉPTE	DFC	OR REC	ORD
hoke Size	Tbg Press	Cst Press	24 Hr Rate	OilBRI	Gas MCE	Water RRI	Gas · O	Ratio	64.	DAV	TD	H.C	ASS
		1435					#DIV	//01		SFF	2)) (9 2008	
Produc	tion - Interval	B Hours	Test				OII GR	avity 1					
Sec. 1	Test Date	Tested	Production	OI BBL	Gas MCF	Water BBL	Corr.	APÍ 0	as Gra			Production	Method
d										PETROI	EUM	ENGINE	ER
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<u>d</u>												<u> </u>	
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Choke	Tog. Press												
``ze	Flwg SI	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	· · · · ·				
			\rightarrow										

instructions and spaces for additional data on reverse side)

28b Produ	ction - Interval (<u> </u>						·	
Produced	Test Date	Tested	Production	Oil BBL	Gas MCF	Water BE	BL Corr. API	Gas Gravity	Production Method
Choke Size	1 bg. Press. Flwg Sl	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BE	BL Gas : Oil Ratio	Well Status	
	<u>*</u>	- <u>-</u>							
28c Produ	iction - Interval L)				· .			
Date First Produced	Test Date	Hours Tested	Production	Oil BBL	Gas MCF	Water BE	Oil Gravity BL Corr. API	Gas Gravity	Production Method
Choke Size	Tbg Press. Flwg Sl	Csg Press	24 Hr. Rate	Oil BBL	Gas MCF	Water BE	BL Gas : Óil Ratio	Well Status	······································
(See instruc	ctions and space	es for additio	nal data on reve	rse side)			·		·
29. Disposit	tion of Gas (Solo	d, used for fu	el, vented, etc)		·				
Show all im stem tests, i pressures a	ry of Porous 200 portant zones of including depth ind recovenes.	f porosity and interval teste	Aquirers). I contents therea id; cushion used	of, Cored in , time tool o	tervals and a pen, flowing	all drill- and shut-in)) Markers	
Eor	mation	Ton	Rottom	Deecrin	tione Conto	nte ata		Nama	Maar Depth
	mauon	- iob	DULLOIN	Descrip	uons, conte	ins, eic	Vales	ivanie	A76'
			•	r r			Yates Queen Grayburg San Andres Tubb Abo Wolfcamp Cisco Strawn Atoka Morrow Morrow Clastics Lower Morrow		476' 1218' 1572' 2072' 4824' 6016' 7682' 8912' 9513' 9628' 9828' 9928' 9965' 10104'
32. Addition	al remarks (inclu	ude plugging	procedure).		<u> </u>			·	
33 Indicate	which items hav	e been attac	hed by placing a	check in th	e appropriate	e box	<u>_</u>		
		(1 6 ···	a no otal)		Castacte P			Describer of O	
	al/Mechanical L	ogs (1 tuil se	et req'a)		Seologic Re	port []		Directional Survey	<u>.</u>
	y Notice for plug	iging and cei	ment verification		Core Analysi	s 🗹	Other Wellbor	e Schematic	attached instruction - 14
34. I hereby	centify that the it	pregoing and	attached inform	ation is com	iplete and co	orrect as det	emined from all ava	allable records (see	attached instructions)"
Name (Pleas	e Anne		Norvella	Adams		Title	s	ir. Staff Engineering	Technician
	XT	~		DE	1		9/17/2	008	
Ű.s.c	Section 100, and	Title 49430	Section 1212, m	ake it a crime	for any perso	n knowlingly a	and willfully to make to	any department or ag	ency of the United States any false,
licanous or trat	udulent statements	s or representa	ations as to any ma	atter within its	jurisdiction.		,		
	·						- -		

February 2005) DEPAR	UNITED STATES	· _ ·		FORM APROVED OMB NO. 1004-0137
BUREA	U OF LAND MANAGEMENT			EXPIRES: March 31, 2007
SUNDRY NO	TICES AND REPORTS ON WE	ELLS	5 Lease S	erial No
abandoned well. Us	e Form 3160-3 (APD) for suc	h proposals	6. If Indian,	Allottee or Tribe Name
SUBMIT IN TRIP	LICATE - Other instructions or	n page 2		
			7. Unit or C	A Agreement Name and No.
	ell 🗹 Other SWD conver	sion. Admin Order SWD-1135	8 Well Nan	ne and No
Name of Operator		· · · · ·		Federal T 1
DEVON ENERGY PRODUC	TION COMPANY, LP		9 API Wel	No
I, Address	14 70400	3b. Phone No. (include area o	code)	30-015-26404
Location of Mell / Ecotade Sec. T	R / JTU2	405-552-8198	10. Field ar	Id Pool, or Exploratory Area
660 FNL 990 FEL A 1	2 18S 27E		11. County	or Parish, State
		<u> </u>	Ed	dy NM
12. CHECH	(APPROPRIATE BOX(es) TO	INDICATE NATURE OF NOTI	CE, REPORT OR OTH	ER DATA
ITPE US SUBMISSION			ACTION	· · · · · · · · · · · · · · · · · · ·
Notice of Intent		Li Deepen Li Fracture Treat	Production (Start/Resu Reclamation	ime) UWater Shut-Off Well Integrity
Subsequent Report	Casing Repair	New Construction	Recomplete	Other
Final Abandonment Notice	Change Plans	Plug and Abandon	Temporarily Abandon Water Disposal	
Describe Proposed or Completed Operations (C	learly state all pertinent details, and give	pertinent dates, including estimated date	of starting any proposed work	and approximate duration thereof if the proposal
ermined that the site is ready for final inspection) Converted to SWD. Administrative Ord	ler SWD-1135 BOP. TIH with bit and drill coll	lars.		
Converted to SWD. Administrative Ord 3/04/08 RU unit. ND well/head and NU 3/04/08 RU unit. ND well/head and NU 3/05/08 Drill CIBP at 6800' and 7078'. ""^f/08 Drilled through cement at 7525 8 Ran step rate test; pumped 50 3 bbls/min – 170# psi, pumped 5 38 Trucked in and established inje 38 Trucked in and established inje 37 Julied cement retainers at 774 3/14/08 Drilled cement retainers at 774 3/13/08 Perforate Cisco from 7893' – 8 167,552 # 20/40 White sand. 3/14/08 TIH with retrievable tool and 1 2/28 total holes	ler SWD-1135 BOP. T/H with bit and drill coll 5', C/BP at 7300' and cement al bbls at ½ bbl/min – 0# psi, pur 50 bbls at 4 bbls/min – 250 psi. ection in the Wolfcamp at 150 5', and 7780'. Y and 8000'. Circulate hole and 060', total 140 holes. T/H and atch onto packer. Release pac	llars. t 7560' and CIBP at 7595'. mped 50 bbls at 1 bbl/min -20# p BWPD at 170 psi. d TOH with tubing and bit. set packer at 7688'. Frac with t cker and TOOH with packer and	psi, pumped 50 bbls at 5,040 gals 15% HCl + 1 tubing. RU wireline ar	2 bbls/min – 75# psi, pumped 50 20,372 gals Spectra Star 2500 + d perforate Cisco from 7758'-7840';
Converted to SWD. Administrative Ord Wo4/08 RU unit. ND wellhead and NU W05/08 Drill CIBP at 6800' and 7078'. "%6/08 Drilled through centent at 7525 '8 Ran step rate test; pumped 50 3 bbls/min – 170# psi, pumped 50 3 brilled through centent at 7525 '8 Run step rate test; pumped 50 3 bbls/min – 170# psi, pumped 50 3 bbls/min – 17	ler SWD-1135 BOP. T/H with bit and drill coll 5', CIBP at 7300' and cement at bbls at ½ bbl/min – 0# psi, pur 50 bbls at 4 bbls/min – 250 psi. action in the Wolfcamp at 150 5', and 7780'. 1' and 8000'. Circulate hole and 060', total 140 holes. TiH and atch onto packer. Release pac 2'. NU frac valve.	llars. t 7560' and CIBP at 7595'. mped 50 bbls at 1 bbl/min -20# p BWPD at 170 psi. d TOH with tubing and bit. set packer at 7688'. Frac with 5 cker and TOOH with packer and	psi, pumped 50 bbls at 5,040 gals 15% HCl + 1 tubing. RU wireline ar	2 bbls/min – 75# psi, pumped 50 20,372 gals Spectra Star 2500 + d perforate Cisco from 7758'-7840';
Converted to SWD. Administrative Ord 3/04/08 RU unit. ND well/head and NU 3/04/08 RU unit. ND well/head and NU 3/05/08 Drill CIBP at 6800' and 7078'. ""^f/08 Drilled through cement at 7525 "8 Ran step rate test; pumped 50 3 bbls/min – 170# psi, pumped 5 38 Trucked in and established inje 3/11/08 Drilled cement retainers at 774 3/12/08 Drilled cement retainers at 774 3/13/08 Perforate Cisco from 7893' – 8 167,552 # 20/40 White sand. 3/14/08 TIH with retrievable tool and 1 2/28 total holes 3/15/08 TiH with packer and set at 758 3/16/08 Release packer. TOOH with pa	ler SWD-1135 BOP. T/H with bit and drill coll 5', C/BP at 7300' and cement al bbls at ½ bbl/min – 0# psi, pur 50 bbls at 4 bbls/min – 250 psi. ection in the Wolfcamp at 150 5', and 7780'. 1' and 8000'. Circulate hole and 060', total 140 holes. T/H and atch onto packer. Release pac 2'. NU frac valve. s 15% Spearhead acid + 119,2 acker and tubing	llars. t 7560' and CIBP at 7595'. mped 50 bbls at 1 bbl/min -20# p BWPD at 170 psi. d TOH with tubing and bit. set packer at 7688'. Frac with t cker and TOOH with packer and 255 gals Spectra 2500 + 106,750	psl, pumped 50 bbls at 5,040 gals 15% HCl + 1 tubing. RU wireline ar 0 # 20/40 100% White	2 bbls/min – 75# psi, pumped 50 20,372 gals Spectra Star 2500 + d perforate Cisco from 7758'-7840'; sand. RD.
Converted to SWD. Administrative Ord 3/04/08 RU unit. ND wellhead and NU 3/04/08 RU unit. ND wellhead and NU 3/05/08 Drill CIBP at 6800' and 7078'. 1116/08 Drilled through centent at 7525 18 Ran step rate test; pumped 50 13 bbls/min – 170# psi, pumped 5 18 Trucked in and established inje 3/11/08 Drilled cement retainers at 774 3/12/08 Drilled cement retainers at 774 3/13/08 Perforate Cisco from 7893' – 8 167,552 # 20/40 White sand. 3/14/08 TIH with retrievable tool and the 228 total holes 3/15/08 TIH with packer and set at 758 3/16/08 Frac 7758'-8060' with 4500 gal 3/18/08 Release packer. TOOH with p 1/20/08 TIH with bailer and bailed sand 3/18/16 NIH with bailer and bailed sand	ler SWD-1135 BOP. TIH with bit and drill coll 5', CIBP at 7300' and cement al bbls at ½ bbl/min – 0# psi, pur 50 bbls at 4 bbls/min – 250 psi. ection in the Wolfcamp at 150 (5', and 7780'. Y and 8000'. Circulate hole and 060', total 140 holes. TIH and atch onto packer. Release pac 2'. NU frac valve. s 15% Spearhead acid + 119,2 acker and tubing . Bailed sand to 8460'. TOOH	llars. t 7560' and CIBP at 7595'. mped 50 bbls at 1 bbl/min -20# p BWPD at 170 psi. d TOH with tubing and bit. set packer at 7688'. Frac with 5 cker and TOOH with packer and 255 gals Spectra 2500 + 106,750 H with tubing. ND BOP and NU f	psi, pumped 50 bbls at 5,040 gals 15% HCl + 1 tubing. RU wireline ar 0 # 20/40 100% White Range. Waiting on tubi	2 bbls/min – 75# psi, pumped 50 20,372 gals Spectra Star 2500 + d perforate Cisco from 7758'-7840'; sand. RD.
Converted to SWD. Administrative Ord Wo4/08 RU unit. ND wellhead and NU W05/08 Drill CIBP at 6800' and 7078'. "%6/08 Drille CIBP at 6800' and 7078'. "%6/08 Drille through centent at 7525 "8 Ran step rate test; pumped 50 3 bbls/min – 170# psi, pumped 50 3 bbls/min	ler SWD-1135 BOP. T/H with bit and drill coll 5', CIBP at 7300' and cement at bbls at ½ bbl/min – 0# psi, pur 50 bbls at 4 bbls/min – 250 psi. ection in the Wolfcamp at 150 5', and 7780'. 1' and 8000'. Circulate hole and 060', total 140 holes. T/H and atch onto packer. Release pac 2'. NU frac valve. s 15% Spearhead acid + 119,2 acker and tubing . Bailed sand to 8460'. TOOH et packer at 6789'. ND BOP an ubing and set at 6789'. Injectio	llars. t 7560' and CIBP at 7595'. mped 50 bbls at 1 bbl/min -20# p BWPD at 170 psi. d TOH with tubing and bit. set packer at 7688'. Frac with t cker and TOOH with packer and 255 gals Spectra 2500 + 106,750 H with tubing. ND BOP and NU f hd NU tree Ran MIT test to 500 on line installation in progress.	psi, pumped 50 bbls at 5,040 gals 15% HCl + 1 tubing. RU wireline ar 0 # 20/40 100% White flange. Waiting on tubi 9 # for 30 minutes – ok,	2 bbls/min – 75# psi, pumped 50 20,372 gals Spectra Star 2500 + d perforate Cisco from 7758'-7840'; sand. RD. ng. notified Mike Bratcher with OCD
Converted to SWD. Administrative Ord 3/04/08 RU unit. ND well/head and NU 3/04/08 RU unit. ND well/head and NU 3/05/08 Drill CIBP at 6800' and 7078'. ****6/08 Drilled through cement at 7525 8 Ran step rate test; pumped 50 3 bbls/min – 170# psi, pumped 5 38 Trucked in and established inje 38 Trucked in and established inje 39 Trucked in and established inje 39 Trucked in and established inje 30 Trucked in and established inje 31 Trucked in and established inje 32 Trucked in and established inje 32 Trucked in and established inje 32 Trucked in and established inje 33 Trucked in and established inje 34 Trucked in and established inje 34 Trucked in and established inje 34 Trucked in and established inje 35 Trucked inje 36 Trucked inje 37 Trucked inje 37 Trucked inje 38 Trucked inje 38 Trucked inje 38 Trucked inje 38 Trucked inje 38 Trucked inje 39 Trucked inje 39 Trucked inje 39 Trucked inje 30 Trucked	ler SWD-1135 BOP. TIH with bit and drill coll 5', CIBP at 7300' and cement al bbls at ½ bbl/min – 0# psi, pur 50 bbls at 4 bbls/min – 250 psi. ection in the Wolfcamp at 150 5', and 7780'. Y and 8000'. Circulate hole and 060', total 140 holes. TIH and atch onto packer. Release pac 2'. NU frac valve. s 15% Spearhead acid + 119,2 acker and tubing . Bailed sand to 8460'. TOOH at packer at 6789'. ND BOP an ubing and set at 6789'. Injectio	lars. t 7560' and CIBP at 7595'. mped 50 bbls at 1 bbl/min -20# p BWPD at 170 psi. d TOH with tubing and bit. set packer at 7688'. Frac with 5 cker and TOOH with packer and 255 gals Spectra 2500 + 106,750 h with tubing. ND BOP and NU f nd NU tree Ran MIT test to 500 on line installation in progress.	psi, pumped 50 bbls at 5,040 gals 15% HCl + 1 tubing. RU wireline ar 0 # 20/40 100% White lange. Waiting on tubi # for 30 minutes – ok,	2 bbls/min – 75# psi, pumped 50 20,372 gals Spectra Star 2500 + d perforate Cisco from 7758'-7840'; sand. RD. ng. notified Mike Bratcher with OCD
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LIME ROCK RESOURCES II-A, L.P. certifies that all below-grade tanks constructed and installed prior to June 16, 2008 associated with the selected wells are in compliance with 19.15.17 NMAC, have been closed pursuant to 19.15.17.13 NMAC, or have been retrofitted to comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC.

LIME ROCK RESOURCES II-A, L.P. understands that the OCD's approval of this operator change:

- 1. constitutes approval of the transfer of the permit for any permitted pit, below-grade tank or closed-loop system associated with the selected wells; and
- 2. constitutes approval of the transfer of any below-grade tanks constructed and installed prior to June 16, 2008 associated with the selected wells, regardless of whether the transferor has disclosed the existence of those below-grade tanks to the transferee or to the OCD, and regardless of whether the below-grade tanks are in compliance with 19.15.17 NMAC.

As the operator of record of wells in New Mexico, LIME ROCK RESOURCES II-A, L.P. agrees to the following statements:

- 1. I am responsible for ensuring that the wells and related facilities comply with applicable statutes and rules, and am responsible for all regulatory filings with the OCD. I am responsible for knowing all applicable statutes and rules, not just the rules referenced in this list. I understand that the OCD's rules are available on the OCD website under "Rules," and that the Water Quality Control Commission rules are available on the OCD website on the "Publications" page.
- 2. I understand that if I acquire wells from another operator, the OCD must approve the operator change before I begin operating those wells. See 19.15.9.9.B NMAC. I understand that if I acquire wells or facilities subject to a compliance order addressing inactive wells or environmental cleanup, before the OCD will approve the operator change it may require me to enter into an enforceable agreement to return those wells to compliance. See 19.15.9.9.C(2) NMAC.
- 3. I must file a monthly C-115 report showing production for each non-plugged well completion for which the OCD has approved an allowable and authorization to transport, and injection for each injection well. See 19.15.7.24 NMAC. I understand that the OCD may cancel my authority to transport from or inject into all the wells I operate if I fail to file C-115 reports. See 19.15.7.24.C NMAC.
- 4. I understand that New Mexico requires wells that have been inactive for certain time periods to be plugged or placed on approved temporary abandonment. See 19.15.25.8 NMAC. I understand the requirements for plugging and approved temporary abandonment in 19.15.25 NMAC. I understand that I can check my compliance with the basic requirements of 19.15.25.8 NMAC by using the "Inactive Well List" on OCD's website.
- 5. I must keep current with financial assurances for well plugging. I understand that New Mexico requires each state or fee well that has been inactive for more than two years and has not been plugged and released to be covered by a single-well financial assurance, even if the well is also covered by a blanket financial assurance and even if the well is on approved temporary abandonment status. See 19.15.8.9.C NMAC. I understand that I can check my compliance with the single-well financial assurance requirement by using the "Inactive Well Additional Financial Assurance Report" on the OCD's website.
- 6. I am responsible for reporting releases as defined by 19.15.29 NMAC. I understand the OCD will look to me as the operator of record to take corrective action for releases at my wells and related facilities, including releases that occurred before I became operator of record.
- 7. I have read 19.15.5.9 NMAC, commonly known as "Part 5.9," and understand that to be in compliance with its requirements I must have the appropriate financial assurances in place, comply with orders requiring corrective action, pay penalties assessed by the courts or agreed to by me in a settlement agreement, and not have too many wells out of compliance with the inactive well rule (19.15.25.8 NMAC). If I am in violation of Part 5.9, I may not be allowed to drill, acquire or produce any additional wells, and will not be able to obtain any new injection permits. See 19.15.16.19 NMAC, 19.15.26.8 NMAC, 19.15.9.9 NMAC and 19.15.14.10 NMAC. If I am in violation of Part 5.9 the OCD may, after notice and hearing, revoke my existing injection permits. See 19.15.26.8 NMAC.
- For injection wells, I understand that I must report injection on my monthly C-115 report and must operate my wells in compliance with 19.15.26 NMAC and the terms of my injection permit. I understand that I must conduct mechanical integrity tests on my injection wells at least once every five years. See

http://www.emnrd.state.nm.us/ocd/OCDPermitting/Report/C104A/C104AReport.aspx?Pe... 12/16/2010

19.15.26.11 NMAC. I understand that when there is a continuous one-year period of non-injection into all wells in an injection or storage project or into a saltwater disposal well or special purpose injection well, authority for that injection automatically terminates. See 19.15.26.12 NMAC. I understand that if I transfer operation of an injection well to another operator, the OCD must approve the transfer of authority to inject, and the OCD may require me to demonstrate the well's mechanical integrity prior to approving that transfer. See 19.15.26.15 NMAC.

- 9. I am responsible for providing the OCD with my current address of record and emergency contact information, and I am responsible for updating that information when it changes. See 19.15.9.8.C NMAC. I understand that I can update that information on the OCD's website under "Electronic Permitting."
- 10. If I transfer well operations to another operator, the OCD must approve the change before the new operator can begin operations. See 19.15.9.9.B NMAC. I remain responsible for the wells and related facilities and all related regulatory filings until the OCD approves the operator change. I understand that the transfer will not relieve me of responsibility or liability for any act or omission which occurred while I operated the wells and related facilities.

http://www.emnrd.state.nm.us/ocd/OCDPermitting/Report/C104A/C104AReport.aspx?Pe... 12/16/2010



MAP ID NO. 99

MEWBOURNE OIL CO. CHALK BLUFF FEDERAL COM NO. 003

API NO. 30-015-27163

APD ATTATCHMENT

Mewbourne Oil Company Chalk Bluff Federal Comm. #3 NM-016788 1980' FSL & 990' FEL Sec. 1-T18S-R27E Eddy County, NM.

- Casing Design and Safety Factors (See schedule 1 for used casing design program.)
- 2.)
- Cement Program for Casing Strings. Surface Casing:

250 sacks of Class "C" containing 2% CaCL2 + 1/4#/sack of cellophane flakes followed by 200 sacks of Class "C" containing 3% CaCL2.

Intermediate Casing:

700 sacks of Class "C" containing 6% gel + 2% CaCL2 + 1/2#/sack of cellophane flakes + 5#/sack of Gilsonite followed by 200 sacks of CLass "C" containing 3% CaCL2

Production Casing:

A cement diverter tool (D. V. Tool) will be run at a depth of approximately 7500' from surface. 1st Stage: 850 sacks of Class "H" containing 5#/sack KCL + .7% fluid loss additive + 5#/sack compressive strength extender.

2nd Stage:

900 sacks of Class "C" Lite containing 1/2#/sack cellophane flakes + 5#/sack Gilsonite + .4% fluid loss extender followed by 100 sacks of Class "H" containing .4% fluid loss additive + 5#/sack compressive strength extender.

- 3.) Drilling time will require approximately 35 40 days and drilling operations should begin approximately November 1, 1992.
- 4.) The possibility of encountering H2S gas in this area remote. Mewbourne Oil Company has drilled offset wells to this proposed location and none of these wells have encountered any H2S gas in the Pennsylvanian. In the event H2S is encountered, the necessary H2S safety equipment will be installed on location to provide for a safe working environment.
- 5.) Anticipated formation temperature and pressure in the Morrow zone will be approximately 155 degrees fahrenheit and 3,000# psi.

- 1. A.
- 6.) This location is a non-standard location. A hearing is scheduled for October 15, 1992 in Santa Fe, New Mexico before the New Mexico Oil Conservation Division for an unorthodox location exception.
- 7.) The pressure rating on the BOP STACK (see exhibit "D" of the APD) is 3,000# psi. The correct pressure rating of ANSI 900 series is noted in the APD. The API standard for pressure ratings for flanged equipment is in ANSI series. ANSI 600 series is 2,000# psi working pressue test, ANSI 900 series is 3,000# psi working pressure, ANSI 1500 series is 5,000# psi workpressure.

-2-

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SCHEDULE ONE



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Submit to Appropriate District Office State Lease - 4 copies Fos Lease - 3 copies

DISTRICT I Bax 1980, Hobbs, NM 88240

DISTRICT II P.O. Drawer DD, Artesia, NM \$\$210

DISTRICT III 1000 Rio Brazos Rd., Aztec, NM \$7410

State of New Mexico -cnergy, Minerals and Natural Resources Departum:

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

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12. <u>CERTIFICATION:</u>

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drilling site and necessary access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by MEWBOURNE OIL COMPANY and its' contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved.

September 9, 1992

Kelly Ryan District Superintendent MEWBOURNE OIL COMPANY

C. The estimated depths at which anticipated water, oil or natural gas can be expected are: Water: Possible surface water between 100' - 300'.

> Oil: Penrose @ 1520' Gas: Wolfcamp @ 6900'

D. Proposed Casing Program: See Form 3160-3

E. Pressure Control Equipment: See Form 3160-3 and Exhibit "D".

F. Mud Program: See Form 3160-3.

G. Auxiliary Equipment: Mud-gas seperator, PVT system, and Hydraulic choke from 6,000' to T.D.

H. Testing and Coring Program: Possibility of 4 DST's in the following zones: Wolfcamp, Cisco, Strawn, Morrow. No cores are planned at this time.

- I. Logging: Gamma Ray Spectral Density Dual Spaced Neutron Log from T.D. to surface. Gamma Ray - Dual LaterLog - Micro Guard Log from T. D. to Intermediate casing.
- J. No abnormal pressures or temperatures are anticipated. In the event abnormal pressures are encountered the proposed mud program will be modified to accomodate the increased pressures.

K. Anticipated Starting Date: As soon as possible after BLM approval.

11. OPERATOR'S REPRESENTATIVES:

The field representatives responsible for assuring compliance with the approved surface use and operations plan are as follows:

Kelly Ryan	(505) 393-5905	Box 5270
Bill Pierce	24. hour aswering	Hobbs, NM
Greg Milner	service.	88241

-4-

7. ANCILLARY FACILITIES:

A. None required.

- 8. WELLSITE LAYOUT:
 - A. Exhibit "C" shows the relative location and dimensions of the well pad, mud pits, reserve pits, trash container and location of major rig components.
 - B. A 400' X 400' area has been flagged surroundthe staked well.

9. PLANS AND RESTORATION OF THE SURFACE:

A. After completion of drilling and/or completion operations, all equipment not needed for producing operations will be removed. Pits will be filled in after all fluids have evaporated and the location cleaned of all trash and junk to leave the wellsite in an asthetically pleasing condition as reasonably possible. All production facilities left on location will be painted to conform with BLM painting regulations within 120 days of completion.

10. OTHER INFORMATION:

A. The geologic surface formation is hard clay interspersed with sand and chert outcroppings. Vegatative covering is generally sparse except in low-lying areas where grass is prevelant. Other vegatative covering consists mostly of greasewood and bear grass.

B. The estimated tops of geologic markers are as follows:

Queen	1260'	Cisco	7740*
✓San Andres	2100'	Canyon	8350'
Glorieta	3720'	Strawn	8900'
Tubb	4930'	Atoka	9500'
Abo	5900	Morrow	9600'
✓ Wolfcamp	6900'	Miss.	10,100'

-3-

4. LOCATION AND TYPE OF WATER SUPPLY:

A. Water will be purchased from trucking companies servicing this area and will be trucked to the wellsite over existing and/or proposed roads shown on Exhibits "A" and "AA".

5. LOCATION OF CONSTRUCTION MATERIALS:

A. Caliche for construction of the location and any needed road repairs hopefully will come from the location itself. If this is not possible, caliche will be taken from a BLM pit located in the NE4/NW4 of Sec. 12-T18S-R27E which is BLM pit #18271203. This pit also extends into the SE4/SW4 of Sec. 1-T18S-R27E which is BLM pit # 18270114. An alternative pit which may be used in the event BLM pit #18271203 contains unsuitable material is a BLM pit located in the SW4/NE4 of Sec. 1-T18S-R27E which is BLM pit #18270107.

6. METHODS OF HANDLING WASTE DISPOSAL:

- A. Drill cuttings will be disposed of in the drilling pits.
- B. Drilling fluids will be allowed to evaporate in the drilling pits until pits are dry.
- C. Water used and produced during stimulation, production testing, squeezing opeations etc. will be disposed of in the drilling pits. Oil produced during tests will be stored on site in steel test tanks until sold.
- D. Current laws and regulations pertaining to the disposal of human waste will be complied with.
- E. All trash, junk and other waste material will be contained in an appropriate container to prevent scattering and will be removed and deposited in an approved sanitary landfill.
- F. All trash and debris will be buried or removed from the wellsite within 90 days after drilling and/or completion operations have ceased.

This plan is submitted with the Application for Permit to Drill (APD) the above captioned well. The purpose of the plan is to describe the location of the proposed well, the proposed construction activities, operations plan and the magnitude of necessary surface disturbance involved, so that a complete, comprehensive appraisal can be made as to the environmental effects associated with this operation. The surface is owned by the Federal Government and is managed by the Bureau of Land Management.

- 1. EXISTING ROADS:
 - A. From the junction of U. S. 82 and U. S. 285 Highways in Artesia, proceed east on U. S. 82 12 miles. Turn right (south) on Eddy County Road #206 (Illinois Camp Road) and proceed south for 1.75 miles. Turn right (northwest) on Eddy County Road #204 and proceed .75 miles. Turn left (west) on caliche lease road and proceed 1 mile. Turn right (north) 100 yards on caliche lease road and location will be on the right hand side of the lease road. (Exhibit "A" & "AA")
 - B. Culverts: None required
 - C. Cuts and Fills: A two foot cut will be required to construct the location.
 - D. Turn-Outs: None required.
 - E. Gates or Cattleguards: None required.
- 2. LOCATION OF EXISTING WELLS
 - A. Existing wells in a 1 mile radius are shown on Exhibit "B".
- 3. LOCATION OF PROPOSED ACTIVITIES:
 - A. If the well is productive, all production facilities will be constructed on the existing pad.

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INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated, on all types of lands and leases for appropriate action by either a Federal or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable State or Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on this reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal or State agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective production zone.

ITEM 22: Consult applicable Federal or State regulations, or appropriate officials, concerning approval of the proposal before operations are started.

NOTICE

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR Part 3160.

PRINCIPAL PURPOSE: The information is to be used to process and evaluate your application for permit to drill, deepen, or plug back an oil or gas well.

ROUTINE USES: (1) The analysis of the applicant's proposal to discover and extract the Federal or Indian resources encountered. (2) The review of procedures and equipment and the projected impact on the land involved. (3) The evaluation of the effects of proposed operation on surface and subsurface water and other environmental impacts. (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions, as well as routine regulatory responsibility.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if the lessee elects to initiate drilling operation on an oil and gas lease.

The Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq) requires us to inform you that:

This information is being collected to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases.

This information will be used to analyze and approve applications.

Response to this request is mandatory only if the lessee elects to initiate drilling operations on an oil and gas lease.

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3160-5 1990)	UNITEI DEPARTMENT (BUREAU OF LA)	D STATES DF THE INTERIOR ND MANAGEMENT	rs 5. Leas	FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 e Designation and Serial No.
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Mewbourne 01	1 Company		9. API 1	w _{ell No.} Comm. #3 101527163
P.O. Box 5270 Location of Well (Footage, S	0 Hobbs, New Mexi ec., T., R., M., or Survey Descrip	<u>co 88241 (505) 393-5905</u>	10. Fick NO	and Pool, or Exploratory Area
1980' FSL & 9 Sec. 1-T18S-F	990' FEL R27E		11. Cou	nty or Parish, State Morrow
CHECK AP	PROPRIATE BOX(s) 1	O INDICATE NATURE OF NOTI	CE, REPORT, OR	OTHER DATA
TYPE OF SUI	BMISSION	TYPE	OF ACTION	· · · · · · · · · · · · · · · · · · ·
Notice of Inte	ent leport	Abandonment Recompletion Plugging Back Casing Repair		hange of Plans ew Construction on-Routine Fracturing fater Shut-Off
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GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations, and reports of such operations when completed, as indicated, on Federal and Indian lands pursuant to applicable Federal law and regulations, and, if approved or accepted by any State, on all lands in such State, pursuant to applicable State law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

SPECIFIC INSTRUCTIONS

Item 4—If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 13-Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by local Federal and/or State offices. In addition, such proposals and reports should include reasons for the abandonment, data on any former or present productive zones, or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to top of any left in the hole; method of closing top of well; and date well site conditioned for final inspection looking to approval of the abandonment.

NOTICE

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et. seq., 351 et. seq., 25 U.S.C. et. seq.; 43 CFR 3160.

PRINCIPAL PURPOSE — The information is to be used to evaluate, when appropriate, approve applications, and report completion of secondary well operations, on a Federal or Indian lease.

ROUTINE USES:

- (1) Evaluate the equipment and procedures used during the proposed or completed subsequent well operations.
- (2) Request and grant approval to perform those actions covered by 43 CFR 3162.3-2(2).
- (3) Analyze future applications to drill or modify operations in light of data obtained and methods used.
- (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION — Filing of this notice and report and disclosure of the information is mandatory once an oil or gas well is drilled.

The Paperwork Reduction Act of 1980 (44 U.S.C. 3501, et. seq.) requires us to inform you that:

This information is being collected in order to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

This information will be used to report subsequent operations once work is completed and when requested, to obtain approval for subsequent operations not previously authorized.

Response to this request is mandatory for the specific types of activities specified in 43 CFR Part 3160.

BURDEN HOURS STATEMENT

Public reporting burden for this form is estimated to average 25 minutes per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management, (Alternate) Bureau Clearance Officer, (WO-771), 18 and C Streets, N.W., Washington, D.C. 20240, and the Office of Management and Budget, Paperwork Reduction Project (1004-0135), Washington, D.C. 20503.

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3160-5 1990)	UNI DEPARTMEN BUREAU OF I	TED STATES T OF THE INTERIOR AND MANAGEMENT	JAN 0 4 1993	FORM APPROVED Budget Bureau No. 1004–0135 Expires: March 31, 1993 5. Lease Designation and Serial No.	
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Mewbourne (Address and Telephone No	<u>)il Company</u> o.		······································	3001527163	
P.O. Box 52	270 Hobbs, New Me	xico 88241 (505)	393-5905	10. Field and Pool, or Exploratory Area	
1980' FSL 8 Sec. 1-T185	1980 FEL 5-R27E			N. 1111015 Lamp. MO. 11. County or Parish, State	<u>rro</u> w
CHECK A) TO INDICATE NATUR	RE OF NOTICE, REPO	RT, OR OTHER DATA	0
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Notice of	Intent	Abandonment	l	Change of Plans	
Subsequen	it Report	Recompletion	i Ik	New Construction	
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Li Final, Aba	ndonment Notice	Other Cem	ent 9-5/8" Inter. Casing	Conversion to Injection Conversion to Injection Dispose Water (Note: Report results of multiple completion on V Conversion on	Well
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presentations as to any mat	us wunn is jurisartion.	*See instruction on Re	verse Side		

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations, and reports of such operations when completed, as indicated, on Federal and Indian lands pursuant to applicable Federal law and regulations, and, if approved or accepted by any State, on all lands in such State, pursuant to applicable State law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

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NOTICE

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AUTHORITY: 30 U.S.C. 181 et. seq., 351 et. seq., 25 U.S.C. et. seq.; 43 CFR 3160.

PRINCIPAL PURPOSE — The information is to be used to evaluate, when appropriate, approve applications, and report completion of secondary well operations, on a Federal or Indian lease.

ROUTINE USES:

- (1) Evaluate the equipment and procedures used during the proposed or completed subsequent well operations.
- (2) Request and grant approval to perform those actions covered by 43 CFR 3162.3-2(2).
- (3) Analyze future applications to drill or modify operations in light of data obtained and methods used.
- (4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION — Filing of this notice and report and disclosure of the information is mandatory once an oil or gas well is drilled.

The Paperwork Reduction Act of 1980 (44 U.S.C. 3501, et. seq.) requires us to inform you that:

This information is being collected in order to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

This information will be used to report subsequent operations once work is completed and when requested, to obtain approval for subsequent operations not previously authorized.

Response to this request is mandatory for the specific types of activities specified in 43 CFR Part 3160.

BURDEN HOURS STATEMENT

Public reporting burden for this form is estimated to average 25 minutes per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management, (Alternate) Bureau Clearance Officer, (WO-771), 18 and C Streets, N.W., Washington, D.C. 20240, and the Office of Management and Budget, Paperwork Reduction Project (1004-0135), Washington, D.C. 20503.

*U.S. GPO: 1990-773-016/26019

DEFART NEW OF THE INTERNON BURRAU OF LAND MANAGEMENT SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to diff or to deepen or reentry to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals Use "APPLICATION FOR PERMIT—" for such proposals SUBMIT IN TRIPLICATE Type of Well De one use this form for proposals to diff or to deepen or reentry to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals SUBMIT IN TRIPLICATE Type of Well De one use this form for proposals to diff or to deepen or reentry to a different reservoir. SUBMIT IN TRIPLICATE Type of Well De one use this form for proposals to diff or to deepen or reentry to a different reservoir. SUBMIT IN TRIPLICATE Type of Well De one use this form for proposals to diff or to deepen or reentry to a different reservoir. SUBMIT IN TRIPLICATE Type of Well De one use this form for proposals to diff or to deepen or reentry to a different reservoir. Well New and Ne. Chail Kell New Mexico. BR241 ABANGED FOR SUBMISSION De disc for the New Mexico. BR241 CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA TYPE OF SUBMISSION De disc for form Abandement	Form 3160-5	UNITE	D STATES	FORM APPROVED Budget Bureau No. 1004-0135
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Charle Bluff Fed. Comm Charle Bluff Fed. Bluff Fed. Bluff Fed. Com	I. Type of Well Oil Gas	<u> </u>	e de se se	8. Well Name and No.
Methodurne (111 Company) 30-015-27163 P. O. Roy 5270. Hohrs, New Mexico. B8241 Warte and Tables And or Exploring Arm A Locale of Windows, S., J. M. or Savey Decription 10. Field and Rod, or Exploring Arm 1980' FSL: & 1400' FEL N. M. O'Savey Decription Sec. 1-T18S-R27E Eddy 10. Field and Rod, or Exploring Arm N. 1111nois Camp Morr 1980' FSL: & 1400' FEL Eddy 10. Field and Rod, or Exploring Arm N. 1111nois Camp Morr 1980' FSL: & 1400' FEL Eddy 10. Field and Rod, or Exploring Arm N. 1111nois Camp Morr 11. County or Notice Eddy 12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA TYPE OF SUBMISSION TYPE OF COUNTIER DATA 13. Notice of Intera Advantage Stress 14. Subsequent Report One Camp Camp Mark 15. Subsequent Report One Camp Camp Mark 16. Subsequent Report One Camp Camp Mark 17. Staff A 294', N-80 & S-99, grade used API casing and set 0 8958'. Mail Stage W/350 18. Staff Projected Operation (Cherry fact Apr Ander For Casing and set 0 8958'. Mail Staff the first stage W/350 19. Staff A 294', N-80 & S-99, grade used API casing and set 0 8958'. Mail Staff the first stage W/350 <td>2. Name of Operator</td> <td></td> <td>[100 i</td> <td>Chalk Bluff Fed. Comm.</td>	2. Name of Operator		[100 i	Chalk Bluff Fed. Comm.
P. O. Roy 5270. Hohts, New Mexico. 88241 In Field ad Poil, or Exploratory Area 4. Locade of Well (Foouge Sec., T. N. M. de Savey Description) II. The Mexico Press, Savey Description) 1980' FSL & Jedd FEL Sec. 1T18S-R27E Eddy 12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA TYPE OF SUBMISSION TYPE OF ACTION Based of Local and Poil, or Exploratory Area Based of Complete of Submy Description Notice of Issue Based of Complete Press Based of Complete Press Field Abasedonment Notice Based of Complete Operations (Clark field for all maters and sour pertinent data, fielding estimated and field on the Complete Presented and field on the Abase of Submy Description on the Complete Presented of the Submy Description on the Complete Presented and Field on the Abase of Submy Description Press, Submy Description Description Press, Submy Description Description Press, Submy Description Description Description Description Description Press, Submy Description Descriptin Descriptin Descriptin Descriptin Description Description Descri	Mewbourne 0	il Company		30-015-27163
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CRECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, ON OTHER DATA TYPE OF SUBMISSION	Sec. 1-1105			Eddy
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Final Abandonment Notice Gasing Repair Gasing Repai	Subseque	at Report	Plugging Back	Non-Routine Fracturing
Other <u>Cernent 7" Casing</u> Dippose Water Complete Operations (Clark that M perform details, and give perform date, including estimated date of surface performs of meansplates now well control provided Operations (Clark that M perform details, and give perform date, including estimated date of surface meansplates now well give subsurface locations and measured as free vertical depths for all markers and zones perform to this work." Lost complete returns @ 7683' Dry drilled 8-3/4" hole tp 8968'. Ran 226 Jts. of 7", 26# & 29#, N-80 & S-95 grade used API casing and set @ 8968'. Multiple stage cementer @ 6997' and external casing packer @ 7026'. Western cemented the first stage w/350 sks. of Class "H" containing 8 pps CSE + .75% CF-14 + 5 pps Gilsonite + .35% Thrifty Lite. Set ECP and opened DV tool. Cemented 2nd stage w/750 sks. of Class "C" containing 1 pps celloseal + 5 pps gilsonite + 3% salt followed by 100 sks. of Class "H" Neet. Plug down to 6997' @ 2:45 a.m. 12/26/92 ACC	Final Ab	andonment Notice	Casing Repair Aftering Casing	Water Shut-Off
Completion of Recompletion Reported Operations (Clearly tests all pertinent details, and give pertinent dates, including estimated date of surfage any proposed work. If well is directionally divided give subsurface locations and measured and they be pertinent details, and give pertinent dates, including estimated date of surfage any proposed work. If well is directionally divided give subsurface locations and measured and they be pertinent details, and give pertinent dates, including estimated date of surfage any proposed work. If well is directionally divided give subsurface locations and measured and they be subsurface locations and approval, if any interval and willfully to make to any dep			other <u>Cement 7" casing</u>	(Note: Report results of multiple completion on Well
ACC	escribe Proposed or Com give subsurface locat 26# & 29#, N @ 6997' and sks. of Class Lite. Set El containing 1 "H" Neet. P	npleted Operations (Clearly state all per ions and measured and rue vertical d -80 & S-95 grade us external casing pac s "H" containing 8 CP and opened DV to pps celloseal + 5 lug down to 6997' @	timent details, and give pertiment dates, including estimated date of s epoths for all markers and zones pertiment to this work.)• Dry drilled 8-3/4" hole tp 8968 ed API casing and set @ 8968'. ker @ 7026'. Western cemented t pps CSE + .75% CF-14 + 5 pps Gil ol. Cemented 2nd stage w/750 sk pps gilsonite + 3% salt followed 2:45 a.m. 12/26/92	tarting any proposed work. If well is directionally drilled, Wultiple stage cementer he first stage w/350 sonite + .35% Thrifty s. of Class "C" by 100 sks. of Class
Its interest the ipregoing is the and correct Signed Date			ACC (MED) FOR RECO OR G. SGD.) DAVID R HEB 4 1993 CARLSEAD, NEW MED	JAN 25 9 40 AM '93 AREA BEAGE AND BE
(This space for Federal or State office use) Approved by	14. I hereby certify that the fo	Pregoing is true and correct	Time Drilling Superintendent	Date 01/20/93
Approved by Title Date Date Date	(This space for Federal or	State office use)		
- 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements	Approved by Conditions of approval, if	any:	Title	Date
	a 18 U.S.C. Section 1001, or representations as to any ma	makes it a crime for any person know aner within its jurisdiction.	vingly and willfully to make to any department or agency of the U	nited States any false, fictitious or fraudulent statements

with [7 70]		STATES .	Budget Bureau No. 1004-0135
·	DEPARIMENTO	IF THE INTERIOR	Expires: March 31, 1973
	BUREAU OF LAN	D MANAGEMENI	5. Lease Designation and Serial No
	SUNDRY NOTICES AN	D REPORTS ON WELLS	NM-0557371
Do not use this to U	rm for proposals to drill or se "APPLICATION FOR PE	r to deepen or reentry to a different reser ERMIT—" for such proposals	rvoir.
	SUBMIT IN	TRIPLICATE	7. If Unit or CA, Agreement Designation
. Type of Well Oil Gas Well Well		5 A D A R 1993	8. Well Name and No.
Name of Operator			Chalk Bluff Fed. Comm. #
Mewbourne Oil	l Company		9. API Well No.
P.O. Box 527(0 Hobbs. New Mexico	88241	10. Field and Pool, or Exploratory Area
Location of Well (Footage	, Sec., T., R., M., or Survey Descript	ion)	N. Illinois Camp Morrow
10001 501 0 1	990		11. County or Parish, State
Sec. 1-T18S-F	R27E		Eddy
CHECK A	APPROPRIATE BOX(s) T	O INDICATE NATURE OF NOTICE, R	EPORT, OR OTHER DATA
TYPE OF S	BUBMISSION	TYPE OF AC	
Notice of	Intent	Abandonment	Change of Plans
Subserver	ne Persone	Recompletion	New Construction
and Subsequen	и керол		Water Shut-Off
Final Aba	indonment Notice	Altering Casing	Conversion to Injection
		Other Run 4-1/2" Liner	Dispose Water
			Completion or Recompletion Report and Log form.)
Drilled wel N-80, used w/200 sks. 100 sacks o rig and mov	Il to a total depth API casing and hung of Class "H" contai of Klay-Treat. Plug yed off location. O	of 10,150' w/6" hole, ran 45 j liner from 8599' to 10,150'. ning 5 pps CSE + 20 pps SF-3 + down to 10,113' @ 5:00 a.m. 0 1/08/93	ts. of 4-1/2", 11.6#, Western cemented .9% CF-14 + 1 gal./)1/06/93. Released
		ACCUMULATION	
		(PRIG. SGD.) DAVI 11-20 4 1993 0	6 R. GLASS 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
L beneby certify that the five	regoine is tale and correct	(PRIG. SGD.) DAVI 17-20 4 1993 0.	R. GLASS CO M 5 ₹ ₹ 6 ₹ ₹ 6 ₹ ₹ 70 5 ₹
I hereby certify that the for Signed	regoing is take and correct	(PRIG. SGD.) DAVII F_D 4 1993 C. Title Drilling Superintendent	R. GLASS Co fin 5 7 6 7 7 7 6 7 7 8 7 8 7 8 7 12 12 12
I hereby certify that the for Signed	regoing is take and correct State office use)	(PRIG. SGD.) DAVII r_b 4 993 C. Title Drilling Superintendent	R. GLASS Co M 5 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 7 6 7 7 6 7 7 7 6 7 7 7 </td
I hereby certify that the for Signed	regoing is take and correct State office use) any:	(PRIG. SGD.) DAVII F_D 4 1993 C	Date

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OP <u>ER</u>	ATOR ME	WBOYRNE (<u>JIL ()</u>		-	•
WELL	NAME	S AS PER	MARK ASHLEY	· · · · · · · · · · · · · · · · · · ·	-	DATE _/-25-93
				•		
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Anhy Salt Sait		. T. Canyon	त्र 932 9490	T. Ojo Alamo	d	_ T. Penn. "B" _ T. Penn. "C" _ T. Penn. "D"
(ales	450	. T. Miss		T. Cliff House		_ T. Leadville
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OIL OF GAS S	iands of zones	
No. 1. from	No. 3. from	
No. 2. from	No. 4, from	
IMPOHTANT	WATER SANDS	
Include data on rate of water inflow and elevation to which water m	as in hole	
No. 1, from	first.	
No. 2, from	feet:	
No. 3, from	foor	======================================

9710

T. Ellenburger.

T. Gr. Wash_

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T. Bone Springs

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REMARKS:

. Blinebry

. Drinkard

C. Wolfcamp

r. Cisco (Bough C)

Tubb

C. Abo_

Г. Penn

_ · · ·				CW INICAMO	_			Form C-104
Appropriate District Office DISTRICT 1		Energy, Min	erais and Nat	ural Resourc	es Departme	int.		Revised 1-1-85
P.O. Box 1980, Hobbs, NM 88240		OIL CONSERVATION DIVISION				N		at Bottom of I
DISTRICT II P.O. Drawy DD. Anteria NM 28210			P.O. B	ox 2088	74 7 131U		RECEIVED	
DISTRICT III		Santa	i Fe, New M	lexico 8750)4-2088		1. 21 P	93
1000 Rio Brazos Rd., Aziec, NM 8741	® REQL	JEST FOP						•••
<u>I.</u>		TO TRAN	SPORT OIL	AND NA	TURAL GA	S		
Operator Mouthousene Oril Comp			•			Wall	APINO.	~~~
Address	iny		· · · ·				0-015-2/1	bJ
P.O. Box 5270 Hob	bs, New M	<u>1exico </u> {	38241					
Reason(s) for Filing (Check proper box	c)	Orana in Tra		C Oth	st (Piease expla	in)		
Recompletion	Oit		y Ges					
Change in Operator	Casingher	ul Gas 🗌 Co	mdensate					
If change of operator give name and address of previous operator			· · · · · · · · · · · · · · · · · · ·					
IL DESCRIPTION OF WEL	L AND LE	ASE						
Lease Name		Well No. Po	ol Nazae, Includi	ing Formation		Kind	of Lease	Lease N
Chalk Bluff Federal (Comm.	3 NC	orth Illi	nois Cam	o Morrow	XXXA.	recensi or FileX	I NM-05573
Inte Lance I	. 19	980 _	S S	outh .	99() _		East
		Po	a muu 106		, and	Fi	a ram 166	
Section I Town	ahip 18S	Ra	inge 27E	<u>, NI</u>	APM,		Eddy	Co
III. DESIGNATION OF TR/	INSPORTE	R OF OIL	AND NATU	RAL GAS				
Name of Authorized Transporter of Oil		or Condensate	<u>ند</u> '	Address (Give	i áddrezt to whi	ch approved	capy of this form	n is to be sent)
Amoco Pipeline IPC	rin shared Gas			502 N.	lest Ave.	Level	land, Tx.	79336-391
Iranswestern Pinelin	e Company	/ W.		P.0. Bo	x 1188 Ho	us ton,	Texas 7	7251
If well produces oil or liquide,	Ueit	Sec. Tu	TP. Res.	ls gas actually	y comeeted?	When	7	
if this conduction is commissioned with st			18S 127E	<u>Yes</u>		0	1/15/93	
Designate Type of Completio Des Spudded	n - (X) Date Com	pl. Rendy to Pac	X	X Total Depth	i		P.B.T.D.	
11/24/92	North P	01/16/	/93	Too Oil/Gas I	10,150			10,102'
KB 3643' DF 3641' GL 3	3628' Lo	ower Morr	now.		9950'	· .	Tuning Depth	9972'
Performines				•			Depth Casing S	bos
9950-9954 9957-9	<u>99/2'</u> T		SING AND		C PECODI	<u>, </u>		10,150'
HOLE SIZE				CEMENTIN				
· • • • • • • • • • • • • • • • • • • •		SING & TUBIN	IG SIZE	CEMENTIN	DEPTH SET		SA	CKS CEMENT
17-1/2"	13-3/8	SING & TUBIN 3" 54	IG SIZE	CEMENTIN	DEPTH SET	00'1	SA 100 sacks	CKS CEMENT
17-1/2" 12-1/4" 8-3/4"	<u>13-3/8</u> 9-5/8	SING & TUBIN 3" 54. 3"	NG SIZE . 5# 36# 26#		DEPTH SET 40 2.60	00'±	54 100 sacks 250 sacks	CKS CEMENT S Port IL
17-1/2" 12-1/4" 8-3/4" 6"	13-3/8 9-5/8 7" 4-1/2	SING & TUBIN 3" 54. 3" 2" Liner	NG SUZE 5# 36# 26# <u>11.6#</u>	CEMENTIN 8,600'	0 RECORI DEPTH SET 4(2.6(8.9(to 10.15(00' <u>1</u> 00' 58'	54 100 sack 250 sack 1200 sack 200 sack	CKS CEMENT S Port II S 2-12- KS comp S
17-1/2" 12-1/4" 8-3/4" V. TEST DATA AND REQUI	13-3/8 9-5/8 7" 4-1/2 EST FOR A	SING & TUBIN 3" 54. 3" 2" Liner LLOWABI	NG SIZE 5# 36# 26# 11.6# .E 2-	CEMENTIN 8.600' 3/8" & 2	0EPTH SET 40 2.60 8.96 to 10,150 -7/8")0' <u>'</u>))'	SA 100 sack 250 sack 1200 sack 200 sack	CKS CEMENT S Port II S 2 - 1.2 - KS composed S
17-1/2" 12-1/4" 8-3/4" 6" V. TEST DATA AND REQUI OIL WELL (Test must be after Date First New Oil Run To Tank	13-3/5 9-5/6 7" 4-1/2 EST FOR A r recovery of to Date of Tes	SING & TUBIN 3" 54. 3" 2" Liner LLOWABI tol volume of lo a	NG SIZE 5# 36# 26# 11.6# LE 2- ad oil and must	CEMENTIN 8.600' 3/8" & 2: be equal to or Producing Me	DEPTH SET 4(2.6(8.96 to 10.15(-7/8" recent top allow bad (Flow, particular))0' -)0' 18')' vable for this up, gas lift, e	SA 100 sack 250 sack 1200 sack 200 sack depth or be for main or be for	CKS CEMENT S Port F(S 2 -12 - KS carry V S full 24 hours.)
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17-1/2" 12-1/4" 8-3/4" 6" V. TEST DATA AND REQUI OIL WELL (Tast neart be after Date First New Oil Run To Tank Length of Test Accual Prod. During Test GAS WELL	13-3/5 9-5/5 7" 4-1/2 EST FOR A r recovery of to Date of Tet Tubing Pres	SING & TUBIN 3" 54, 3", 2" 1 iner LLOWABI tal volume of lo a saure	NG SIZE .5# .36# .11.6# .11.6# .LE 2- .ad oil and must	CEMENTIN 8,600' 3/8" & 2 be equal to or Producing Me Cosing Press	U RECOR DEPTH SET 4(2.6(8.99 to 10, 15(-7/8" exceed top allow that (Flow, pur 10	00'- 00' 8' 1)' vable for this	SA 100 sack: 250 sack: 1200 sack: 200 sack: depth or be for ac.) Choice Size Case-MCF	CKS CEMENT S Port I L S 2 - 1.2 - KS correct V S full 24 hours)
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INSTRUCTIONS: This form is to be filed in compliance with Rule 1104
1) Request for allowable for newly drilled or deepened well must be accompanied by tabulation of deviation tests taken in accordance with Rule 111.
2) All sections of this form must be filled out for allowable on new and recompleted wells.
3) Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
4). Separate Form C-104 must be filled for each pool in multiply completed wells.

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Form 3160-4. (October 1990)	•	UNITER	STATES	OTT SUBMIT B	м		FOL	PROVED
••••			E THE M		V Sere oth	er In- Expi	7. 600	ember 31, 1991
	UEFAR			astia. NH 8	R210 reverse	side) 5. LEABE	STAGNAT	HUN THE MELAL NO
	BUR					<u>NM-05</u>	2 371	
WELL CC	MPLETION	OR RECO	MPLETION !	REPORT AN	1040G			10
I. TYPE OF WE	LL: 011.	. [X] 6AM		Other		E 7. I'NIT AG	RANGTEN	T NAME
L TYPE OF CO	(PLETION:			CAFe	i î	IS	- \'O.	e. s
WELL.	WORK DE BE	^{р.} 🗌 г.аа	JUNETUP			8. FARM	OR LE	SHARE AND
NAME OF OFERA	TOB					Chalk	Bluf	f Fed. Comm.
Mewbourn	<u>e Oil Compa</u>	ny			<u></u>	9. AM WEL	L NO.	
D O D D	D TELEPHONE NO	1		(505) 000		30-0	15-2	7163
P.U. BOX	5270 HODD K.L. (Report locatio	S, New Mex	accordance with an	(505) 393- y State requireme	<u>5905</u> n(s)*	N T	11:0	aic Comp Maw
At surface 7				•		11. SEC., T.	<u> []]</u> , в., м.,	OF BLOCK AND BURYET
i At top prod. In	YOU FOL & terval reported bel	990 FEL				OR ARE	*	
						Con	1 .	
At total depth	Same			n, =4			I~ 	103-K2/E
					·	PARISE	~.	N M
DATE SPUDDED	16. DATE T.D. R.	ACHED 17. DAT	B COMPL. (Ready 1	o prod.) 18. gr.1		1 EUQY	19.	ELEY. CASINGHEAD
11/24/92	01/06/9	3	01/16/93	KB 36	43' DE 3		2	36281
TOTAL DEPTH. MD	A TVD 21. PLUG	, BACK T.D., MD &	TYD 22. IF MIT.	TIPLE COMPL.,	23. INTERS	ALS ROTARY TO	OLE	CABLE TOOLS
10,150'		10,102'		·····		<u> </u>		
PRODUCING INTE	RVAL(B), OP THIR	COMPLETION-TO	P, BOTTOM, NAME ()	40 AND TVD)*			2	5. WAS DIRECTIONAL SUBVEY MADE
9950'-995	4', 9957'-9	972' Lowe	er Morrow Or	ange Sand				Yes
TTPE BLECTRIC	AND OTHER LOGS R	en	· · · · · · · · · · · · · · · · · · ·				1 27. 1	FAR WELL CORED
SDL-DSN D	ual-Latero-	MFSL-GR So	nic CBL					No
		CAS	ING RECORD (Rep	wort all strings set	in well)			
ASING SIZE/GRADE	WEIGHT, LB./F	T. DEPTH SE	T (MD) HO		TOP OF CEMEN	T. CEMENTING RECOR	D	AMOUNT PULLED
<u>13-3/8"</u>	54	.5# 4	00'- 17-	1/2"	<u>100 sx.</u>	<u>Class "H"</u>		None
<u>9-5/8"</u>	26.0	$\frac{36\pi}{20}$	$\frac{100' - 12}{12}$	2/4/1	<u>250 sx.</u>	<u>Class "C"</u>		None
1	<u>20 a</u>	<u>29# 0, 5</u>	<u>/00 0-</u>	3/4 1	<u>200 SX.</u>	LIASS C &	<u>H</u>	None
. <u></u>	1	INER RECORD			30.	TUBING REC	ORD	
8128	TOP (ND)	BOTTON (ND)	SACKS CEMENT*	SCREEN (MD)	\$12B	08PTH 887 (MD)	FACKER SPT (MD)
4-1/2"	86001	10,150'	200 SXS	News	0 7/04			07071
				None	2-1/8"	<u>9972'</u>		9/9/
				None	2-3/8"	9972		9/9/
PERFORATION REC	CORD (Interval, size	: and number)		<u>Norie</u> 32. Ad	2-3/8" 2-3/8"		IT SQU	5628, BTC.
72277777777777777777777777777777777777	54' 9957'-	e and number) 99721		32. Ad	2-3/8" 2-3/8" CID. SHOT. F.	RACTURE. CEMEN	IT SQU	SEZE, ETG.
9950'-99	54' 9957'-	e and number) 99721		NONE 32. Ad DEPTH INTERVA 9950'-9' 9957'-9	2-3/8" 2-3/8" CID. SHOT. F 1 (MD) 954' 972'	RACTURE, CEMEN ANOUNE AND EL None None	IT SQU	SEZE, ETC.
9950'-99	54' 9957'- 9' 76 hole	e and number) 9972' S		None 32. Ad DEPTH INTERVA 9950'-9 9957'-9	2-7/8" 2-3/8" CID, SHOT. P 954' 972'	ANOCHE AND RI NONE NONE	ft squ sd of	BEZR, ETG.
9950'-99! 4 SPF 1	54' 9957'- 9' 76 hole	s		None	2-778" 2-3/8" CID. SHOT. P 1 (ND) 954' 972'	ANOUNE AND EL NONE NONE	IT SQU	BEZR, ETC.
9950'-99! 4 SPF 1	54' 9957'- 9' 76 hole	5 484 sumber) 9972' S	PROL Towing, gas lift, pu	NORE	2-7/8" 2-3/8" CID. SHOT. F 954' 972'	ANOUNE AND EI None None	IT SQU	SEZE, ETC. MATERIAL USED
9950'-99! 4 SPF 1!	оно (Interval, ster 54' 9957'- 9' 76 hole юж раовис	9972' S	PROL Towing, gas lift, pu	NOTIC 32. Address DEPTH INTERVA 9950'-9' 9950'-9' 9957'-9 9957'-9 9957'-9 NICTION Imping-size and in	2-7/8" 2-3/8" CID. SHOT. P L (ND) 954' 972' 972'	ANOCHE AND EL ANOCHE AND EL NONE NONE	IT SQU ND OF	SEZE, ETC. MATERIAL USED
9950'-99 4 SPF 1 71100 REC 9950'-99	овы (Interval, ster 54' 9957'- 9' 76 hole юм раовис ночав театер	9972' S <u>Flowing</u> CHOKE SIZE	PROL 'lowing, gas lift, pu PROD'M. POR	NONE 32. Ar DEPTH INTERVA 9950'-9 9950'-9 9957'-9	2-3/8" 2-3/8" CID, SHOT, P 1 (MD) 954' 972' 972' wpe of pump) GAS-MCF.	ANOUNE AND EL ANOUNE AND EL None None Wetter and Pr Water BR	IT SQU ND OF STATU St48) Oduc	SEZE, ETC. MATERIAL USED (Producing or ing UAB-OIL RATIO
9950'-99! 4 SPF 1! • FILST PRODUCTS 01/16/93	0000 COBD (Interval, ster 54' 9957' 9' 76 hole NOR PRODUC NOURS TESTED 24	9972' S <u>Flowing</u> CHOKE SIZE 10/64"	PROD'N. POR TEST FERIOD	NONE 32. Ad DEPTH INTERVA 9950'-9 9957'-9 	2//8" 2-3/8" CID. SHOT. P 954' 972'	ANOUNE AND EL ANOUNE AND EL None None Well of Pr Water-Be	IT SQU ND OF STATU St-is) Oduc	SEZE, ETC. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/RRI
9950'-99! 4 SPF 1! • FILST PRODUCTS 01/16/93 • OP TROT 01/16/93 • START	ово (Interval, ster 54' 9957'- 9' 76 hole рож расовис 24 Слания равовите	e end number) 9972' S <u>TION METHOD (F</u> Flowing снока віза]0/64" (CALCULATED 24-ROUS BAT	PROD'N. FOR TEST PERIOD	NONE 32. Av DEPTH INTERVA 9950'-9 9957'-9 9957'-9 	2-7/8" 2-3/8" CID. SHOT. F 954' 972' 972' Image: state	ANOUNE AND EL ANOUNE AND EL NONE NONE WELL BR Pr WATER-BR O ATERRBL.	IT SQU BD OF BD	SEZE, ETC. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/BBL RAVIET-AFI (CORE.)
9950'-99! 4 SPF 1: • FIRST PRODUCT: 01/16/93 • OP TRET 01/16/93 • STRING PRODUCT: 2720	0000 1000 1 54' 9957'- 9' 76 1000 PRODUC 1000 1000 24 CABING PRESSURE 0	e and number) 9972' S TION METHOD (F Flowing CROKE BIER 10/64" CALCULATED 24-ROUE BATH	PROD'N. POR TEST FERIOD Cit	NONE 32 An DEPTH INTERVA 9950'-9 9957'-9 9957'-9 9957'-9 DUCTION Imping-else and I OIL-BBL. 50 GAB-MCF. 2000	2-7/8" 2-3/8" CID, SHOT. P 954' 972' 972'	ANOUNE AND EL ANOUNE AND EL None None None Wetter-BL.	IT SQU ND OF STATU STATU STATU Ofuc IL. OIL G	SEZE, ETC. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/BBL RAVIET-API (CORR.)
9950'-99! 4 SPF 1! • FIRST PRODUCT: 01/16/93 • FURST PRODUCT: 01/16/93 • FURST PRODUCT: 01/16/93 • FURST PRODUCT: 01/16/93	овр (Interval, size 54' 9957' 9' 76 hole носяз театер 24 слана равовске 0 ав (Bold, used for f	e and number) 9972 ' S TION METHOD (F Flowing CROKE SIZE 10/64" CALCULATED 24-ROUE BATE Wel, vented, etc.)	PROD PROD'N. POR TEST PERIOD PROD'N. POR TEST PERIOD 011BSL. 60	None 32. Ad DEPTH INTERVA 9950'-9 9957'-9 9957'-9 N'CTION Imping-slass and I oitBBL. 50 GAB_MCP. 2000	2//8" 2-3/8" CID. SHOT. P 954' 972'	ANOUNE AND EL ANOUNE AND EL None None Well of Pr Water-BBL	NT SQU ND OF STATU MI 48) Oduc NL.	SEZE, ETC. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/BBL RAVIET-API (CORE.)
9950'-99! 4 SPF 1! • • • • • • • • • • • • • • • • • • •	COUCH COUCH COUCH CASING PRODUC CASING CASING <td>e end number) 9972 ' S TTION METHOD (F Flowing CHOKE BIZE 10/64" CALCULATED 24-ROUE HAT ALCULATED 24-ROUE HAT Mel, vented, etc.)</td> <td>PROD'N. POR TEST PERIOD OIL</td> <td>None 32. Av DEPTH INTERVA 9950'-9 9957'-9 9957'-9 010-000 010-000 010-000 010-000 010-000 010-000 000</td> <td>2//8" 2-3/8" CID. SHOT. F 954' 972'</td> <td>ANOUNE AND EL ANOUNE AND EL None None Water-BE. TEST WITH</td> <td>IT SQU ND OF STATU MI-IN) Oduc IL.</td> <td>SEZE, ETC. MATERIAL USED (Producing or ing UAB-OIL RATIO 40 MCF/BBL RAVIET-API (CORR.)</td>	e end number) 9972 ' S TTION METHOD (F Flowing CHOKE BIZE 10/64" CALCULATED 24-ROUE HAT ALCULATED 24-ROUE HAT Mel, vented, etc.)	PROD'N. POR TEST PERIOD OIL	None 32. Av DEPTH INTERVA 9950'-9 9957'-9 9957'-9 010-000 010-000 010-000 010-000 010-000 010-000 000	2//8" 2-3/8" CID. SHOT. F 954' 972'	ANOUNE AND EL ANOUNE AND EL None None Water-BE. TEST WITH	IT SQU ND OF STATU MI-IN) Oduc IL.	SEZE, ETC. MATERIAL USED (Producing or ing UAB-OIL RATIO 40 MCF/BBL RAVIET-API (CORR.)
9950'-99! 4 SPF 1! • • • • • • • • • • • • • • • • • • •	СССС СОВО (Interval, ster 54' 9957'- 9' 76 hole 9' 76 hole 100 PRODUC 100 PRODUC 24 Самия PRESEURE 24 Самия PRESEURE 0 10 10 10 10 10 10 10 10 10	e and number) 9972' S TION METHOD (F Flowing CHOUS BISE 10/64" CALCULATED 24-ROUS BAT 24-ROUS BAT Wel, vented, etc.) in confid	PROL PROD'N. POR TEST PERIOD PROD'N. POR TEST PERIOD 011	NOTICE 32. Av DEPTH INTERVA 9950'-9 9957'-9 9957'-9 010-000 010-000 010-000 010-000 010-000 010-000 000-000	2-778" 2-378" CID. SHOT. F 954' 972' 972' 1 1 1 1 1 1 1 1 1 1 1 1 1	ANOCHE AND EL ANOCHE AND EL None None None Wetter Water-BE DATER-BE. TEST WITH	AT SQU ND OF STATU Statu Statu Oduc It. Oil o Statu	SEZE, ETG. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/BBL EAVIET-API (CORE.) T
9950'-99 4 SPF 1 • • • • • • • • • • • • •	COULD Interval, star SOBD (Interval, star 54' 9957' 9' 76 hole PRODUCE HOURS TESTED 24 CASING PRESSURE 0 AS (Bold, used for f CASING PRESSURE 0 CASING P	e and number) 9972' S TION METHOD (F Flowing CHOKE BIER 10/64" CALCULATED 24-ROUE BATH 24-ROUE BATH well, vented, etc.) in confid and attached in	PROD'N. POR TEST PERIOD Oll	None 32. Ad DEPTH INTERVA 9950'-9 9957'-9 9957'-9 01L-BBL. 50 GAS-MCF. 2000 CCEPTED F 2000 CCEPTED F COMPANY CONTROL	2778" 2-3/8" CID. SHOT. P 954' 972'	ANOUNE AND EL ANOUNE AND EL NONE NONE NONE WELL WELL WELL WELL ONTERRBL. TEST WITNI D. JON IL available	IT SQU ND OF ND	SEZE, ETC. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/BBL RAVIET-API (CORE.)
9950'-99: 4 SPF 1: • • • • 71887 PRODUCTI • • • • • • • • • • • • • • • • • • •	INTER (Bold, used for f Casing Pressure (Bold, used for f Casing Pressure Casing Presser Casing Pressure Casing Pressur	e and number) 9972' S TION METHOD (F Flowing CHOKE BIZE 10/64" CALCULATED 24-ROUE BATT CALCULATED 24-ROUE BATT Mel, vented, etc.) in confid and attached in	PROD'N. POR TEST PERIOD OIL	NOTICE 32. An DEPTH INTERVA 9950'-9 9957'-9 9957'-9 010-000 010-000 010-000 010-000 010-000 000-000	2//8" 2-3/8" CID. SHOT. F 954' 972'	ANOUNE AND EL ANOUNE AND EL NONE NONE NONE WELL ANOUNE AND EL NONE NONE NONE NONE NONE NONE NONE NO	IT SQU ND OF STATU S	SEZE, ETC. MATERIAL USED (Producing or ing GAB-OIL RATIO 40 MCF/BBL RAVIET-API (CORR.) IT

Site 15 U.S.C. Section 1301, makes it a crime for any person knowingly and willfully to make to any department or agency of the the state of the sta

/. SUMMARY OF POROUS ZONES: (Show all important zones of porosity and contents the summary of porosity and contents the summary of the sum	ereof; cored intervals; and all	1
drill-stein, tests, including depth interval tested, cushion used, time tool open, flow recoveries):	ing and shut-in pressures, and	38.

GEOLOGIC MARKERS

Ξ

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.		TOP		
M Morrow	9950'	9972 '	Sandstone	NAME	MEAS. DBPTH	TRUE VERT. DEPTH	
H. HOLLOW	5500	3312		Yates	450'		
				7 Rivers	564 '	. '	
				Queen	1159'		
				Grayburg	1492'		
				San Andres	1985'		
				Glorieta	3536 '		
				Tubb	4760'		
				Drinkard	5524		
	1999 - 1 99			Аво	5744		
				Wolfcamp	6474 '		
				Cisco	7686 '		
				Canyon	8440'		
: .				Strawn	8932'		
				Atoka	9490'		
				Morrow	9594 '		
				Morrow Clasti	c 9800'		
				L. Morrow	9911'		
					· ·		

-J.J. 6P0:1991-575-735/48086

			K 	EN REYNDLDS-PRESIDENT I <u>E Newkirk-Vice-Pre</u> sident
	DRILLING CO., INCR	WELL DRI	LLING CONTRACTOR	35
	REUEI	P. D.	Box 1498 RO5WE 505/623-5070	LL, NEW MEXICO 88202-1455 505/746-2719
8188	JAN 27 10	52 M '93	ROSWELL, NM	ARTESIA, NM
	CARLA A	E LOG E RS		

January 06,1993

Mewbourne Oil Company P.O. Box 5270 Hobbs, N.M. 88240

RE: Chalk Bluff Federal #3

The following is a Deviation Survey on the above referenced well located in Eddy County, New Mexico.

5033' - 2 3/4°

5222' - 3 1/4°

5283' - 3 3/4°

5346' - 3 3/4°

5464' - 4 1/4°

5555' - 4 1/4°

5587' - 4 1/4°

5650' - 4 1/4°

5719' - 4 1/2°

5096' - 3°

5158' - 3°

5409' - 4°

400'	- 3/4°
887 '	- 1°
1359'	- 1°
1864 '	- 2°
2336'	- 1 1/2°
2600'	- 3/4°
2792'	- 1 1/4°
3086'	- 1°
3580'	- 1 1/3°
4079'	- 1 ⁰
4358'	- 1 3/4°
4846'	- 2 3/4°

Gary/W. Chappell

Contracts Manager

STATE OF NEW MEXICO)

COUNTY OF CHAVES

The foregoing was acknowledged before me this O6th day of January 1993 by Gary W. Chappell.

NOTARY PUBLIE

October 07,1996

MY COMMISSION EXPIRES

RECEIVED JAN 0 7 1993

5875' - 4° 5967' - 3 3/4° 6094' - 3 3/4° 6217' - 3 1/4° 6720' - 3 1/2° 7213' - 3° 7685' - 2 1/2° 8155' - 2 1/4° 8654' - 2° 9003' - 2° 9509' -9837' -10150' - 1 3/4°

5813' - 4°

1/4°

3/4°

TD

}	COMPANY	:MEW8OURN	E OIL	LEASE	CHALK BU	UFF FED.CO	INWELL NO.	: 3		Pc = 2273.2	Pc2 =	5167.4 +
	UNIT	:I		SECTION	: 1	• •	TOWNSHIP :	- 13	l	1 1		# 1 i
	Ĺ	9961	H	9961	L/H	: 1	G/GMIX :	0.849	i t	Pt2 = 5031.9	Pw =	2244.7 *
	\$C02	: 0.42	3N2	: 0.33	H2S	:		DATE	: 1	4810.1		2199.5 #
	đ	2.279	۶r	:0.012892	GH	: 8456.9		RANGE	: 27 :	4465.6		2132.7 *[]
:::										4053.0		2055.4 *!!
												*
	V01 1	: 655	PSIA 1	: 2243.2			RESV. TEMP	173.6		Pc2-Pw2= 128.6	P#2 =	5023.8 */
	VOL 2	: 1310	25TA 2	2193.2				•••••	1	329.8		4837.6 *!!
	VOL 3	2283	PSTA 3	: 2113.2			SHUT-IN PR	2273.2	i	618.9		4548.6 *
	V0L 4	. 3294	2514 4	2013.2						942.6		4224.8 *
			1 4 4 11 4						,	1		*
				808	• 668				ŧ		0.884	*
				TCR	- 401				1	1		*!!
				1.04					I I	Pr2/(Pr2-Pw2) :	40.184	#]]
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	22.02	i Anic I	e 1	i vute e	1 1	1	1	1 1		1	9 350	¥!
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		0.655	0 655	1 310	1 310	2 283	2,783	3 294	3 794	1		*!!
2	1¥	534	534	534	1 534	534	534	534	534	![Pc2/Pc2-Pw2]n =	26 181	¥.
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د ۲	77	1 V.ILI 1 ADA 6	1 V.750	, J.ILI 1 A7A L	1 470 5	1 125 2	1 1.133	1 104 5	1 424.0	1 ADE- 0	17 148	x ¹¹
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<i>i</i> a	20/12	1 17.724	1 17.047	17.710	+ 17.071	1 17.071	1 17.774	1 17.027	1 17.032) 1	14,713	* 1 # 1
2	83 1-8-5	1 2.111 1 0.594	1 2.000		1 A 500	+ 2.105	1 2.977	1 2.104 1 A EAC		1	14.700	T 1 1 g 2 1
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- 1 V - 1 1	85 F5 00	1 2243.2 1 5071 0	5071 0	1 1010 1	· 2173.2	1 2110.2	1 4445 4	1 2010.Z	1 2013.2 1			711 X ¹¹
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2V 71	7 2e	, Li 32. 3 A 11	1 L190.0 1 4 11	ι 2079.2 · · Δ7	1 4 65	2004.7	1 2301.0	1 1971.1 1 7 7 1	4 2477.8 j	i i		E I I
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P.01

Services

₹ ^L		Норг	Oratory S 1331 Tasker os, New Mex	Services Drive Ico 88240		
S	· · ·	Tele	phone: (505)	397-3713		
FOR;	Mewbourne Oil Co Attention: Mr. M P. O. Box 5270 Hobbs, New Mexic	2. 3. Jones 20 88240	ŀ	SAMPLE IDENTIFICATION COMPANY: LEASE: PLANT:	: Chalk Bluff # Mewebourne Oi	3 1 Co.
SAMPLE DATA:	DATE SAMPLED: ANALYSIS DATE: PRESSURE - PSIG SAMPLE TEMP. *F	3/4/93 03-05 53	12:30PM -93 0.0	GAS (XX) SAMPLED BY: ANALYSIS BY:	LIQUID() R. Jones Rolland Perry	
REMARKS:						
		CON	APCNENT A	NALYSIS		
	COMPONENT		MOL PERCEN	T GP	M	
	Hydrogen Sullde Nitrogen Carbon Dioxide Methane	(H2S) (N2) (CO2) (C1)	0.3 0.4 83.1	3 2		
	Ethane Propane I-Butane	(C2) (C3) (IC4)	8.1 3.1 0.4	4 2.16 4 9.86 0 0.13	54 52 10	
	N-Butane I-Pentane N-Pentane Hexane	(NC4) (IC5) (NC5) (C6)	0.8 0.3 0.4 2.8	6 0.27 9 0.14 1 0.14 1 1.21	70 80 87 84	
	Heptanes Plus BTU/CU.FT. ~ DRY	(C7+)	<u>0.0</u> 100.0	o 0.00 0 4.92 9 MOLE	20 27 ECULAR WT.	21.1701

1265

1239

1298

1004

. . .

Laborator

• •

MOLECULAR WT. 21.1701 26# GASOLINE -1.591

SPECIFIC GRAVITY -CALCULATED 9.73I MEASURED

DRY

WÉT

DAY

WET

AT 14.650

AT 14.650

AT 15.025

AT 15.025

FRI

9:52

5-93

MAR-

MEWBOURNE OIL COMPANY Chalk Bluff Federal Com. Well #3 1-18S-27E Eddy County, New Mexico 3/4/93



Dimeriour

Submit in duplicate to opriate district office 33 ule 401% Bule 1122

5 . . .

State of New Mexico Energy, Minerals and Natural Resources Department

Form C-122 Revised 4-1-91

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Oper	ator MEWVC	URNE OIL	COMPANY				1	Lease or I	Unit Name IALK BLI	र प्र	DERAT.	MUN		
Туре	Test_	 						Test Date		<u></u>	Well No.			
	A Initial		Annual	Special	- D I-			3/4	<u>+/93</u>			3		
Com 1	/16/93	LOCAL	10150	Plu	g back 1∩1	02	·	CT	36391		Umiller.	• Sec 1	WF - K 100	375
Csg.	Size V	Vt. d	Set	At Per	foration	<u>u</u> :	<u>-</u> <u>-</u>				County	_	109-	-4/15-
1.1.		10 5	1 052 1	600		0050		_ ^						
42	Size I		+.052	OLOU Fro	m: forstion	9950	······	To: 9	954		Pool Ei	JUY		
108.	2718	4.7 & 1	.91								TOOL	MO	RROW	1
23	1/8 &	6.5 2	.441 9	972 Fro	m:	9957	•	<u>To:</u>	972		N	ORTH IL	LINO.	IS Com
Type Sub	Well - Single - Igke	Bradenhead - C	G.G. or G.O. Mu	ltiple		Packer Set /	AL 9797	7		•	Formatio M	DRROW		
Prod	ucing Thru F	leservoir Temp.	.°F Mean An O	nual Temp. °F		Baro, Press	-P. 13	3.2			Connect	ion 1sweste	m	
b 995	ю ^н 9	950 ^G	.731 %0	¹⁰ 2.42	% N	² .33	% H_2	S	Prover		Meter Ru 3. Of	11 11 11 11 11 11 11 11 11 11 11 11 11	Taps f	19.
	<u> </u>	FLOW	DATA		<u> </u>		τυ	BING D		C	ASING I			
NO	Prover	Orifice	Press	Diff.		Тепп.	Press		Temp	Pres		Temp		of
	Line X Size	Size	p.s.i.g.	h,		ala L	p.s.i.g.	.	٩F	p.s.i	.g.	۹F	F	low
SI							2260)		Pkr			48	hr.
1.	<u>3 X 1.</u>	500	530	5		148	2230)		11			1	hr.
2.	<u>3 X 1.</u>	500	530	19		124	2180)		11		4	1	hr.
· _	<u>3 X 1.</u>	500	535	52	<u> </u>	88	2100						1	hr.
4	<u>3 X 1.</u>	500	540	102		_70	2000					-	1	hr.
•														
<u> </u>	0055550		· · · · · · · · · · · · · · · · · · ·	- KA	TE OI	F FLOW C	ALCULA	TIONS	uine Eastan					
NO.	(24 HOUR		h _w P _m	Pm		Flow	or FL	Un	Fg.	Fact	compress. or, F pv.	K	le of rio Q, Mcfd	/₩
1.	11.13		52.12	543.	2	.924	8		1.170	1.0	43	65	5	
2.	11.13		J1.59	543.2	2	.943	36		1.170	1.0	49	131	0	
3.	11.13		27 5/	548.2	2	.974	1	<u> </u>	1.170	1.0	66	228	3	
<u>4.</u>	11.15		J7 • J4	553.2	2	.990	15	+	1.170	1.0	75	329	4	-
٦.	p		T		1	L		<u>.</u>	00 (<u> </u>	<u> </u>	<u> </u>		
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1.	.81	608	1.52	.919	A.F.	L Gravity of	Liquia riyo	arocandor Sar	731	1.0		YYY	***	
2.	.81	584	1.46	.909	Speci	fic Gravity I	Powine Flu	nid		XXXX	X	G	<u>non</u> Mix	.849
3.	.82	548	1.3/	880	Critic	al Pressure	66	58			P.S.L	A 66	4	P.S.LA.
4.	.0.2	0.00	1.34	.802	Critic	al Temperat	ure	401				R 44	1	R
<u>p_2</u>	273.2	P ² 516	57.4		<u>l</u>	-				·····				
NO	p.2	P	P 2	P.2 - P.2	(ו ך	P _c ²	=	5.4821	<u> </u>	⁽²⁾	P _c ²	1 .=-	4.50	<u> </u>
1.	5031.9	2244.7	5038.8	128.6	1	$P_c^2 - P_w$	2			F	2 - P 2	-		
2.	4810.1	2199.5	4837.6	329.8	1					L	-	4		ļ
3.	4465.6	2132.7	4548.6	618.9	AC	F = Q	F P	2	• <u>= 14</u>	,823				[
4.	4053.9	2055.4	4224.8	942.6			P ²	- p 2	-					
5.				!	·		L°	- w _					·	
Absoli	ne Open Flow_	14,823	3		_Mcfd (@ 15.025	Angle	of Slope (o49		s	lope, n	884	• , ·
	13.	BBLS CC	NDENSATE	PRODUCEI	D DU	RING TE	ST						·	
	·····		· · · ·											
	ver 3. Division			4 Rui			Calculated	Bv.	· · · · · · · · · · · · · · · · · · ·		Checked	Bv:		
	الافتاحاطة وبستعبده	•						~						

KS

КS

TO WELL TESTERS

THE TERN CONTAIN C. NUL MERICA

WATER ANALYSIS

BOBBE, NEW MEXICO LAB

ANALYSIS #: HE010251

	GENERAL	INFORMATION
OPERATOR: WELL: FIELD: FORMATION: COUNTY: STATE:	Mewbourne Oil Company Chalk Bluff Fed #3 Eddy NM	DEPTH: 0 DATE SAMPLED: DATE RECEIVED:02/24/93 SUBMITTED BY: Leonard Pounds WORKED BY: M Keith PHONE #: 505-392-5556

SAMPLE DESCRIPTION: all water

PHYSICAL AND CHEMICAL DETERMINATIONS

			and the second s			
	SPECIFIC GRAV	/ITY: 1.003 @	70 •F	PH:	6.75	
	RESISTIVITY ((MEASURED): 3	ohms Q 0	°F		
	IRON (FE++):	150 PPM	SUL	fate:		100 PPM
	CALCIUM:	10 PPM	TOT	L HARDNESS	i	50 PPM
	MAGNESIUM:	6 PPM	BIC	Arbonate:		487 PPM
	CHLORIDE:	1595 PPM	SODI	IUM CHLORIDI	CALC)	2624 PPM
	BODIUM+POTASS	: 1243 PPM	TOT	DISSOLVED	SOLIDS:	3474 PPM
	KCL	:no trace	OIL		inone	
┢						
	REMARKS:					- /
					·	

STIFF TYPE PLOT (IN MEQ/L)



					*	1
rm 316// 5 ne 1990	UNITED STAT DEPARTMENT OF THE BUREAU OF LAND MA	ES INTERIOR NAGEMENT	<u>ak OIL CONS.</u> Drawer DD Artesia , M	BORIO	FORM APPROVE: Budge: Bureau No. 10.4-6111 Expires: March 31, 1953 5. Lease Designation and Seriel No.	<u> </u>
S Do not use this forr Use	SUNDRY NOTICES AND REP m for proposals to drill or to dee e "APPLICATION FOR PERMIT-	ORTS ON WI open or recardy -" for such pr	ELLS to a different re oposals	servoir.	NM-0557371 6. If Indian, Allonee or Tribe Name	
······	SUBMIT IN TRIPL	ICATE			7. If Unit of CA, Agreement Designat	ion
Type of Well Oil Gas Well Well	Other				B. Well Name and No.	
Name of Operator Mewbourne 011	1 Company	j), si	LEIVED		Chalk Bluff Fed.	<u>Com.</u> #
Address and Telephone No. P.O. Box 527(0 Hobbs, New Mexico 88	241 APF	2 6 1993		30-015-27163 10. Field and Pool, or Exploratory Area	<u> </u>
Location of Well (Footage,	Sec., T., R., M., or Survey Description)) ;;;;;		· ·	N. Illinois Camp II. County or Parish, State	Morrow
Sec. 1-T18S-F	R27E				Eddy Co., N.M.	
CHECK AF	PPROPRIATE BOX(s) TO IND	CATE NATU	RE OF NOTICE	REPORT	, OR OTHER DATA	
TYPE OF SU	JBMISSION		TYPE OF	ACTION	·	
Notice of In	ntent	Abandonme	nt R		Change of Plans	
Subsequent	Report	Plugging Ba	ck		Non-Routine Fracturing	
Final Abany	donment Natice		lir ling		Water Shut-Off	
		Other			X Dispose Water (Note: Report results of multiple completion of	n Weil
scribe Proposed or Compl give subsurface location	leted Operations (Clearly state all pertinent details ns and measured and true vertical depths for all	, and give pertinent da markers and zones pe	tes, including estimated da rtinent to this work.)*	te of starting an	Completion or Recompletion Report and Log y proposed work. If well is directionally	drilled,
1) Formations	Marrow				,	
 Amount of w Amount of w Water analy Water is st Produced wa The disposa Eddy County 	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico	lass tank I & W Inc. alter Solt	#1, Unit Let	ter L, S	ection 5-T18S-R28E	
2) Amount of w 3) Water analy 4) Water is st 5) Produced wa 6) The disposa Eddy County SWD #318	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico	lass tank I & W Inc. alter Solt	#1, Unit Let	ter L, S	ection 5-T18S-R28E	
2) Amount of w 3) Water analy 4) Water is st 5) Produced wa 6) The disposa Eddy County SWD #318	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico	lass tank I & W Inc. alter Solt	#l, Unit Let	ter L, S	ection 5-T18S-R28E	
2) Amount of v 3) Water analy 4) Water is st 5) Produced wa 6) The disposa Eddy County SWD #318	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico	lass tank I & W Inc. alter Solt	#1, Unit Let	ter L, S	ection 5-T18S-R28E	
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 Profilation: Amount of w Water analy Water is st Produced wa The disposa Eddy County SWD #318 	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico	lass tank I & W Inc. alter Solt	#1, Unit Let	ter L, S	ection 5-T18S-R28E	
2) Amount of v 3) Water analy 4) Water is st 5) Produced wa 6) The disposa Eddy County SWD #318 1 hereby certify the the fore Signed The disposation of the fore Signed The disposation of the fore Signed The disposation of the fore Signed The disposation of the fore	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico Title	lass tank I & W Inc. alter Solt	#1, Unit Let on Engineer	ter L, S	ection 5-T18S-R28E March 4, 1993	
2) Amount of v 3) Water analy 4) Water is si 5) Produced wa 6) The disposa Eddy County SWD #318 I hereby certify bit the fore Signed (This space for Federal or S Approved by (ORIG. S Conditions of approval, if an	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico Title tate office use) GD. DAVID R. GLASS Title	lass tank I & W Inc. alter Solt PETROLE	#1, Unit Let on Engineer	ter L, S	Dete March 4, 1993	
I hereby certify dot the fore Signed	water produced 10 BW/mo. ysis attached tored on lease in fiberg ater will be trucked by al well is I & W Inc., W y, New Mexico Title tate office use) GD. DAVID R. GLASS TTACHED attact actions for any more boundary of the second tate office use) GD. DAVID R. GLASS Tate	lass tank I & W Inc. alter Solt PETROLE	#1, Unit Let on Engineer	ter L, S	Dete March 4, 1993	

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0	COMPANY	:MEW90URI	NE DIL	LEASE	CHALK B	LUFF FED.C	JANELE NU.		2	11 PC = 22/3.2	PC2 =	516/.4 *;
	UNIT	:I		SECTION	: 1		TOWNSHIP	: 15		f t J 3		¥11
	L	: 19961	H	: 9961	L/H	: 1	G/GMIX	: 0.849		Pt2 = 5031.9	₽w =	2244.7 *;;
	\$002	: 0.42	1 N2	: 0.33	H2S	:		DATE	:	4810.1		2199.5 *
	d	: 2.278	Fr	:0.012892	GH	: 8456.9		RANGE	: 27	4465.6		2132.7 *;
::										4053.0		2055.4 *
										11		*!
	VOL 1	: 655	PSIA 1	: 2243.2			RESV. TEMP	173.6		Pc2-Pw2= 128.6	PK2 =	5038.8 *!!
	VOL 2	: 1310	PSIA 2	: 2193.2						329.8		4837.6 *!!
	VOL 3	: 2283	PSIA 3	: 2113.2			SHUT-IN PR	= 2273.2		618.9		4548 6 11
	VOLA	, 3294	05TA 4	• 2013 2						942.6		4074 9 11
		• • • • • • •	10111 1							11 JAR1A		****
				000						11 18	0 004	*ii •!!
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				104	401	-			1	 0_0//050_050\	10.104	*ii
		1	,			-		1		(PCZ/(PCZ-PWZ) =	40.184	
	LINE	i RRILI	i	KAIL Z	•	; RAIE 5	i i	; RAIE 4	1		15.666	7 11
							i		.ii		8.350	* 1 1
		i ISI	ZND	151	ZND	151	ZND	151	ZND		5.482	***
												*[]
1	QM	0.655	0.655	1.310	1.310	2.283	2.283	3.294	3.294			*11
2	TW	534	534	534	534	534	534	534	534	[Pc2/Pc2-Pw2]n =	26.181	*!!
	Ts	633.6	633.6	633.6	633.6	633.6	633.6	633.6	633.6		11.386	*::
	T	583.8	583.8	553.8	583.8	583.8	; 583.8	583.8	583.8	t F	6.528	***
	PR (est)	3.36	1	3.28	1	3.16	1	3:01	1 1	1	4.500	#]}
ì	Z(est)	0.727	0.738	0.727	0.736	0.728	0.733	0.731	0.730	1		*
,	12	424.5	430.8	424.6	429.5	425.2	427.7	426.5	426.0	AOF= Q	17.148	***
1	GH/TZ	19.924	19.629	19.918	19.691	19.891	19.774	19.829	19.852	1	14.915	*
}	вS	2.111	2.088	2.110	2.093	2.108	2.099	2.104	2.105	1	14.903	x : :
	1-e-S	0.526	0.521	0.526	0.522	0.526	0.524	0.525	0.525	1	14.823	*!!
	Pt	2243.2	2243.2	2193.2	2193.2	2113.2	2113.2	2013.2	2013.2			*!!
l	pt2 /1000	5031.9	5031.9	4810.1	4810.1	4465.6	4465.6	4053.0	4053.0	1		*!!
	Fr	0.012892	0.012892	0.012892	0.012892	0.012852		0.012852	0.0128924			*!!
5	Fc=FrT2	5.472	5.555	5.474	5.537	5,481	5.514	5.498	5,492	1		*!!
1	FcQm	3.58	3.64	7.17	7.25	12.51	12.59	18.11	16.09	1		*!!
5	/H(FcQm)	12.8	13.2	51.4	52.6	156.6	158.5	328.0	327.3	t		*!
	Fw	6.761363	6.896568	27.05758	27.47.57	182.32401	82.97298	172.0865	171.83059			*!!
1	Pw2	5038.7	5038.8	4837.2	4837.6	4547.9	4548.6	4225.1	4224.8	*		¥!]
}	Ps2	10636.7	10519.8	10208.7	10123.1	9588.7	9547.9	8887.4	8294.3	1		*!!
)	Ps	3261.4	3243.4	3195.1	3181.7	3096.6	3090.0	2981.2	2982.3	1		¥11
;	P	2752.3	2743.3	2694.2	2687.4	2604.9	2601.6	2497.2	2497.8	t		*!! *!!
	Pr	4.12	4.11	4.03	4:02	3.90	3.89	3.74	3.74	1. 1		
)	Tr	1.46	1.46	1_46	1 46	1.44	1.46	1 46	1 46	1		_ 2 E E
- (7	0 71R	0 7 7 9	0 734	0 735	1 0 777	1 170	0 710	0.770	1 SU		111 1 111
	- 1				1 01100	1 0.100	; v./02	1 01100	1 0.750 1	; ru	NO VIZZE	/ TH

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		Laboratory Services 1331 Tasker Drive Hobbs, New Mexico 88240						
SS		Telephone: (505) 397-3713					
FOR;	Mewbourne Oil Co Attention: Mr. 9 P. O. Box 5270 Hobbs, New Mexic). R.Jones :0 86240	SAMPLE IDENTIFICATION: COMPANY LEASE: PLANT:	Chalk Bluff #3 Mewebourne Oil Co.				
SAMPLE DATA:	DATE SAMPLED: ANALYSIS DATE: PRESSURE - PSIG SAMPLE TEMP. *F ATMOS. TEMP. *F	3/4/93 12:30PM 03-05-93 530.0	GAS (XX) SAMPLED BY: ANALYSIS BY:	LIQUID () R. Jones Rolland Perry				

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Labor

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CONT 19

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COMPONENT ANALYSIS

		MOL		
COMPONENT		PERCENT	GPM	
Hydrogen Sulfide	(H2S)			
Nitrogen	(N2)	0.33		
Carbon Dioxide	(002)	0.42		
Methane	(C1)	83.10		
Ethane	(C2)	8.14	2.164	
Propane	(C3)	3.14	0.862	
I-Butane	(IC4)	0.40	0.130	
N-Butane	(NC4)	0.86	0.270	
I-Pentane	(IC5)	0.39	0.140	
N-Pentane	(NC5)	0.41	0.147	
Hexane	(C6)	2.81	1.214	
Heptanes Plus	(C7+)	0.00	0.000	
· .		100.00	4.927	
BTU/CU.FT DR	Y	1269	MOLECULAR WT.	21.1701
AT 14.650 DRY		1265		
AT 14.650 WET		1239	26# GASOLINE -	1.591
AT 15.025 DRY		1298		
AT 15.025 WET		1304		
SPECIFIC GRAVIT	Y -			
CALCULATE	Ð	0.731		
MEASURE	D			
				· · · ·

°.01

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MEWBOURNE OIL COMPANY Chalk Bluff Federal Com. Well #3 1-18S-27E Eddy County, New Mexico 3/4/93



Q MCF/DAY

Log Q1=6500:209=3.81291 Log Q2=850:209=2:92942 .5100= N=,88349 = .884 Submit in duplicate to appropriate district office See Rule 401 & Rule 1122 State of New Mexico. inergy, Minerals and Natural Resources Dept ont

RECEIVED Form C-122 Revised 4-1-91

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OIL CONSERVATION DIVISION

P.O. Box 2088 Santa Fe, New Mexico 87504-2088 1.PR (1 8 1993

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Operator MEWY	OURNE OII	COMPANY					ease or Unit CHAT	Name K BL	नत्वत्र नना	TRΔT.	COM	
Type Test	· · · · · · · · · · · · · · · · · · ·	1.	<u> </u>	•	•	Т	est Date	<u></u>		ell No.	0001.	
A Initial		Annual		ll Ding Dagi	L TTD		3/4/9	13	·		3	1/D D
1/16/93	100	10150	1		102			001	Ur	ui Lur. · T	- SEC 1	WP - Kge.
Csg. Size	WL. d	Set	At 1	Perforatio	DES:	l	<u>(41, .)(</u>	12.0		unty	<u> </u>	185 2/E
		1 050	3600									,
4 2	10.5	4.052	10150	From:	<u>9950</u>	T	<u>o: 995</u>	4		ED	DY	
Tog. Size Z 7/8	₩ ^L .7 & ^d 1	.91 Set	AL I	Perforatio					Po	ol	MO	RROW
2 3/8 &	6.5 2	.441	9972	From:	9957	Т	o: 997	2		NO	RTH IL	LINOIS CAR
ype Well - Single	- Bradenhead -	G.G. or G.O. M	ultiple		Packer Set	At 9797			Fo	mation MO	DDOLL	
poducing Thru	Reservoir Tem	o. °F Mean An	nual Temp. 9	;	Baro, Press	-P. 12	<u>ີ</u>		Ca	nnecti	on	
-bg.			J	1	<u> </u>	15	.2			Iran	sweste	<u>m</u>
б950 ^н 9	9950 ^{Gg}	.731	.42	% N	• .33	% H ₂ S	Pr	over	M	zer Run 3.06	8	flg.
	FLOW	DATA				TUE	BING DAT	Ά	CAS	NG D	ATA	Duration
VO. Line V	Orifice	Press.	Duit.		Temp.	Press.	Ta	mpi.	Press.	- I - '	Temp.	of
Size	Size	p.s.i.g.	. ^h w		Ŧ	p.s.i.g.	9	F	p.s.i.g.		٩F_	Flow
τ						2260			Pkr.			48 br
3 X 1.	500	530	5		148	2230			11			1 hr.
3 X 1.	500	530	19		124	2180			11			1 hr.
. <u>3 X 1.</u>	500	535	52		88	2100			17			1 hr.
3 X 1.	500	540	102		70	2000			11			1 hr.
								,				1 .
			F	ATE O	F FLOW C	ALCULAT	IONS					
COEFFICIE	ENT R)	h_P_m	Pres P	sure m	Flow 7 Facto	Temp. or FL	Gravity Fg.	Factor	Super Com Factor, F	press. pv.	Rat	e of Flow), Mcfd
. 11.13		52.12	543	.2	.924	+8	1.	170	1.043	-	65	5
11.13	1	01.59	543	.2	.943	36	1.	170	1.049		1310	<u>,</u>
11.13	1	68.84	548	.2	.974	1	1.	170	1.066		228	3
11.13	2	37.54	553	.2	.990)5	1.	170	1.075		32.9/	4
P,	Temp. ^e R	T,	Z	Gas	Liquid Hydro	carbon Ratio		23,6	i3			Mcf/bbl.
0.	609	1 52	010	- A.P.	L Gravity of	Liquid Hydr	ocarbons	5	57.0			Deg.
<u>- 01</u>	584	1.52	000	Spec	ific Gravity S	Separator Gas		.731			XXXX	XXXXXX
.01	5/9	1.40	1 000	Spec	ific Gravity F	Flowing Fluid	۰ ۱		XXXXX		GN	fix .849
.02	520	1.3/	000	Critic	cal Pressure_	668	·			P.S.I.A.	664	P.S.LA.
.05		1.54	.005	Criti	cal Temperati	ure	401 -			<u> </u>	441	R
2273.2	P ² 51	67.4		<u>I·</u>		· · · · · · · · · · · · · · · · · · ·			· · · ·			
P ²	c P	P 2	P ² - P ²	- 1)	P _c ²	<u> </u>	4821		(2) P ²	[,] 1	"=	4.500
5031 0	2244 7	5038 8	128 6	\dashv	P ² - P ²	2			P 2 -	P_2		
4,810 1	2100 5	4837 6	320 0	-					L°	- 1	I	
4465 6	2132 7	4548 6	618 0		OF = O	F P ²	۹ ۵	_ 14	,823			
4053 0	2055 /	4274 R	042 6	\dashv	- -	<u>n 2</u>	<u></u>			-		
4033.9		7447.0	<u> </u>	-1		<u> </u>	ا ۲ ۰۰					
solute Open Flow	14,82	3	. <u>1</u>	Mcfd	@ 15.025	Angle of	Slope O	49		Slor		384
12	2 222 0	ANTI ENTE A THE	סוותסמי		סדארי ישר	<u>ר</u> יכידי						
emarks: 13.	יו כיוםם ר	MULADAIL	PRODUCI	u DU.	ATING TE	<u></u>			· · · · · · · · · · · · · · · · · · ·	·		·
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proved By Division	n		d By: Liett Teg	2TTDC	C	VC	<i>r</i> :		Che v	cked By 'C	y:	ļ
			WENDLE IFA	211243	1	D . D			. 1 K			

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Form 3160-5 June 1990) Do not use this f	UNITED DEPARTMENT BUREAU OF LAN SUNDRY NOTICES AN orm for proposals to drill of	D STATES DF THE INTERIOR ND MANAGEMENT ID REPORTS ON WE	N.M. Oil ans 811 S. 191 Artesta No. 2 LLS y to a different reservoir	DIVISION FORM APPROVED Budget Bureau No. 1004-0135 Expires: March 31, 1993 0-9864 Designation and Serial No. NM 0557371 6. If Indian, Allottee or Tribe Name
	Use "APPLICATION FOR I SUBMIT IN	PERMIT-" for such p	roposals	7. If Unit or CA, Agreement Designation
1. Type of Well Ol G Well X W 2. Name of Operator	ias /ell			8. Well Name and No. Chalk Bluff Fed. Comm. #3
Mewbourne Oil C 3. Address and Telephon	ompany ne No.	<u>,</u>	· · · · · · · · · · · · · · · · · · ·	9. APi Well No. 30-015-27163
P. O. Box 5270, H 4. Location of Well (Foot	lobbs, NM 88241 505-393-5 age, Sec., T., R., M., or Survey Descript	905 ion)	<u></u>	10. Field and Pool, or Exploratory Area N. Illinois Camp Morrow
1980, FST & 990.	FEL of Section 1, 1185, R27E			11. County or Parish, State Eddy
12. CHECK	(APPROPRIATE BOX(s) TO	INDICATE NATURE	OF NOTICE, REPORT,	DR OTHER DATA
TYPE	F SUBMISSION		TYPE OF ACTION	
X Notice	e of Intent	Abandonme	nt n	Change of Plans
🛄 Subse	equent Report	Plugging Ba	ck air	Non-Routine Fracturing Water Shut-Off
Final.	Abandonment Notice	Attering Cas	ing W/S	Conversion to Injection Dispose Water (Note: Report results of multiple completion on Well Completion of Record and Log form)

Arectionally drilled, give subsurface locations and measured and true vertical depths for all markders and zones pertinent to this work.)* Add Morrow perforations 9860' to 9870'.



14. I hereby certify that the foregoing is true and correct		· · ·		
Signed (/Ellen Colars	Title	District Manager	Date	04/15/99
(This space for ederator State office use) Approved by Conditions of approval, if any:	Title		Date	· · · · · · · · · · · · · · · · · · ·

18 U.S.C. Section 1001, makes it a crime for any person knowingly and wilifully to make to any department or agency of the United States any false, fictilious or fraudulent ments or representations as to any matter within its jurisdiction.

"See Instruction on Reverse Side



MAP ID NO. 98

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MEWBOURNE OIL CO. CHALK BLUFF 6 STATE NO. 001

API NO. 30-015-26943



Mewbourne Oil Company 990' FSL & 730' FWL Sec. 6-T18S-R28E Chalk Bluff "6" State #1

BOP Diagram

Submit to Appropriate -District Office State Lease - 4 copies Fee Lease - 3 copies

DISTRICT I O. Box 1980, Hobbs, NM 88240

DISTRICT II P.O. Drawer DD, Anesia, NM \$8210

DISTRICT III 1000 Rio Brazos Rd., Aztec, NM \$7410

State of New Mexico Energy, Minerals and Natural Resources Dep tent

OIL CONSERVATION DIVISION P.O. Box 2088

Santa Fe, New Mexico 87504-2088

NELL LO	OCATION	AND	ACREAGE	DEDICATION	PLAT
---------	---------	-----	---------	------------	------

All Distances must be from the outer boundaries of the section

Operator	<u></u>				Lease				Well No.	
MEWB	OURN:	E OIL CO	OMPANY	· .	CHAL	K BLUFF	"6" State		1	
Unit Letter	Section	T	owaship		Range			County		
M	6		·18	SOUTH	28	EAST	NMPM	EDDY		
Actual Footage Loca	ation of V	/ell:							· · ·	
9.90	feet fro	n the SOI	JTH	line and	730		feet from t	he WES	T line	
Ground level Elev.	1	Producing P	onneuon.		1001				Dedicated Acre	Lge:
3635		Mor	row		North	Illinois	Camp Morre	W	334.98	Acres
I. Online	e line acre	ige dedicated to	the subject w	Net by colored per	CIL OF INCOUR	mana on the pa	E DELOW.			•
2. 11 mon	e than on	lease is dedicat	led to the wel	l, outline each and	identify the o	wnership thereof	(both as to workin	g interest and a	royalty).	
3.17 mm	n than an	less of differe	et anembie	is dedicated to the	well have the	internet of all o	smerr heen onnenli	dated by some		
unitiza	tion. fore	-rooling. etc.?	er ownerendb	is dedicated to us	Weit, dave ui					
	Yes	۲ 🗋	No Li	enswer is "yes" ty	e of consolids	tion				
If answer	r is "no" l	at the owners an	d tract descri	ptions which have	actually been	consolidated. (l	les reverss side of			
No allow	a acces	be assigned to the	e well until 1	ll interests have b	een consolidat	ed (by communit	ization, unitization.	forced-pooling	z, or otherwise)	
or until a	200-state	lard unit, elimin	ating such int	erest, has been ap	proved by the	Division.		• • •		
								OPERAT	OR CERTIFI	CATION
		1				Į		I hereby	certify that th	un information
							co	mained herei	in true and c	omplete to the
		1					ba	ist of my brawl	edge and belief.	
						1	5			
								771 K	1101	NA
		1				I.	Pr	inted Name	Vicia	
		<u> </u>	· ·			1		T.T. T.T. (C	١
			·	<u> </u>		T		w · II · ·	LIAVEY	
		1				1		Distr	ict Sunt	
		1				1	C	mpasy		
		1						Mewbor	urne Oil	Co.
			•			I	D	ue.		
		1				l		July	9. 1991	
		1				1		SURVEY	OR CERTIEN	CATION
		t		-		1		501(121		
		1				1	1	hereby certify	that the well l	ocation shown
		1				1	0	this plat we	as plotted from	field notes of
		1				1	1	inal surveys wervison, and	i that the same	or under my e is true and
		1				1	60	wrect to the	best of my k	nowledge and
		1		1		1	6	dief.		
		I		1		1		ate Surveyed	· · · · · · · · · · · · · · · · · · ·	
		<u> </u>				·	——— <u>}</u>	6/28	E 01	
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730'9		1				1			veyur	e
		1				1			TERS .	
06		1	· 		•			S.r.	10/18 /	čj.
0 1		I		1.		1		de la	F. A. S. M. S.	? !
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0 330 660	990 1	20 1650 19	80 2310	2640 20	00 1500	1000	500 0			

State Lease - 6 copies	Enersy	, Minerals and Natura	l Resources Department		Form C-101 Revised 1-1-89
Fee Lease - 5 copies	ОП	CONSEDVAT			
VISTRICT I O. Box 1980, Hobbs, J	NM 88240	P.O. Box	2088	API NO. (assigned	by OCD on New Wells)
DISTRICT II		Santa Fe, New Mexi	co 87504,2088 VED	5. Indicate Type	$f = \frac{d(a/7)}{d(a/7)}$
P.O. Drawer DD, Artesi	a, NM 88210				STATE FEE
DISTRICT III 1000 Rio Brazos Rd., A	ziec, NM 87410		JUL 1 5 195	6. State Oil & Ga	s Lease No.
APPLIC	ATION FOR PERMIT	TO DRILL. DEEPEN	NOR PLUE BACK		
1a. Type of Work:		· · · · · · · · · · · · · · · · · · ·	ARTESIA, OFFIC	7. Lease Name or	Unit Agreement Name
DR.	ILL 🕅 RE-ENTEI	R 🗌 DEEPEN 🔲	PLUG BACK		
	N OTHER	SINCI ZONE	LE MULTIPLE	Chalk Bl	uff "6" State
2. Name of Operator				8. Well No.	· · · · · ·
ł	<u>lewbourne Oil Com</u>	mpany		1.	
3. Address of Operator		the New Verdie	- 997/1	9. Pool name or W	incis Camp Manage
4. Well Location	2.U. BOX 32/U Ho	DDDS. New Mexic	0 00241	<u> </u>	incis camp ffffffff
. Unit Letter	<u>M</u> : <u>730</u> Feet I	From The West	Line and	990 Feet From	The South Line
Section 6	Tour	utrin 185	Range 28E	NMPM	Eddy County
		10. Proposed De	poh 11.	Formation	12. Rotary or C.T.
13. Elevations (Show whe	ther DF, RT, GR, etc.)	14. Kind & Status Plug. Bo	nd 15. Drilling Contract	or 16. A	pprox. Date Work will start
3635'	G.L.	Blanket on fi	le WEK Drill	ing Co.	August 10, 1991
17.	PF	ROPOSED CASING	AND CEMENT PROC	RAM	
<u>SIZE OF HOLE</u>	SIZE OF CASING	WEIGHT PER FOO	T SETTING DEPTH	SACKS OF CEN	Surface
12-1/4"	9-5/8"	36#	- 2,600'	1000	Surface
7-7/811	5-1/2"	17#	10,200'	600	Back 6,000'
Blow Out Prev	entor: Schaffer	LWS or equival	lent (Double Ram	Hydraulic) 9	00 series. O Jrn
Blow Out Prev Mud Program:	entor: Schaffer Hydril totco f 400' - 2,600' 2,600' - 8,400' 8,400' - 10,200'	LWS or equival 900 series annu low monitors or Fresh water wi Fresh water wi Cut brine with Cut brine with Wt. 9,2-9.6 pr	lent (Double Ram ular preventor. n pits. ith spud mud. Pa ith LCM as needed n lime. n Drispac, salt g og WL 10 cc's on	Hydraulic) 9 Grant rotati aper for LCM n d. gel, lime, soo r less	00 series. ng head, Port ID- 3-14-9 Mur hat Hi naterial da ash
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Blow Out Prev Mud Program: Gas is not dea IN ABOVE SPACE DE ZONE. GIVE BLOWOUT PRE I hereby certify that he info SIONATURE TYPE OR FRINT NAME (This space for State Use)	entor: Schaffer Hydril totco f 0' - 400' 400' - 2,600' 2,600' - 8,400' 8,400' - 10,200' dicated. SCRIBE PROPOSED PROG VENTER PRODUCTION ANY.	LWS or equival 900 series annu low monitors or Fresh water wi Cut brine with Cut brine with Wt. 9,2-9.6 pp RAM: PROPOSAL STODER to the best of my knowledge of BY	lent (Double Ram ular preventor. n pits. ith spud mud. Pa ith LCM as needed n lime. n Drispac, salt g og WL 10 cc's on APPR PERM UNLE EPENOR FLUG BACK, GIVE DATAG	Hydraulic) 9 Grant rotatin aper for LCM n del, lime, sou r less OVAL VALID FOR HT EXPIRES SS DRILLING UP DN RESENT RODUCTIVE 2	00 series. ng head, 2-14-9 2-14-9 2-14-9 10 + 10 + 10 naterial da ash 2/10 DAYS 8/11/52 NDERWAY DONE AND PROPOSED NEW PRODUCTIVE DATEJuly 11, 19 TELEPHONE NO. FEB 1 1 1992
Blow Out Prev Blow Out Prev Mud Program: Gas is not dev IN ABOVE SPACE DE ZONE GIVE BLOWOUT FRE I hereby certify that he info SHONATURE	entor: Schaffer Hydril totco f 0' - 400' 400' - 2,600' 2,600' - 8,400' 8,400' - 10,200' dicated. SCRIBE PROPOSED PROGI WENTER PROOBANK, MANY. SCRIBE PROPOSED PROGI WENTER PROOBANK, MANY. SCRIBE PROPOSED PROGI WENTER PROOBANK, MANY. SCRIBE PROPOSED PROGI MIKE WILLIAMS SUPERVISOR DIST PANY:	LWS or equival 900 series annu low monitors or Fresh water wi Cut brine with Cut brine with Wt. 9.2-9.6 pp RAM: PPROFOSAL STODES to the best of my knowledge of BY RICT 19	lent (Double Ram ular preventor. n pits. ith spud mud. Pa ith LCM as needed n lime. n Drispac, salt g og WL 10 cc's or APPR PERM UNLT ETENOR FLUG BACK, GIVE DATAG mod belief. TIME	Hydraulic) 9 Grant rotatin aper for LCM n d. gel, lime, soor r less OVAL VALID FOR HT EXPIRES SS DRILLING UP Supt.	00 series. Poit ID- ng head, D-V4-9 DATE
Blow Out Prev Blow Out Prev Mud Program: Gas is not dev IN ABOVE SPACE DE ZONE. GIVE BLOWOUT PRE I hereby certify that he info SKONATURE TYPE OR FRINT NAME (This space for State Use) AFFROVED BY CONDITIONS OF AFFROVAL	entor: Schaffer Hydril totco f 0' - 400' 400' - 2,600' 2,600' - 8,400' 8,400' - 10,200' dicated. SCRIBE PROPOSED PROG dicated. SCRIBE PROPOSED PROG Micated. ORIGINAL SIGNED MIKE WILLIAMS SUPERVISOR DIST RAMY:	LWS or equival 900 series annu low monitors or Fresh water wi Cut brine with Cut brine with Wt. 9,2-9.6 pp RAM: PROPOSAL STODER to the best of my knowledge of BY RICT 19	lent (Double Ram ular preventor. n pits. ith spud mud. Pa ith LCM as needed n lime. n Drispac, salt g og WL 10 cc's on APPR PERM UNLE EPENOR FLUG BACK, GIVE DATAG	Hydraulic) 9 Grant rotati aper for LCM n del, lime, sou r less OVAL VALID FOR IT EXPIRES SS DRILLING UP DN RESENT RODUCTIVE 2	00 series. Port ID- p-V4.9 paterial da ash <u>10 DAYS</u> <u>8/11/52</u> NDERWAY DONE AND PROPOSED NEW PRODUCTIVE July 11, 19 TELEPHONE NO. FEB 1 1 1992
Blow Out Prev Blow Out Prev Mud Program: Gas is not der IN ABOVE SPACE DE ZONE GIVE BLOWOUT PRE I hereby certify that he info SKONATURE	entor: Schaffer Hydril totco f 0' - 400' 400' - 2,600' 2,600' - 8,400' 8,400' - 10,200' dicated. SCRIBE PROPOSED PROG dicated. SCRIBE PROPOSED PROG MIKE PROPOSED PROG MIKE WILLIAMS SUPERVISOR DIST FANY: 7621	LWS or equival 900 series annu low monitors or Fresh water wi Cut brine with Cut brine with Wt. 9.2-9.6 pp RAM: PPROFOSAL IS TO DER to the best of my knowledge of BY RICT 19	lent (Double Ram ular preventor. n pits. ith spud mud. Pa ith LCM as needed n lime. n Drispac, salt g og WL 10 cc's on APPR PERM UNLE EVENOR FLUG BACK GIVE DATAGE mod belief. TIME	Hydraulic) 9 Grant rotatin aper for LCM n d. gel, lime, source r less OVAL VALID FOR T EXPIRES SS DRILLING UP Supt.	00 series. Poi/ID- p-V4-9 paterial da ash <u>10</u> DAYS <u>8/11/72</u> NDERWAY DONE AND PROPOSED NEW PRODUCTIVE

			RECEIVED
Submit 3 Copies to Appropriate	State of Ne Energy, Minerals and Natu	w Mexico ral Resources Departn	APR 3-1992 Form C-103 nent Revised 1-1-89
District Office			O. C. D.
(STRICT I). Bax 1980, Hobbs, NM 88240	OIL CONSERVA P.O. Bo	TION DIVISIC x 2088	WELL API NO. 30-015-26943
DISTRICT II P.O. Drawer DD, Artesia, NM 88210	Santa Fe, New Me	xico_87504-2088 MAR 2 3 1991	2 5. Indicate Type of Lease STATE FEE
1000 Rio Brazos Rd., Aztec, NM 8741	0	O. C. D.	6. State Oil & Gas Lease No. E-7179
SUNDRY NO	OTICES AND REPORTS ON	WELLS	
(DO NOT USE THIS FORM FOR) DIFFERENT RE (FOR)	PROPOSALS TO DRILL OR TO DE SERVOIR. USE "APPLICATION FO M C-101) FOR SUCH PROPOSALS.	EPEN OR PLUG BACK 1 OR PERMIT")	TO A 7. Lease Name or Unit Agreement Name
I. Type of Well: OIL QAS WELL WELL	OTHER	· .	CHALK BLUFF "6" STATE
2 Name of Operator Mewbourne Oil Co	 mpany/		8. Well No. 1
3. Address of Operator		· · · · · · · · · · · · · · · · · · ·	9. Pool name or Wildcal
P. O. Box 7698,T	yler, Texas 75711		NORTH ILLINOIS CAMP MORE
4. Well Location		•	
Unit Letter :	130 Feet From The Wes	ST Line and	990 Feet From The South
Section 6	Township 185	Range 28E	NMPM Eddy County
	10. Elevation (Show w	hether DF, RKB, RT, GR, e	ic.) ////////////////////////////////////
	///////	<u>3635' GR</u>	
11. Chec	k Appropriate Box to India	ate Nature of Noti	ce, Report, or Other Data
NOTICE OF I	NTENTION TO:	1	SUBSEQUENT REPORT OF
	יייביייביים או או או או או או או או או או או או או	<u> </u>	
'ERFORM REMEDIAL WORK	PLUG AND ABANDON		RK ALTERING CASING
	CHANGE PLANS		
	7		
	1	CASING TEST A	AND CEMENT JOB
DTHER:			
12. Describe Proposed or Completed Op work) SEE RULE 1103.	perations (Clearly state all pertinent det	ails, and give pertinent date	es, including estimated date of starting any proposed
2/18/92 - Spud 7:45 A 10 pps Cals + 6% gel + + 2% CaCl ² . okay. Did with 150 sx	M 2/17/92. Cemented eal + 5 pps Gilsonite pps Flocele + 5# gi Plug down 4:15 PM 2 not circulate cement. s Class "C" Neat. Ci	13-3/8" casing + 1/2 pps Floc lsonite + 2% Ca /17/92. Pressu WOC 3 hrs. F rculated 20 sac	at 400° with 100 sxs Class "C" + cele + 2% CaCl ² and 200 sxs Class " aCl ² . Tailed in with 200 sxs Class are tested casing to 1000#. Ploat P Ran 1" and tagged at 190°. Cemented cks to pit. Total 12-1/4 hrs. WOC
2/22/92 - Ran 9-5/8 calseal + 1 1 pps Floce full return casing to 1	24# J-55 casing set a pps Flocele + 5 pps (le + 5 pps Gilsonite. s while cementing. P 000# for 30 mins, flo	t 2600' and cem Gilsonite + 2% Tailed in wit lug down at 10: at held okay.	mented with 100 sxs Class "C" + 10 CaCl ² and 700 sxs Class "C" Lite 4 th 300 sxs Class "C" + 2% CaCl ² . Ha 30 PM 2/22/92. Pressure tested Circ 65 sxs to pit. WOC 8 ¹ / ₂ hours.
I hereby certify that the information prove is	the that complete to the best of my knowled	ge and belief.	
I hereby certify that the information from is skonature	theread complete to the best of my knowled	ge and belief. Engr.Opr	ns.Secretary DATE 3/19/92
I hereby certify that the information forve is SIGNATURE	theread complete to the best of my knowled	fe and belief. <u>mus</u> <u>Engr.Opr</u>	TIS_SECRETARY DATE 3/19/92 TELEPHONE NO.
I hereby certify that the information source is SIONATURE CONTRACTOR OF THE SIONATURE CONTRACTOR OF THE SUBJECT OF STATE Use)	RIGINAL SIGNED BY	ge and belief. <u>mus</u> <u>Engr.Opr</u>	TRE-Secretary DATE 3/19/92 TELEPHONE NO. APR 2 3 1992

Submit 3 Copies State of New Mexico Form C-103 to Appropriate Energy, Minerals and Natural Resources Department Revised 1-1-89 District Office Control of the second	"0p+
CIL CONSERVATION DIVISION P.O. Box 2088 WELL API NO. 30-015-26943	
DISTRICT II P.O. Drawer DD, Anesia, NM 88210 DISTRICT II P.O. Drawer DD, Anesia, NM 88210 DISTRICT II FE	# 🗌
DISTRICT III MAR 2 3 19926. State Oil & Gas Lease No. 1000 Rio Brazos Rd., Aztec, NM 87410 0 C D E-7179 E-7179	
SUNDRY NOTICES AND REPORTS ON WELLS ARTESIA OFFICE (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)	
1. Type of Well: OL GAS WELL OTHER OTHER	TE
2. Name of Operator Mewbourne Oil Company / 1	
1. Address of Operator 9. Pool mame or Wildcat P. O. Box 7698, Tyler, Texas 75711 9. Pool mame or Wildcat	ORRO
4. Well Location Unit Letter <u>M</u> : <u>730</u> Feet From The <u>West</u> Line and <u>990</u> Feet From The <u>South</u>	_ Liae
Section 6 Township 18S Range 28E NMPM Eddy C 10. Elevation (Show whether DF, RKB, RT, GR, etc.) 3635' GR	ounty
II. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data NOTICE OF INTENTION TO: SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK PLUG AND ABANDON REMEDIAL WORK	
``PRARILY ABANDON CHANGE PLANS COMMENCE DRILLING OPNS. PLUG AND ABANDONMING	
JR ALTER CASING	

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12. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

3/14/92 - Ran 7" 26# S-95 casing set at 9445'. Bottom of packer at 7096'. DVT at 7033'. CEMENTED 1ST STAGE with 325 sacks Class "H" + 2 pps KCL + .3% CFR-3 + .4% Halad 22A + 5 pps Gilsonite + 5 pps Silicalite & 300 sacks Class "H" + 2 pps KCL + .3% CFR-3 + .4% Halad 22A + 5 pps Silicalite. Plug down at 9:00 AM 3/15/92. Pressure tested casing to 2600# and set packer. Checked float collar. Held okay. Did not have returns while cementing. Dropped bomb and opened DVT at 9:30 AM. Pumped 1 bbl and had full returns. Circulated bottoms up from DVT. Did circulate cement. CEMENTED 2ND STAGE with 1170 sacks H/L + ½ pps Flocele + 5 pps Silicalite + 5 pps salt. Tailed in with 100 sacks Class "H" + 5# Silicalite + 2 pps KCL. Had full returns while cementing. Started losing returns with 140 bbls displacement gone. Lost complete returns with 240 bbls of displacement gone. Plug down at 11:45 AM 3/15/92. Closed DVT. Held okay. Did not circulate on 2nd stage. WOC 19-1/4 hours.

SIGNATURE LELA	menomprove	ms Engr. Oprns. Secretary	DATE 3/19/92
TYPE OR PRINT NAME		· · · · · · · · · · · · · · · · · · ·	TELETIONE NO.
This space for State Use)	ORIGINAL SIGNED BY MIKE WILLIAMS		
	SUPERVISOR, DISTRICT I		MAR 2 6 1992

1	·-		c15F_			
Submit 3 Copies to Appropriate District Office	State of New M Energy, Minerals and Natural R	exico esources Department	Form C-103			
<u>RICT I</u> Box 1980, Hobbs, NM 88240	OIL CONSERVATIO	N DIVISION	WELL API NO. 30-015-26943			
DISTRICT II P.O. Drawer DD, Artesia, NM 88210	Santa Fe, New Mexico	87504-2088	5. Indicate Type of Lease STATE			
DISTRICT III 1000 Rio Brazos Rd., Aziec, NM 87410	-		6. State Oil & Gan Lease No. E-7179			
SUNDRY NOT	CES AND REPORTS ON WE	LLS				
(DO NOT USE THIS FORM FOR PRO DIFFERENT RESER (FORM C	DPOSALS TO DRILL OR TO DEEPEN VOIR, USE "APPLICATION FOR PE -101) FOR SUCH PROPOSALS.)	I OR PLUG BACK TO A	7. Lease Name or Unit Agreement Name			
1. Type of Well: OR. QAS WELL WELL	OTHER	RECEIVED	CHALK BLUFF "6" STATE			
2 Name of Operator Mewbourne Oil Comp	any / AF	PR 2 4 1992	8. Well No. 1			
3. Address of Operator P. O. Box 7698, Tyl	er, Texas 75711 🙀	O. C. D.	9. Pool mame or Wildcat NORTH ILLINOIS CAMP MORROW			
4. Well Location						
Unit Letter :	10 Feet From The West	Line and99	U Feet From The South Line			
Section 6	Township 185 R	ange 28E	NMPM Eddy County			
	10. Elevation (Show whether 3	DF, RKB, RT, GR, etc.) 635' GR				
11. Check	Appropriate Box to Indicate	Nature of Notice, R	eport, or Other Data			
NOTICE OF INT	ENTION TO:	SUB	SEQUENT REPORT OF:			
		REMEDIAL WORK				
	CHANGE PLANS					
OR ALTER CASING		CASING TEST AND CE	MENT JOB			
OTHER:		OTHER:				

12. Describe Proposed or Completed Operations (Clearly state all persinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

- 3/24/92 Ran 4-1/2" 11.6# N-80 liner. Top of liner at 9077'. Set liner at 10,198'. Cemented with 750 gals mud flush followed by 175 sxs Class "H" + 5 pps KCL + 5 pps Silicalite + 6/10Z Halad 22A + 4/10Z CRF-3. Plug down to 10,151' at 7:15 AM 3/23/92 with full returns. Checked float. Held okay.
- 4/10/92 Tested casing to 1000# for 30 mins, held okay. Drilled out 120' cement in 4½" liner. Drilled through at 9200'. Tagged up at 10,103'. Drilled down to landing collar at 10,151'. Circulated hole. Tested casing to 1000# for 30 mins. Held OK.
- 4/11/92 Western spotted acid over perforation interval. Ran CBL from TD 10,159' to 620'. Had good bond around 4½" lienr from TD to 9600'.

I hareby certify that the inform	nation source is trat and complete to the topic of my knowledge	ge æd belef.	
SKONATURE	Mal Impune	mg Engr.Oprns.Secretary	DATE 4/22/92
TYPE OR PROFT NAME		•	TELEFIONE NO.
(This space for State Use)	ORIGINAL SIGNED BY MIKE WILLIAMS SUBERVISOR, DISTRICT I		MAY 2 5 1992
	SUPERVISOR, DISTRICT II	- TMLE	DATE

		· ·	
Submit 3 Copies to Appropriate District Office	State of New Mo Energy, Minerals and Natural Ro	exico esources Department	Form C-103 Revised 1-1-89
RICT I Box 1980, Hobbs, NM 88240	OIL CONSERVATIO	N DIVISION	WELL API NO. 30-015-26943
DISTRICT II P.O. Drawer DD, Artesia, NM 88210	Santa Fe, New Mexico	87504-2088	5. Indicate Type of Lease
DISTRICT III 1000 Rio Brazos Rd., Aztec, NM 87410		•	6. State Oil & Gas Lease No. E-7179
SUNDRY NO (DO NOT USE THIS FORM FOR PF DIFFERENT RESI (FORM	FICES AND REPORTS ON WEL ROPOSALS TO DRILL OR TO DEEPEN ERVOIR. USE "APPLICATION FOR PEI C-101) FOR SUCH PROPOSALS.)	LS OR PLUG BACK TO A RMIT" RECEIVED	7. Lease Name or Unit Agreement Name
1. Type of Well: OR. QAS WELL WELL	/ OTHER	APR 2 4 1992	CHALK BLUFF "6" STATE
2. Name of Operator Mewbourne Oil Com	Ipany	O. C. D.	B. Well No. 1
1. Address of Operator P. O. Box 7698, Ty	ler, Texas 75711		9. Pool name or Wildcat NORTH ILLINOIS CAMP MORROW
4. Well Location Unit Letter <u>M</u> : <u>7</u>	30 Foot From The West	Line and99	0 Feet From The South Line
Section 6	Township 185 Ra	nge <u>28E</u> DF, RKB, RT, GR, etc.) 535 'GR	MPM Eddy County
11. Check NOTICE OF IN	Appropriate Box to Indicate I TENTION TO:	Nature of Notice, Re	port, or Other Data SEQUENT REPORT OF:
		REMEDIAL WORK	ALTERING CASING
	CHANGE PLANS	COMMENCE DRILLING	OPNS. DPLUG AND ABANDONMENT
		CASING TEST AND CE	
		OTHER: Ferro	Tate and actuize
12. Describe Proposed or Completed Open work) SEE RULE 1103.	sticas (Clearly state all pertinent details, an	d give pertinent dates, includ	ing estimated date of starting any proposed
4/14/92 - Ran 2-3/8" 16 points o	tubing set at 9990'. T compression.	ested to 8000 # .	Held okay. Set packer with
4/15/92 - Perforated	Lower Morrow 10,084' -	10,092'. 8' net	., l SPF, 9 holes.
4/16/92 - Acidized pe balls. MTH 10/64" chol	rfs with 2600 gals 7½% ? 3800#. Max TP 7600#. A te. FTP 3000#.	HCL + additives vg 6300 #. W ell	and 1367 scf/bbl N ² & 15 frac started flowing to pit on
$\bigcirc \circ \circ$	$\rho = 1$		
I hereby certify has the information above is tr	a and complete to the best of my knowledge and t	belief.	

	Upla I ponghow	mr Engr.Oprns.Secretary	DATE4/22/92
TYPE OR FRINT NAME	<u> </u>		TELEPHONE NO.
(This space for State Use)	ORIGINAL SIGNED BY		MAY 9 5 1000
AOVED BY	SUPERVISOR DISTRICT I	TITLE	- DATE

CONDITIONS OF APPROVAL, IF ANY:

SEC_6_TWN_183_RGE_28e	API # 30-015-26943
OPERATOR Mewbourne O:1 Well NAME Chalk Bluff 6" St. #1	
STATE OCD TOPS AS PER Darrell Moore	DATE 5/27/92

Southeastern New Mexico

Northwestern New Mexico

T. Anhy	T. Canvon	_ T. Oio Alamo	T. Penn. "B"
T. Salt	T. Strawn 8910	_ T. Kirtland-Fruitland	T. Penn. "C"
B. Salt	T. Atoka 9593	_ T. Pictured Cliffs	Т. Репл. "D"
T. Yates	T. Miss	T. Cliff House	T. Leadville
T. 7 Rivers	T. Devonian	T. Menefee	T. Madison
T. Queen 1209	T. Silurian	T. Point Lookout	T. Elbert
T. Grayburg 1560	T. Montova	T. Mancos	T. McCracken
T. San Andres 2062	T. Simpson	T. Gallup	T. Ignacio Otzte
T. Glorieta 3632	T. McKee	Base Greenhorn	T. Granite
T. Pridock	T. Ellenburger	T. Dakota	T
" bry	T. Gr. Wash	T. Morrison	T
1	T. Delaware Sand	T. Todilto	T
T. Drinkard	T. Bone Springs	T. Entrada	Т
T. Abo	T. Morrow 9842	T. Wingate	T
T. Wolfcamp 6910	т	T. Chinle	T
T. Penn	т	T. Permain	T
T. Cisco (Bough C)	т.	Т. Репл "А"	T
	OIL OR GAS S	ANDS OR ZONES	
No. 1, from	to	No. 3, from	
No. 2, from.	to	No. 4, from	to
	IMPORTANT	WATER SANDS	
Include data on rate of water infl	ow and elevation to which water ros	se in hole.	
No. 1, from.	to	feet	
No. 2, from.	to	feet	
No. 3, from	to	feet	
			<i>,</i>

REMARKS: Parls reported (10,084-10,092) are wrong.



March 3, 1992

Mewbourne Oil Company P.O. Box 5270 Hobbs, N.M. 88202

REF: Chalk Bluff "6" St. #1

Gentlemen:

The following is a Deviation Survey on the above referenced well located in Eddy County, New Mexico.

400' -3/40 912' - 1° 1405' -3/40 1878' - 1º 2367' - 1° 2600' - 1 1/4° 3082' - 2 1/4° 3176' - 1 1/2° 3299' - 1 1/4° 3791' - 1 1/20 4287' - 2 1/4° 438-1 - 1 1/40 4752 - 1 1/40

5168' - 2° 6351' - 2 3/4° 5262' - 2 1/2° 6443' - 2 1/2° 5316' - 2 1/2° 6534' - 2 3/4° 5419! - 2 3/4º 6625' - 1 1/4° 5513' - 3° 7151' -7278' - 1 1/4° 5605' - 2 1/2° 5698' - 2 1/2° 7770' - 1 1/4° 5792' - 2 1/2° 8289' - 1° 5885' - 2 1/4° 8778' - 1° 5979' - 2 3/4° 9282' - 1 1/4° 6072' - 2 3/4° 9450' - 1 3/4° 6166' - 3 1/4° 10200! - 1 1/2º 6259' - 3°

Sincerely

3/40

Arnold Newkirk Vice President

STATE OF NEW MEXICO)

COUNTY OF CHAVES)

The foregoing was acknowledged before me this 31st day of March-1992 by Arnold Newkirk.

MY COMMISSION EXPIRES

October 07,1992

IOTARY PUBL

								-			~	SFA
							. .					Ø₽, ¹
Submit to Appropriate	;	Energy, M	State of N inerals and Nat	iew Mexi ural Reso	ico Durces D	epartmer	nt .			For Rev	m C-105 ised 1-1-89	୫୩) ८४
Lease - 6 copies Lease - 5 copies TRICT 1	L .	OILCO	ONSERVA	TION	I DIV	ISION	N W	ELL API N	0.			
O. Box 1980, Hobbe	, NM 88240	San	P.O. B	ox 2088	RECEN	ED	5	300 Indicate 1	T5-2694 Type of Lease	3		
P.O. Drawer DD, Arte	zia, NM 88210	Jan		LA LA	AV - 4	4 1992	6	State Oil	S & Gas Lease	TATE	FEE	
DISTRICT III 1000 Rio Brazos Rd.,	Aziec, NM 87410		· · · · · · · · · · · · · · · · · · ·	۱۷ ۱				E-71	79	mm		\overline{m}
WELL	COMPLETION	OR RECO	MPLETION R	EPORT	ANDE	CIEIC "		//////////////////////////////////////	//////////////////////////////////////		///////	
OIL WELL	GAS WELL	L DRY	OTHER				<u> </u>	CHAL	K BLUFF	"6" S	STATE	
NEW WORL WELL WORL	a: K [] Deserven [OTHER								
Name of Operator	OTI. COMPANY						8	. Well No.				,
Address of Operato	X							. Pool nam	e or Wildcat			<u> </u>
P. O. Box	76 98, Tyle r	, Texas	75711				N	ORTH I	LLINOIS	CAMP	MORROW	
. Well Location Unit Letter	<u>M: 73</u>	0 Feet From	The WE	ST	Line	and	990	Foot	From The	SC	DUTH	Line
Section	. 6	Township	185	Range	2	8E	NM	PM	EDD	Y	Cou	щу
1 Date Spudded 2/17/92	11. Date T.D. Resc 3/21/92	thed 12	Date Compl. (Read 4/16/9	y to Prod.) 2	12	3. Elevation	es (DF&	RKB, RT, 0	GR, etc.) 1	14. Elev.	Casinghead	
Total Depth 10,200'	16. Plug Back T.D. 10. 151 17. If Muhiple Compl. How Many Zones? Drillow					avals llod By	Rotary To	ols X	tCable Te	ools		
Producing Interval(a	s), of this completion 0.092 - Mor	- Top, Bottom	, Name		<u> </u>			1	20. Was Dir	i Inclicent Su Ves	arvey Made	
Type Electric and C	ther Logs Run							22. Was W	Vell Cored			
SUL-USN, D	IL/ULL-MSFL	CASID	C DECODI) //						O		
CASING SIZE	WEIGHT I	B/FT.	DEPTH SET	H	DLE SIZ	E	CFM	ENTING	RECORD		OUNT PU	
13-3/8"	48# & 6	8#	400 *	17	-1/2"		500	SXS -	circ		None	
9-5/8"	24#		2,600'	12	<u>-1/4"</u>		1100	SXS -	circ		None	
7**	26#		9,445'	7.	-7/8"	·]	1895	sxs -	circ ls	t	None	
····· 									strin	B. :	- <u>.</u>	
· · · · · · · · · · · · · · · · · · ·	L	LINER R	ECORD	<u> </u>	-,.	. I_	25.	π	JBING RF	CORD		
SIZE	TOP	BOTTO	M SACKS C	EMENT	SCR	EEN		SIZE	DEPT	H SET	PACKER	SET
4-1/2"	9077'	10,198	175		•		2-	3/8"	9,9	90'	9,990	
Perforation rec	ord (interval, siz	e, and numb	er)		27. A	CID, SH	IOT, F	RACTUR	E, CEME	NT, SQL	JEEZE, E	rc.
10 00/1 10	0011 01	1 00-	, , ¹ -		DEPT	H INTERV	AL	AMO	UNT AND K	IND MAT	ERIAL USE	
10,084'-10	,092. – 8.,	I SPF, 9	holes		10,08	54-092		Acidiza	ed with	2600	<u>gals 7</u>	<u> </u>
	•	<u></u>	<u> </u>			<u> </u>		bbl N ²	$\underline{\&}$ 15 fr	cac ba	11s.	
	·····		PROD	UCTIO	N							
4/17/92		Production Me	hod (Flowing, gas R1 ourie	lift , pumpů vor	ng - Size a	nd type put	πφ)		Well Su	w <i>us (Prod.</i> Datasia	or Shut-in)	
a of Test	Hours Tested	Choke :	Size Prod'n I	+5 For (). Элі - ВЫ.	G	s - MCI		Water - Bbl		GM - Oil R	Latio
4/28/92	24 hours	12/64	IT Test Per	riod	36	1	,902		0	52,	833:1	
w Tubing Press. 2690 #	Casing Pressure	Calculat Hour R	ued 24- Oil - Bi Ne 36	ol.	Gaa - 1	MCF	Walc	r - Bbl D	Oil Gra	viry - API	- (Cort.)	·
Disposition of Gas (S	old, used for fuel, ve	nied, etc.)		· · · ·		<u> </u>		Test V	Vitnessed By	/ (· · ·	
Sold		•						I	<u>Bill Pie</u>	erce		
List Attachments	-)			. –						· · ·		
Logs	t the information	thown on hard	sides of this for	m is true	and comm	lete to the	her of	my knowl	edoe and h	lief	·····	
	1 A		,									
Simon IT	Kal M	man	North G	lavlon	Thomp	son	77.11-	Ener ()prns Se		4/28/9	2
Signature All	yen fil				p					U1	<u>, -, -, -, -</u>	
		•										

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico

100-10 might

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Northwestern New Mexico

T. Anhy		T. Canyon 8,432'	_ T. Ojo Alamo	T. Penn. "B"
T. Salt		_ T. Strawn 8,944'	_ T. Kirtland-Fruitland	T. Penn. "C"
B. Salt		T. Atoka 9.562*	_ T. Pictured Cliffs	T. Penn. "D"
T. Yates	478	T. Miss	_ T. Cliff House	T. Leadville
T. 7 Rivers	<u> </u>	_ T. Devonian	T. Menefee	T. Madison
T. Queen	1,209'	_ T. Silurian	_ T. Point Lookout	T. Elbert
T. Grayburg 🔔	1,560	T. Montoya	_ T. Mancos	T. McCracken
T. San Andres_	2,062'	T. Simpson	_ T. Gallup	T. Ignacio Otzte
T. Glorieta	3,626'	T. McKee	Base Greenhorn	T. Granite
T. Paddock		T. Ellenburger	_ T. Dakota	T
T. Blinebry		_ T. Gr. Wash	_ T. Morrison	T
T. Tubb	4,736'	T. Delaware Sand	_ T. Todilto	T
T. Drinkard	<u>5,531'</u>	T. Bone Springs	T. Entrada	T
T. Abo	<u>5,878'</u>	<u>T. Morrow</u> 9,664'	T. Wingate	T
T. Wolfcamp	6,606'		T. Chinle	T
T. Penn		T.L.Morrow 10,006*	T. Permain	T
T. Cisco '	7,742'	T	T. Penn "A"	T
		OIL OR GAS S	ANDS OR ZONES	,

No. 1, from. 10,084* 10,092' No. 2, from......to......

No. 3, from.....to.....

from	to
	from

IMPORTANT WATER SANDS

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	То	Thickness in Feet	Lithology	From	То	Thickness in Feet	Lithology
0 430 2490 2600 4782 7520 9450	430 2490 2600 4782 7520 9450 9840	430 2060 110 2182 2730 1930 390	Red Bed & Anhydrite Anhydrite Anhydrite & Dolomite Dolomite Dolomite & Lime No Returns Lime				
10028	102001	172'	Shale				
: .	di sy	960 (A.)					
		्रम् इति घट			1		
		n an an an an an an an an an an an an an	n An an				
	. + 8 - T						

Submit & Corries		State of I	New Mexico			B 0 444
Appropriate District Office	Energy,	Minerals and Na	atural Resources	Department		Form C-104 Revised 1-1-89 San Instantion
P.O. Box 1980, Hobbs, NM 88240	OT A	CONSERV		VISION		at Bottom of Pr
DISTRICT II P.O. Drawer DD, Antesia, NM 88210	2	P.O. E anta Fe. New N	Box 2088 Mexico 87504-	2088		
DISTRICT III 1000 Rio Brazos Rd., Azzec, NM 87410						
I.	TOTR	ANSPORT OI		RAL GAS	UUN .	
Operator	CONDANNY				Well API No.	16 26042
Address	COMPANY	· · · · · · · · · · · · · · · · · · ·				115-20943
P. O. Box 769	B, Tyler, To	exas 75711				
Reason(s) for Filing (Check proper box) New Well) Change i	in Transporter of:	RECONCU	lease explain)		
	oii 🗍	Dry Gas	APR 2 4 19	92		
Change in Operator L.J.	Caunghead Gas		0. C. D.			
and address of previous operator	· · · ·		APITUA OFF	C*		· · · · · · · · · · · · · · · · · · ·
II. DESCRIPTION OF WELL	L AND LEASE	Pool Name Jaclus	ling Formation		Kind of Lana	Leve No.
CHALK BLUFF "6" S	PATE 1	N. ILLIN	NOIS CAMP	MORROW	State, Federal or	Fee E-7179
Location						
Unit LetterM	:730	_ Feet From The	Vest Line and	4990	Feet From T	w South
Section 6 Towns	hip 18S	Range 281	C NMPN	1,	Eddy	Cour
III. DESIGNATIÓN OF TPA	NSPORTER OF C	. AND NATT	BAL CAS			
Name of Authorized Transporter of Oil	or Coade		Address (Give ad	dress to which a	pproved copy of th	is form is to be sent)
PHILLIPS PETROLEUM	M COMPANY -	TRUCKS	4001 Per	abrook,	Odessa,	Texas 79761
TRANSWESTERN PIPEI	LINE COMPANY	or Dry Gal and Y	P.O.Box	1188, 1	Houston,	Texas 77251
If well produces oil or liquids, rive location of tanks	Unit Sec.	Twp. Rge.	Is gas actually co	anected?	When 7	
f this production is comminded with the		1185 28E	Yes		4/2	2/92
		7 DOOL PIVE COMPINIES	ling order number			
V. COMPLETION DATA		r pool, give comming	ling order number:		· · ·	
V. COMPLETION DATA	Oil Wei	I Gas Well	ling order number:	orkover D	Deepen Plug Ba	ck Same Res'v Diff R
V. COMPLETION DATA Designate Type of Completion Date Spudded) Oil Wel n - (X) Date Compt. Ready t	r pool, give comming	ling order number:	orkover D	Peepen Plug Ba	ck Same Res'v Diff R
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elementar (DS PK) PT CP (c)	n - (X) Date Compt. Ready t 4/16/92	r pool, give contuning II Gas Well X to Prod. 2	New Well W X Total Depth 10,	orkover D , 200 '	Peepen Plug Ba	ck Same Res'v Diff R 10,151'
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, etc.) DF 3339', GR 3324'	Oil Wel Oil Wel Date Compl. Ready t 4/16/92 Name of Producing F MOTTOW	r pool, give comming II Gas Wett J X to Prod. 2 "ormation	Ing order number:	orkover D , 200 '	Peepen Plug Ba P.B.T.D. Tubing I	ck Same Rei v Diff R 10,151' Septh 9,990'
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, stc.) DF 3339', GR 3324' Performitions 10,084' - 10,092'	Oil Wel - (X) Date Compl. Ready t 4/16/92 Name of Producing F MOTTOW	r pool, give comuning II Gas Well X to Prod. 2 iormation	ling order number: New Well W X Total Depth 10, Top Oil/Gas Pay 10,	orkover D , 200 ' , 084 '	Peepen Plug Ba P.B.T.D. Tubing I Depth Ce	ck Same Rea'v Diff R 10,151' Depth 9,990' ssing Shoe
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, KT, GR, etc.) DF 3339', GR 3324' erforations 10,084' - 10,092'	Date Compt. Ready to 4/16/92 Name of Producing F Morrow TUBING	r pool, give comuning II Gas Well X to Prod. 2 comstion , CASING AND	Ling order number:	orkover D , 200 ' , 084 ' RECORD	Peepen Plug Ba P.B.T.D. Tubing E Depth Ca	ck Same Rea'v Diff R 10,151' Depth 9,990' ssing Shoe
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, etc.) DF 3339', GR 3324' Perforations 10,084' - 10,092' HOLE SIZE	n - (X) Date Compt. Ready t 4/16/92 Name of Producing F MOTTOW TUBING CASING & T	r pool, give comming II Gas Well X to Prod. 2 Committion CASING AND UBING SIZE	ling order number:	orkover D , 200 ' , 084 ' RECORD 'TH SET	Peepen Plug Ba P.B.T.D. Tubing E Depth Ca	ck Same Res'v Diff R 10,151' Depuh 9,990' asing Shoe SACKS CEMENT
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, CR, stc.) DF 3339', GR 3324' Perforations 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4"	Oil Well Oil Well Date Compt. Ready t 4/16/92 Name of Producing F MOTTOW TUBING CASING & T 9-	r pool, give comming II Gas Well X io Pool. 2 ionmation , CASING AND UBING SIZE -3/8 " -5/8 "	ling order number:	orkover D , 200 ' , 084 ' , 084 ' , 084 ' , 084 ' , 084 ' , 084 '	Peepen Plug Ban P.B.T.D. Tubing I Depth Ce 5 1 1	ck Same Res'v Diff R 10,151' Depth 9,990' asing Shoe SACKS CEMENT 00 - circ 00 - circ
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, etc.) DF 3339', GR 3324' Performations 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4" 7-7/8"	CASING & T Case Compt. Ready I A / 16/92 Name of Producing F MOTTOW	r pool, give comming II Gas Well X to Prod. 2 commation CASING AND UBING SIZE -3/8 " -5/8 "	ling order number: New Well W X Total Depth 10, Top Oil/Gas Pay 10, CEMENTING CEMENTING 2 9	orkover D , 200' , 084' , 00' , 084' , 00' , 084' , 00' , 084' , 00' , 084' , 00' , 084' , 00' , 00' , 00' , 084' , 00' ,	Peepen Plug Ba P.B.T.D. Tubing E Depth Ca 5 11 18	ck Same Reiv Diff R 10,151' Depth 9,990' ssing Shoe SACKS CEMENT 00 - Circ 00 - circ 95 - circ 1s
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, KT, CR, etc.) DF 3339', GR 3324' effortions 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4" 7-7/8" 7" V. TEST DATA AND REQUE	Oil Wein - (X) Date Compt. Ready to 4/16/92 Name of Producing F MOTTOW TUBING CASING & TI 13- 9- 7* 4]* Li ST FOR ALLOW	r pool, give comming II Gas Well X to Prod. 2 commation , CASING AND UBING SIZE -3/8" -5/8"	ling order number:	orkover D , 200' , 084' RECORD 7TH SET 400' 2, 600' 1, 445' , 198'	Neepen Plug Bau P.B.T.D. Tubing E Depth Ca 	ck Same Reiv Diff R 10,151' Depth 9,990' ssing Shoe
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, stc.) DF 3339', GR 3324' Performings 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4" 7" 7" 7" 7" 7" 12-1/4" 7"	Oil Well Oil Well	r pool, give comming II Gas Well X to Prod. 2 CASING AND UBING SIZE -3/8 " -5/8 " Iner ABLE of load oil and must	ling order number: New Well W X Total Depth 10, Top Oil/Gas Pay 10, CEMENTING Q 9 10 0 0 0 0 0 0 0 0 0 0 0 0 0	orkover D , 200' .084' .084' .084' .084' .000' .400' .445' .0, 198' .0, 198'	Peepen Plug Ban P.B.T.D. Tubing E Depth Ca 5 11 18 18 1 1 1 1 1 1 1 1 1 1	ck Same Res'v Diff R 10,151' Depth 9,990' saing Shoe
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, elc.) DF 3339', GR 3324' Perforations 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4" 7-7/8" 7" . TEST DATA AND REQUE DIL WELL (Test must be after Date First New Oil Run To Tank	CASING & T Case Compl. Ready I A / 16 / 92 Name of Producing F MOTTOW TUBING, CASING & T 13- 9- 4 ¹ "Li ST FOR ALLOW. recovery of total volume Date of Test	r pool, give comming II Gas Well X to Prod. 2 iormation CASING AND UBING SIZE -3/8 " -5/8 " Iner ABLE of load oil and must	ling order number: New Well W X Total Depth 10, Top Oil/Gas Pay 10, CEMENTING CEMENTING 2 9 10 be equal to or exce Producing Method	orkover D , 200 ' , 084 ' RECORD 'TH SET 400 ' , 445 ' , 198 ' ed top allowable (Flow, pump, g	Peepen Plug Ba P.B.T.D. Tubing I Depth Ce 	ck Same Res V Diff R 10,151' Depth 9,990' ssing Shoe
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, KT, GR, etc.) DF 3339', GR 3324' efforstions 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4" 7-7/8" 7" 7. TEST DATA AND REQUE ILL (Ten must be after Sate First New Oil Run To Tank ength of Test	CASING & T CASING & T CASING & T CASING & T CASING & T CASING & T ST FOR ALLOW recovery of total volume Date of Test Tubing Pressure	r pool, give comming II Gas Well X to Prod. 2 committion , CASING AND UBING SIZE -3/8" -5/8" -5/8" -5/8" -5/8"	ling order number: New Well W X Total Depth 10, Top Oil/Gas Pay 10, CEMENTING CEMENTING DEI 2 9 10 be equal to or exce Producing Method Casing Pressure	orkover D , 200' , 084' RECORD 7H SET 400' 2, 600' 1, 198' ed top allowable (Flow, pump, g	Peepen Plug Bar P.B.T.D. Tubing E Depth Ca Depth Ca 11 18 1 18 19 19 10 10 10 10 10 10 10 10	ck Same Reiv Diff R 10,151' Depuh 9,990' ssing Shoe
V. COMPLETION DATA Designate Type of Completion Date Spudded 2/17/92 Elevations (DF, RKB, RT, GR, etc.) DF 3339', GR 3324' Feforations 10,084' - 10,092' HOLE SIZE 17-1/2" 12-1/4" 7-7/8" 7" 7. TEST DATA AND REQUE DIL WELL (Test must be after Date First New Oil Run To Tank ength of Test	Oil weither teale of Oil Weither (X) Oil Weither (X) Date Compt. Ready to 4/16/92 Name of Producing F MOTTOW TUBING, CASING & TO TOR ALLOW, recovery of total wolume Date of Test Tubing Pressure Oil - Bale	r pool, give comming II Gas Well X to Prod. 2 commation , CASING AND UBING SIZE -3/8 " -5/8 "	ling order number: New Well W X Total Depth 10, Top Ol/Gas Pay 10, CEMENTING CEMENTING DEI 2 9 10 be equal to or exce Producing Method Casing Pressure Weler - Divis	orkover D , 200' , 084' RECORD PTH SET 400' 2, 600' 1, 445' , 198' ed top allowable (Flow, pump, g	beepen Plug Bar P.B.T.D. Tubing E Depth Ca Depth Ca 11 18 1 18 1 1 1 1 2 Choke Sii Choke Sii	ck Same Res' Diff R 10,151' Depth 9,990' saing Shoe
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All sections of this form must be filled out for allowable on new and recompleted wells.
 Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
 Separate Form C-104 must be filed for each pool in multiply completed wells.

1

MEWBOURNE OIL COMPANY Chalk Bluff "6" St., Well # 1 6-18-28 Eddy County, New Mexico 4-24-92



Q MCF/DAY

11:1 X. State of New Mexico

Energy, Minerals and Natural Resources Department

Form C-122 Revised 4-1-91

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Submit in duplicate to appropriate district office Rule 401 & Rule 1122

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

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Submit 3 Copies to Appropriate District Office		Energy, Minera	ils and Natural	Résources Department	l.	rorm (-114 Revised 1-1-89
DISTRICT I P.O. Box 1980, Hobb	s. NM 88240	UIL CON	SERVATI	ON DIVISION	WELL API NO	
DISTRICT II		Santa Fe	P.O. Box 2 e, New Mexic	0 87504-2088		5-26943
P.O. Drawer DD, An	esia, NM 88210			NOV 1 6 1953	5 Indicate Typ	STATE FEE
1000 Rio Brazos Rd.,	Aziec, NM: 87410			O. K. D.	6. State Oil & E-717	Gas Lease No. 9
	SUNDRY NOTI	CES AND REP	ORTS ON W	ELLS		
(DO NOT USE TH	DIFFERENT RESER (FORM C-	POSALS TO DHIL VOIR: USE "APPL 101) FOR SUCH P	LOH TO DEEPE LICATION FOR P ROPOSALS.)	EN OR PLUG BACK TO A	7. Lease Name	or Unit Agreement Name
I. Type of Well: OL WELL	QAS WELL		OTHER		Cha 1 k	Bluff "6" State
Name of Operator		/			8. Well No.	
Mewbourne	0il Company	\checkmark			9 Pool name o	Wildras
P.O. Box	5270 Hobbs,	New Mexico	88241 (505) 393-5905	North I	linois Camp Morrow
Section	6	Township] {	BS I Liton (Show whethe 3339' DF	Range 28E 17 DF. RKB. RT. GR. etc.) 3324 GR	NMPM [ddy Coun
.1.	Check A	ppropriate Bo	x to Indicate	Nature of Notice, R	eport, or Oth	er Data
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		ENTION TO: plug and a		SUB REMEDIAL WORK		
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30-015-26943

DERID 14744 PROP 1877 FDI 78890

> 1923010-0 1923830-G 1923050-W

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Oxford [®]		
	A ESSELTE	
MADE IN U.S.A.	NO. R753 1/3	
• •	• • •	
IT IS THEREFORE ORDERED T	HAT:	R-9631 12-19-91

(1) All mineral interests, whatever they may be, from the base of the Abo formation to the base of the Morrow formation, underlying Lots 3 through 7, the SE/4 NW/4, and the E/2 SW/4 (W/2 equivalent) of Section 6, Township 18 South, Range 28 East, NMPM, Eddy County, New Mexico, thereby forming a non-standard 334.98-acre gas spacing and proration unit for any and all formations and/or pools developed on 320-acre spacing within said vertical extent, which presently includes, but is not necessarily limited to the Undesignated Empire-Pennsylvanian Gas Pool and the Undesignated North Illinois Camp-Morrow Gas Pool, are hereby pooled, said unit shall be dedicated to a well to be drilled at an unorthodox gas well location 990 feet from the South line and 730 feet from the West line (Unit M) of said Section 6.

R-9631

5-22-92 O wal & paad A who Surf - 9416

2588 - 9452



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MAP ID NO. 100

MEWBOURNE OIL CO. CHALK BLUFF 36 STATE NO. 001

API NO. 30-015-27286

Submit to Appropriate		State of	New Mex	ico	-			· · · · · · ·
District Office	E y	, Minerals and N	latural Res	ources Departn	net.			Form C-10 (17 μ) Revised 1.1.5 a.V
State Lease - 5 copies								54
	OIL	CONSERV	'ATIO	N DIVISIO)N			-
DISTRICT I P.O. Box 1980 Hobbs NM 18740	-,	P.O .	Box 2088			API OU. (D of New Wells
F.O. BOX 1990, HODOX, 101, 86240	-	Santa Fe. New 1	Mexico 8	75 860519 50		20-0	10-21.	2.56
DISTRICT II						5. Indicate	Type of Leas	
P.U. DTSWET DU, ARESIA, NMI 86210	,			1911 I St. 14	••• •		S	
DISTRICT III	110/			u av a v E	33	6. State Oil	& Gas Lease	No.
IOU KIO BRIZOG KA., AZIEC, NM 8/	410°			0.0.0	_	E-379	-4	
APPLICATION FO	DR PERMIT	TO DRILL, DEI	EPEN, OF	A PLAG BAG	fr	<i>\///////</i>	$\label{eq:linear}$	
a. Type of Work:		······	•			7. Lease Na	me or Unit A	greement Name
	DE ENTE		, m		Ъ	1		
b. Type of Well:	RE-ENTER		' []	TLUGBACK L				
			STNCLE			Chalk	Bluff	"36" State
Name of Operator	_					8. Well No.		
Mewbourne 0il Com	pany 🗸				_	1.1.	·	
Address of Operator						9, Pool nam	e or Wildcat	
P.O. Box 5270 Hol	bbs, New	Mexico 882	:41			🖌 Illin	ois Cam	p Morrow North
Well Location								
Unit Letter M :	<u>990</u> Feet I	From The Wes	t	Line and	60	50 Feet 1	From The	South Line
·								:
Section 36	Town	ntin 17S	Range	27E	1	NMPM	Ē	ddy County
	mmm	1)////////////////////////////////////	TITI	///////////////////////////////////////	TTŤ	1111111	mm	in min
		10. Рторо	sed Depth		11. F	ormalion		12. Rotary or C.T.
		///// 10,	300'			Morrow		Rotarv
3. Elevations (Show whether DF, RT,	GR. atc.)	14. Kind & Status Pl	lug. Bond	15. Drilling Cor	inclor	I	16 Annor	Date Work will start
3635' G.R.		Blanket on	file	WEK Dr	·i11	ing	Jan.	31, 1993
7.								
···		ROPUSED CAS	SING ANL	CEMENT PH	IOGH			
SIZE OF HOLE SIZE	OF CASING	WEIGHT PER	FOOT	SETTING DEP	<u>ידא</u>	SACKS OF	CEMENT	EST. TOP
17-1/2" 13-	<u>-3/8"</u>		48#	4(<u>)0'-</u>	<u>400 sks</u>	*	Circ.
12-1/4" 9-	<u>-5/8"</u>		36#	2.60	<u>10'</u>	<u>700 sks</u>	•	Tie back into sur
<u>8-3/4" 5-</u>	-1/2"		<u> 17# </u>	10.30	<u>)0'-</u>	<u>600 sks</u>	•	Bring above top
`							1	of Abo
ıd Program:								A-1- TO 1
0' - 400' Spud r	nud w/fre	sh water qe	1, LCM	as needed.				1-12-45
400' - 2,600' Fresh	water de	1 & lime.	LCM as	needed.			•)	EVIS ANEL
500' - 9.200' Cut b	rine with	lime for p	H contr	ol. WL-NC	<u>.</u>			
200' - 10.300' Cut b	rine w/Dr	ispac. salt	ael. 1	ime, soda	ash	and star	ch. Wt	. 9.2-9.6 npg.
WL 10	cc or le	ss. Vis. 32	-36. R	aise wt. a	CCOY	dinaly i	f abnor	mal pressures
are e	ncountere	d.				j .j .		
)P Program:								
1500 4	Series Do	uble Ram Hv	draulic	BOP w/900) Ser	ries Hvdr	il from	Intermediate
CSG 1	to T.D	900 Series	Hvdril	on Surface		i to Inte	ermedia	te csa noint
DVT cv	stem mu	d-aas sener	ator r	otating he	ad f	From Wolf	camp to	
is is not dedicated	is conginite	a gus sepen	acorgi	ocucing in			cump co	1.0.
IN AROVE SPACE DECIDED	POSED PROG			R FLUG BACK GIVE		PRESENT PRODUCT		D PROPOSED NEW PRODUCTIVE
ZONE. GIVE BLOWOUT PREVENTER FROG	RAM, PANY.							
I hardin cartify that the information shows	is true and complete	is to the heat of my ine	wiedee and bei			·····		
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SIGNATURE _ Sect D.	renc	Ľ		Driffing	Supe	rincende	DAT	E UI/ 10/ 93
- n11 n2								(202)
TYPE OR FRONT NAME BILL PIG	erce						TELL	EHONE NO. 393-3903
	- · ·							
(This space for State Use)	10				1.			
Ala la Al	<i>V.</i>			1 Ami	1			1-19-93
ATTROVED BY UPPONT KA	~n/		TITLE	on po		<u> </u>	DATI	E
CONDITIONS OF APPROVAL. IF ANY:	/							KIC.
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	/ /0	CASING	ג		5	The second the		

Submit to Appropriate District Office State Lease - 4 copies Fee Lease - 3 copies

DISTRICT II P.O. Drawer DD, Artesia, NM 88210

State of New Mexico intergy, Minerals and Natural Resources Depart.

OIL CONSERVATION DIVISIO

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

DISTRICT III 1000 Rio Brazos Rd.	, Aziec, Niv	4 87410	WEL	L LOCA	TION A	ND ACRI	EAGE D	EDICAT	ION PL	AT			
Operator					• •	Lease	<u>.</u>					Well No.	
MEWBOURNE	OIL CO	MPANY				CHAI	LK BLUI	F 36 S	STATE			1	
Unit Letter	Section		Township)		Range				Ca	unty	·	
M	36		17	SOUTH		27	EAST		NMP	M	EDDY		
Actual Footage Loca	ation of Wel											,	
.990	feet from 1	the W	EST		line and	-60	50		fect fro	m the	SOUTH	line	
Ground level Elev.	, ,	Producing	Formation			Pool		,		;		Dedicated Acreage:	
3635	М	orrow				Ill III III	nois Ca	mp Mor	row No	orth		320 Acres	
1. Outline 2. If more	s the screage s than one is	e dedicated	to the subj icated to the	well, outlin	colored per	identify the	e marks on ownership (the plat be	low, h as to wor	ting in	terest and a	oyaliy).	
3. If more unitizat	a than one is lion, forca-p Yes is "no" list : if neccessar able will be non-standar	the owners y.	erent owner .? No and tract d	thip is dedi if answer escriptions v abil all interv h interest, h	caled to the is "yes" typ which have ests have be as been app	e well, have t se of consolid actually bee sen consolida proved by the	ted (by con	<u>Commur</u> ed. (Uso m munitization	ni ti za t sverse side on, unitizati	olidate tion of ios, for	d by com	sunitization, 2. or otherwise)	
										Contail best of Signar Printee Bill Positic Dril Comp Mewb Date Octo	PERAT hereby ned herei (my brown d Name Pier 20 1ing 20 20 20 20 20 20 20 20 20 20 20 20 20	OR CERTIFICATIO cartify that the inform is true and complete edge and belief. <u>Decence</u> Ce Superintendent <u>Oil Company</u> 7. 1992 OR CERTIFICATIO	N mation to the
990'										I here on the actual super correct belief. Date I Correct Signa Profe	eby certify is plat w I surveys vison, and c to the Surveyed)/19/9)/19/9)/19/9 June & Se second Sur Market Na	that the well location as plotted from field no made by me or under i that the same is tru best of my knowledge 2 i of response i for 3640	shown Ves of tr my e and e and
0 130 660	990 1320	1650	1980 231	0 2640	200	0 1500	1000	500					·



Mewbourne Oil Company Chalk Bluff "36" State #1 660' FSL & 990' FWL Section 36-T17S-R27E Eddy County, New Mexico Lease Number E-379-4

· #1

FIELD REPORT FOR CEMENTING OF WELLS

OIL CONSERVATION DIVISION

	·.	••• • •				API	30-015	- 27 28	6
Operator Mewel	ourn	e Oil Co.	Lease	lk Bl	ull	"36" St	.Well #		
Location of Well	Unit M	Section 36		Towns!	ip	Range 27	County	in.	
Drilling Contractor	WEK	Drilling	•	Туре	of T R	Equipment		0	
		APPROV	ED CASI	NG PRO	GRAN	<u>. 0</u>			
X Witness Size of Hole	Size	of Casing	Weigh Foc	t Per t	Net	v or Used	Depth	Sacks	Cement
171/2	<u>× 1</u>	33/8	. 4	-8#			400±	400	Circ
121/4	C	15/8	3	6#			2600±	700	Surf
834	r	51/2)	7#			10.300±	600	Top
Casing Data:									of ABO
Surface	joints	of 133/8" i	nch 48	#	Grad	le H-40			
		Approv	ed) (Re	iected))	· ·			÷
nspected by	m.s	<u> </u>				date J	Pn 2-	93	
Cementing Pro	gram								
Size of hole_	101/211		asing]'	3/8" 5	iacks	s coment :	required	ι.	
Type of Shoe	used <u>au</u>	<u>ide</u> Float c	ollar u	seding	Tin	Btm 3 jt:	s welded	vies	
TD of hole 40	<u>o'</u> s	et 400 ' Fee	t of 13.3	"Inch	48	<i>∓</i> Grade	H-40		
New used csg.	@ 400	with 200	Jyocs a	cks ne	at (cement ar	ound sho	e	
+ <u>230</u> sax	Hallin	wrton Lite	additiv	es 1/4#	floc	ele 5#gil	sonite 27	٥٢٢	
Plug down @ <u>8</u>	:45	_(AD) (PM)	Date_	JAN, "	3 - 19	192			
Cement circul	ated	Ves		No. o	f Sa	ack <u>s 30</u>	X		
Cemented by	tallibu	rton			ssed	i by mike	(STUBB)	field	
Temp. Survey	ran @	<u>(AM) (P</u>	M) Dat	e		top cer	nent@	` 	
Casing test @		(AM) (P	Ni) Dat	9					
Method Used				Witne	ssei	i by			
Checked for s	hut of	6 @ (AM) (PM)	Date					
Method used				_Witne	sseu	i by			
Remarks: <u>* Cen</u>	hent f	ell back At	ter Plug	Down	<u> </u>				
Rea	dy mixe	d cmt ton	to suif	ne 2	VAF-	te.			
	1	Y		· · ·	7.	<u></u>			·
4 centraligers		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·			Lost circ	. D 31	19'

			•
- Submit 3 Copies to Appropriate District Office	State of N Energy, Minerals and Na	New Mexico tural Resources Department	Form C-103 Revised 1-1-5 C
TRICTI	OIL CONSERVA	ATION DIVISION	
Box 1980, Hobbs, NM 88240	P.O. B	ox 2088 من الم	WELL API NO.
TRICT I	Santa Fe, New M	lexico 87504-2088	30-015-27280
J. Drawer DD, Anesia, NM 88210		1 3 0 9 1993	S. Indicate Type of Lease
DISTRICT III 1000 Rio Brazos Rd., Aztec, NM 87410)		6. State Oil & Gas Lease No.
		C. C. D.	E-379-4
SUNDRY NO	TICES AND REPORTS O	N WELLS	
(DO NOT USE THIS FORM FOR P	ROPOSALS TO DRILL OR TO D	EEPEN OR PLUG BACK TO A	7. Lease Name or Unit Agreement Name
UIFFERENT RES	ENVOIR. USE "APPLICATION F C-101) FOR SUCH PROPOSAL	OR PERMIT S.)	-
Type of Well:			4
OL GAS	OTHER		Chalk Bluff "36" State
Name of Operator			8 Well No
Mewbourne Oil Compan			1
Address of Operator	<u> </u>		9. Pool name or Wildcat
P. 0. Box 5270 H	lobbs, New Mexico 8	8241	Illinois Camp Morrow North
Well Location		,	
Unit Letter M :9	90_ Feet From The West	Line and66(Feet From The South Line
Section 36	Township 1/S	Range Z/E	NMPM Eddy County
	TO. Eleastice (240%)	whener Lat, KLD, KI, GK, &C.) うらうちま ヘロ	
<u>Charles</u>	A anno da Dan da Ind	JOJD GK	
	Appropriate Box to Ind	icate Nature of Notice, R	eport, or Uner Data
NOTICE OF IN	NIENHON IO:	I SUB	SEQUENT REPORT OF
	PLUG AND ABANDON		
	PLUG AND ABANDON		
PORARILY ABANDON	PLUG AND ABANDON CHANGE PLANS	REMEDIAL WORK COMMENCE DRILLING	ALTERING CASING
ERFORM REMEDIAL WORK	PLUG AND ABANDON CHANGE PLANS	REMEDIAL WORK	ALTERING CASING
PORARILY ABANDON	PLUG AND ABANDON CHANGE PLANS	REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER	ALTERING CASING
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ERFORM REMEDIAL WORK	PLUG AND ABANDON CHANGE PLANS		ALTERING CASING
ERFORM REMEDIAL WORK	PLUG AND ABANDON CHANGE PLANS	REMEDIAL WORK REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: Casils, and give pertinent dates, includ Spudded 17 1/2" su	ALTERING CASING
ERFORM REMEDIAL WORK	PLUG AND ABANDON CHANGE PLANS	REMEDIAL WORK REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: COTHER:	ALTERING CASING OPNS. PLUG AND ABANDONMENT MENT JOB Ung estimated date of starting any proposed rface hole @ 6:00 P. M. MST. jts. of 13 3/8", 48#, J-55, ST
ERFORM REMEDIAL WORK Image: Complete the second	PLUG AND ABANDON CHANGE PLANS Fraticous (Clearly state all persiment de rilling Co. Rig #2. 1/2" surface hole Howco cemented w/10	REMEDIAL WORK REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: COTHER:	ALTERING CASING OPNS. PLUG AND ABANDONMENT MENT JOB Ung estimated date of starting any proposed rface hole @ 6:00 P. M. MST. jts. of 13 3/8", 48#, J-55, ST containing 10#/sk. Cal-Seal +
ERFORM REMEDIAL WORK PORARILY ABANDON LL OR ALTER CASING THER: 2. Describe Proposed or Completed Ope work) SEE RULE 1103. 2-2-93: MIRU WEK D 2-3-93: Drilled 17 new casing to 400'. 5#/sk. Gilsonite + 1	PLUG AND ABANDON CHANGE PLANS TRAINING CLEARLY state all persiment de rilling Co. Rig #2. 1/2" surface hole Howco cemented w/10 /2#/sk. Flocele + 2	REMEDIAL WORK REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: Spudded 17 1/2" su to 400' K. B. Ran 9 00 sks. of Class "C" % CaCl ₂ followed by	ALTERING CASING ALTERING CASING PLUG AND ABANDONMENT MENT JOB Ung estimated date of starting any proposed rface hole @ 6:00 P. M. MST. jts. of 13 3/8", 48#, J-55, ST containing 10#/sk. Cal-Seal + 230 sacks of Class "C" Lite con
ERFORM REMEDIAL WORK	PLUG AND ABANDON CHANGE PLANS Fraticos (Clearly state all perimens de rilling Co. Rig #2. 1/2" surface hole Howco cemented w/10 /2#/sk. Flocele + 21 cele + 5#/sk. Gilson	REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: Spudded 17 1/2" su to 400' K. B. Ran 9 00 sks. of Class "C" % CaCl ₂ followed by nite + 2% Cacl ₂ , tai	ALTERING CASING ALTERING CASING PLUG AND ABANDONMENT MENT JOB Ment JOB
PORARILY ABANDON	PLUG AND ABANDON CHANGE PLANS Fraticols (Clearly state all perimens de rilling Co. Rig #2. 1/2" surface hole Howco cemented w/10 /2#/sk. Flocele + 2 cele + 5#/sk. Gilson 2% CaCl ₂ . Plug down	REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: Casing and give pertinent dates, includ Spudded 17 1/2" su to 400' K. B. Ran 9 00 sks. of Class "C" % CaCl_2 followed by nite + 2% Cacl_, tai n to 353' @ 8:45 AM.	ALTERING CASING ALTERING CASING PLUG AND ABANDONMENT MENT JOB MENT JOB
ERFORM REMEDIAL WORK PORARILY ABANDON LL OR ALTER CASING LL OR ALTER CASING THER: 2. Describe Proposed or Completed Open work) SEE RULE 1103. 2-2-93: MIRU WEK D 2-3-93: Drilled 17 new casing to 400'. 5#/sk. Gilsonite + 1, taining 1/4#/sk. Flo "C" Neet containing cement to the pit.	PLUG AND ABANDON CHANGE PLANS Entions (Clearly state all perimens de rilling Co. Rig #2. 1/2" surface hole Howco cemented w/10 /2#/sk. Flocele + 2 cele + 5#/sk. Gilson 2% CaCl ₂ . Plug down Cement Job witnessed	REMEDIAL WORK COMMENCE DRILLING CASING TEST AND CE OTHER: Casing test and ce OTHER: Casing test and ce Casing test and ce OTHER: Casing ALTERING CASING ALTERING CASING PLUG AND ABANDONMENT MENT JOB MENT JOB	
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	S Energy, Mineral	itate of New Mex s and Natural Res	tico ources Department		Form C-103 Revised 1-1-89
TRICT I	OIL CONS	ERVATIO	N DIVISION	WELL APLNO	······
TRICT II	40 Santa Fe	P.O. Box 2088	3 2504LD088	30-015-27	286
J. Drawer DD, Artesia, NM 8.	8210 Santa I e,	INCW INICAIOS	h90+2088	5. Indicate Type of Lea	
DISTRICT III 1000 Rio Brazos Rd., Aziec, NM	87410	1 28 (. 9 1993	6. State Oil & Gas Lean	se No.
CUNIDD		Ö.	C.D.	E-379-4	
(DO NOT USE THIS FORM I DIFFEREN (FOR PROPOSALS TO DRILL IT RESERVOIR. USE "APPLI FORM C-101) FOR SUCH PF	OR TO DEEPEN C CATION FOR PERI IOPOSALS.)	NR PLUG BACK TO A	7. Lease Name or Unit	Agreement Name
1. Type of Well: OE. G		OTHER	· · · · · · · · · · · · · · · · · · ·	 Chalk Bluff "	36" State
2. Name of Operator	· · · · · · · · · · · · · · · · · · ·			8. Well No.	
Mewbourne Oil Cor 3. Address of Operator	mpany	· · · · · · · · · · · · · · · · · · ·		9. Pool name or Wildow	it
P. O. Box 5270	Hobbs, New Mexic	:0 88241		Illinois Camp	Morrow, North
4. Well Location	990 5-15-5	West			South
Unit Letter	: Peet From The	ncal		reet From The	
Section 36	Township	17S Rang	E REA RT CR MC	NMPM	Eddy Cour
		363	5' GR		
и. С	Theck Appropriate Boy	to Indicate Na	ature of Notice, R	eport, or Other Dat	ta.
NOTICE (OF INTENTION TO:		SUB	SEQUENT REP	ORT OF:
PERFORM REMEDIAL WORK	PLUG AND AE		REMEDIAL WORK		ERING CASING
IPORARILY ABANDON		NS 🔲		OPNS. DPLU	G AND ABANDONMEN
LL OR ALTER CASING			CASING TEST AND CE	MENT JOB	
OTHER:	·		OTHER:	· · · · · · · · · · · · · · · · · · ·	
12. Describe Proposed or Complet work) SEE RULE 1103. 2-7-93: Drilled new LS casing and 1/4#/sk. flocele CaCl ₂ . Plug down Lead slurry weigh Tail slurry weigh Total slurry weigh Total slurry volu 12 hrs. @ 70° F. WOC 12 hrs. NU f w/rig pump. All	red Operations (Clearly state all) 12 1/4" Intermedi d set @ 2603' K. E + 8#/sk. salt fol n to 2557' @ 6:15 hed 13.8#/gal. and hed 14.8#/gal and ume was 1,754 cu. Estimated format BOP and pressure t held 0. K.	ate hole to ate hole to be Howco ce lowed by 20 P.M. MST 2- lyield was yield was 1 ft. Compre- ion temp. i ested blind	give pertinent dates, includ 2603' K.B. F mented w/950 s 0 sks. of Clas 7-93. Circula 166 cu. ft./sk .36 cu. ft./sk ssive strength s 75° F, estim and pipe rams	ting estimated date of starti (an 58 jts. of 9 (ks. of Class "(ted 50 sacks to c. Slurry volum for tail slurry ated slurry tem , and casing to	ng any proposed 9 5/8", 36#, J C" Lite contai ent containing o pit. ne was 1520 cu ne was 268 cu. ry is 1350 ps mp. was 72° F. o 1,000# for 3
I hereby certify that the infogration of SIONATURE	Pierce	f my knowledge and bei	id. Drilling Supe	rintendentD	кте <u>2/8/93</u> 50 2.ерноне но.393-590
I bereby certify that the information at SIONATURE	Pierce	f my knowledge and bei	id. Drilling Supe	rintendentp	кте <u>2/8/93</u> 50 Ілерноме но.393-590
Submit 3 Copies to Appropriate District Office	State of New M Energy, Minerals and Natural R	exico esources Department	For Revi	n C-103 (sed 1-1-89	
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Box 1980, Hobbs, NM 88240	OIL CONSERVATIO P.O. Box 200	DN DIVISION	WELL API NO. 30-015-27286		
P.O. Drawer DD, Artesia, NM 88210	Santa Fe, New Mexico	87904-2088	5. Indicate Type of Lease		
DISTRICT III 1000 Rio Brazos Rd., Aztec, NM 87410	LiAK 2	4 1993	6. State Oil & Gas Lease No.		
SHNDRY NOT					
(DO NOT USE THIS FORM FOR PRO DIFFERENT RESER (FORM C	OPOSALS TO DRILL OR TO DEEPEN IVOIR. USE "APPLICATION FOR PE 101) FOR SUCH PROPOSALS.)	OR PLUG BACK TO A RMIT	7. Lease Name or Unit Agreement N	Vame	
1. Type of Well:	075-859		Chall Dluff 1251 C+-		
2. Name of Operator		· · · · · · · · · · · · · · · · · · ·	8. Well No.		
Mewbourne Oil Compa	ny 🗸		1	·	
3. Address of Operator Box 5270 Hobbs, Ne	w Mexico 88241		9. Pool name or Wildcat	North	
4. Well Location				_NOT LII	
Unit Letter :990	Feet From The West	Line and660	Feet From The <u>South</u>	Line	
Section 36 II. Check A NOTICE OF INT	Township 175 Ra 10. Elevation (Show whether 3635' Appropriate Box to Indicate I ENTION TO:	nge 27E I DF. RKB. RT. GR. etc.) GR Nature of Notice, Re SUB	POPT, or Other Data SEQUENT REPORT OF	County	
		REMEDIAL WORK			
	CHANGE PLANS		OPNS. PLUG AND ABA		
PULL OR ALTER CASING		CASING TEST AND CE	MENT JOB		
OTHER:	LJ				
 Describe Proposed or Completed Operat work) SEE RULE 1103. 	ons (Clearly state all pertinent details, an	d give pertinent dates, includ	ing estimated date of starting any prope	osed	
2-24-93: Drilling 8 3 and spotted 150 sack c 3-5-93: Drilled to 92 Casing stuck 36' off of 3% KCL + 1% Halad 322 + tool 0 6654' and circul 1/4#/sk. Flocele follor Flocele + .6% Halad 322 1st stage cement slurry ume was 818 cu. ft. BH strength of cement was ft./sk. 0 12.7#/gal. Yie	74" production hole. ement plug. Regained p 89'. Ran 215 joints of bottom. Cemented 1st 5#/sk. Gilsonite + 5#, ated 6 hrs. Cemented wed by 335 sacks of C . Plug down to 6654' weighed 14.8#/gal. wi by logs was 123° F. 2025 psi in 12 hrs. ield for slurry was 134 Id was 586 cu. ft. To	Lost complete re partial returns, f new 26#, N-80, stage by Howco /sk. SilicaLite 2nd stage w/750 lass "H" contain @ 5:00 PM 3-5-93 th a yield of 1. Estimated slurr 2nd. stage lead 37 cu. ft. Tail tal slurry volum	<pre>turns @ 8250'. Spott 7" API casing and se w/535 sacks of Class + 10#/sk. Microbond. sacks of Class "H" Li ing 8#/sk. SilicaLite circulated 56 sack 53 cu. ft./sk. Total y temp. was 73° F. Cl cement slurry yield cement slurry yield ne was 1973 cu. ft. E</pre>	ed mud pills t @ 9253'. "H" containing Opened D. V. te containing + 1/4#/sk. s to the pit. slurry vol- compressive was 1.85 cu. was 1.75 cu. stimated	
I hereby cartify that the information above is true SIGNATURE	and complete to the best of my knowledge and b	maina. <u>P</u> Drilling Supe	rintendent <u>DATE</u> 3-22	-93	
TYPEOR PRINT NAME Bill Pierc	9		TELEPHONE NO.	<u>505 393-5</u> 905	
(This space for State Use) ORIGIN MIKE W SUPERV	ALISIGNED BY ILLIAMS VISOR, DISTRICT II	P	APR	5 1993	
CONDITIONS OF APPROVAL, IF ANY:	••••			·	

formation temp. was 100° F, estimated slurry temp. was 72° F. Compressive strength for 2nd stage lead slurry in 12 hrs. was 1600 psi and tail slurry was 1900 psi. WOC 24 hrs. Drilled out D. V. Tool, float collar, and 1/2 of shoe joint. Pressure tested casing, blind rams, and pipe rams to 2,000# for 30 min. Held O. K.

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Appropriate Sistrict Office	ļ	Energy, Minerals	and Natural R	esources Departmen	ſ	Rev	ised 1-1-89
O. Box 1980, Hobbs, NM	88240	OIL CONS	ERVATIC	N DIVISION	WELL API NO.	<u> </u>	· · ·
ISTRICT II		Santa Fe,	State of New Mexico Try, Minerals and Natural Resources Department Dem Critical State of Neuronal State of Neu				
O. Drawer DD, Artesia, NM	1 88210			يا ۽ ديونيا جا ۽	. Indicate Type	VELL API NO. 30-015-27286 S. Indicate Type of Lease STATE FEE State Oil & Gas Lease No. E-379-4 Lease Name or Unit Agreement Name Chalk Bluff "36" State A Well No. Prool name or Wildcat Illinois Camp Morrow-North Feet From The South I PM Count Ort, or Other Data EQUENT REPORT OF: ALTERING CASING PNS. PLUG AND ABANDONMENT ENT JOB estimated date of starring any proposed W 11.35#, N-80, 4-1/2" W/225 sks. of Class n to 10,012' @ 6:15 D p.m. 03/20/93 Sas TELEPHENE NO. 39 3 - 5	FEE
000 Rio Brazos Rd., Azlec, I	NM 87410			LIAR 24	1993 E-379-		
SUNE	ORY NOTIC	ES AND REPO	RTS ON WE		2. ////////////////////////////////////		
DIFFER	ENT RESERV	OR. USE APPLIC	ATION FOR PE OPOSALS.)	RMIT"	The set of the set of	or Unit Agreement]	Name
Type of Well: OIL WELL	GAS WELL		nher .		Chalk	Bluff "36"	State
Name of Operator	C	· · · · · · · · · · · · · · · · · · ·			Department Form C-103 Revised 1-1-39 VISION WELL API NO. 30-015-27286 2088 Indicate Type of Lease STATE 1 Indicate Type of Lease STATE 2088 State Oil & Cas Lease No. 5-379-4 2088 State Oil & Cas Lease No. 5-379-4 2088 E-379-4 2088 F7. Lease Name or Unit Agreement Name Chalk Bluff "36" State 8. Well No. 9. Pool same or Wildcat 111 inois Camp Morrow-North ine and 660 Feet From The South 72 NMPM 72 NMPM 73 Count 74 Count 75 NMPM 76 NMPM 77 Lease Non Data 8 SUBSEQUENT REPORT OF: 04 ALTERING CASING ENCE DRILLING OPNS. PLUG AND ABANDONMENT Intent dates, including estimated date of starting any proposed 7 jts. of new 11.35#, N-80, 4-1/2" vco cemented w/225 sks. of Class Plug down to 10,012' @ 6:15 leased @ 3:00 p.m. 03/20/93 Sista 10 <td></td>		
Address of Operator	Lompany	. <u></u>	<u></u>		9. Pool same or	Form C-103 Revised 1-1-89 27286 1 Lease STATE FEE Lease No. Unit Agreement Name Unit Ag	
P.O. Box 5270	Hobbs,	<u>New Mexico</u>	88241	<u> </u>	Illinois	Camp Morr	ow-North
Unit Letter M	. 990	Feet From The	West	Line and 6	i60 Feet Fm	m The Sout	h ı.
Section 30		Township 1/S	Ri 00 (Show whether	unge 2/L DF, RKB, RT, GR, etc.)	NMPM		
			635' GR	•	<u> </u>	<u> </u>	
	Check Ag	propriate Box	to Indicate	Nature of Notice,	Report, or Othe	r Data	
NOTICE		NTION TO:		SU	IBSEQUENT I	REPORT OF	5
RFORM REMEDIAL WOF	як 🔲	PLUG AND AB	ANDON	REMEDIAL WORK		ALTERING CAS	SING [
PORARILY ABANDON		CHANGE PLAN	a 🗌	COMMENCE DRILLI	NG OPNS.	PLUG AND AB	
LL OR ALTER CASING							
HER:	•			OTHER:			· [
Describe Proposed or Com work) SEE RULE 1103.	pleted Operation	us (Clearly state all p	ertinent details, as	l nd give pertinent dates, inc	cluding estimated date of	of starting any prop	osed
3/19/93 T.D. flush joint li	6" hole (ner. Hun 5% salt Top of	9 10,060'. 1g liner 0 1 + 5% Halad liner 0 84:	Ran logs 0,057' KB 22-A + 5% 39' KB. R	and 37 jts. of . Howco cemer CFR-3. Plug ig released @	new 11.35#, ited w/225 sk down to 10,0 3:00 p.m. 03	N-80, 4-1, s. of Clas 12' @ 6:15 /20/93	/2" S
p.m. 03/19/93.							
p.m. 03/19/93.			:				
p.m. 03/19/93.			•				
p.m. 03/19/93.			!				
p.m. 03/19/93.							
p.m. 03/19/93.			:				
р.m. 03/19/93.							
p.m. 03/19/93.	n above is true and	I complete to the best of	my knowledge and	belief.		02//	PEE PEE
p.m. 03/19/93.		1 complete to the best of	my knowledge and	belief. LB Drilling S	upt.	Form C-103 Revised 1-1-89 0. 15-27286 ype of Lease STATE FEE t Gas Lease No. 9-4 fe or Unit Agreement Name k Bluff "36" State or Wildcat is Camp Morrow-North From The South Line County form The South Line County her Data FREPORT OF: ALTERING CASING PLUG AND ABANDONMENT Luc of starring any proposed #, N-80, 4-1/2" sks. of Class ,012' @ 6:15 03/20/93 DATE 03/22/93 SS 5 TELEPHENTE NO. 39 3 - 59	
heroby certify that the information konature Rill YPE OR FRENT NAME B	State of New Mexico Energy, Minerals and Natural Resources Department Definition NM 8620 P.O. Box 2088 Santa Fe, New Mexico 87:04-2088 VIEL API NO. 30-015-27266 NM 8620 Santa Fe, New Mexico 87:04-2088 Santa Fe, New Mexico 87:04-2088 Santa Fe, New Mexico 87:04-2088 NM 8740 LiAK 3:4 199.5 Santa Fe, New Mexico 87:04-2088 Santa Fe, New Mexico 87:04-2088 Santa Fe, New Mexico 87:04-2088 ND REPORTS ON WELLS O. C. D. Santa Fe, New Mexico 86:041 Santa Fe, New Mexico 86:041 Fee Form Te Offic Company Ortus Chalk Bluff "36" State 11 Company New Mexico 88:241 1111inois Camp Morrow-North 120 Hobbs, New Mexico 88:241 1111inois Camp Morrow-North 11 Company New From Te West Like and 660 Fee From Te South 6 Townigh 17S Range 76K, R. C. R. RC. Nofm Camp 120 Hobbs, New Mexico 88:241 1111inois Camp Morrow-North Camp 121 Company New From Te SUBSEQUENT REPORT OF South 126 OF INTENTION TO: SUBSEQUENT REPORT OF PLUG AND ABANDON PLUG AND ABANDON PLUG AND ABANDON 05° And Dege Plans Ortus Cament and e	22/93 5 = 5 343 - 59					
Date: 3 Code 3 Appropriate The difference of the diff	22/93 5 - 5 <u>3 4 3 - 5</u> 1 1993						
p.m. 03/19/93. sereby certify that the informatio DNATURE TPE OR FRONT NAME Bia space for State Use) FROVED BY	ORIGINAL MIKE WIL SUPERVIS	I complete to the best of ice ise SIGNED BY EIAMS iOR, DISTRICT	/ my knowledge and mm	beid. LB Drilling S	upt.	DATE03/2 TELEPHONE NO APF DATE	22/93 5 = 5 <u>39 3 - 5</u> 8 pm 5 1993

ł

SEC 36 THIN 17 REE 27	• 1 •	APT # 30-015-27286
OPERATOR MENBONRAE OF LO		
WELL NAME CARLY ALWEF 36 ST #		
STATE OCD TOPS AS PER		DATE 4-23.93
Southeastern New Mexico		Northwestern New Mexico

8327 T. Perm. T.-Anhy T. Qia Alama _ T. Canyon. 8210 T. Perm. C. T. Kintand-Fruidand Sair _ T. Smarwa -9380 T. Penn. D'-3. Sait T. Amira-T. Pictured Cliffe T. Lendville 10040 T. Cliff House C. Yates_ 328 T. Miss -T. Madison T. Dermian _ T. Menefee C. 7 Rivers 464 T. Elbert T. Silmin _ T. Prime Locicone C. Queen 1018 T. McCracken. T. Mancre 1360 C. Graybury_ T. Montya -T. Ignacio Otzae_ . T. Gailmy ____ **C.** S T. Simoson ____ 1785 Indices T. Granine F. Ginner 3155 Base Greening T. McRee Τ._ T. Ellenburger. T. Dairona L. Paddocir Τ. T. Blinebry T. Gr. Wash T. Montison T. Deizware Sand T. T. Todilin T. Tubb 4025 T. Bone Springs T. Ennada T. . T. Drinkard 4855 T. Motern La 9494 T. T. Wingare T. Aba 5120 25 9674 T. T. Chinie 1 T. Walfcamp 6702 τ.__ T. Permain Τ. T. Penn 8210 Ť. T. Penn "A" T. T. Cisco (Bough C) OIL OF GAS SANDS OF ZONES No. 3. from No. 1. from. No. 4. from. 101 No. 2. from 1 IMPORTANT WATER SANDS Include data on rate of water inflow and elevation to which water rose in hole. feet. No. 1. from 10..... _____ feet No. 2. from **m**. feer No. 3. from

REMARKS :



RECEIVED

APR 1 5 1993

C. L D.

T.D.

6415' - 2 3/4°

6915' - 1 3/4°

7322' - 1 12/° 7824' - 1 1/4°

8274' - 1 1/4°

8702' - 1 1/2° 8973' - 1 1/2°

9289' - 1 1/2°

9388' - 1 3/4°

9833' - 2 1/2°

10060' - 2 1/2°

March 19,1993

Mewbourne Oil Company P.O. Box 5270 88240 Hobbs, N.M.

RE: Chalk Bluff "36" State #1

Gentlemen:

The following is a Deviation Survey on the above referenced well located in Eddy County, New Mexico.

5411' - 3°

5505' - 3°

5693' - 3°

5882' - 3°

5976' - 4°

6039' - 4°

6070' - 4°

6195' - 4°

6320' - 3° 5 7 3

5599' - 2 1/2°

5787' - 2 1/2°

6132' - 3 3/4°

6258' - 3 1/4°

424'	- 3/4°	4197' 2 3/4°
920	- 3/4°	4290' - 2 3/4°
1391'	- 10	4384' - 2 1/2°
1891'	- 1 1/4°	4477' - 2 3/4°
2396'	- 1 3/4°	4572' - 2 1/2°
2600'	2 1/4°	4664' - 2 1/4°
2779'	- 2°	4758' - 2°
31931	$-13/4^{\circ}$	4851' - 2 1/2°
3688'	- 2 1/2°	4943' - 3 1/4°
3814'	- 2 3/4°	5036' - 3°
39071	- 2 3/4°	5129' - 3 1/4°
4001	- 2 1/2°	5223' - 3°
4096	- 2 3/4°	5317' - 2 3/4°

)



Contracts manager STATE OF NEW MEXICO)

COUNTY OF CHAVES

The foregoing was acknowledged before me this 19th day of March 1993 by Gary W. Chappell.

MY COMMISSION EXPIRES

NO.

NOTARY PUBLIC

October 07, 1996

DISTRICT II P.O. Drawer DD, Artesia	L, NM 88210	Santa Fe	, New Mexi	co 87504	2088		5. Indicate Ty	rpe of Lease S.		FEE
DISTRICT III 1000 Rio Brazos Rd., A	ziec, NM 87410			APR	1519	93	6. State Oil & E-379-	: Gas Lease 4	No.	
WELL C	OMPLETION OF	RECOMPL	ETION REP	ORT	100					
Ia. Type of Well: OIL WELL	GAS WELL	DRY	OTHER				7. Lease Nam	e or Unit Ap	greement N	lame
b. Type of Completion:							Cha]k	Bluff "	'36" S	tate
WELL X OVER	DEERPEN	Max []	RESVR 075				8 Well No			
Mewbourne ()il Company			<u> </u>			1			
3. Address of Operator	270 Hobbs I	New Mexico	88241				9. Poolname N. Ill	or Wildcau ino is C	amp Mo	orrow
4. Well Location	<u>n 000</u>		West			660			South	h
Unit Letter _	<u>M_: 990</u>	Feet From The	West	Ľ	ne and	000	Feet P	rom The	5000	Line
Section 36		Township]	7S	Range 2	7E	NM	PM	R ato 1	Eddy	County
02/02/93	03/17/93	03/	30/93	P700.)	3650	KB 30	35' GR	K, E IC.)	363	5' GR
15. Total Depth	16. Plug Back 1	r. D .	17. If Multiple Many Zones	Compt. How	18.	Intervals Drilled By	Rotary Tool	5	Cable Too	ala
19. Producing Interval(s),	of this completion - T	op, Bottom, Nam	8	<u>6.,</u>			2	0. Was Dire	ctional Sur	ivey Made
9842'-9886'	Lower Morro	<u>w</u> w					The West	Yes		
SDL-DSN_DL	L-MSFL-GR.S	onic. CBL			<u>.</u>		22. W15 WC	<u>No</u>		
		CASING R	ECORD	Report all	strings	set in v	vell)			
CASING SIZE	WEIGHT LB/	T. DEP	TH SET	HOLE S	ZE	CEN	ENTING R	ECORD	AM	OUNT PULLED
<u> </u>	$\frac{40 \# / f l}{36 \# / f t}$		2603'	12-1	/4"	1150 s	x. Class	s "C"	Circ	culated
	26#/ft.		9253'	8-3	/4"	1620 s	x. Class	s "H"	Circ	culated
	·		· · · · ·							
24.		LINER RECC	ORD			25.	<u></u> TU	BING RE	CORD	
4-1/2"	8439'	BOTTOM	225 SX	ENT S	CREEN	2-7/8	SIZE -2-3/8"	9803	SET	PACKER SET 9702
					1000					
	ru (interval, size, a		_	DE	ACID, PTH INTE	SHUT, I	AMOU	T AND KI	ND MATE	EEZE, ETC.
9842'-9856 9864'-9886	' 14' 4 spi ' 22' 4 spi	r 49 hole F 80 hole	!S !S					••	•	
	·						· · · · ·		•	
28. Date First Production	Pro	fuction Method (PRODUC Flowing, eas lift.	TION	and type	(pump)		Well Stat	us (Prod. o	or Shut-in)
03/30/93	F	lowing						Produ	cing	
Date of Test 03/31/93	Hours Tested 24 Hours	Choke Size 1/4"	Prod'a For Test Period	0-1 - 1 0	с . 1	Gas - MC 1500	r ₩)	aler - Bbl. ()	150	J MCF/BBL
Flow Tubing Press.	Casing Pressure	Calculated 24 Hour Rate	- 011-Boh.	Ga	- MCF	Wat	er - BbL	Oil Grav	vity - API -	- (Corr.)
1500#	Packer Id, used for fuel. venter	L etc.)	1 10	I	1500		Test Wit	tnessed By	55.0	
29. Disposition of the 130			<u> </u>				Eric	ck W. N	lelson	
Sold										
Sold 30. List Artschments										

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled r deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special lests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico

Northwestern New Mexico

T. Anhy		T. Canvon 8328'	T. Ojo Alamo	T. Penn. "B"
T. Salt		T. Strawn 8822'	. T. Kintland-Fruitland	T. Penn. "C"
B. Salt		T. Atoka 9380'	T. Pictured Cliffs	T. Penn. "D"
T. Yates	328'	T. Miss 10040'	T. Cliff House	T. Leadville
T. 7 Rivers	464	T. Devonian	T. Menefee	T. Madison
T. Oueen	1007'	T. Silurian	T. Point Lookout	T. Elbert
T. Gravburg	1322'	T. Montova	T. Mancos	T. McCracken
T. San Andres	1784'	T. Simpson	T. Gallup	T. Ignacio Otzte
T. Glorieta	3164'	Т. МсКее	Base Greenhorn	T. Granite
T. Paddock		T. Ellenburger	T. Dakota	T
T. Blinebry		T. Gr. Wash	T. Morrison	T
T. Tubb	4028'	T. Delaware Sand	T. Todilto	T
T. Drinkard	4870'	T. Bone Springs	T. Entrada	T
T. Abo	5120'	T. Morrow Line 9494	T. Wingate	T
T. Wolfcamp	6706	T. Morrow Clastics9674	T. Chinle	T
T. Penn	82081	Т.	T. Permain	T.
T. Cisco (Bough C)		T	T. Penn "A"	T
		OIL OR GAS S	ANDS OR ZONES	•
00/01		00501		

No. 1, from	No. 3, from

IMPORTANT WATER SANDS Include data on rate of water inflow and elevation to which water rose in hole.

No. 1.	from None	to	feet
No. 2.	from	to	feet
No 3	from	to	feet
110. 39			

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	То	Thickness in Feet	Lithology	From	To	Thickness in Feet	Linulogy
0'	1600'	1600'	Redbed & Anhydrite				
1600'	6700 [.] '	5100'	Dolomite Sandston				.;
6700'	8200'	1500'	Limestone & Shale				· ·
8200'	8600'	400'	No Returns		-		
8600'	9700'	1100'	Lime & Shale				
9700 <i>'</i>	9900'	200'	Sand & Shale				
9900'	10060'	160'	Shale				
			· · · ·				
. 1		le le			ł	l	

AL S

Laboratory Services 1331 Tasker Drive

Hobbs, New Mexico 88240

Telephone: (505) 397-3713

SAMPLE FOR: Mewbourne Oil Company IDENTIFICATION: Chalk Bluff 36 State #1 Attention: Mr. Jay Prudhomme COMPANY: Mewbourne Oil Co. P. O. Box 5270 LEASE: Hobbs, New Mexico 88241 PLANT: GAS (XX) LIQUID () SAMPLE DATA: DATE SAMPLED: 05-18-93 SAMPLED BY: ANALYSIS DATE: 05-18-93 ANALYSIS BY: Vickie Walker PRESSURE - PSIG SAMPLE TEMP. °F ATMOS. TEMP. "F

REMARKS:

	COM	PONENT ANALY	515	
COMPONENT		MOL PERCENT	GPM	
Hydrogen Sulfide	(H2S)			
Nitrogen	(N2)	0.41		
Carbon Dioxide	(CO2)	0.41		•
Methane	(C1)	88.13		
Ethane	(C2)	7.02	1.866	
Propane	(C3)	2.44	0.669	
I-Butane	(IC4)	0.31	0.102	
N-Butane	(NC4)	0.59	0.184	
I-Pentane	(IC5)	0.19	0.070	
N-Pentane	(NC5)	0.15	0.055	
Hexane	(C6)	0.35	0.150	
Heptanes Plus	(C7+)	0.00	0.000	-
		100.00	3.096	
BTU/CU.FT.				
AT 14.696 DR	IY	1135	MOLECULAR WT.	18.6894
AT 14.650 DRY	1	1132		
AT 14.650 WET	٢	1109	26# GASOLINE -	0.337
AT 15.025 DRY	1	1161		
AT 15.025 WE1	F ^{ra} a	1166		
SPECIFIC GRAVIT	Y			
CALCULATE MEASURE	D D	0.645		

MEWBOURNE OIL COMPANY Chalk Bluff 36 State, Well #1 36-17S-27E Eddy County, New Mexico 5-18-93



Q MCF/DAY

)

Submit in duplicate to appropriate district office See Rule 401 & Rule 1122

OIL CONSERVATION DIVISION

P.O. Box 2088 Santa Fe, New Mexico 87504-2088



MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

Opera	MEWBOUI	RNE (DIL CO	MPANY					Lease of	r Unit Name C	HALK	BLUFF	36 STAT	E
Туре	Test X Initial			Annual		al			Test Da 5-1	8-93		Well	^{vo.} 1	
Com	pletion Date 3-18-93	3	Total	Depth 10060	_	Plug Bac	6089		Elevatio	° 3635		Unit L	6-175-27	E - Rge.
Csg.	Size	WL.	d	Set A	u	Perforatio	ons:					County	y	·····
	$4\frac{1}{2}$	11.6	50 4.	052 10	012	From:	9842		To: 9	856			EDDY	
Tbg.	Size 2 3/8	^{wi.} 6.	5 2.	441 Set 8	024	Perforatio	ons:					Pool	<u></u>	
	2 7/8	4.	7 1	.91 96	88	From:	9864		To: 9	886			NORTH II	LINOIS
Туре	Well - Single single	- Brade	nhead - G	.G. or G.O. Mul	liple		Packer Se 96	588				Forma	MORROW	
Produ	tbg.	Reservo	vir Temp.	°F Mean Ann 6	ual Temp. ¶ O ⁰	F	Baro, Pre	ss - P	13.	2		Conne	ranswes	tern
^L 986	4 ^H 98	364	Gg	645 % C	⁰ ,41	%)	³ 2 .41	% H	2 ^S	Prover		Meter	Run .068	Taps Fl.g.
			FLOW	DATA	· · · ·			T	UBING	DATA	. (ASING	DATA	
NO	Prover	Ori	fice	Prese	Diff.	T	Temp	Pres		Temp	D		Terro	Duration
NU.	Line X Size	Si	76	p.s.i.g.	h,		₽F	p.s.i.		eF.	p.s.	i.g.	۹F	Flow
SI				·	<u>+</u>			2140			Pkr	<u> </u>		+
1.	3.068	X 1.	,000	425	15.00	$\overline{)}$	L05	2125				<u> </u>		60 Min
2.	3.068	X 1.	.000	425	57.00	5	90	2100			18			60 Min
3.	3.068	X1.	.750	425	38.00		82	1990			**			60 Min
4.	3.068	X 2.	.000	440	74.00		75	1800			11			60 Min
					<u> </u>					·				
			·			RATE O	FFLOW	CALCUL/	TIONS					
NO.	COEFFICIE (24 HOUI	ENT R)		h P m	Pres		Flov Fac	v Temp. nor FL	Gn	Fg.	Super Fact	Compres	is. Ra	te of Flow 2, Mcfd
1.	4.789		81.	07	438.	.2	.959	94 1.245 1.03			34	48	0	
2.	4.789		158.	04	_438.	.2	.968	30	1.245 1.0			38	94	7
3.	15.61		129.	04	438.	2	.979)5 1.245 1.0			1.0	39	255	2
4.	21.32		183.	13	453.	.2	.985	59	1.	<u>245</u>	1.0	47	501	8
5.			L			- <u>r</u>	<u> </u>			<u> 70 7.</u>				
NO.	P	Tem	p.ºR	T	Z	Gas	Liquid Hyd	rocarbon Ra	tio	02.4	19			Mcf/bbl.
1.	.654	565		1.519	.935	- A.P.	L Gravity o	of Liquid Hy	drocarbo	ns <u>)</u>	3	·		Deg.
2.	.654	550)	1.478	.929	Spec	ific Gravity	Separator (Jas	.045				
3.	.654	542	2	1.457	.926	Spec	afic Gravity	/ Flowing Fl	uud	670	XXXX		669	.095
4.	.676	535	<u> </u>	1.438	.913		cal Pressure	·	3	72		P.SJ	B 388	P.S.I.A.
5.	80 0		4791	7				audic		·	·····			R
P		P_2		• / 			n 2		1.02		(n)	p 2	_ n	2 50/
NO.	P,2		P.	P _w ²	$P_c^2 \cdot P_w^2$	· 1)	P	_ =_4	<u>4U3</u>		⁽²⁾	r	_] `=-	2.294
1.		217	2.6	4720.2	71.5	5	$P_c^2 - P$	w z			F) ² - P	'],	
2.	· · · · · · · · · · · · · · · · · · ·	215	3.7	4638.4	153.3				_				-	
3.		206	8.9	4280.3	511.4	A)F = Q	ГР	2	<u>= 18</u>	3.034			
4.		192	4.4	3703.3	1088.4			P_2	- P_2					
5.			<u> </u>							l ·				
Absolu	ite Open Flow	·	18,0	34		Mcfd	@ 15.025	Angle	of Slope	9 49	<u> </u>		Slope, n	.863
Remar	ks:6 BE	LS o	f 53	Gravity ()il Dur	ing 1	lest							
{	Calc	ulat	ed wi	th B.H.P.	Instr	ument	.s			·				
A	ved Ry Divisio			Conducted	By:			Calculated	By:	·		Checker	d By:	
- Abbio		••		PRO W	ELL TE	STERS		KS	<i></i> .			KS		
t														

+

Amit 5 Conies			State of Ne	ew Mexico			_	Form C.	104
.ppropriate District Office	En	ergy, Mir	ierals and Nati	aral Resourc	es Departm	m	الالت	ED Revised 1	i-1-89 uctions
P.O. Box 1980, Hobbs, NM 88240 DISTRICT II	0	L CO	NSERVA	TION D	IVISIO	n 4	PR15	1993	n of Pa
NU. Drawer DD, Artesia, NM 88210		Sant	I Fe, New Mr	exico 8750	4-2088		<u>C. L</u>	D.	
1000 Rio Brazos Rd., Aziec, NM 87410	REQUE	EST FOR				ZATION	. Andrije i	Ref P	
L. Operator		UTRAN	SPORT UIL	AND NAT	UHAL GA	Ver 1	PINo.		
Mewbourne Oil Company Address				<u> </u>		30-1	015-2728	86	;
P.O. Box 5270 Hobbs,	New Mex	<u>cico 8</u>	8241						
New Well X Recompletion	C Qil	Xianga in Tr	xasporter of: vy Gas		r (r sease espie	uny			
Change in Operator L_) If change of operator give name	Casinghead		andenenin [_]				<u> </u>		
					· · · ·				
Lease Name		Nell No. P	ool Name, Includi	ng Formation		Kind	f Lense		ae No.
Chalk Bluff "36" State	L		N. Illino	is Camp	Morrow	State,	KYRKAUAK IN	E-379	9-4
Unit Letter M	.:990	R	et Prom The	West_Line	and000	Fe	et From The .	South	<u></u>
Section 36 Township	<u>175</u>	<u> </u>	ange 27E	NN	(PM,	Eddy			Cour
III. DESIGNATION OF TRAN	SPORTER	OF OIL	AND NATU	RAL GAS	address to	ich annau d	com of this 4	ann is to be	
Amoco Pipeline ICT				0il Ten	der Dept	. Box 7	02068 T	ulsa, Ok	741
Name of Authorized Transporter of Casing	head Gas	•	r Day Gas 🚺	Address (Give	address to wi	ick approved	copy of this f	orm is to be ser 77251	4)
Iranswestern Pipeline If well produces oil or liquids,	Umat S	iec. T	wp. Res.	Is gas actually	x 1100 m	When	7	11251	
give location of tanks.	<u>im 13</u>	<u>36 []</u>	7 <u>5</u> 27E	<u> </u>	Yes		(3/30/93	
IV. COMPLETION DATA	Iom my ounir	ness or po	n, gwe comming:	nd other name	er:				
Designate Type of Completion	- 00	Oil Well	Gas Well	New Well	Workover	Deepen	Phug Back	Same Res'v	Diff R
Date Spudded	Dets Compl.	Ready to P	1 <u></u> rod.	A Total Depth			P.B.T.D.	I	L
<u>N2/02/93</u> Elevations (DE BKB BT GB etc.)	03/:	<u>30/93</u>	nation	Top Oil/Ges J	0.060'		The Dee	10,012	
3650' KB 3635' GR	Mor	row			9,842'		roomy wep	9,803	I
Performational 98421-98561 98641-988	6'						Depth Casia	g Shoe	
<u> </u>	π	JBING, C	ASING AND	CEMENTI	IG RECOR	D			
HOLE SIZE	CASI	NG & TUB	ING SIZE		DEPTH SET		520 54	CLACKS CEME	NT
12-1/4"	9.	<u>-5/8"</u>		1			220 27		᠂ᢅᡊ᠃
					2603		1150 s	x. Class	
8-3/4"	7	N	·····		9253		1150 s 1620 s	x. Class x. Class	<u> "J"</u>
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INSTRUCTIONS: This form is to be filed in compliance with Rule 1104 1) Request for allowable for newly drilled or deepened well must be accompanied by tabulation of deviation tests taken in accordance with Rule 111.
All sections of this form must be filled out for allowable on new and recompleted wells.
Fill out only Sections I, II, III, and VI for changes of operator, well name or number, transporter, or other such changes.
Separate Form C-104 must be filed for each pool in multiply completed wells.

District I PO Box 1980, Hobbs, NM 89241-1980

District II 811 South First, Artesia, NM 88210

District III 1000 Rio Brazos Rd., Aztec, NM 87410

District IV 2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico Energy, Minerals & Natural Resources Department

Submit to Appropriate District Office State Lease - 6 Copies Fee Lease - 5 Copies

CI

OIL CONSERVATION DIVISION 2040 South Pacheco Santa Fe, NM 87505

X AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

Mewbourne Oil Company P. O. Box 5270			14744
Hobbs, NM 88241		30 - 0	3API Number 15-27286
Property Code	sProperty Name Chalk Bluff "36" State		«Weil No. 1

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West Line	County
M	36	17S	27E		660	South	990	West	Eddy
·	l				L				

Proposed Bottom Hole Location If Different From Surface

UL, er let no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West Line	County
	eum p Ato	Proposed ka Gas Po	l Pool 1 COI				10Propos	ed Pool 2	

wWork Type Code	12Well Type Code	13Cable/Rotary	HLease Type Code	15Ground Level Elevation
Р	G	R	S	3635
16MuRiple	nProposed Depth	18Formation	19Contractor	20Spud Date
No	10060	Atoka	Key Energy Services	09-15-99

²¹Proposed Casing and Cement Program

Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
13-3/8"	48#	399	530	Surface
9-5/8"	36#	2603	1150	Surface
. 7"	26#	9253	1620	Surface
4-1/2" Liner	11.6#	10057	225	TOL @ 8439'
	Casing Size 13-3/8" 9-5/8" 7" 4-1/2" Liner	Casing Size Casing weight/foot 13-3/8" 48# 9-5/8" 36# 7" 26# 4-1/2" Liner 11.6#	Casing Size Casing weight/foot Setting Depth 13-3/8" 48# 399 9-5/8" 36# 2603 7" 26# 9253 4-1/2" Liner 11.6# 10057	Casing Size Casing weight/root Setting Depth Sacks of Cement 13-3/8" 48# 399 530 9-5/8" 36# 2603 1150 7" 26# 9253 1620 4-1/2" Liner 11.6# 10057 225

²²Describe the proposed program. If this application is to DEEPEN or PLUG BACK give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

1) Temporarily abandon Morrow perforations 9842-9856' and 9864-9886' by setting a cast iron bridge plug at 9800' and dumping 20' cement plug on top.

2) Test the Atoka Formation through perforations 9442-9446' and 9452-9464'.

3) File for commingling permit if well conditions warrant.

6" 5000 psi WP dual hydraulic BOP's will be utilized on this project. Any produced fluids will be diverted through a 5000 psi WP adjustable choke to a steel tank via 2" steel lines

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.	Ċ	IL CONSERV	ATION DIVISION
Signature: Iselan Elin	Approved By:	ORIGINAL SIG	NED BY TIM W. GUM
Printed name: Serry Elgin	Titie:	DISTRICT II DU	PERVISOR
Title: District Manager	Approval Date:	8.11.55	Expiration Date: 8-17-00

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District I PO Box 1980, Hob District II	bs, NM 88241-	1980		St Energy, N	ate of N Vinerals & Nati	lew ural Re	/ Mexico		Revise	Form C-* ed October 18, 19 Instructions on b
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2040 South Pache	co, Santa Fe, I	NM 87505		S	Santa Fe	, NA	1 87505 A			
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								Jerry Elgi	n ()	
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NEW MEXICO ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT

ADMINISTRATIVE ORDER DHC-2464

Mewbourne Oil Company P.O. Box 7698 Tyler, Texas 75711

Attention: Mr. K. M. Calvert

13141516

Chalk Bluff "36" State No. 1 API No. 30-015-27286 Unit M, Section 36, Township 17 South, Range 27 East, NMPM, Eddy County, New Mexico. Wildcat-Atoka (Gas – N/A), and North Illinois Camp-Morrow (Gas – 78890) Pools

Dear Mr. Calvert:

Reference is made to your recent application for an exception to Rule 303.A. of the Division Rules and Regulations to permit the above described well to commingle production from the subject pools in the wellbore.

It appearing that the subject well qualifies for approval for such amendment pursuant to the provisions of Rule 303.C., and that reservoir damage or waste will not result from such downhole commingling, and correlative rights will not be violated thereby, you are hereby authorized to commingle the production as described above and any Division Order which authorized the dual completion and required separation of the zones is hereby placed in abeyance.

The maximum amount of gas which may be produced daily from the well shall be determined by Division Rules and Regulations or by the gas allowable for each respective prorated gas pool as printed in the Division's Southeast Gas Proration Schedule.

Assignment of allowable to the well and allocation of production from the well shall be on the following basis:

Wildcat-Atoka Gas Pool	Oil-100%	Gas-73%	
North Illinois Camp-Morrow Gas Pool	Oil-0%	Gas-27%	78890

Administrative Order DHC-2464 Mewbourne Oil Company September 21, 1999 Page 2

REMARKS: The operator shall notify the Artesia District Office of the Division upon implementation of the commingling process.

Pursuant to Rule 303.H., the commingling authority granted herein may be rescinded by the Division Director if conservation is not being best served by such commingling.

Approved at Santa Fe, New Mexico on this 21st day of September, 1999.

STATE OF NEW MEXICO OIL CONSERVATION DIVISION

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LORI WROTENBERY Director

SEAL

LW/DRC

cc: Oil Conservation Division - Artesia / State Land Office-Oil & Gas Division

State of New Mexico Description Descripti	•							
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Section 36 Township 17s Range 27e MAPA Eddy County Information (Show whather Dr, RVB, RT, GR, etc.) "Information Show whather Dr, RVB, RT, GR, etc.) SUBSEQUENT REPORT OF: SUBSEQUENT REPORT OF: "Information Show No CHANGE PLANS County A LTERING CASING CHANGE PLANS County County Casing Status A LTERING CASING CHANGE PLANS County Casing Status REMEDIAL WORK A LTERING CASING CHANGE PLANS County Casing Status Remedial Work A LTERING CASING CHANGE PLANS County Casing Status Remedial Work A LTERING CASING CHANGE PLANS County Casing Status County Casing Status Remedial Work A LTERING CASING CHANGE Status County Status County Casing Status County Casing Status Remedial Work A LTERING CASING CHANGE Status County Status County Status County Status County Status County Status County Status County Status </td <td>Well Location Unit Letter <u>M 660</u></td> <td> Feet From The</td> <td>South</td> <td> Line and</td> <td>990</td> <td> Feet From The</td> <td>We</td> <td>est Line</td>	Well Location Unit Letter <u>M 660</u>	Feet From The	South	Line and	990	Feet From The	We	est Line
3825 GL Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data NOTICE OF INTENTION TO: SUBSEQUENT REPORT OF: REMEDIAL WORK PLUG AND ABANDON COMMENCE PRILING OF INTENTION TO: SUBSEQUENT REPORT OF: REMEDIAL WORK ALTERING CASING COMMENCE PRILING OFNS. PLIG AND MEANCONAL COMMENCE DRILING OFNS. PLIG AND MEANCONAL COMMENCE DRILING OFNS. PLIG AND MEANCONALIT CASING TEST AND CEMENT JOB OTHER: Test Atoka OTHER: Test Atoka OTHER: Test Atoka Device Proposed or Completed Openations (Clearly state all pertirent details, and give pertirent details, include statistical gestimated date of starting any proposed Acticize new Atoka perfs w/ 30,000 gals 70 Quality Foam using 10,000 lbs 20/40 Interprop. Flow test. 10-19-99Turn to sales. Thereby contify that the information above is true and complete to the best of my browledge and pelief. Sochar perfs wide w/ 30,000 gals 70 Quality Foam <td colspan="2</td> <td>Section 36</td> <td>Township</td> <td>17s F</td> <td>Range RKB, RT, GR, etc.)</td> <td>27e</td> <td>NMPM</td> <td>Eddy</td> <td>County</td>	Section 36	Township	17s F	Range RKB, RT, GR, etc.)	27e	NMPM	Eddy	County
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DTHER:	ULL OR ALTER CASING	:		CASING TEST A	ND CEME	ENT JOB		
Indexitive Proposed or Completed Operations (Clearly state all pertinent datas, and give pertinent dates, including estimated date of starting any proposed (1974) (21-99) - DOH will Tbg. 9-21-99) - Ref RLE Plow test. 10-16-99 Trice Atoka perfs will 3000 gals 70 Quality Foarm using 10,000 lbs 20/40 Interprop. Flow test. 10-16-99 Trice Atoka perfs will 30,000 gals 70 Quality Foarm using 10,000 lbs 20/40 Interprop. Flow back & clean-up. 10-19-99 Turn to sales. I hereby certity that the information above is true and complete to the best of my knowledge and bellef. I hereby certity that the information above is true and complete to the best of my knowledge and bellef. SIGNATURE Will Marker NIMYOUNG TURE SIGNATURE NIMYOUNG TELEPHONE NO 393-590 TYPE OR PRINT NAME NIMYOUNG TURE Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Michael Signature Date Signature Date Michael Signature Date Sig	OTHER:		🗌	OTHER: Test	Atoka			
9-21-99 Acidize new Atoka perfs. Perforate Atoka perfs @ 9486-84. GiH w/ Pkr & tog. 9-24-99 Acidize new Atoka perfs w/ 3000 gais 7/0 Quality Foam using 10,000 lbs 20/40 Interprop. Flow back & clean-up. 10-18-99 Turn to sales. I hereby certify that the information above is true and complete to the best of my knowledge and belief. SIGNATURE W////////////////////////////////////	Describe Proposed or Completed Operati work) SEE RULE 1103.	ions (Clearly state all pertinen	t details, and give	pertinent dates, in	cluding es	timated date of starting	any propose	d
I hereby certily that the information above is true and complete to the best of my knowledge and belief. SIGNATURE <u>WILL</u> DATE <u>11-01-99</u> SOS TYPE OR PRINT NAME <u>N M YOUN G</u> TOPE OR PRINT NAME <u>N M YOUN G</u> TRUE <u>BGM</u> (This space for State Use) APPROVED BY CONDITIONS OF APPROVAL, IF ANY:	9-21-99POOH w/ Tbg. 9-22-99Set RBP over Morrow p 9-24-99Acidize new Atoka perfs 10-18-99Frac Atoka perfs w/ 30 10-19-99Turn to sales.	verfs. Perforate Atoka p s w/ 3000 gals 7 1/2% f),000 gals 70 Quality Fo	erfs @ 9466-8 HCL adding N Dam using 10,0	14. GIH w/ Pkr 8 2 w/ Ball Sealer 000 lbs 20/40 k	& tbg. s. Swab nterprop	9 & Flow test. 9. Flow back & cle	an-up Mily RECEIN OCD - AR	ED LESIA
SIGNATURE W///// DATE 11-01-99 SOS TYPE OR PRINT NAME NM YOUN G (This space for State Use) APPROVED BY CONDITIONS OF APPROVAL, IF ANY: SIGNATURE ONLY	I hereby certify that the Information above	is true and complete to the b	est of my knowled	ige and belief.	·····	r.	<u> 2018</u>	1491
TYPE OR PRINT NAME NIM YOUNG (This space for State Use) APPROVED BY CONDITIONS OF APPROVAL, IF ANY: TITLE CONDITIONS OF APPROVAL, IF ANY: TITLE	SIGNATURE 4/1/144		TIT	LE CONSU	I have			11-01-99 505
(This space for State Use) APPROVED BY	TYPE OR PRINT NAME NMYOUN C	<u>.</u>	, 				TELEPHONE	No 393-540
CONDITIONS OF APPROVAL, IF ANY:	(This space for State Use)	m W. Sus	36Х мт	LE Distr	ict 5	upervisor) Date _	11-5-99
	CONDITIONS OF APPROVAL, IF ANY:							
		•		· .				

Submit to Appropriate		_	St	ate of New	Mexico	0				C17	₹, ₩ ₹, ₩	ĨM.d	Form	C-105
State Lease - 6 copies Fee Lease - 5 copies		Energy	, Minerals a	nd Natura	l Resou	irceș D	epartm e	nt				ςγ.		eq 1-1-69
DIS <u>TRICT </u> Nox 1980, Hobbs, N	IM 88240	OIL	CONSI	ERVAT	ION	DIV	ISIOI	N	WE 30	LL API N)-015-27	0. 286			
<u>dict II</u>	NM 98210		204 Sai	10 Pacheo nta Fe,	o St. NM	87505			5.	Indicate T	ype	of Lease	17	
DISTRICT III 1000 Rio Brazos Rd, Az	tec, NM 87410			161	11819	2027 <u>2</u>	star in		6. F	State Oil 8 379-4	s Ga	s Lease M	No.	/ FEE [_]
WELL CO	MPLETION O	RREC	OMPLETI	ON REPO			5 DC	<u>, </u>				~~- V I	k e ser e	
1a. Type of Well: OIL WELL	GAS WELL	. XI		OTHER O	RECI				7.1	.ease Nam	e or t	Unit Agree	ment Nan	ne
b. Type of Completion: NEW WORK WELL OVER	DEEPEN	PLUG J BACK		SVR COOTH	СД . А, нак	RTESIA			c	halk Bluf	f"36	" State		
2. Name of Operator			÷	- X	2978	245	New York (* 19 24		8.1	Vell No.				
3. Address of Operator	inpany			<u></u>					9. F	ool name	or Wi	Idcat SE	E Los	an Draw
P. O. Box 5270, Ho	obbs, NM 88241	I								idcat At	oka	Gas Poe	* -	ALOKA
4. Well Location Unit Letter	<u>M 660</u>	Feet	From The	Sou	th	Lin	e and		990	Fee	t Fror	n The	W	est ` Line
Section	36	Town	ship 17	7S	Range	2	7E		NMP	۸	_		Edd	y County
10. Date Spudded	11. Date T.D. Reach	ed	12. Date Cor	npl. (Ready to /QQ	o Prod.)	T	13. Elevat 3635' C	ions R	(DF & I	RKB, RT, G	SR, el	k.)	14. Elev	Casinghead 3635'
15. Total Depth	16. Plug Bac	k T.D.	1	7. If Multiple	Compl. H	low	18.1	nterv	als	Rotary To	ols	<u>ا</u> 1	Cable T	pols
10060'	of this completion - 7	9780' San Betta	m Alama	Many Zon		NA		M1600	. Бу		$\frac{X}{120}$	Was Dir	ectional	Survey Made
9466-9470' & 947	6-9484', Atoka										20.		No	
21. Type Electric and Oth DIL	er Logs Run									22. Was V	Vel) C	ored	No	
		CAS	SING RE	CORD	Repo	rt all s	trings	se	in w	ell)				
CASING SIZE	WEIGHT LB	/FT.	DEPTH	SET	НС	LE SIZ	E		CEN	ENTING	REC	ORD	AN	None
9-5/8"	36#		260)3 .		12-1/4"			11	50 sks C	lass			None
7"	26#		925	53'		8-3/4"		•	16	20 sks (lass	H	_	None
24.		LINE	R RECOP	RD				_	25.	T	UBI	NG RE	CORD	
SIZE 4-1/2"	8439'	<u>BO</u>	TTOM	SACKS CE	MENT	SCI	REEN	-+		51ZE 2-3/8"	+	DEPTH 940	<u>SET</u> 7'	9407
								1						
26. Perforation record	(interval, size, and	number) holos totol			27. A	CID, SH	10.	<u>r, FR</u>	ACTUR	E, C	EMEN	T, SQL	JEEZE, ETC.
9400-9464 , 0.44	entry note diame	iler, 50 l				UEP	466-94	84'	L	Fractu	re st	imulated	with 10	000# IP 20/40
								<u> </u>						
28.			P	RODUC	стю	N					.			
Date First Production 09/24/99	Flow	Productio	n Method (Flo	wing, gas lift,	, pumping	g - She a	nd type pi	ump)				Well St	atus (Pro Proc	od. or Shut-in) lucing
Date of Test 10/18/99	Hours Tested 24	C	noke Size 24/64"	Prod'n Fo Test Peri	od	Oli - BbL 2		G	317		Wat	ber - BbL. 2		Bas - Oll Ratio 158500
Flow Tubing Press.	Casing Pressure	C	alculated 24- our Rate	Oil - BbL		Ga	s-MCF 317		Water	- BbL.		Oil Grav	ity - API -	· (Corr.)
29. Disposition of Gas (Se	old, used for fuel, ver	nted, etc.)					<u> </u>			Test	Witne	ssed By		
Sold 30. List Attachments				· · ·	<u> </u>	<u> </u>				Mr.	Mille	er	:	<u> </u>
I hereby certify that th	e information shown	on both s	ides of this fo	m is true and	i complet	e to the L	est of my	knov	vledge	and belief			· ·	
Signature	Asny Di	e-		Printed Je	rry Elgi	n <u>.</u>		<u></u>	Title	District	Mai	nager	Da	te 10/19/99
0	00													• · · · • • • • • • • • • • • • • • • •

District II 811 South Fin	Hobbs, i st, Artesk	NM 88241-1980 a, NM 88210	1	Sta Energy, Miner OIL CONS	ite of New Mi als & Natural Resou SERVATION	exico rces Department N DIVISIO	N Subar	Revised In No Approp	Form (October 18, structions on riate District (
District IV	:09 Rd., /	Aztec, NM 87410)	20 Sa	40 South Paci anta Fe, NM 87	neco 7505	<u>v</u>	153	5 C
2040 South Pr	actusco, S	REQUES	T FOR A	LLOWABL	E AND AUT	HORIZAT	ION TO TRA	WSPOR	T
Mewbourn	e Oli Ci	ompany	¹ Operator n	me and Address				² OGRID Nu 14744	mber
P. O. Box S Hobbs, NM	5270 A 8824	1			÷			Reason for File	ng Code
			э					Plug Back	
4A 30 - 0 15	PI Numt	xer (TARKA SA	ka One Basi (Pool Nam	•	·	0	Pool Code
7Pi	roperty C	ode			Property Nar	aw: Airl	in se	-1-10	*Well Number
	7871		Chalk Bluff	"36" State		<u> </u>			1
)). 10 <u>(</u>	Surfac	ce Location	n I Renne	T Lat Ida T	Fact from the	I Marth Carthol	an I Cash barra Mar	I manada a f	
M	38	175	27E	Locian	660	South	990	West	ne County Eddy
11	Botto	m Hole Lo	cation	· · · · · · · ·		1		· · · · · · · · · · · · · · · · · · ·	
UI or lot no.	Section	n Township	Range	Lot Idn	Feet from the	North/South L	ne Feet from the	East/West B	ne County
12 Lse Code	13 Prot	fucing Method C	ode ¹⁴ Gan	Connection Date	¹⁶ C-129 Perm	iit Number	¹⁶ C-129 Effective	Date	C-129 Expiration
		Flowing	I	10/24/94					••••
III. Oil a	nd Ga	is Transpo	orters						
³⁰ Transpor OGRID	ter		¹⁹ Transporter r and Addres	izme S	Del∝	D 210	G	²² POD ULSTR and Descri	Location ption
13864(8	Amoco Pipeli Tulsa, OK	ne Company	,	19238	10 C			·· .
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000990)	Transwestern Houston, TX	1 Pipeline Co	mpany	28195	23 G		HECO	19. 19
91 - 1969 - 19 79	2 ° 1 1908 7 1 1							UCD 4R	VED TESIA
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								5.9 2000	; ;
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IV. Prod	uced \	Water							
20 p 192	'OD 3850				*POD UL	STR Location an	d Description		
V Well	Come	Letion Dat	<u> </u>						<u> </u>
2 ³ Spur	d Date	10001 200	Ready Date	i	TO	#PBTD	28 Perfor	ations	SOHC, DC, M
02/0	3/93		09/24/99	1	10060	9780	9466-9	484'	
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VI. Wel	6-1/8 Test	Data						essure	⁴⁰ Cag. Pressu Parker
VI. Wel	6-1/8 I Test	Data *Ges (Delivery Date	²⁷ Test D	nte 1	* Test Length 24 hours	* Tbg. Pri	: · [
VI. Wel * Date N 09/24 41 Choke	6-1/8 Test ww Oil /99	Data ³⁴ Ges 1 09	Delivery Data 0/24/99 ⁴² Oli	³⁷ Test D 1.0/18/ ⁴³ Wate	nte 3 199 Vr	*Test Length 24 hours 44 Gas	45 AO	; ` F	44 Test Metho
VI. Wel ³⁹ Date N 09/24 ⁴¹ Choke 24/6	6-1/8 I Test Iw Oil I/99 Size 34"	Data ³⁴ Gas I 09	Delivery Dete 0/24/99 ⁴² Ol 2	³⁷ Test Di 10/18/ ⁴³ Wate 2	nto 1 199 Vr	* Test Length 24 hours * Gas 317	45 45 45	5 · · · · · · · · · · · · · · · · · · ·	4 Test Metho Sold
VI. Wel ³⁹ Date N 09/24 ⁴¹ Choke 24/6 ⁴⁷ I hereby co compiled w to the best Signature:	6-1/8 I Test iew Oil 1/99 I Size 34" rttly that ifth and th of my kn	Data ²⁶ Gas 08 the rules of the 4 hat the informati rowledge and be <i>P()</i>	Delivery Dato 3/24/99 ⁴² Ol 2 Oli Conservatio ion given above def.	³⁷ Test Di 1.0/18/ ⁴³ Wate 2 n Division have be- is true and comple	ate 3 99 en ste Approve	* Test Length 24 hours 44 Gas 317 OIL ORIGI d by: BAST	CONSERVAT	F ION DIVI: IV TIM W.	4 Test Metho Sold SION GUM
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VI. VVel ²⁹ Date N 09/24 ⁴¹ Choke 24/6 ⁴⁷ I hereby ce complied w to the best Signature: Printed name	6-1/8 I Test lew Oil //99) Size 34" rttly that with and th of my Im //599 //50 //599 //599 //599 //599 //599 //509 //599 //50 //50	Data Second DB DB The rules of the 4 frat the informati sovietige and be by Elows Figin	Delivery Data 3/24/99 4ª01 2 Oli Conservatio for given above dief.	³⁷ Test D 10/18/ ⁴³ Wate 2 n Division have be is true and comple	ata 3 99 en en bbo Approve Tilis: Approva	* Test Length 24 hours 4 Gas 317 OIL 0RIGI 0HSTF	CONSERVAT NAL SIGNED E		4 Test Metho Sold SION GUM BLC
VI. Wel ³⁹ Date N 09/24 ⁴¹ Choka 24/c ⁴⁷ I hereby co compiled v to the best Signature: Printed name Title: Distri Date: 10	6-1/8 II Test In Test	Data Sa Gas DS DS DS DS DS DS DS DS DS DS	Delivery Data 3/24/99 42 Oll 2 Oll Conservatio for given above dief. Phone:	³⁷ Test D 10/18/ ⁴³ Wate 2 n Division have be- is true and comple 505-393-59/	ate 3 99 vr en ate Approve 7itie: Approve 05	* Test Length 24 hours 4 Gas 317 OIL 0RHGI 0HSTF	CONSERVAT NAL SIGNED E HET II SUPERN	5 F ION DIVI IV TIM ₩. NBOR	4 Test Metho Sold SION GUM

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5	Z(est)	0.809	0.793	0.815	0.799	0.824	0.807	0.835	1 0.819		1.720 -	*!!
6	TZ	469.9	460.5	473.7	464.1	478.5	468.9	485.3	476.0	1 AOF= 0	0 528	*11
7	GH/TZ	13.901	14.185	13.790	14.074	13.650	13,929	13.458	1 13.724	1	0 551	*!!
8	eS	1.684	1.702	1.677	1.695	1.668	1.686	1.656	1.673	1	0.535	*
9	1-e-S	0.406	0.413	0.404	0.410	0.401	0.407	0.396	0.402		0.532	- *
10	Pt	1332.2	1332.2	1262.2	1262.2	1178.2	1178.2	1068.2	1068.2			*11
11	Pt2 /1000	1774.8	1774.8	1593.1	1593.1	1388.2	1388.2	1141.1	1141.1			.*[]
12	Fr	0.018231	0.018231	0.018231	0.018231	0.018231	0.018231	0.018231	0.0182311	1		*!!
	-FrTZ	8.567	8.395	8.636	8.462	8.724	8.549	8.848	8.677	1		*
	cQm	0.76	0.75	1.35	1.32	1.85	1.81	2.44	2.39	İ		*
15	L/H(FcQs)	0.6	0.6	1.8	1.7	3.4	3.3	6.0	5.7	*		*]]
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17	Pw2	1775.0	1775.0	1593.9	1593.9	1389.5	1389.5	1143.4	1143.4			*
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State of New Mexico

Energy, Minerals and Natural Resources Department

Submit in duplicate to appropriate district office [°]ce Rule 401 & Rule 1122

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

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NEW MEXICO ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION DISTRICT II ARTESIA 811 S. FIRST ST. ARTESIA, NM 88210 (505) 748-1283 FAX (505) 748-9720

Jennifer A. Salisbury CABINET SECRETARY

January 28th, 1999 2000

Mewbourne Oil Company P.O. Box 5270 Hobbs, NM 88241

Re: Well Placed In Pool

Gentlemen/Madams:

As the result of Division Order 11300, the following described gas well has been placed in the pool shown below. This change in nomenclature has been made in our files. Please change your records to reflect the proper pool name. All subsequent reports must show this nomenclature until further notice.

Logan Draw; Atoka, Southeast Gas Pool Chalk Bluff '36' State #1 Unit M, Section 36, Township 17 South, Range 27 East, NMPM Poolcode: 96979

Transporters are advised by copy of this letter, to change their records to reflect the pool name as established by this order, effective October 1, 1999.

Sincerely,

upm Anus

Bryan Arrant District Geologist

Cc: Amoco Pipeline Company Transwestern Pipeline Company Santa Fe Mae Well File

OIL CONSERVATION DIVISION - DISTRICT II ARTESIA - 811 S. FIRST ST. -Artesia, NM 88210 (505) 748-1283 FAX (505) 748-9720

District I PQ Box 1960, Hobb	os, NM 88241-	1980		Sta Energy, Mir	te of New		nent	•••	R	evised Oc	Form C-101 tober 18, 1994	CISE
District II 811 South First, Art	esia, NM 8821	10		37, 1				Suba	nit ta A	Instru	Clions on back	KL
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if results v	varrant. M	lewbourne	Oil Com	bany would	d like to test the	Wolfcamp (D +/-7	7200'.	•		·	` ·
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During op	erations o	of plugback	: & testing	g, a 7 1/16	x 3000 psi BO	P w/ 2 3/8"ra	ms &	blinds will be u	sed.			
²³ I hereby certify	that the info	mation give	n above is f	rue and com	plete to the	Bin ~			TIO			-
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Printed name: N.M. Young)	Title:	
Title: District Manager	Approval Date: AUG 2 9 2001	Expiration Date: ABG 2 9 2012

Submit to Appropriate District Office State Lease - 4 copies Fee Lease - 3 copies

DISTRICT I Box 1980, Hobbs, NM. 82240

ICT II Jrawer DD, Artesia, NM 88210

DISTRICT III 1000 Rio Brazos Rd., Aziec, NM 87410

State of New Mexico rgy, Minerals and Natural Resources Departur

OIL CONSERVATION DIVISION P.O. Box 2088

Santa Fe, New Mexico 87504-2088

WELL LOCATION AND ACREAGE DEDICATION PLAT All Distances must be from the outer boundaries of the section

perator	i		Lette	•			Well No.
MEWBOLIENE	OTL COMPA	NY	CH	ALK BLIFF	36 STATE		1
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<u> </u>		-		inois Camp	Morrow Nor	tn	<u>320 Acres</u>
1. Outline	s the acreage dedic	ated to the subject well by	colored pencil or hach	ure marks on the	plat below.		
2. If more 3. If more writiza	e than one lease is than one lease of tion, force-pooling Yes	dedicated to the well, out different ownership is do , etc.?	ins each and identify th ficated to the well, hav	the ownership there the interest of all	of (both as to workin I owners been consol	ng interest and r idated by comm	oyalty). xunitization,
If answer	is "no" list the ow	mens and tract description	which have actually b	ees consolidated.	(Use reverse side of	011	······
this form	if neccessary.					•	
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or until a	non-standard unit,	eliminating such interest,	has been approved by	the Division.			
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District Office	Ene Minerals and Natural Reso	co ources Department	CISI	Revised 1-1-89
DISTRICT 20. Box 1980, Hobbs, NM 88240	OIL CONSERVATION	N DIVISION	WELL API NO.	· · · · · · · · · · · · · · · · · · ·
TRICT II O. Drawer DD, Artesia, NM 88210	Santa Fe, NM 8750	05	30-015-27286 sIndicate Type of Lease	
DISTRICT III 1000 Rio Brazos Rd., Aztec, NM 87410			State Oil & Gas Lease No.	
SUNDRY NOT (DO NOT USE THIS FORM FOR PR DIFFERENT RESE (FORM (FICES AND REPORTS ON WELLS OPOSALS TO DRILL OR TO DEEPEN OF RVOIR. USE "APPLICATION FOR PERMI C-101) FOR SUCH PROPOSALS.)	S R PLUG BACK TO A IT"	Lease Name or Unit Agree Chalk Bluff 36 State	ement Name
Type of Well: OIL GAS WELL WELL	OTHER			
Name of Operator Mewbourne Oil Company			sWell No. 1	
Address of Operator PO Box 5270, Hobbs, New Mexic	co 88241		Pool name or Wildcat Logan Draw Atoka	
Well Location	Feet From TheSouth	Line and990	Feet From The	West Line
Section 36	Township 17S Ran	nge R28E	NMPM E	ddy County
	dElevation (Show whether DF, RK 3635' GL	B, RT, GR, etc.)		
11 Check A	ppropriate Box to Indicate Natu	ire of Notice, Re	port, or Other Data	
NOTICE OF IN	ITENTION TO:	SUBS	SEQUENT REPO	RT OF:
	PLUG AND ABANDON	REMEDIAL WORK	AL	TERING CASING
EMPORARILY ABANDON	CHANGE PLANS	COMMENCE DRILLING O	PNS. PLL	IG AND ANBANDONMENT
COR ALTER CASING	[c	ASING TEST AND CEME		* and an *
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DTHER:		OTHER: <u>PB Atoka. Test</u>	& plug off Canyon. Test & f	Produce Wolfcamp X
DTHER:	ns (Clearly state all pertinent details, and give pe 1/2" CIBP & set @ 9400'. Dump 35' ca 28-72' (12'. 2 spf. 24 holes). Acidize wa	DTHER: <u>PB Atoka. Test</u> entinent dates, including es ement on plug. New / 2100 gals 20% Ne-	& plug off Canyon. Test & f timated date of starting any p PBTD @ 9365'. Test to Fe & ball sealers. Swab	produce Wolfcamp X roposed 0 1000 psi. OK. 0 test.
DTHER: DTHER: Describe Proposed or Completed Operatio work) SEE RULE 1103. 6/28/01 POOH w/ tbg. RIH w/ 4 Perforate Canyon @ 85 7/05/01POOH. RIH & set 7" RB (29'. 2 spf. 58 holes). Gli	ns (Clearly state all pertinent details, and give pe 1/2" CIBP & set @ 9400'. Dump 35' co 28-72' (12'. 2 spf. 24 holes). Acidize w/ P @ 8300'. Load & test to 1000 psi. Of H w/ tbg. Acidize perfs w/ 5000 gals 20	OTHER: <u>PB Atoka. Test</u> Infinent dates, including est ement on plug. New / 2100 gals 20% Ne-I K. New PBTD @ 830 % Ne-Fe & ball seale	& plug off Canyon. Test & f timated date of starting any p PBTD @ 9365'. Test to Fe & ball sealers. Swab 00'. Perforate Wolfcam ers. Swab test.	Produce Wolfcamp X roposed 0 1000 psi. OK. 0 test. p @ 7164-7277'
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DTHER:	ns (Clearly state all pertinent details, and give pe 1/2" CIBP & set @ 9400'. Dump 35' cc 28-72' (12'. 2 spf. 24 holes). Acidize w/ P @ 8300'. Load & test to 1000 psi. Of H w/ tbg. Acidize perfs w/ 5000 gals 20 at. Run tbg & rods & put well on product at. Run tbg & rods & put well on product	oTHER: <u>PB Atoka. Test</u> ement dates, including est ement on plug. New / 2100 gals 20% Ne- K. New PBTD @ 830 % Ne-Fe & ball seak stion.	& plug off Canyon. Test & f timated date of starting any p PBTD @ 9365'. Test to Fe & ball sealers. Swab 00'. Perforate Wolfcam ers. Swab test.	Produce Wolfcamp X roposed 0 1000 psi. OK. 0 test. 0 @ 7164-7277' 456 0 001 EIVED ARTESIA
DTHER:	ns (Clearly state all pertinent details, and give pe 1/2" CIBP & set @ 9400'. Dump 35' cc 28-72' (12'. 2 spf. 24 holes). Acidize w/ P @ 8300'. Load & test to 1000 psi. Ol H w/ tbg. Acidize perfs w/ 5000 gals 20 at. Run tbg & rods & put well on product at. Run tbg & rods & put well on product to the best of my knowledge 	and belief.	& plug off Canyon. Test & f timated date of starting any p PBTD @ 9365'. Test to Fe & ball sealers. Swab D0'. Perforate Wolfcam ers. Swab test.	Produce Wolfcamp X roposed 0 1000 psi. OK. 0 test. 0 $@$ 7164-7277' 456 > 89 A EIVED ARTESIA DATE 08-24-01
DTHER: DTHER: Describe Proposed or Completed Operatio work) SEE RULE 1103. 6/28/01 POOH w/ tbg. RIH w/ 4 Perforate Canyon @ 85 7/05/01POOH. RIH & set 7" RB (29'. 2 spf. 58 holes). Gll 7/16/01POOH w/ test equipmen 1 hereby certify that the information above is SIGNATURE	ns (Clearly state all pertinent details, and give pe 1/2" CIBP & set @ 9400'. Dump 35' ca 28-72' (12'. 2 spf. 24 holes). Acidize w/ P @ 8300'. Load & test to 1000 psi. Of H w/ tbg. Acidize perfs w/ 5000 gals 20 at. Run tbg & rods & put well on produce at. Run tbg & rods & put well on produce to the best of my knowledge TITLE	oTHER: <u>PB Atoka. Test</u> entinent dates, including est ement on plug. New / 2100 gals 20% Ne- K. New PBTD @ 830 % Ne-Fe & ball seak ction.	& plug off Canyon. Test & f timated date of starting any p PBTD @ 9365'. Test to Fe & ball sealers. Swab D0'. Perforate Wolfcam ers. Swab test.	Produce Wolfcamp X roposed 0 1000 psi. OK. 0 test. 0 7164-7277' 4 5 6 7 8 9 1001 EIVED ARTESIA DATE 08-24-01 PHONE NO. 505-393-5905
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INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all specific orsts conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true tical depths shall also be reported. For multiple completions, Items 25 through 29 shall be reported for each zone. The form is to be d in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Sou	utheastern	New Mexico		Northw	vestern	New Mexico
T. Anhy	T.	Canyon	8327.0	T. Ojo Alamo	T.	Penn. "B"
T. Salt	<u> </u>	Strawn	8820.0	T. Kirtland-Fruitland	T.	Penn. "C"
B. Salt	T.	. Atoka	9380.0	T. Pictured Cliffs	T.	Penn. "D"
T. Yates	<u> </u>	Miss	10040.0	T. Cliff House	T.	Leadville
T. 7 Rivers	464.0 T.	Devonian		T. Menefee	T.	Madison
T. Queen	<u>1008.0</u> T	Silurian	<u>. </u>	T. Point Lookout	<u> </u>	Elbert
T. Grayburg	<u>1360.0</u> T.	. Montoya		T. Mancos	T.	McCracken
T. San Andres	<u> 1785.0 </u> T.	. Simpson 🔄		T. Gallup	T.	Ignacio Otzte
T. Glorieta	<u>3155.0</u> T.	. МсКее		Base Greenhorn	T.	Granite
T. Paddock	T.	. Ellenburger		T. Dakota	T.	
T. Blinebry	T.	`Gr. Wash		T. Morrison	T.	· · · · · · · · · · · · · · · · · · ·
T. Tubb	<u>4025.0</u> T.	. Delaware Sand		T. Todilto	T.	
T. Drinkard	<u>4855.0</u> T.	. Bone Springs		T. Entrada	T.	
T. Abo	<u>5120.0</u> T.	Молоw	9494.0	T. Wingate	T.	
T. Wolfcamp	<u> </u>	·		T. Chinle	T.	
T. Penn	<u> 8210.0</u> T.	•		T. Permain	T.	
T. Cisco (Bough C	C) T.	•		T. Penn. "A"	T.	·
	•	OIL OR G	AS SAN	IDS OR ZONES		
No. 1, from	to)		No. 3, from		to
ັ ວ. 2, from	to			No. 4, from		to
		IMPO	RTANT	WATER SANDS		
Include data on	rate of water	r inflow and eleva	ation to v	which water rose in h	ole.	
No. 1, from		to		feet		
No. 2, from		to		feet		
No. 3, from		to		feet		
	LITHOLO	OGY RECOP	RD (Atta	ach additional sheet i	f necess	ary)

From	То	Thickness in Feet	Lithology	From	То	Thickness in Feet	Lithology
		· · ·					
				•			•

ubmit to Appropriate listrict Ofce											
Tate Lease - 6 copies		Energy,nera	State of New Is and Natural	Mexico Resou	rces Departme	ent			f	Form C-1(Revised 1	05 CIS
ee Lease - 5 copies <u>ISTRICT I</u> .O. Box 1980, Hobbs, N	M 88240	OIL CON	SERVAT	ION	DIVISIO	N	WELL A 30-015	PI NO. -27286			
TRICT II Drawer DD, Artesia,	NM 88210		2040 Pachec Santa Fe,	o St. NM	87505		5. Indica	te Type of Le	ase STATE	X	FEE SI
<u>STRICT III</u> 00 Rio Brazos Rd, Azt	ec, NM 87410						6. State E-379-	Oil & Gas Le 4	ase No.		· · · · · · · · ·
WELL CO	MPLETION O	R RECOMPLI	ETION REPO		ND LOG				·		
Type of Well: OIL WELL	GAS WEL			4	234567	20	7. Lease	Name or Unit /	Agreemen	t Name.	
Type of Completion: NEW WORK WELL OVER	DEEPEN	PLUG BACK		/ 3 3	A SEP ™E*		Chaik	Bluff 36 Sta	te		
Name of Operator Aewbourne Oil Cou	mpany /	· <u></u> ·			RECEIVED		8. Well N	0.			<u></u>
Address of Operator				}0(so - Artesi /		9. Pool n	ame or Wildcal	<u></u>		
O Box 5270, Hob	bs, New Mexico	88241		<u></u>			Logan	Draw Wolfo	camp		
. Well Location Unit Letter	<u>M</u> : 660) Feet From Th	e Sou	th	Line and	99	0	Feet From Th	e	West	Line
Section	36	. Township	17S	Range	-28E	N	MPM		·····	Eddy	County
0. Date Spudded 1 02/03/93	11. Date T.D. Reach 03/19/93	ned 12. Date 07	Compl. (Ready to 7/17/01	o Prod.)	13. Eleva 3635' (illions <i>(C</i> GL	л- & RKB,	K I, GR, etc.)	14.	Elev. Ca	isinghead 635'
. Total Depth 10060	16, Plug Ba	ck T.D. 8300	17. If Multiple Many Zor	Compl. H tes?	low 18.	Intervala Drilled B	s Rota y	iny Tools	Ca	ble Tools	
. Producing Interval(s), 7164-7277	of this completion -	Top, Bottom, Name						20. Wa	is Directi	onai Sur NO	vey Made
J. Type Electric and Oth CBL, DN & DLL	er Logs Run						22. V	as Well Cored	No)	<u></u>
•		CASING	RECORD	(Repo	rt all strings	s set i	n well)				
	WEIGHT L	B/FT. DE	PTH SET	нс			CEMENT	ING RECOR	Ď	AMOL	INT PULLED
13 3/8"	48#		399'		17 1/2"	 		30 sks			N/A
9 5/8	30#	······	2003		12 1/4 8 3/4"		16	20 sks			N/A
	201		0200								
						L					
		LINER REC	ORD			2	5.	TUBING	RECC		
SIZE	TOP	BOTTOM	SACKS CE	MENT	SCREEN		SIZE	DE	7252	T F	ACKER SET
4 1/2	8439	10057	225				2 1 10		1352		AC @ 7 190
5. Perforation record	(interval, size, and	d number)			27. ACID, S	HOT,	FRACT	URE, CEN	/ENT,	SQUE	EZE, ETC.
7164-7277'. 58.3	8" diameter hole	es			DEPTH INT	RVAL	AN	IOUNT AND	KIND MA	TERIAL	USED
					7164-7	277		5000 gals 2	20% Ne-	Fe&ba	all sealers
						<u> </u>			·		
			PRODUC	CTIO	N						
3.	Pun	Production Method nping, 2" x 1 1/2	1 (Flowing, gas lift " x 24'	, pumpin	g - Size and type (oump)		W	ell Statu	s <i>(Prod.</i> Produc	or Shut-in) ing
8. Date First Production 07/17/01		Choke Size	Prod'n Fo	or iodi	Oil - BbL. 88	Gas	- MCF 88	Water - 78	BbL.	Gas	- Oil Ratio 1000
8. Date First Production 07/17/01 Date of Test 07/22/01	Hours Tested	N/A							il Gravity	API - (Co	эп.)
3. rate First Production 07/17/01 rate of Test 07/22/01 low Tubing Press. N/A	Hours Tested 24 Casing Pressure 35	N/A Calculated Hour Rate	24- Oil - Bbl 88	3	Gas-MCF	·, 	Nater - Bb 78			38	
3. Date First Production 07/17/01 Tate of Test 07/22/01 Iow Tubing Press. N/A 3. Disposition of Gas (Set Sold	Hours Tested 24 Casing Pressure 35 old, used for fuel, ve	N/A Calculated Hour Rate	24- Oil - Bbl 88	3	Gas-MCF 88	, 	Nater - Bb 78	Test Witnesse	d By	38	
8. Date First Production 07/17/01 Tate of Test 07/22/01 Tow Tubing Press. N/A 9. Disposition of Gas (Se Sold 0. List Attachments C-103 & C104	Hours Tested 24 Casing Pressure 35 old, used for fuel, ve	N/A Calculated Hour Rate	24- Oil - Bbl 88	3	Gas - MCF 88	,, 	Nater - Bb 78	Test Witnesse J. Capps	d By	38	
8. Date First Production 07/17/01 Date of Test 07/22/01 Now Tubing Press. N/A 9. Disposition of Gas (Se Sold 0. List Attachments C-103 & C104. 1. / hereby certify that the	Hours Tested 24 Casing Pressure 35 old, used for fuel, ve	N/A Calculated Hour Rate ented, etc.) m on both sides of th	24- Oil - Bbl 88	3 1 complet	Gas - MCF 88	y knowle	Nater - Bb 78	Test Witnesse J. Capps elief	d By	38	~
8. Date First Production 07/17/01 Date of Test 07/22/01 NVA 9. Disposition of Gas (Se Sold 0. List Attachments C-103 & C104. 1. / hereby certify that th Signature	Hours Tested 24 Casing Pressure 35 old, used for fuel, ve	N/A Calculated Hour Rate ented, etc.) n on both sides of th	24- Oil - Bbi 85 is form is true and Printed Name N.	3 d <i>complet</i> M. You	Gas - MCF 88 le to the best of m	y knowle	Nater - Bb 78 adge and b Title Di	Test Witnesse J. Capps elief	d By		08/24/01
8. Date First Production 07/17/01 Date of Test 07/22/01 N/A 9. Disposition of Gas (Se Sold 0. List Attachments C-103 & C104. 1. I hereby certify that th Signature	Hours Tested 24 Casing Pressure 35 old, used for fuel, ve	N/A Calculated Hour Rate ented, etc.) n on both sides of th	24- Oil - Bbl 85 is form is true and Printed Name N.	3 d complet M. You	Gas - MCF 88 te to the best of m	y knowle	Nater - Bb 78 9dge and b Title <u>Di</u>	Test Witnesse J. Capps elief strict Manag	d By		08/24/01
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District II 811 South Fin	nuoos, I st. Artesia	±nn 00241-1980 3, NM 88210	•	Energy, Min			ces Depart		Vir	Revise	ed October Instructions	18, on
District III 1000 Rio Braz	os Rd., A	ztec. NM 8741	0		NGERVA 2040 Sout	h Pach	eco		Submit	to Appro	priate Distr	ict (5 Ci
District IV			7505	5	Santa Fe,	NM 87	505		•		AMENDED	RE
1	301800, 3	REQUES	ST FOR AI	LOWAB	LE AND		HORIZ	ATIC	N TO TRA	NSPOF	रा	
Marchan		/	Operator nar	ne and Address	3		· · · · · · · · · · · · · · · · · · ·		········	² OGRID N	Number	
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Hobbs, Ne	w Mexi	co 88241							-1 Dhuail	Reason for H	ling Code	
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30 - 0 15-	27286		Logan Draw	Wolfcamp.	•		•		·		96960	,
7 Pi	operty C	ode			* Prop	perty Nam	e		-		⁹ Well Numb	er
11 10	7871		Chalk Bluff	36 State				-			1	•
Ul or lot no.	Surface Section	n Township	n Range	Lotidn	Feet from t	the	North/So	uth Line	Feet from the	East/Wes	tine County	
	36	175	27É		66	0	Sou	ith	990	Wes	st E	Eddy
11	Botto	n Hole Lo	ocation						<u> </u>			
UI or lot no.	Sectio	n Townshij	p Range	Lot Idn	Feet from t	the	North/So	uth Line	Feet from the	East/Wes	t line County	-
12 Lee Corte	13.pm	lucing Method	Code 14 Gen	Connection Det	te 1 15 C-1	129 Perm	t Number		C.129 Effective	Date	17 C-129 Ever	ration
		Pumping		07/17/01		1201 010			C-125 Eligente	Date	-125 CAP4	aw
III. Oila	nd Ga	s Transp	orters	·	<u>I</u>			.		L _		
18 Transport OGRID	ter		¹⁰ Transporter Na and Address	ame		2º PO	- 1	21 O/G	1 3	POD ULST	R Location	
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Fikhom Oper			ratino Sompo	W ARCO						23450	78.0	·
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1923	850				<u></u>							
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02/0	3/93		07/17/01		10060		830	5	7164-7	277	5110, 54	0 , 100
	³¹ Hole S	lize	32 Ci	asing & Tubing	Size	1	33	Depth Se	A	3	4 Sacks Cemen	t
	17 1/2			13 3/8"				399'			530	
	12 1/4			9 5/8"				2603'			1150	
	8 3/4	•		. 7"				9253'			1620	
	6 1/8			4 1/2*			•	10057'	•		225	<u> </u>
VI. Wel	l Test	Data		T					· · · · · · · · · · · · · · · · · · ·			
35 Date N	ew Oil //01	* Gas	Delivery Date	³⁷ Test	Date 2/01	34	Test Leng 24	lh	³⁹ Tbg. Pre N/4	ssure	40 Csg. Pr 3F	ressu 5
41 Choke	Size	·	42 01	43 Wé	ater	+	44 Gas		45AOI	F	44 Test M	letho
N/.	A		88	7	78		88				Pum	ping
47 I hereby ce complied v to the best Signature:	rtify that rith and t of my kn	the rules of the hat the informa owledge and b	Oil Conservation tion given above elief.	Division have t a true and com	been plete	Approved		DIL CO DRIGH DISTR	DNSERVAT IAL SIGNED	ION DIV BY TIN VISOR	VISION W. CUM	
Printed name:	N.M	Young				Title:						
and a second sec	ct Man	ager				Approval	Date:			SEP *	* 6 2001	
Title: Distri												
^{Title:} Distri Date: 08	/24/01		Phone:	505-393-5	5905							-

JUTUN" & 1004

Ongard -101 Ċ 152 OK C C-1070

OCRID # 14744 PROP # 7871

Pool # 96960

xford

110 4

NO. R753 43

4-15-93 Dual Spaced Neutron Log Suy - 92421 9370'-10,059 Comp. Sonic Log. 1220'-9240' Dual Fat. 2598'- 9275' 9310'- 10,009' DHC-2464 Pt 100 01

NS1- R-9815



MAP ID NO. 117

MACK ENERGY CORPORATION STATE H NO. 2

API NO. 30-015-35814

<u>District II</u> 1301 W. Grand Ave., Attesia, NM 88210 Phone (505) 748-1283 Fax (505) 748-9720 State of New Mexico

Form C-101 Pennit 60506

Energy, Minerals and Natural Resources

Oil Conservation Division

1220 S. St Francis Dr.

Santa Fe, NM 87505

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1: Openan MACK H	Name and Address INERGY CORP	2. OGRID Number 13837
PO ARTESI	BOX 960 A , NM 88211	3. API Number
		30-015-33814
4. Property Code	5. Property Name	6. Well No.
30384?	STATEH	002

7. Surface Location

UL Lot.	Section	Township	Range	Lot. Idn	Feet From	N/S Line	Feet From	E/W Line	County
H	2	18S	27E	H	2063	N	441	E	EDDY
				8. P	ool Inform	ation			

CHALK BLUFF; WOLFCAMP GAS

96963

<u>.</u>	· · · · · · · · · · · · · · · · · · ·	Additional Well Inform	nation			
9. Waak Type New Well	10. Well Type OIL	11. Cable/Rotary	12. Lesse Type State	13. Ground Level Elevation 3590		
14. Muhiple Ň	15. Proposed Dep	th 16. Formation Wolfcamp	16. Formation 17. Contractor Wolfcamp			
Depth to Ground 50	Water	Distance from nearest fresh water	Distance from newest fresh water well			
it: Liner: Synthetic	mils th	ick Clay Pit Volume: bbl	Drilling Method:			

	19. Proposed Casing and Cement Program								
Type	Hole Size	Casing Type	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC			
Surf	12.25	8.625	24	360	400	0			
Prod	7.875	5.5	17	7313	1300	. 0			

Casing/Cement Program: Additional Comments

Mack Energy proposes to drill a 12 1/4 hole to 360', run 8 5/8 casing and cement. Drill a 7 7/8 hole to 7313', run 5 1/2 casing and cement. Note: On production string a fluid caliper will be run and will figure cement with 25% excess, attempt to circ.

Proposed Blowout Prevention Program							
Туре	Working Pressure	Test Pressure	Manufacturer				
DoubleRam 2000		2000					

I hereby certify that the inform of my knowledge and belief. I further certify that the dri	ation given above is true and complete to the best	Approved By: Bryan Arrant Title: Geologist			
NMOCD guidelines . a ge OCD-approved plan	neral permit , or an (attached) alternative				
Printed Name: Electronic	ally filed by Jerry Sherrell				
Title: Production Clerk		Approved Date: 9/19/2007	Expiration Date: 9/19/2008		
Email Address: jerrys@	nackenergycorp.com				
Date: 9/11/2007	Phone: 505-748-1288	Conditions of Approval Attached			

1625 N. French Dr., Hobbs, NM 88240 Phone:(505) 393-6161 Fux:(505) 393-0720 District II

1301 W. Grand Ava., Artesia, NM 88210 Phone: (505) 748-1283 Fax: (505) 748-9720 District. III

1000 Rio Bruzos Rd., Azzec, NM 87410 Phone (505) 334-6178 Fax: (505) 334-6170 District IV

1220 S. St Francis Dr., Santa Fe, NM 87505 Phone: (505) 476-3470 Fax: (505) 476-3462

Energy, Minerals and Natural Resources Oil Conservation Division 1220 S. St Francis Dr.

Santa Fe, NM 87505

State of New Mexico

WELL LOCATION AND ACREAGE DEDICATION PLAT 1. API Number 2. Pool Code 3. Pool Name 30-015-35814 96963 CHALK BLUFF; WOLFCAMP GAS 4. Property Code 6. Well No. 5. Property Name 303847 STATE H 002 7. OGRID No. 9. Elevation 8. Operator Name 13837 MACK ENERGY CORP 3590

<u>.</u>	10. Surface Location								
UL Lot	Section.	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
н	2	18S	27E		2063	N	441	E	EDDY

11. Bottom Hole Location If Different From Surface

UL - Lot.	Section	Township	Range	Lot. kin	Feet Fram	N/S Lina	Feet From	E/W Lina	County
H	2	18S	27E	H	2300	N	340	E	EDDY
12. Dedicated Acres 40.00		13.	Joint or Infill	l	4. Consolidation	Code		15. Order No.	

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location(s) or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest; or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. E-Signed By: Jerry Sherrell Title: Production Clerk
Date: 9/11/2007 SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Surveyed By: Ronald Eidson Date of Survey: 8/28/2007 Certificate Number: 3239

Form C-102 Permit 60506

Permit Comments

Operator: MACK ENERGY CORP, 13837 Well: STATE H #002 AFI: 30-015-35814

Created By	Comment	Comment Date
JWSHERRELL	H2S concentrations of wells in this area from surface to TD are low enough that a contingency plan is not required.	9/11/2007

Permit Conditions of Approval Operator: MACK ENERGY CORP, 13837 Well: STATE H #002 API: 30-015-35814

OCD Reviewer	Condition Pit construction and closure must satisfy all requirements of your approved plan, D.C.D. Rule 19.15.2.50, and the Pit and Below-Grade Tank Guidelines				
BArrant					
BArrant	As noted, operator to drill surface hole writesh water mud.				
BArrant	Cement to cover all oil, gas and water bearing zones.				

SEP 12 2007

MACK Energy Corp.

Eddy County, NM (NAD 27 NME) State H #2 State H #2 Wellbore #1

Plan: Plan #1

Standard Planning Report

11 September, 2007


MACH Emil Element	<u><u> </u></u>			Scie Pl	antific Drill anning Repor	ng t			9	Scientific Drilling
Databaše (FE Compeny: M. Project Site: Sit	DM 2003 16 S ack Energy Co Idy County N ate H #2 ate H #2 etbore #1 an #1	ingle User Db XP M (NAD 27 Ni	4E)	S M S	scál Čo-ordineta VD Referênce: D Reference: Orth Reference: urvey Cálculatio	Reference:	Wells WELL WELL Grid	tala H #2 @ 3608.00ft @ 3606.00ft	(KB Elev) (KB Elev)	
Project	Eddy Count	y, NM (NAD 2	7 NME)- 52-0		Sec. 194-2	17	*****	den gara	(4) (54) (7) <i>-</i> (44.4. 4. J. P
Map System; Geo Datum; Map Zone;	US State Pla NAD 1927 (N New Mexico I	ne 1927 (Exa IADCON CON East 3001	at solution) US)		System Datum:		Mean	Sea Lovel		
Site.	State H #2:	5112 m	e the school	li hense i	3.48 4 .49	idei yörb	历代中国		9.185° 4	
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Well	State H #2			. Augustyne		Silling T	the second	i herigene		10421223255
Well Position	+N/-S	D 00 ft	Northir	ng:	64	6,629 20 ft	Latitude);		32* 46' 39.510 N
	+E/-W	0 00 ft	Easting	;	52	8,184 50 ft	Longitu	de:		104° 14' 29.874 W
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	IGR	F200510	9/11	/2007		8.37	······································	60.68		49,269
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Version:			Phase:	PLAN	F	Tie On D	lepth:	O.	.00	
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Plan Sections Measured Depth Inctin	etion Azir	nuth D	riical opin (N):	//-S R)	Do E/-W Ri (ft) [711	ileg B te F	iulid tate 100M) - C (7	fum Rate.	TFO CL	Target
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COMPASS 2003.16 Build 42

MACK

Scientific Drilling

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Engy Blynei				Planning	Report				cientific Drilling
Database: G. EDM 2	003.16 Single	User Db /b		Local Co-o	rdinate Refere		State H #2.7		
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Scientific Drilling Planning Report



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6 600 00	0.00	0.00	6 586 70	-237 00	101.00	257 82	0.00	0.00	0.00
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and the second second			1.1.1		-1-A-2	North Sec.	See Secon	Latitude:	Longitude Than
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 plan hits target 									ļ
- Circle (radius 10.00)									
									ļ
South HL-State H #1	0.00	0 00 7,300	0.00 -247	.00 111 00	646,382	.20 52	8,295 50	32° 46' 37.065 N	104" 14' 28.576 W
- plan misses by 14 14ft	81 7313.308	MD (7300.00 TV	D237 00 N	101.00 E)		_			
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COMPASS 2003.16 Build 42

MACK Engl Brown			Scientific I Planning R	Drilling Report	Scientific Dritting
Denhaner Park (1997) Company (1997) Project: All Company (1997) State	Single User Db. Corp NM (NAD 27 MME		Local Coor TVD Referen HD Referen Horth Refer Survey Cal	tinut Reference real real real sere sere selen Method Selen Selen Selen sere selen Selen Selen sere sere selen Selen sere sere sere selen Selen sere s	500.00 (RB Ear) 500.00 (RB Ear
Plan Annotations	Vertical Depths	Local Coordia NIS (11)	ntes 14 +EL-M1 1057 (1)	Comment S	
460.00 768.78 2,854.52 3,163.30	460.00 768.18 2,841.82 3,150 00	0.00 -15.29 -221.71 -237.00	0.00 6.52 94.48 101.00	KOP 460' Start 2.0'/100' EOC hold 6.18" Start Drop 2.0'/100' EOC hold 0.0'	

9/11/2007 10:54:28AM

COMPASS 2003, 16 Build 42



Well API NO. 30-015-35814 5. Indicate Type of Lease STATE FEE 6. State Oil & Gas Lease No. B-9391 7. Lease Name or Unit Agreement Name State H 8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
5. Indicate Type of Lease STATE FEE 6. State Oil & Gas Lease No. B-9391 7. Lease Name or Unit Agreement Name State H 8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
STATE FEE 6. State Oil & Gas Lease No. B-9391 7. Lease Name or Unit Agreement Name State H 8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
6. State Oil & Gas Lease No. B-9391 7. Lease Name or Unit Agreement Name State H 8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
B-9391 7. Lease Name or Unit Agreement Name State H 8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
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State H 8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
8. Well Number 2 9. OGRID Number 013837 1 0. Pool name or Wildcat
9. OGRID Number 013837 I 0. Pool name or Wildcat
I 0. Pool name or Wildcat
Chalk Bluff Wolfcamp
441 Fast from the East line
NMPM County Eddy
TAME INI COULINY
ance from nearest surface water
struction Material
Report or Other Data
SEQUENT REPORT OF:
ГЈОВ
l give pertinent dates, including estimated date ach wellbore diagram of proposed completion
OCT 22 2007
OCD-APTESIA
UUD-AR I EQIA
· · · ·
nd belief. I further certify that any nit or below-
or an (attached) alternative OCD-approved plan 🔲
D + 77 10/19/07
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ergycorp.com Telephone No (505)748-1288
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Mack Energy Corp.

Eddy County, NM (NAD 27 NME) State H #2 State H #2 Wellbore #1

OCT 22 2007 OCD-ARTESIA

Plan: Plan #2

Standard Planning Report

19 October, 2007





Scientific Drilling

Planning Report



Database: Company: Project: Site: Well: Wellbore Design:	EDM 2003 Mack Energy Eddy Count State H #2 State H #2 Wellbore # Plan #2	16 Single User gy Corp ty, NM (NAD 2 1	7 NME)		Local Co-ord TVD Referenc MD Referenc North Refere Survey Calcu	linate Refere ce: e: nce: llation Meth	od:	Well State H #2 WELL @ 3606 0 WELL @ 3606 0 Grid Minimum Curvati	oft (KB Elev) Oft (KB Elev) ure	
Project	[Eddy	County, NM (N/	D 27 NME)							
Map System: Geo Datum: Map Zone:	US Stat NAD 19 New Me	e Plane 1927 (27 (NADCON (exico East 3001	Exact solution) CONUS)		System Dal	um:		Mean Sea Level	•	
Site	State	H #2								
Site Position: From: Position Uncert	Ma ainty:	p 0 00 f	North Eastii t Slot F	lng: ng: tadlus:	646, 528,	,629 20 ft ,184 50 ft ft	Latitude: Longitude: Grid Conve	ergence:		32* 46' 39 510 N 104* 14' 29 874 W 0 05 *
Weil	State H	1 #2			· · · · · · · · ·					·····
Well Position	+N/-S +E/-W	0	00 ft Ne 00 ft Ea	orthing: asting:		646,629 528,184	20 ft L 50 ft L	atitude: ongitude:		32° 46' 39 510 N 104° 14' 29 874 W
Position Uncert	ainty	0	00 ft _W	ellhead Elev	ation:	3,606	00 ft G	Fround Level:		0 00 ft
Wellbore	Wellb	ore #1							<u></u>	<u></u>
Magnetics	M	odel Name	Sampi	e Date	Declina (*)	tion	Dij	o Angle (°)	Field S	itrength 1T)
		IGRF200510		10/19/2007		8 36		60 68		49,259
Design	Plan #	2	·							
Audit Notes:										
Version:			Phas	e:	PLAN	. 1	'ie On Depth:		0 00	
Vertical Section	:		Depth From (T	VD)	+N/-S (ft)		E/-W	Di	rection	
			0.00		0.00		0 00		56 92	
Plan Sections	(· · · · · · · · · · ·
Depth (ft)	inclination (*)	Azimuth (*)	Depth (ft)	+N/-S (ft)	+E/-W (ft)	Rate (*/100ft)	Rate (*/100ft)	Rate (*/100ft)	TFO (°)	Target
0 00	0 00	0 00	0 00	0 00	0.00	0.0	0 00	00 0 00	0 00	<u></u>
1,250 00 1,785 00	0 00 10 70	0.00 156.92	1,250 00 1,781.89	0.00 -45,82	0 00 19 53	0 0 2 0	0 00 0 20	00 0.00 00 0.00	0.00 156 92	

10/19/2007 3·34.17PM

2,636 01

3,171 01

7,321 01

10 70

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156.92

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2,618 11

3,150 00

7,300 00

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-237 00

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2 00

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-2 00

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0 00 PBHL-State H #1

180 00

Page 2

COMPASS 2003 16 Build 42



2,400 00

2,500 00

2,599 99

2,636 01

2,699 99

2,799 99

2,899 99

2,999 99

3,099 99

3,171.01

7,321 01

EOC hold 0.0*

Start Drop 2.0º/100

10 70

10.70

10 70

10 70

9.42

7 42

5.42

3 42

1 42

0.00

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East HL-State H #1 - PBHL-State H #1 - South HL-State H #1

156.92

156 92

156 92

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156.92

156 92

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156 92

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2,386 20

2,484 46

2,582 72

2,618 11

2,681 11

2,780 03

2,879 39

2,979 09

3,079 00

3,150 00

7,300.00

~

-150 87

-167 95

-185 03

-191 18

-201 46

-214 93

-225 22

-232 31

-236 19

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.....

64.29

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78 85

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85 85

91 59

95.98

99 00

100 65

101 00

101 00

. - 163 99

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207 81

218 99

233 63

244 81

252 52

256 74

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257 62

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Scientific Drilling Planning Report



E	and the second									Olivectional Drilling Operations
Data Com Proje Site: Vell Well Dési	base: EL pany: Ma ect: Ec : St bore: W gn: Pl	DM 2003 16 Single ack Energy Corp idy County, NM (1 ate H #2 ate H #2 ellbore #1 an #2	e User Db NAD 27 NME)		Local Co TVD Refe MD Refer North Re Survey C	-ordinate Refer rence: ence: ference: alcutation Met	rence: hod:	Well State H #2 WELL @ 3606. WELL @ 3606 Grid Minimum Curva	00ft (KB Elev) 00ft (KB Elev) nture	
Plan	ned Survey				·			<u></u>		
	Measured Depth (ft)	inclination (*)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogieg Rate (°/100ft)	Build Rate (*/100ft)	Turn Rate (°/100ft)
	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0.00	0 00	0 00
	1,150 00	0.00	0 00	1,150 00	0 00	0 00	0.00	0 00	0 00	0.00
	8 5/8" Casir	ng								
	1,250 00	0 00	0.00	1,250 00	0 00	0,00	0 00	0 00	0 00	0 00
4	KOP 1250'	Start 2.0*/100'								
	1,300 00	1 00	156 92	1,299 99	-0.40	0 17	0 44	2.00	2 00	0 00
	1,400 00	3 00	156 92	1,399 93	-3 61	1 54	3,93	2 00	2 00	0 00
	1,500 00	5.00	156.92	-1,499 68	-10 03	4.27	10 90	2 00	. 200	0 00
	1,600 00	7 00	156 92	1,599 13	-19 64	8 37	21 35	2.00	2 00	0 00
	1,700 00	9 00	156.92	1,698 15	-32 45	13.83	35 27	2 00	2.00	0 00
	1,785 00	10 70	156 92	1,781 90	-45 82	19 53	49 81	2 00	2 00	0 00
	EOC hold 1	0.70*]
	1,800 00	10 70	156 92	1,796.63	-48 38	20 62	52 59	0 00	0 00	0.00
	1,900 00	10 70	156 92	1,894 89	-65 46	27 90	71 16	0 00	0 00	0.00
	2,000 00	10 70	156 92	1,993 15	-82 54	35 18	89 73	0 00	0 00	0 00
	2,100 00	10 70	156 92	2,091 41	-99 63	42 46	108.29	0 00	0 00	0 00
	2,200 00	10.70	156.92	2,189 68	-116 71	49.74	126 86	0 00	0 00	0 00
	2,300.00	10.70	156.92	2,287 94	-133 79	57.01	145 43	0 00	0.00	0 00

Targets				······				· · · ·	· · · · ·
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	Т <u>У</u> D (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL-State H #1 - plan hits target - Circle (radius 10	0 00 <u>)</u>	0 00	7,300 00	-237 00	101.00	646,392 20	528,285 50	32° 46' 37 164 N	104* 14' 28.693 W
South HL-State H #1 - plan misses by 1 - Rectangle (sides	0 00 4 14ft at 7321.0 W0 00 H200.00	0 00 Ift MD (7300 D0.00)	7,300 00).00 TVD, -23	-247 00, 37 00 N, 101.(111 00 00 E)	646,382 20	528,295 50	32° 46' 37 065 N	104° 14' 28 576 W
East HL-State H #1 - plan misses by 1 - Rectangle (sides	0 00 4 14ft at 7321 0 W800 00 H0 00	0 00 Ift MD (7300 D0 00)	7,300 00 0 00 TVD, -23	-247 00 37.00 N, 101.(111 00 00 E)	646,382.20	528,295 50	32* 46' 37 065 N	104° 14' 28.576 W

10/19/2007 3 34-17PM

COMPASS 2003.16 Build 42

MA	CK
England	Contraction

Scientific Drilling

Planning Report



					<u>`</u>			
Database:	EDM 2003.16	Single User Db		Local Co-o	dinate Reference:	Well State H #2		
Сотралу:	' Mack Energy (Corp		i TVD Refere	nce:	WELL @ 3606 00ft (K	B Elev)	. 1
Project:	Eddy County, I	NM (NAD 27 NME	5)	' MD Referer	ice:	WELL @ 3606 00ft (K	B Elev)	
Site:	State H #2	-		North Refe	ence:	Gnd		,
Well:	State H #2			Survey Cal	culation Method:	Minimum Curvature		:
Wellbore	Wellbore #1					1		:
Design:	Plan #2			t				
Design:	F1617 #2					<u> </u>		<u></u>
·····								
Casing Points	tores a se			· · · · · · · · · · · · · · · · · · ·				
	Measured	Vertical				Casing	Hole	
	Depth	Depth				Diameter	Diameter	
	(ft)	. (ft)		Name	r	(ft)	(ft)	
	1,150 00	1,150 00	8 5/8" Casing			8 62500	12.25000	
Plan Appotation	,							
· ·	Measured	Vertical	Local Coor	dinates				
	Depth	Depth	+N/-S	+E/-W				
	(ft)	(ft)	(ft)	. (ft)	Comment			
	1,250 00	1,250 00	0 00	0.00	KOP 1250' Start 2 0*/1	00'		
	1,785 00	1,781 90	-45 82	19.53	EOC hold 10.70°			
	2,636 01	2,618 11	-191 18	81 47	Start Drop 2 0°/100'			
	3,171 01	3,150 00	-237.00	101 00	EOC hold 0 0°			

Page 4

COMPASS 2003.16 Build 42



· ·		
 District I Stat	e of New Mexico	Form C-103
1625 N. French Dr., Hobbs, NM 88240	erals and Natural Resources	Pennit 65781
District II		WELL API NUMBER
1301 W. Grund Ave., Attesia, NM 88210	nservation Division	30-015-35814
Phone: (505) 748-1283 Fax: (505) 748-9720 1220	S. St Francis Dr.	
1000 Rio Brezos Rd., Azzec, NM 87410 Sant	ta Fe, NM 87505	5. Indicate Type of Lease
Phone: (505) 334-6178 Fax: (505) 334-6170		S
District IV 1220 S. St. Francis Dr. Santa En. MM 97505		
Phone: (505) 476-3470 Fax: (505) 476-3462		6. State Oil & Gas Lease No.
SUNDRY NOTICES AND REPORT	IS ON WELLS	7. Lease Name or Unit Agreement Name
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR	TO DEEPEN OR PLUG BACK TO	STATE H
A DIFFRENT RESERVIOR. USE "APPLICATION FOR PERM PROPOSALS)	AIT" (FORM C-101) FOR SUCH	8. Well Number
1. Type of Well:O		002
2. Name of Operator	······································	9. OGRID Number
MACK ENERGY CORP	· · · · ·	13837
3. Address of Operator	· · · · · · · · · · · · · · · · · · ·	10. Pool name or Wildom
PO BOX 960 , , 11352 LOVINGTON HWY ART	TESIA , NM 88211	
4. Well Location		F
Section 2 Township 185	me and <u>441</u> test from the	<u>Eline</u> Fddy Compy
11. Elevation (Show	whether DR, KB, BT, GR, etc.)	
	3590 GR.	
Pit or Below-grade Tink Application or Closure		
Pit Type Depth to Groundwater Distance from nee	rest fresh water well Distance from	n nearest suffice water
12. Check Appropriate Box to Ind	licate Nature of Notice Report	or Other Data
NOTICE OF INTENTION TO:	SUBSEQUE	NT REPORT OF:
PERFORM REMEDIAL WORK 🦳 PLUG AND ABANDON	REMEDIAL WORK	ALTER CASING
TEMPORARILY ABANDON , CHANGE OF PLANS	COMMENCE DRILLING OPN	S. T PLUG AND ABANDON
PULL OR ALTER CASING MULTIPLE COMPL	CASING/CEMENT JOB	
Other.	Other: Drining/Cement	~
 13 Describe proposed or completed operations. (Clearly state all particular	details and give pertinent detas including	actimated date of starting any proposed
work.) SEE RULE 1103. For Multiple Completions: Attach wellbore dia	gram of proposed completion or recompletic	n.
1003172007 Sport 17 172 hole @ 1000pm. 11/1/2007 TD @ 201 Ran Site 13 3/2 H-40 424/@ 2011 Cont	w/25flsx C+2%CC aim 104ev plan	down 12:20nm WAC 18hrs test to
1800# 30min, OK.		
11/4/2007 TD 12 1/4 hole @ 1165'.	000 Augusta : 010 - 1	
111/1/2007 kan 27jts 8 5/8 1-55 32# @ 1170". Cmt w/475sx C, 30min. OK	2005x C+2%CC, cure 2185x, plug do	wn 5:00am. WUU 12hrs têst to 600#
11/20/2007 TD @ 7545'.		
11/22/2007 Ran 177jts 5 1/2 J-55 17#@ 7495', Cmt w/530sx	C, circ 217sx. 2nd stage 365sx C, 52	lsx C, plug down 6:55pm, circ 200sx.
10/31/2007 Spudded well.		
•		
Cuing and Const Program	- Est Doth	
Date String Type Size Size Ib/ft	Grade TOC Set Sacks Yiel	d Class Dpth Held Drop Hole
11/01/07 Surf FreshWater 17.5 13:375 48 11/05/07 Int1 FreshWater 12.25 8.825 32	H-40 0 201 250 J-65 0 1170 875	С 1800 О.Ү С 800 О.Ү
11/22/07 Prod CutBrine 7.875 5.5 17	J-55 0 7495 1415	C 800 0 Y
Thereby contributions the higher proton above is teres and committee as the base	of my knowledge and halist I finither cartify	that my nit or below-grade tank hac
been Avill be constructed or closed according to NMOCD guidelines [, a	general permit or an (attached) alternativ	e OCD-epitoved plan
SIGNATURE Electronically Signed TITLE	E Production Clerk	DATE 12/11/2007
Type or point name Line Charles T	race in man al	Celenhone No. 505 249 1399
Type or print name Jeny Shenell E-mail add For Shete Use Only:	ress jerrys@mackenergycorp.com	Celephone No. 505-748-1288

SW/WRITH CODIAC LA CONTONCIATA L'HETELOT			Form
Office	State of	New Mexico	FOIIII C May 27
District I 1625.N. French Dr., Hobbs, NM 88240	Energy, Minerals	and Natural Resources	WELL API NO.
District 11	OIL CONSERV	ATION DIVISION	30-015-35814
District III	1220 South	n St. Francis Dr.	5. Indicate Type of Lease
1000 R10 Brazos Rd , Aztec, NM 87410 District IV	Santa Fo	e, NM 87505	6. State Oil & Gas Lease No.
1220 S St Francis Dr., Santa Fe, NM 87505		· ·	B-9391
SUNDRY NOT	ICES AND REPORTS O	N WELLS	7. Lease Name or Unit Agreement Na
(DO NOT USE THIS FORM FOR PROPO DIFFERENT RESERVOIR USE "APPL!	DSALS TO DRILL OR TO DEE CATION FOR PERMIT'' (FOR	PEN OR PLUG BACK TO A M C-101) FOR SUCH	State H
PROPOSALS)		FFD 2 6 2008	8. Well Number 2
2. Name of Operator		FFB LO LOOD	9. OGRID Number
Mack En	ergy Corporation	OCD-ARIESIA	013837
3. Address of Operator		1 00 00	I 0. Pool name or Wildcat
P. O. Bo	ox 960 Artesia, NM 8821	1-0960	Red Lake; Glorieta-Yeso NE
4. Wen Elocation	2063 feet from the	North line and	441 feet from the East
Section2	Township	18S Range 27E	NMPM County Eddy
	1 1. Elevation (Show wh	ether DR, RKB, RT, GR, etc	ノートの目的な
Pit or Below-grade Tank Application	or Closure	3590' GR	
Pit type Depth Groundy	vater Distance from ne	arest fresh water well Di	stance from nearest surface water
Pit Liner Thickness:	Below-Grade Tank: Vo	lume bhis: Co	Instruction Material
12 Check	Annronriate Box to In	dicate Nature of Notice	Penart or Other Data
12. Chock	Appropriate Dox to In	dicate Mature of Monee,	, Report of Other Data
NOTICE OF I	NTENTION TO:		BSEQUENT REPORT OF:
	PLUG AND ABANDON		
TEMPORARILY ABANDON [CHANGE PLANS		
PULL OR ALTER CASING	MULTIPLE COMPL		
OTHER:		OTHER: Compl	etion
13. Describe proposed or com	pleted operations. (Clearly	state all pertinent details, an	d give pertinent dates, including estimat
	· · · · · · · · · · · · · · · · · · ·		
of starting any proposed v	vork). SEE RULE 1103. F	or Multiple Completions: At	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion.	vork). SEE RULE 1103. F	or Multiple Completions: At	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134	.5-6434' 57 holes.	or Multiple Completions: A	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals	vork). SEE RULE 1103. F .5-6434' 57 holes. : 15%.	or Multiple Completions: A	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/	vork). SEE RULE 1103. F .5-6434' 57 holes. : 15%. '8 tubing SN @ 6439'. RJ	or Multiple Completions: At	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/	vork). SEE RULE 1103. F .5-6434' 57 holes. 15%. '8 tubing SN @ 6439'. RJ 35' cement cap. Perforate	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 I	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/ 12/27/2007 Acidized w/4500 gals 12/28/2007 Perforated from 5391	vork). SEE RULE 1103. F .5-6434' 57 holes. & 15%. '8 tubing SN @ 6439'. RJ 35' cement cap. Perforate & 15%. -5700 5' 83 holes. Acidiz	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 f	ttach wellbore diagram of proposed com
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/ 12/27/2007 Acidized w/4500 gals 12/28/2007 Perforated from 5391 12/29/2007 RIH w/188 joints 2 7/	vork). SEE RULE 1103. F .5-6434' 57 holes. 3 15%. /8 tubing SN @ 6439'. RJ 35' cement cap. Perforate 3 15%. -5700.5' 83 holes. Acidiz /8 tubing SN @ 5965'. R1	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 f ed w/5000 gals 15%. H w/2 1/2"x2"x20' pump.	noles.
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/ 12/27/2007 Acidized w/4500 gals 12/28/2007 Perforated from 5391 12/29/2007 RIH w/188 joints 2 7/ 1/7/2008 Set CIBP @ 5300' w/35'	vork). SEE RULE 1103. F .5-6434' 57 holes. : 15%. /8 tubing SN @ 6439'. RJ 35' cement cap. Perforate : 15%. -5700.5' 83 holes. Acidiz /8 tubing SN @ 5965'. RJ ' cement cap. Perforated	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 f ed w/5000 gals 15%. H w/2 1/2"x2"x20' pump. from 4118.5-4197' 40 holes	noles.
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/ 12/27/2007 Acidized w/4500 gals 12/28/2007 Perforated from 5391 12/29/2007 RIH w/188 joints 2 7/ 1/7/2008 Set CIBP @ 5300' w/35 1/8/2008 Acidized w/2000 gals 12	vork). SEE RULE 1103. F .5-6434' 57 holes. 15%. 8 tubing SN @ 6439'. RJ 35' cement cap. Perforate 15%. -5700.5' 83 holes. Acidiz 78 tubing SN @ 5965'. RJ ' cement cap. Perforated 5%.	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 f ed w/5000 gals 15%. H w/2 1/2"x2"x20' pump. from 4118.5-4197' 40 holes	noles.
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/ 12/27/2007 Acidized w/4500 gals 12/28/2007 Perforated from 5391 12/29/2007 RIH w/188 joints 2 7/ 1/7/2008 Set CIBP @ 5300' w/35' 1/8/2008 Acidized w/2000 gals 12 1/9/2008 Frac w/8130# liteprop. 6	vork). SEE RULE 1103. F .5-6434' 57 holes. 3 15%. /8 tubing SN @ 6439'. RJ 35' cement cap. Perforate 3 15%. -5700.5' 83 holes. Acidiz /8 tubing SN @ 5965'. RJ ' cement cap. Perforated 1 5%. 58,890# 16/30 sand, 14,00"	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 H ed w/5000 gals 15%. H w/2 1/2"x2"x20' pump. from 4118.5-4197' 40 holes 46# siberprop, 91,292 gals	noles. 30/40# gel.
of starting any proposed v or recompletion. 12/15/2007 Perforated from 6134 12/17/2007 Acidized w/4500 gals 12/18/2007 RIH w/203 joints 2 7/ 12/26/2007 Set CIBP @ 6020' w/ 12/27/2007 Acidized w/4500 gals 12/28/2007 Perforated from 5391 12/29/2007 RIH w/188 joints 2 7/ 1/7/2008 Set CIBP @ 5300' w/35' 1/8/2008 Acidized w/2000 gals 1: 1/9/2008 Frac w/8130# liteprop, 6 1/11/2008 RIH w/134 joints 2 7/8	vork). SEE RULE 1103. F .5-6434' 57 holes. a 15%. /8 tubing SN @ 6439'. RJ 35' cement cap. Perforate a 15%. -5700.5' 83 holes. Acidiz /8 tubing SN @ 5965'. RJ ' cement cap. Perforated 5%. 58,890# 16/30 sand, 14,0 '' tubing SN @ 4243'. RJ	or Multiple Completions: At H w/2 1/2"x2"x20' pump. d from 5789.5-5957.5' 52 H ed w/5000 gals 15%. H w/2 1/2"x2"x20' pump. from 4118.5-4197' 40 holes 46# siberprop, 91,292 gals H 2 1/2 x 2 x 20' Pump.	noles. 30/40# gel.
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District I 1625 N. French Dr., Hobbs, NM 88240

District 11 1301 W Grand Avenue, Artesia. NM 88210 District III 1000 Rio Brazos Rd , Aztec, NM 87410

District IV 1220 S. St. Francis Dr., Santa Fe. NM 87505

State of New Mexico Energy, Minerals & Natural Resource FEB 2 6 2008

Form C-104 Revised Feb. 26, 2007

OCD-ARTESHIN to Appropriate District Office **Oil Conservation Division** 5 Copies 1220 South St. Francis Dr.

DISTICTIV				• •				,				
1220 S. St. Fran	cis Dr., San	ta Fe. NM 875	05		Santa Fe, N	M 87505				MENDED REPORT		
<u> </u>	1.	REQUES	ST FOR	ALLO	DWABLE A	ND AUTI	HOF	IZATION	ATION TO TRANSPORT			
Operator r	ame and	Address Mac	c Energy	Corpora	ition			2 OGRID Number 013837				
			P.O. B	ox 960	3 Reason for Fi				iling Code/ Effect	ctive Date		
		Arte	sia, NM	88211-0	160 NW							
+ API Numb 30-015-3	er 5814	' i Poo	Name		Red Lake; Glorieta-Yeso, NE				" Pool Code 51120 96 36			
7 Property C 303	ode 847	* Pro	perty Nar	ne .	State	н			» Well Numb	• Well Number 2		
H. Surf	ace Loc	ation										
UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South	line	Feet from the	East/West line	County		
Н	2	18S	27E		2063	North		441	East	Eddy		
Bo	ttom Ho	le Locatio	n									
UL or lot no.	UL or lot no. Section Township Range Lot Idn Feet from the Nort							Feet from the	East/West line	County		
н	2 18S 27E 2300 North						340	East	Eddy			
. Les Codo	* Producing	Method Code	 Gas Conn 	ection Date	C-129 Perm	ut Number		120 Efforting	Data IZC-1	29 Expiration Date		

S 1/11/08 P ***

	as Transporters	
18 Transporter	19 Transporter Name	²⁰ O/G/W
OGRID	and Address	
015694	Navajo Refining	o
	Artesia, NM 88211-0159	· · · · · · · · · · · · · · · · · · ·
036785	DCP Midstream LP	G
	4001 Penbrook Odessa, TX 79762	
_		
	·	

IV. Well Completion Data 29 TD 24 PBTD 25 Perforations 26 DHC, MC 21 Spud Date 10/31/2007 11/23/2007 7545' 5265' 4118.5-4197' 29 Depth Set 2* Casing & Tubing Size 10 Sacks Cement n Hole Size 17 1/2 13 3/8 201 250 12 1/4 8 5/8 1170 675 7 7/8 7495 1415 5 1/2 4243 2 7/8

					the second second second second second second second second second second second second second second second s	
V. Well Test	Data	•			•	
11 Date New Oil	32 Gas Delivery Date	n Test Date	34 Test Longth	¹³ Tbg. Pressure	³⁶ Csg. Pressure	
1/14/2008	1/14/2008	1/30/08	24 hours			
" Choke Size	¹⁸ Oil	39 Water	# Gas		41 Test Method	
	8	30	30		P	
⁴² I hereby certify the been complied with complete to the best Signature: Printed name Jerry W. Sherrell	hat the rules of the Oil Conse and that the information giv LoCmy knowledge and belie my W Sh	rvation Division have en above is true and f enal	OIL	congervation division of the second s	<u>rilson</u>	
Title: Production Clerk		·	Approval Date: 3-5-	08 00		
E-mail Address: jerrys@mackener	gycorp.com					
Date: 2/25/08	Phone: (575)748-128	28)			

Submit to Appropria District Office • State Lease - 6 copies Fee Lease - 5 copies	atc ss -	Energy, Mir	State of N nerals and Nat	lew Mexico tural Resou	rces Departi	nent	VELLABUNO		Form	n C-105 ised I-I-89
DISTRICT I P O Box 1980, Hob	bs, NM 88240	OIL CO	NSERVA	ATION	DIVISI	$ON \begin{bmatrix} \\ \\ \end{bmatrix}$	0-015-35814	ŀ		
STRICT II	oria NIX 99310	San	2040 300 ta Fe, New	Mexico	87505	Ĕ	5 Indicate Typ	e of Lease		
DISTRICT III	USIA, INIM 86210					-	6 State Oil & Ga	ST s Lease No		FEE
1000 Rio Brazos Rd	, Aztec, NM 87410	· · · · · · · · · · · · · · · · · · ·		. <u></u>		I	B-9391	- 48575	-184	Witness Williams
WELL	COMPLETION	OR RECOM	PLETION R	EPORT A	ND LOG			É.		
OIL WELL	GAS WELL	DRY	OTHER		<u></u>		7 Lease Name	or Unit Agi	eement N	lame .
b Type of Completic	n					·				
	R Deepen	PLUG BACK	DIFF RESVR	OTHER			tata U			
2 Name of Operator					0 6 2008		8 Well No			
Mack Energy Cor	poration			FEB	20 2000	<u>a</u> 2	2		·	
Address of Operat	or	N/0		OCD	ARIES	m ,	9 Pool name o	r Wildcat		-
4. Well Location	esia, NM 88211-09	/60	·			<u>1</u>	Ked Lake; GI	orieta-ye	SO, NE	.
Unit Letter	<u>H</u> : 2063	Feet From	The N	lorth	Line and	441	Feet Fr	om The	Ea	1st Liné
Section	2	Township	185	Range	27E	NN	ирм	Eddy		County
10/31/2007	11 Date TD Reach 11/21/200	ed 12 D: 7	ate Compl (Read 1/11/6	ly to Prod.)	13 Eleva	tions <i>(DF)</i> 35	& RKB, RT, GR 90' GR	, e1c)	14 Elev	Casinghead
15 Total Depth	16. Plug Ba	ck TD	17 If Multiple	Compl How	18	Intervals	Rotary Tools	I	Cable 1	Fools
7545'		5265'				Drilled By	Ye	S		
19 Producing Interval 4118 5_4107	(s), of this completion	- Top, Bottom, 1	laine				20) Was Direc	tional Su Vo-	rvey Made
21 Type Electric and	Other Logs Run	······································					22 Was Wai	Cored	t es	, .
Gamma Ray, Neut	ron, Density, Later	alog, Spectral	Gamma Ray					1	No	
		CASING	RECORD	(Report a	ll strings	set in v	vell)			
CASING SIZE	E WEIGHT LB	./FT. [EPTH SET	HOL	E SIZE	CEN	MENTING RE	CORD	AM	OUNT PULLED
13 3/8	48		201	17	/ 1/2	·	250 sx			None
<u> </u>	17		7495	12	7/8		<u>6/5 sx</u> 1415 sv			None
· · · · · · · · · · · · · · · · · · ·				- <u> . </u>		<u> </u>	1110 54	·		TIONO
			·							
94 	TOP	LINER RE	CORD			25	TUE	SING REC	CORD	· · · · · · · · · · · · · · · · · · ·
	IOP	BUTTOM	SACKS C	CEMENT	SCREEN		SIZE	DEPTH 474	SET V	PACKER SET
· · · ·							2 ///0		, 	
6 Perforation reco	ord (interval, size	and number)		27 ACID,	SHOT, F	RACTURE,	CEMEN	t, squ	EEZE, ETC.
6134.5- 5391-59	6434', .42, 57 CIB 957.5', .42, 92 CIB	P@ 5300' w	35' cmt cap	·	DEPTHINT	ERVAL	AMOUN See C-103 1	T AND KIN	ID MATI	ERIAL USED
	4118.5-419	7', .42, 40	55 onn oup				000 0 100 1			······
<u> </u>										
8 ate First Production		roduction Metho	PROD d (Flowing, gas	UCTION	- Size and type	pump)	·	Well Stat	us (Prod.	or Shut-in)
1/14/200	8		2 1/	'2x2x20' Pu	mp	1			Produ	cing
)ate of Test	Hours Tested	Choke Siz	e Prod'n I	For Oil	- Вы	Gas - MC	CF W	ater- Bbl		Gas - Oil Ratio
1/30/08	24 hours	Calculate			8 Gas - MCE	30	ter- Phi	30		3750
10 W TOOLIS LICSS	Cashig riessure	Hour Rate	24- 011-Bt	, 2	Oas - MiCr	30 wa	iei - DOI.		uy - APl	- (Cont.)
9 Disposition of Gas (Sold, used for fuel, ven	led, etc)	<u>I^V</u>		<u> </u>		Test Wit	nessed By		
old	· · · · · · · · · · · · · · · · · · ·			· · ·				Rober	t C. Cha	ase
Ust Attachments	nd I ago							_		
anon Survey an hereby certifierth	na Logs of the information s	hown on both	sides of this for	rm is true on	d complete ti	the best	of my knowled	dge and he	hef	
	110	A N	7 Parent 1				-,,			
Signature	up W. J	revolt	Name	Jerry W.	Sherrell	Title	Producti	on Clerk	Date	2/25/08
		· · · · · · · · · · · · · · · · · · ·	·····		· · ·	·····				
	÷		· .							



PO Box 1370 Artesia, NM 88211-1370 (505) 748-1288 FEB 2 6 2008 OCD-ARTESIA

November 30, 2007

Mack Energy Corporation PO Box 960 Artesia, NM 88211-0960

RE:

State H #2 2310' FNL & 990' FEL Sec. 2, T18S, R27E Eddy County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned re-entered well.

Very truly yours,

Leroy Curry

Drilling Superintendent

State of New Mexico } County of Eddy }

The foregoing was acknowledged before me this 30th day of November, 2007.

Notary Public



Date	Denth	Dev	Dir
11/01/2007	122.00	0 50	0.00
11/01/2007	133.00	0.30	0.00
11/02/2007	431.00	0.75	0.00
11/03/2007	700.00	0.50	· 0.00
11/04/2007	975.00	1 00	0.00
11/04/2007	375.00	1.00	0.00
11/04/2007	1134.00	0.50	0.00
11/06/2007	1301.00	1.66	164.90
11/06/2007	1396.00	3 41	161 90
11/00/2007	1330.00	5.11 E 10	150.10
11/0//2007	1492.00	2.19	123.10
11/07/2007	1587.00	7.21	156.40
11/07/2007	1683.00	8.51	155.20
11/07/2007	1779.00	0.04	159 10
11/0//2007	1778.00	9,54	120.10
11/07/2007	1873.00	9.56	157.60
11/08/2007	1968.00	10.53	159.60
11/08/2007	2064.00	0.93	160.00
11/00/2007	2004.00	. 9.05	100.00
11/08/2007	2159.00	9.69	100.50
11/08/2007	2350.00	10.78	156.20
11/08/2007	2445 00	10.67	156 40
11/00/2007	2713.00	10.07	155.40
11/08/2007	2540.00	10.54	122.40
11/08/2007	2604.00	10.43	156.30
11/09/2007	00 6695	8 58	156.50
11/03/2007	2000.00	7 20	150.50
11/09/2007	2794.00	7.39	120.00
11/09/2007	2984.00	4.30	162.00
11/09/2007	3080.00	2.86	157.10
11/00/2007	2175 00	1 50	150.00
11/09/2007	31/3.00	1.50	130.00
11/09/2007	3270.00	0.67	256.70
11/09/2007	3365.00	0.82	280.50
11/10/2007	3460.00	0.48	176.00
11/10/2007	3555.00	0.10	101 00
11/10/2007	3556.00	0.51	101.00
11/10/2007	3651.00	0.65	173.10
11/10/2007	3746.00	0.67	157.20
11/10/2007	3841 00	0 59	154 20
11/10/2007	2020.00	0.55	200.20
11/10/2007	3936.00	0.24	309.30
11/11/2007	4031.00	0.30	302.30
11/11/2007	4126.00	0.45	322.60
11/11/2007	4222.00	1.06	337 40
11/11/2007	4222.00	1.00	337.40
11/11/2007	4602.00	1.01	348.10
11/12/2007	4666.00	1.10	18.68
11/12/2007	4729 00	0.53	71.05
11/12/2007	4024.00	0.25	20 14
11/12/2007	4824.00	0.27	20.14
11/12/2007	4920.00	0.71	12.94
11/12/2007	5015.00	1.19	5.48
11/12/2007	5110.00	0.87	20.33
11/12/2007	5206.00	0.02	122.00
11/12/2007	5205.00	0.28	132.80
11/13/2007	5301.00	0.54	23.07
11/13/2007	5396.00	0.34	49.15
11/13/2007	5491 ND	1 12	153 70
11/13/2007	5451.00	2.14	100.20
11/13/2007	5586.00	2.14	109.30
11/13/2007	5660.00	1.31	189.40
11/13/2007	5681.00	1.09	194.70
11/13/2007	5745.00	0.67	318 40
11/13/2007	5030.00	0.07	2210.10
11/13/2007	5839.00	0.24	221.30
11/14/2007	5935.00	1.41	161.10
11/15/2007	5998.00	1.01	182.35
11/16/2007	6188.00	0 34	306.90
	6474 AA	0.11	224 00
11/16/2007	04/4.00	0.11	554.6U
11/16/2007	6570.00	0.15	314.50
11/17/2007	6664.00	0.27	304.50
11/17/2007	6750 00	0.45	205 50
11/1//2007	0/59.00	0.45	293.30
11/17/2007	6854.00	0.46	296.60
11/17/2007	6949.00	0.59	290.10
11/17/2007	7044 00	1 00	134 40
11/1//CVU/	7017.00	1.02	00 50
11/18/2007	/140.00	0.38	09.52
11/18/2007	7235.00	0.57	122.40
11/18/2007	7382.00	0.81	125.40
· · ·			



Scientific Drilling

MACK ENERGY

Field: Chalk Bluff
Site: Eddy County, NM
Well: State H #2
Wellpath: DH - Job #32D11071006
Survey: 11/05/07-11/14/07

This survey is correct to the best of my knowledge and is supported by actual field data.

Luhasto-Company Representative

Notorized this date 19th of Accember, 2007.

Jonal Alles nun Notary Signature

County of Midland e of Texas



FEB 2 6 2008 OCD-ARTESIA



500.00 600.00 700.00

800.00

900.00

1000.00

1100.00

1143.00

0.26 0.28

0.44

0.40

1.01

0.95

0.56 0.26 212.14 250.72

271.18

74.03

96.02

87.15 76.15 86.43 499.99 599.99

699.99

799.98

899.98

999.96

1099.95

1142.95

Scientific Drilling International

Survey Report

Compa Field: Site: Well: Wellpa	any: ath:	MACK Chalk Eddy C State H VH - Ja	ENERGY Bluff County, NM H #2 ob #32K1107	1013		Date: 12/16/2007 Time: 18:34.47 Page: Co-ordinate(NE) Reference: Site: Eddy County, NM, Grid North Vertical (TVD) Reference: SITE 0.0 Section (VS) Reference: Well (0.00N, 0.00E, 156.92Azi) Survey Calculation Method: Minimum Curvature Db: Sy						
Survey: 11/06/07 KSRG 0'-1143' Company: Scientific Drilling Internatio Tool: Keeper;Keeper Gyro						Star Eng Tied	t Date; neer: -to:	11/ Ma Fro	06/2007 drid w/P&M m Surface			
Surve	y											
	MD ft	•	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg	
	10 20 30 40	0 00 0.00 0.00 0.00 0.00 0.00	0.00 0.62 0.42 0.37 0.38	359.95 77.45 110.33 96.72 143.78	0.00 100.00 199.99 299.99 399.99	0.00 0.10 0.45 0.86 1.35	0.00 0.12 0.11 -0.06 -0.36	0.00 0.53 1.40 2.06 2.58	0.00 0.62 0.35 0.11 0.30	0.00 0.54 1.40 2.07 2.61	0.00 77.45 85.60 91.59 98.00	

1.80

1.91 1.74

1.62

2.09

2.81 3.17 3.24 -0.82

-1.10

-1.17

-1.06 -1.06

-1.11

-0.95 -0.90 2.66

2.30

1.69

1.64 2.85

4.56

5.86

6.16

0.37

0.18

0.20

0.83 0.66

0.16

0.41 0.72 107.20 115 41

124.64

122.94 110.38

103.70

99.24 98.28

2.78 2.55 2.05

1.96 3.04

4.69

5.94 6.23



Scientific Drilling International Survey Report

Company: MACK Field: Chalk Site: Eddy (Well: State Wellpath: DH - J	ENERGY Bluff County, NM H #2 lob #32D1107	71006		Date: Co-ordin Vertical Section (Survey C	12/16/2007 ate(NE) Refe (TVD) Refer VS) Referenc Calculation M	Time rence: ence: e: e:	: 19:33:59 Site: Eddy Co SITE 0.0 Well (0.00N,0 Minimum Cur	Pr unty, NM, Grid N .00E,156.92Azi) vature D	age: 1 North b: Sybase	
Survey: 11/0	5/07-11/14/07	7		Star	t Date:	11/	05/2007			
Company: Scie Tool: MWI	D 1206-7367 ntific Drilling D;MWD	Internatio	<u>*.</u>	Engi Tied	Engineer: Hernandez/Biggs/Elger Tied-to: From: Definitive Path					
Survey		• .								
MD ft	Inci deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg	
1143.00	0.26	86.43	1142.95	3.24	-0.90	6.16	0.00	6.23	98.28	
1206.00	0.17	46.81	1205.95	3.26	-0.82	6.37	0.27	6.43	97.37	
1301.00	1.66	164.91	1300.94	4.57	-2.06	6.83	1.84	7.14	106.75	
1396.00	3.41	161.92	1395.84	8.75	-6.07	8.07	1.85	10.10	126.96	
1492.00	5.19	159.14	1491.57	1 5.93	-12.84	10 50	1.87	16.5 9	140.73	
1587.00	7 21	158.46	1586 01	26 10	22.22	14 41	2 15	26 57	147 15	
1682.00	8.51	155.25	1680.01	20.19	-22.32	14.41	2.10	20.07 30 AR	147.10	
1778 00	0.01	158 14	1774 97	/ 5 <u>7.10</u>	-34.17 _ <u>4</u> 8.39	25 80	1.30	53.40 54 77	151 00	
1873.00	9 56	157 67	1868 50	70.65	-63.02	31.85	0.41	70.70	153.26	
1968.00	10.53	159.64	1962.04	87.21	-78.66	37.86	1.08	87.30	154.30	
2064.00	9 83	160.07	2056.53	104.15	-94.59	43.71	0.73	104.20	155.20	
2159.00	9.69	160.58	2150.15	120.23	-109.75	49.13	0.17	120.25	155.88	
2255.00	10 79	160.25	2244.62	137.26	-125.83	54.86	1.15	137.27	156.45	
2350.00	10.78	156.23	2337.95	155.02	-142.33	61.44	0.79	155.02	156.65	
2445.00	10.67	150.45	2431.29	172.70	-158.52	68.54	0.12	172.70	156.62	
2540.00	10.54	155.44	2524.66	190,18	-174.49	75.66	0.24	190.18	156.56	
2604.00	10.43	100.37	2087.60	201.82	-185.12	80,42	0.32	201.83	156.52	
2099.00	0.00	100.01	2001.29	217.01	-199.50	80.09	1.95	217.52	100.01	
2889.00	5.58	158.12	2869.75	241 43	-221.66	95.68	1.91	241.43	156.65	
2984.00	4.30	167.04	2964.40	249.55	-229.42	98.20	1.57	249.55	156.83	
3080.00	2.86	157 16	3060.21	255 49	-235 14	99 94	1.63	255 49	156.97	
3175.00	1.50	150.04	3155.14	259 10	-238.40	101 48	1 46	259 10	156.94	
3270.00	0.67	256.00	3250 13	260.24	-239.61	101.56	1.90	260.24	157.03	
3365.00	0.82	280 00	3345.12	259.79	-239.63	100.35	0.36	259.79	157.28	
3460.00	0.48	176.03	3440.12	259.79	-239.90	99.71	1.10	259 80	157.43	
3556.00	0.51	181.08	3536.11	260 56	-240.73	99.73	0.06	260.57	157.50	
3651.00	0.65	173.19	3631.11	261.46	-241.69	99.79	0.17	261.48	157.57	
3746.00	0.67	157.21	3726.10	262.54	-242.74	100.07	0.19	262.55	157.60	
3841.00	0.59	154.21	3821.10	263.58	-243.69	100.50	0.09	263.60	157 59	
3936.00	0.24	309.36	3916.09	263.89	-244.00	100.55	0.86	263 91	157.60	
4031.00	0.30	302.31	4011 09	263.51	-243.74	100.19	0.07	263.53	157.66	
4126.00	0.45	322.60	4106.09	262.95	-243.32	99.75	0.21	262.97	157.71	
4222.00	1.06	337.45	4202.08	261.69	-242.20	99.18	0.66	261.72	157.73	
4317.00	0.86	37.93	4297.07	260.47	-240.82	99.29	1.03	260.49	157.59	
4412.00	0.59	7.90	4392.06	259.70	-239.78	99.79	0.48	259.71	157.40	
4507.00	1.14	0.19	4487.05	258.42	-238.35	99.86	0.59	258.42	157.27	
4602.00	1 01	346 16	4582.04	256.72	-236.59	99.66	0.31	256.72	157.16	
4667.00	1.10	18.68	4647.03	255.69	-235.44	99.73	0.92	255.69	157.04	
4729.00	0.53	71.05	4709.02	255.27	-234.78	100.19	1.42	255.27	156.89	
4824.00	0.28	38.14	4804.02	255.19	-234 46	100.75	0.35	255.19	156.75	
4920.00	0.71	12.94	4900.01	254.59	-233.69	101.03	0.49	254.60	156.62	
5015.00	1.19	5.48	4995.00	253.25	-232.14	101.25	0.52	253.26	156.43	
5110.00	0.82	20.33	5089.99	251.89	-230.52	101.58	0.47	251.91	156.22	
5206.00	0.28	132.80	5185.98	251.60	-230.03	101.99	1.00	251.63	156.09	
5301.00	0.54	23.07	5280.98	251.51	-229.78	102.34	0.72	251.54	155.99	
5396.00	0.34	49.15	5375.98	251.11	-229.18	102.73	0.29	251.15	155.86	
5491.00	1.12	153 76	5470.97	251.95	-229.83	103.35	1.32	252.00	155.79	
5586.00	2.14	189.33	5565.94	254.38	-232.42	103.47	1.46	254.41	156.00	



Scientific Drilling International Survey Report

Company: MACK Field: Chalk Site: Eddy Well: State Wellpath: DH - J	CENERGY Bluff County, NM H #2 lob #32D1107	1006	1	Date: Co-ordin Vertical Section (Survey C	12/16/2007 ate(NE) Refe (TVD) Referenc VS) Referenc alculation M	Time rence: ence: e: e: ethod:	: 19:33:59 Site: Eddy Co SITE 0.0 Well (0 00N,0 Minimum Curv	Pa unty, NM, Grid N .00E, 156.92Azi) vature Dt	ge: 2 lorth : Sybase
Survey									
MD	inci	Azim	TVD	VS	N/S	E/W	DLS	ClsD	ClsA
ft	deg	deg	ft	ft	ft	ft	deg/100ft	ft	deg
5681.00	1.09	194.79	5660.90	256.59	-235.04	102.96	1.12	256.60	156.34
5745.00	0.67	318.43	5724.89	256.71	-235.35	102.55	2.44	256.72	156.45
5839.00	0.24	221.30	5818.89	256.28	-235.08	102.06	0.79	256.28	156.53
5935.00	1.41	161 10	5914.88	257.54	-236.35	102.31	1.36	257.55	156.59
5998.00	1.01	182.35	5977.87	258 82	-237.64	102.54	0.94	258.82	156.66
6093.00	0.20	294.46	6072.86	259.45	-238.41	102.35		259.45	156.77
6189.00	0.34	306.99	6168.86	259.08	-238.17	101.97	0.16	259.08	156.82
6284.00	0.45	287.60	6263.86	258.59	-237 89	101.39	0.18	258.59	156.92
6379.00	1.01	331.75	6358.85	257.51	-237.04	100.64	0.79	257.51	157.00
6474.00	0.11	334 85	6453.84	256.59	-236.22	100.20	0.95	256.59	157.01
6570.00	0.15	314.50	6549.84	256.38	-236.04	100.07	0.06	256.38	157:02
6665.00	0.27	304.58	6644.84	256.08	-235.83	99.80	0.13	256.08	157.06
6760.00	0.45	295.56	6739.84	255.61	-235.54	99.28	0.20	255.61	157.14
6855.00	0.46	296.68	6834.84	255 04	-235.21	98.60	0.01	255.04	157.26
6950.00	0 51	281.73	6929.83	254.50	-234.95	97.85	0.14	254.51	157.39
7046.00	1.09	134.41	7025.83	255.10	-235.50	98.08	1.61	255.11	157.39
7140.00	0.38	89.52	7119.82	256.05	-236.13	99.03	0.92	256.05	157.25
7235.00	0.57	122.42	7214.82	256.56	-236.38	99.75	0.34	256.56	157.12
7330.00	0.81	125.40	7309.81	257.52	-237.02	100.69	0.26	257.52	156.98
7367.00	0.87	128 12	7346.81	257.99	-237.35	101.13	0.19	257.99	156.92

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Wilson, Kimberly M, EMNRD

From:	Jerry Sherrell [jerrys@mackenergycorp.com]
Sent:	Wednesday, March 05, 2008 3:37 PM
To:	Wilson, Kimberly M, EMNRD
Subject:	FW: Financial Assurance/Rule 40- Mack
Importance:	High

From: Altomare, Mikal, EMNRD [mailto:Mikal.Altomare@state.nm.us] Sent: Tuesday, March 04, 2008 11:03 AM To: Mull, Donna, EMNRD Cc: Rebecca Groh; Jerry Sherrell; Phillips, Dorothy, EMNRD Subject: Financial Assurance/Rule 40- Mack Importance: High

Donna –

I have received a pdf version of what appears to be a properly and fully executed single well bond for the state h no. 001, 03-015-00745, which Mack has assured me that they are overnighting to our office. Everything appears to be in order, and I expect that, upon receipt of the original in our office, it will be reviewed and accepted and Mack will no longer be listed as being out of compliance with financial assurance requirements. That being said, and given that Mack has posted all other necessary financial assurances for all other properties, if there are no other violations or issues with approval of pending Mack applications, consider them to be in compliance for purposes of pending permit applications with your office. Please contact me if you have any questions.

Thanks, Mikal

X Mikal M. Altomare

Assistant General Counsel Oil Conservation Division Energy, Minerals & Natural Resources Department 1220 South St. Francis Drive Santa Fe, NM 87505 Tel 505.476.3480 ~ Fax 505.476.3462 <u>mikal.altomare@state.nm.us</u>

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APPENDIX C

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USGS EARTHQUAKE DATA

SUBSURFACE

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NEIC: Earthquake Search Results

U. S. GEOLOGICAL SURVEY

EARTHQUAKE DATA BASE

FILE CREATED: Mon Jun 4 16:13:25 2012 Circle Search Earthquakes= 225 Circle Center Point Latitude: 32.772N Longitude: 104.233W Radius: 321.860 km Catalog Used: PDE Data Selection: Historical & Preliminary Data

CAT	YEAR	МО	DA	ORIG TIME	LAT	LONG	DEP	MAGNITUDE	IÈM I NFO TF	DTSVNWG	DIST km
PDE	1973	09	22	233835.80	34.47	-106.95	5	3.1 MLGS			314
PDE	1974	11	28	033520.50	32.31	-104.14	5	3.7 MLGS			51
PDE	1975	08	01	072757.30	31.42	-104.01	5	3.0 LgTUL	.F		150
PDE	1976	01	19	040330.50	31.90	-103.08	1	3.5 MDGS	.F		145
PDE	1976	01	22	072157	31.90	-103.07	1	2.8 MDGS			145
PDE	1976	01	25	044827.90	31.90	-103.08	2	3.9 MDGS	5F		145
PDE	1977	01	04	183137.60	32.36	-106.92	5	3.2 MLGS	5F		256
PDE	1977	04	26	090307.30	31.90	-103.08	4	3.3 MLGS	.F		144
PDE	1977	11	28	014050.50	32.95	-100.84	5	3.5 MLGS			318
PDE	1978	03	02	100452.70	31.56	-102.51	11	3.5 MLGS	.F		210
PDE	1979	07	05	010501	32.95	-100.89	4	2.7 UKTUL	.н		312
PDE	1980	03	22	004912.50	34.60	-105.92	5	3.4 MLGS	4F		255
PDE	1981	05	09	123550.80	33.99	-107.03	5	3.1 MLGS	5F		293
PDE	1982	01	04	165608.05	31.18	-102.49	5	3.9 LgTUL	3F		240
PDE	1982	03	16	110302.67	35.36	-103.27	5	3.1 LgTÚL	3F		300
PDE	1982	04	26	083147.79	33.02	-100.84	5	2.8 LgGS			318
PDE .	1982	05	18	060008.50	34.17	-106.95	9	2.8 MLGS	.F		296
PDE	1982	05	18	060838.40	34.20	-106.90	6	2.8 MLGS	.F		293
PDE	1982	05	24	063251.70	34.17	-106.95	6	2.9 MLGS	.F		295
PDE	1982	09	20	035517.20	33.95	-107.06	11	3.5 LgTUL	4F		293
PDE	1982	10	07	124125.99	34.31	-106.82	4	2.4 MLGS	.F		294
PDE	1982	11	28	023648.51	33.00	-100.84	5	3.3 LgTUL	4F		318
PDE	1983	03	02	232219.40	34.30	-106.89	8	4.3 LgTUL	6D		299
PDE	1983	04	30	073420.18	33.32	-106.44	7	3.5 MLGS			214
PDE	1983	09	15	232536.05	35.14	-104.39	5	3.2 LgTUL	5F		263
PDE	1983	09	29	074408.43	35.24	-104.30	5	2.7 MDGS			274
PDE	1984	05	21	133113.54	35.07	-102.23	5	3.1 LgTUL			314
PDE	1984	08	26	021954	34.31	-106.80	5	2.9 MLGS	.F		292
PDE	1984	12	04	203636.02	32.26	-103.56	5	2.9 MLGS		••••	84
PDE	1985	06	05	103600.60	32.56	-106.92	6	2.9 MLGLD	4F		252
PDE	1985	06	27	182000.03	33.62	-106.47	0	3.4 LgGS		E	229
PDE	1985	08	16	145652.96	34.13	-106.83	7	4.1 MLGS	6D		284

PDE	1985	09	06	052246.20	32.54	-106.94	5	2.6	MDGLD	.F.		255
PDE	1985	12	15	071452.23	35.28	-104.64	5	3.6	LqTUL	.F.		280
PDE	1986	04	17	210430.30	32.59	-106.91	5	2.7	MDGLD	.F:		251
PDE	1986	04	28	130016	34.01	-106.82	5	2.6	MDGLD	.F.		276
PDE	1986	08	27	180656.38	35.16	-105.09	5	3.2	MLGS	.F.		276
PDE	1987	05	14	155958.46	33.54	-106.52	0	2.9	MLGS		E	229
PDE	1988	12	25	075233 93	35 12	-105 96	ñ	28	MDSNM	ייי ה		304
	1989	Δ1	20	050715 33	35 22	-104 09	7	3 4	MDGNM	•••	••••••	271
	1000	11	29	000710.00	24 46	-104.09	12	1 7	MIDGINI	 E 12		271
PDE	1000	- T T	27	121610 60	34.40	-106.89	10	4./		SF.		202
PDE	1990	01	29	131610.68	34.46	-106.88	12	4.8	LGILOP	6D.		308
PDE	· 1990	01	31	010819.29	34.44	-106.86	10	4.0	гдлог	5F.	• • • • • • •	306
PDE	1990	02	21	120219.34	34.01	-106.54	5	3.6	MLGS	.F.	• • • • • • •	255
PDE	1990	02	27	132322	33.95	-106.59	5	3.9	MDSNM	4F.		255
PDE	1990	05	05	162622.89	34.45	-106.88	6	3.6	MDSNM	.F.		307
PDE	1990	07	21	192822.79	34.46	-106.86	11	3.0	MDSNM			306
PDE	1990	07	21	203031.34	34.46	-106.86	· 7	3.1	MDSNM			306
PDE	1990	07	21	234804.92	34.45	-106.85	7	3.2	MDSNM			306
PDE	1990	07	22	212705.13	34.84	-106.01	10	3.7	MDSNM			281
PDE	1990	07	31	073240.18	34.46	-106.86	. 7	3.3	MDSNM	.F.		307
PDE	1990	11	08	104653.77	34.45	-106.86	6	4.3	MDSNM	4F.		306
PDE	1990	11	08	110346.51	34.45	-106.86	8	3.1	MDSNM	. F .		306
PDE	1990	11	10	121816 85	34 45	-106 85	7	3 1	MDSNM			305
ਸ਼ੁਰੂ	1990	11	15	072524 38	34 46	-106.86	Ė	3 6	MDGMM	••• 4 ም		306
ם ברבו שתם	1990	12	15	072524.50	34.45	-106.86	0	2.0	MDGNM	чr.	• • • • • • • •	306
	1001	14 02	05	033044.30	24.40	-106.88	0	2.0		··· 211	• • • • • • • •	200
PDE	1991	03	05	201/11.40	34.44	-106.87	9	2.9	MDSNM	3F.		306
PDE	1991	03	06	143659.07	34.44	-106.88	.7	2.5	MDSNM	•••	• • • • • • • •	307
PDE	1991	06	05	184414.90	34.45	-106.85	4	3.0	MDSNM	.F.	• • • • • • •	305
PDE	1991	06	20	1605	33.62	-106.47	0	3.5	MLGS	• • •	E	229
PDE	1991	12	09	124716.50	34.85	-106.55	14	3.1	LgTUL	3F.		314
PDE	1992	01	02	114535.61	32.33	~103.10	5	5.0	LgTUL	5F.		116
PDE	1992	02	23	161752.51	30.65	-105.51	5	3.4	LgTUL			264
PDE	1992	08	24	012535.20	34.01	-106.86	5	2.6	MDSNM	.F.		280
PDE	1992	08	26	032452.67	32.17	-102.71	5	.3.0	LgGS			157
PDE	1993	03	24	023203.50	35.39	-104.19	5	3.0	LgGS	2F.		290
PDE	1993	06	10	1510	33.62	-106.47	0	3.2	MLGS		E	229
PDE	1993	06	23	032312.28	31.35	-102.51	5	2.8	MDSNM			226
PDE	1993	12	22	192511.39	33.33	-105.68	10	3.2	MDSNM			148
PDE	1994	01	01	025131 29	34 44	-106 98	10	2 5	MDSNM	•••		314
DDE	1995	03	19	183643 97	35 00	~104 21	5	2.2	Lacs			246
ם בים בים שרום	1005	0.0	11	002256 17	20.20	-102 25	17	5.5	MwCC	 ссм	••••	240
	1005	04	14	011149 40	20.20	102.35	10	0.7		0 CPI	••••••	207
	1005	04	14	011140.40	50.50	~103.35	10	2.7	LYGS L ~ C C	• • •		200
PDE	1995	04	14	021426	30.30	-103.35	10	2.8	LgGS	•••		200
PDE	. 1995	04	14	021938.50	30.30	-103.35	10	3.3	LgGS	.F.	• • • • • • •	286
PDE	1995	04	14	034842	30.30	~103.35	10	2.6	LgGS	.F.	• • • • • • •	286
PDE	1995	04	14	041116	30.30	-103.35	10	2.4	LgGS	. F.	• • • • • • •	286
PDE	1995	04	14	055339	30.30	-103.35	10	2.7	LgGS	• • •	• • • • • • •	286
PDE	1995	04	14	073936.50	30.30	-103.35	10	2.4	LgGS	.F.		286
PDE	1995	04	14	082712.50	30.30	-103.35	10	2.8	LgGS	.F.		286
PDE	1995	04	14	100258	30.30	-103.35	10	2.9	LgGS	.F.		286
PDE	1995	04	14	105720.40	30.30	-103.35	10	2.3	LgGS	.F.		286
PDE	1995	04	15	031805	30.30	-103.35	10	2.4	LgGS	.F.		286
PDE	1995	04	15	143329.51	30.27	-103.32	10	4.0	LgGS	6D.		290
PDE	1995	04	16	004043.30	30.30	-103.35	10	2.3	LgGS	•••		286
PDE	1995	04	16	102625.50	30.30	-103.35	10	2.5	LgGS	•••		286
PDE	1995	04	16	161609.60	30.30	-103.35	10	2.4	LqGS			286
PDF	1995	04	17	085000.50	30.30	-103.35	10	2.5	Lags			286
	1995	04	21	044144	30 30	-103 35	10	2.9	Lags	 उह		286
PDF	1995	06	01	010615 70	30.30	-103 35	10	25	Lace	ጋ፲ . ፈፑ		286
בים <u>-</u>	1995	07	05	024151	30.30	-103 35	10	2.2	Lace	יידי. ק	•••••	286
	1005	07	00	024101	30.30	102.35	10	2.1		.r. 	••••••	200
LND	エブブン	07	00	024/04	20.20	-TO2.22	τU	4.0	ച്ചവരാ	.г.		200

PDE	1995	08	28	151339.05	34.21	-106.94	3	2.8	LqGS	5F.		297
PDE	1995	11	12	174559.40	30.30	-103.35	10	3.6	LaGS	.F.		286
PDE	1996	03	15	131757.22	33.59	-105.69	10	2.9	Lags	.F.		163
PDE	1996	03	24	201612.70	34.26	-105.68	10	3.5	Lags	.F.		212
PDE	1996	03	24	201923.10	34.27	-105.69	10	3.7	LqGS	.F.		214
PDE	1996	07	22	100614.98	34.20	-105.71	10	3.5	LaGS	. F.		209
PDE	1997	05	20	094105.82	34.19	-105.74	10	3.2	LaGS	. . .		210
PDE	1997	12	31	132830.05	34.53	-106.15		35	MLGS	T		264
PDE	1997	12	31	133206 60	34 55	-106 15	5	35	MLGS	•••		265
202	1997	12	31	133358 90	34 55	-106 15	5	3 4	MLCS			265
שמפ	1998	01	04	080531 87	34 55	-106 19	5	4 0	MLCS	 ਸ		268
PDE	1998	04	15	103342 42	30 19	-103 30	10	36	LaCS	.r. F		200
קטק	1998	07	14	053848 75	35 34	-103 47	10	3.0	MDGMM	ייי. הי		202
	1999	07	01	090023 50	20 57	-104 66	1	2.0	Lace			255
DDE	1999	03	14	224317 97	32.57	-104.63	1	4 0	MDGMM	••••	••••	40
	1000	03	17	102022 11	32.59	-104.63	1	4.0			•••	42
PDE	1999	03	1/	122923.11	32.58	-104.67	10	3.5	MDSNM	•••		46
PDE	1999	00	30	190425.60	32.58	-104.66	TO	3.9	MDSNM	• • •		45
PDE	1999	08	09	065122.97	32.57	-104.59	5	2.9	MDSNM	• • •	••••	40
PDE	2000	02	02	071420.26	32.58	-104.63	5	2.7	LgGS	•••	• • • • • • •	42
PDE	2000	02	26	030100.83	30.24	-103.61	5	2.8	LgGS	.F.	• • • • • • •	286
PDE	2001	06	02	015553.72	32.33	-103.14	5	3.3	LgGS	• • •		113
PDE	2001	11	22	000708.02	31.79	-102.63	5	3.1	LgGS	• • •		186
PDE	2002	09	17	154514.47	32.58	-104.63	10	3.5	LgGS	• • •	••••	42
PDE	2002	09	17	233419.35	32.58	-104.63	10	3.3	LgGS	• • •		43
PDE	2003	06	21	020309.56	32.67	-104.50	5	3.6	LgGS	• • •		28
PDE	2004	05	23	092205.28	32.53	-104.57	5	4.0	mbGS	3F.		41
PDE	2004	05	24	213628.56	34.47	-106.90	5	3.5	MLGS	.F.		310
PDE	2004	06	22	085528.23	32.53	-104.58	5	3.7	LgGS	.F.		42
PDE	2004	08	26	184518.62	32.58	-104.50	5	3.4	MLGS	•••		33
PDE	2004	10	28	025904.82	32.60	-104.50	5	3.0	LgGS	• • •		31
PDE	2004	11	14	212749.90	33.25	-106.20	5	3.5	LgGS	• • •		191
PDE	2005	10	30	025734.81	34.07	-106.98	5	2.4	MLGS	.F.		292
PDE	2005	12	19	202740.37	32.53	-104.55	5	4.1	MwSLM	ЗFМ		40
PDE	2005	12	22	143011.67	32.58	-104.57	5	3.6	LgGS	.F.		37
PDE	2006	01	27	100456.45	32.59	-104.55	5	2.7	LgGS			35
PDE	2006	01	27	160745.84	32.55	-104.58	5	3.1	LgGS			40
PDE	2006	02	04	195510.68	32.58	-104.62	5	2.7	MLGS			42
PDE	2006	03	04	171458.25	30.29	-103.67	5	2.7	LgGS	• • •		280
PDE	2006	03	20	175529.12	32.60	-104.56	5	3.0	MLGS			36
PDE	2006	04	80	180835.23	31.95	-101.42	5	2.9	MLGS			279
PDE	2006	08	12	104909.67	32.90	-100.89	5	2.8	LgGS	.F.		312
PDE	2007	05	23	051655.15	34.07	-106.94	5	3.4	MLGS	3F.		289
PDE	2008	01	29	102453.24	32.90	-100.84	5	3.3	LgGS	.F.		317
PDE	2008	02	18	1415	32.27	-101.42	0	2.1	LgGS	·.C.	E	269
PDE	2008	04	16	090604.36	33.66	-106.06	5	2.7	MLGS			196
PDE	2008	05	23	180305.86	32.50	-104.60	5	2.7	LgGS			45
PDE	2008	07	18	173109.40	32.89	-100.84	5	2.7	LgGS			317
PDE	2008	12	28	205659.99	30.44	-103.36	5	2.6	MLGS	• • •		271
PDE	2009	01	30	014121.66	32.50	-104.61	5	2.7	LgGS	• • •		46
PDE	2009	06	05	171732.94	31.35	-105.98	0	2.4	MLEPT	.F.		227
PDE	2009	06	05	181023.63	31.35	-105.98	0	2.6	MLEPT	.F.	•••••	227
PDE	2009	80	20	015723.10	34.03	-106.87	5	2.7	MLGS	3F.		282
PDE	2009	08	30	003100.29	34.22	-106.89	5	2.5	MLGS	.F.		293
PDE	2009	80	30	063947.47	34.16	-106.86	5	2.6	MLGS	.F.		289
PDE	2009	80	30	070943.72	34.19	-106.88	5	2.1	MLGS	.F.		291 [~]
PDE	2009	11	17	185306.84	32.43	-104.64	5	3.0	LgGS			54
PDE	2010	01	27	045933.05	32.90	-100.83	5	3.1	LgGS	.F.		318
PDE	2010	02	21	095539.77	32.57	-104.61	5	2.8	LgGS			41
PDE	2010	03	28	000355.08	32.44	-104.50	4	4.1	MwRMT	3 FM		44
PDE	2010	04	11	195632.67	32.41	-101.06	5	2.9	LgGS			300

PDE	2010	04	12	002005.97	32.94	-100.88	5	2.8	LgGS	• • •		314
PDE	2010	05	09	071807.37	34.04	-106.83	5	2.1	MLGS	.F.		279
PDE	2010	05	27	204721.87	31.11	-105.58	5	3.7	MLGS			223
PDE	2010	05	31	215819.17	32.52	-104.61	5	4.0	MLGS			44
PDE	2010	08	08	011238.07	32.90	-100.85	5	3.4	MWRMT	2FM		316
ישתם	2010	00	25	020514 32	22.20	-100.96	5	2.1	Lace			215
FDE	2010	00	25	120514.52	32.99	-100.88	5	2.0	LyGS	• • •		212
PDE	2010	08	29	124836.61	32.91	-100.92	5	2.6	LgGS	•••	•••••	310
PDE-W	2010	10	09	074227.63	32.93	-100.89	5	3.1	LgGS	• • •	••••••••	313
PDE-W	2010	10	26	065629.79	32.92	-100.85	5	3.1	LgGS		• • • • • • • •	316
PDE-W	2010	11	01	091058.42	33.00	-100.82	5	2.8	LgGS			320
PDE-W	2011	01	11	043415.77	34.39	-106.99	5	2.7	MLGS			312
PDE-W	2011	02	17	182534 41	30 11	-103 30	5	2 2	LaGS			307
222 ···	2011	03	01	033012 76	32 88	-100.94	5	2 1	Lace	・・・ 2 F		217
ש שתת	2011	0,0	01	063150 00	22.00	100.84	5	э.т э.т	цусз	25.		201
PDE-W	2011	03	10	063159.69	32.84	-100.80	5	2.5	LGG2	• • •	• • • • • • •	321
PDE-W	2011	03	12	152200.86	32.88	-100.90	5	3.0	LgGS	• • •	• • • • • • •	312
PDE-W	2011	03	14	001948.80	32,96	-100.81	5	3.0	LgGS			320
PDE-W	2011	03	28	,091211.95	32.91	-100.82	5	3.0	LgGS			320
PDE-W	2011	04	06	233835.45	34.40	-107.02	5	3.2	MLGS			315
PDE-W	2011	04	25	165631.88	32.82	-100.84	5	2.5	Lags			317
PDE-W	2011	04	28	010341 97	30 74	-105 71	6	4 4	mbGS	ਸ		264
DDF-W	2011	04	28	035625 61	30 74	-105 78	10	4 0	mbGS	•••		260
DDE W	2011	01	20	045023.01	20.74	-105.78	10	4.0	Mad	TIM	• • • • • • • •	200
PDE-W	2011	04	28	045834.59	30.68	-105.75	9	3.6	MWRMT	. FM	••••	272
PDE-W	2011	04	28	074903.45	30.82	-105.80	5	3.1	LgGS	•••	• • • • • • •	262
PDE-W	2011	04	28	075418.94	30.58	-105.85	5	2.7	LgGS .	• • •	• • • • • • •	286
PDE-W	2011	04	30	010716.82	30.76	-105.75	10	4.6	MDUNM	• • •		265
PDE-W	2011	05	02	114328.24	30.73	-105.72	10	4.2	MWRMT	2FM		266
PDE-W	2011	05	02	115836.35	30.74	-105.70	10	3.3	MLGS			264
PDE-W	2011	05	02	134032.64	30.69	-105.75	10	3.3	MLGS			271
PDE-W	2011	05	02	135536.79	30.73	-105.67	5	4.4	mbGS	2F.		264
PDE-W	2011	05	03	025830.18	30.67	-105.73	10	3.8	MWRMT	FM		273
PDE-W	2011	05	03	114203 84	30 49	-105 68	10	28	MLGS	• • • •		287
DDF-W	2011	05	04	162627 03	30.11	-105.00	10	2.0	MurDMT	 м	• • • • • • • •	207
	2011	05		102027.03	30.71	105.75	10	3.1	MUCC	••••	••••	271
PDE-W	2011	05	05	052010.02	30.79	-105.76	10	3.6	MLGS	• • •	• • • • • • •	262
PDE-W	2011	05	06	002426.09	30.75	-105.73	10	2.8	MLGS	•••	• • • • • • •	264
PDE-W	2011	05	06	004559.26	30.81	-105.71	10	2.8	MLGS	• • •	•••••	258
PDE-W	2011	05	07	045100.88	30.64	-105.73	10	4.1	MDUNM	2F.		275
PDE-W	2011	05	08	132449.65	30.75	-105.81	10	3.1	MLGS			269
PDE-W	2011	05	08	134616.49	30.72	-105.76	10.	3.2	MLGS			269
PDE-W	2011	05	08	135758.52	30.71	-105.75	10	2.9	MLGS			269
PDE-W	2011	05	08	190732.13	30.81	-105.31	10	3.0	MLGS			239
PDE-W	2011	05	08	225459 93	30 74	-105 74	10	3 3	MLGS			266
PDE-W	2011	05	09	064019 15	30 76	-105 69	10	39		 দ	· · · · · · · ·	261
	2011	05	10	184118 44	30.70	-105.00	10	2.1	MLCS	••••	• • • • • • • •	201
שמת	2011	05	10	104110.44	30.72	105.72	10	5.4 5.4	MLCC	• • •	• • • • • • • •	207
PDG-W	2011	05	10	124910.20	30.70	-105.45	10	2.0	MDGS	•••	• • • • • • •	250
PDE-W	2011	05	14	220/51.11	30.82	-105.74	10	3.9	MDUNM	. F .	• • • • • • •	259
PDE-W	2011	05	17	200820	30.75	-105.74	10	4.2	MDUNM	• • •	• • • • • • •	265
PDE-W	2011	05	19	103523.51	30.80	-105.69	10	3.4	MwRMT	М		258
PDE-W	2011	05	19	115649.90	30.72	-105.59	10	2.9	MLGS	• • •	••••	260
PDE-W	2011	05	20	231419.06	30.20	-105.55	10	2.7	MLGS	÷		310
PDE-W	2011	05	25	100301.09	30.70	-105.63	10	2.8	MLGS			264
PDE-W	2011	05	27	014128.20	30.80	-105.76	10	3.6	MLGS			261
PDE-W	2011	05	27	014908.92	30.98	-105.78	10	3.0	MLGS			246
PDE-W	2011	07	14	102913.60	32.93	-100.81	5	2.5	LaGS		•••••	321
PDE-W	2011	09	11	183635 11	32.74	-100.84	5	2.5	Lacs	ייי אד		318
	2011	00	11	203150 11	22.14	-100.04	5	2.5	Lace	ンビ・ 2 F	• • • • • • • •	316
	2011	09	10	203130.II	34.07	-100.00	2	4.0	1969 1 - 66	2F.	• • • • • • •	210
PDE-W	ZUII	09	12	003149.11	32.80	-100.88	5	2.7	гдег	2F.		314
PDE-W	2011	09	12	022931.34	32.73	-100.85	5	2.5	LgGS	.H.	• • • • • • •	317
PDE-W	2011	09	12	091946.71	32.85	-100.85	5	2.6	LgGS		•••••	316
PDE-W	2011	09	12	092612.90	32.76	-100.84	5	2.7	LgGS	2F.	•••••	317
PDE-W	2011	09	12	141834.05	32.82	-100.87	7	3.4	LgGS	3F.	• • • • • • •	314

PDE-W	2011	09	28	214637.55	32.52	-104.66	5	2.7	LgGS		48
PDE-W	2011	11	24	064959.99	32.95	-100.81	5	2.8	LgGS		320
PDE-W	2011	11	24	231549.01	32.94	-100.85	5	3.1	LgGS	••• •••••	317
PDE-W	2011	12	09	184733.24	32.94	-100.86	5	3.5	LgGS	3F	315
PDE-W	2011	12	17	144658.46	32.81	-100.85	5	3.2	LgGS	3F	316
PDE-W	2011	12	29	061907.64	32.81	-100.91	5	2.5	LgGS		311
PDE-W	2011	12	29	114808.28	32.88	-100.83	5	2.5	LgĠS	.F	318
PDE-W	2012	01	15	092901.68	31.23	-103.61	5	2.7	LgGS	2F	181
PDE-W	2012	01	24	182102.61	30.32	-103.38	5	3.6	LgGS	4F	283
PDE-W	2012	02	06	040024.75	32.09	-104.91	5	2.7	LgGS		98
PDE-W	· 2012	03	06	031149.71	31.81	-106.31	5	2.51	MLGS	3F	223
PDE-W	2012	03	18	105722.43	32.28	-103.89	5	3.1	LgGS		63
PDE-Q	2012	04	05	091115.95	31.57	-106.09	5	2.91	MLGS	.F	219

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APPENDIX D

INJECTION FLUID ANALYTICAL DATA





08-Mar-2011

Aaron Strange Navajo Refining Company PO Box 159 Artesia, NM 88211

Tel: (575) 748-3311 Fax: (575) 746-5421

Re: Injection Well Quarterly

Work Order: 1102690

Dear Aaron,

ALS Environmental received 2 samples on 24-Feb-2011 08:50 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 39.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

nn F Thibault

Electronically approved by: Glanda H. Ramos

JayLynn F Thibault Project Manager



Certificate No: T104704231-09A-TX

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77099-4338 | PHONE (281) 530-5656 | FAX (281) 530-5887 DOVizUR X SK VD お R US#Bduk# iikkh的CVi0dentdwu) 即 with a sharkwith the seharkwith a bhar r p sdq |

Gardician files (

www.alsglobal.com

RIGHT SOLUTIONS BIGHT PARTNER

ALS Environmental

Date: 08-Mar-11

Client:	Navajo Refining Company	
Project:	Injection Well Quarterly	Work Order Sample Summary
Work Order:	1102690	

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	Collection Date	Date Received	<u>Hold</u>
1102690-01	Effluent	Water		2/23/2011 08:50	2/24/2011 08:50	
1102690-02	Trip Blank	Water		2/23/2011	2/24/2011 08:50	

SS Page 1 of 1

Date: 08-Mar-11

ALS Environmental

Client:	Navajo Refining Company	
Project:	Injection Well Quarterly	Case Narrative
Work Order:	1102690	

Prep Comments for 3510_B, Sample 1102690-01F: Matrix Int. Sample Very Dirty.Batch 50327, Method 8270_W, Sample SLCSDW2-110224: Insufficent sample for MS/ MSD Batch 50327, Semivolatiles, Sample 1102690-01F: Sample had to be ran at 5X due to sample matrix.

Batch R106075, Method 300_W, Sample CCV: Bromide not reported in this analytical sequence. 1102742-01D MS/MSD & 1102725-01B MS/MSD -Spike recoveries out of control due to elevated analytes in background samples causing matrix inteference resulting in poor or over range spike recoveries

Batch R106075, Method 300_W, Sample CCV: Bromide not reported in this analytical sequence. 1102742-01D MS/MSD & 1102725-01b MS/MSD -Spike recoveries out of control due to elevated analytes in background samples causing matrix inteference and poor recoveries

ALS Environmental

Iron

Lead

Nickel

Silver

Magnesium

Manganese

Molybdenum

Potassium

Selenium

Date: 08-Mar-11

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Client:	Navajo Refining Compa	ny				······································	
Project:	Injection Well Quarterly				,	Work Order: 1102690	
Sample ID:	Effluent Lab ID: 1102690-01						1
Collection Date: 2/23/2011 08:50 AM					Matrix: WATER		
Analyses	· · · · · · · · · · · · · · · · · · ·	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY	· · · ·			SW7470		Prep Date: 3/1/2011	Analyst: JCJ
Mercury		ND		0.000200) mg/L	1	3/1/2011 03:35 PM
METALS				SW6020		Prep Date: 2/25/201	Analyst: ALR
Aluminum		6.00		0.500) mg/L	50	2/28/2011 06:13 PM
Arsenic		0.0557		0.00500) mg/L	1	2/25/2011 09:21 PM
Barium		0.0590		0.00500) mg/L	t	2/25/2011 09:21 PM
Beryllium		ND		0.00200) mg/L	1	2/25/2011 09:21 PM
Boron		0.216		0.0200) mg/L	1	2/25/2011 09:21 PM
Cadmium		ND		0.00200) mg/L	1	2/25/2011 09:21 PM
Calcium		124		0.500) mg/L	1	2/25/2011 09:21 PM
Chromium		0.00562		0.00500) mg/L	1	2/25/2011 09:21 PM
Cobalt		ND		0.00500) mg/L	1	2/25/2011 09:21 PM
Copper		0.0265		0.00500) mg/L	1	2/25/2011 09:21 PM

3.80

ND

37.3

0.0940

0.202

28.7

0.382

ND

0.0141

0.200 mg/L

0.200 mg/L

mg/L

mg/L

mg/L

mg/L

mg/L

0.00500 mg/L

0.00500

0.00500

0.00500

0.00500

0.200

0.00500 mg/L

Sodium	959	10.0	mg/L	50	2/28/2011 06:13 PM
Vanadium	0.0193	0.00500	mg/L	1	2/25/2011 09:21 PM
Zinc	1.42	0.00500	mg/L	1	2/25/2011 09:21 PM
SEMIVOLATILES		SW8270		Prep Date: 2/24/2011	Analyst: ACN
1,2,4-Trichlorobenzene	ND	0.025	mg/L	5	2/25/2011 04:39 PM
2,4,5-Trichlorophenol	ND	0.025	mg/L	5	2/25/2011 04:39 PM
2,4,6-Trichlorophenol	ND	0.025	mg/L	5	2/25/2011 04:39 PM
2-Methylnaphthalene	ND	0.025	mg/L	5	2/25/2011 04:39 PM
2-Methylphenol	ND	0.025	mg/L	5	2/25/2011 04:39 PM
2-Nitroaniline	ND	0.025	mg/L	5	2/25/2011 04:39 PM
2-Nitrophenol	ND	0.025	mg/L	5	2/25/2011 04:39 PM
3&4-Methylphenol	ND	0.025	mg/L	5	2/25/2011 04:39 PM
3-Nitroaniline	ND	0.025	mg/L	5	2/25/2011 04:39 PM
4-Nitroaniline	ND	0.025	mg/L	5	2/25/2011 04:39 PM
4-Nitrophenol	. ND	0.025	mg/L	5	2/25/2011 04:39 PM
Acenaphthene	ND	0.025	mg/L	5	2/25/2011 04:39 PM
Acenaphthylene	ND	0.025	mg/L	5	2/25/2011 04:39 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

AR Page 1 of 4

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

2/25/2011 09:21 PM

ALS Environmental

Client: Project:

Sample ID:

Navajo Refining Company Injection Well Quarterly Effluent

Collection Date: 2/23/2011 08:50 AM

Date: 08-Mar-11

Work Order: 1102690

Lab ID: 1102690-01 Matrix: WATER

Analyses	Result	Report Qual Limit	Units	Dilution Factor	Date Analyzed
Aniline	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Anthracene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Benz(a)anthracene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Benzidine	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Hexachloroethane	ND	0.025	mg/L	5	2/25/2011 04:39 PM
Indeno(1,2,3-cd)pyrene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Isophorone	ND	· 0.025	i mg/L	5	2/25/2011 04:39 PM
Naphthalene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Nitrobenzene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
N-Nitrosodimethylamine	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
N-Nitrosodi-n-propylamine	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
N-Nitrosodiphenylamine	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Pentachlorophenol	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Phenanthrene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Phenol	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Pyrene	ND	0.025	i mg/L	5	2/25/2011 04:39 PM
Surr: 2,4,6-Tribromophenol	91.8	42-124	%REC	5	2/25/2011 04:39 PM
Surr: 2-Fluorobiphenyl	<i>88</i> .7	48-120	%REC	5	2/25/2011 04:39 PM
Surr: 2-Fluorophenol	65.7	20-120	%REC	5	2/25/2011 04:39 PM
Surr: 4-Terphenyl-d14	80.2	51-135	%REC	5	2/25/2011 04:39 PM
Surr: Nitrobenzene-d5	77.4	41-120	%REC	5	2/25/2011 04:39 PM
Surr: Phenol-d6	64.9	20-120	%REC	5	2/25/2011 04:39 PM
VOLATILES		SW8260			Analyst: PC
1,1,1-Trichloroethane	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
1,1,2-Trichloroethane	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
1,1-Dichloroethane	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
1,1-Dichloroethene	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
1,2-Dichloroethane	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
2-Butanone	ND	0.010	mg/L	1	2/24/2011 06:32 PM
2-Chloroethyl vinyl ether	ND	0.010	mg/L	1	2/24/2011 06:32 PM
2-Hexanone	ND	0.010	mg/L	1	2/24/2011 06:32 PM
4-Methyl-2-pentanone	ND	0.010	mg/L	1	2/24/2011 06:32 PM
Acetone	0.025	0.010	mg/L	1	2/24/2011 06:32 PM
Benzene	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
Bromodichloromethane	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
Bromoform	ND	0.0050	mg/L	1	2/24/2011 06:32 PM
Bromomethane	· ND	0.0050	mg/L	1	2/24/2011 06:32 PM
Carbon disulfide	ND	0.010	mg/L	1	2/24/2011 06:32 PM
Carbon tetrachloride	ND	0.0050	mg/L	1	2/24/2011 06:32 PM

See Qualifiers Page for a list of qualifiers and their explanation. Note:
Matrix: WATER
ab ID: 1102690-01
Order: 1102690

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Chlorobenzene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Chloroethane	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Chloroform	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Chloromethane	NÐ		0.0050	mg/L	1	2/24/2011 06:32 PM
cis-1,3-Dichloropropene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Dibromochloromethane	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Ethylbenzene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
m,p-Xylene	ND		0.010	mg/L	1	2/24/2011 06:32 PM
Methylene chloride	ND		0.010	mg/L	1	2/24/2011 06:32 PM
Styrene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Tetrachloroethene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Toluene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
trans-1,3-Dichloropropene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Trichloroethene	ND		0.0050	mg/L	1	2/24/2011 06:32 PM
Vinyl acetate	ND		0.010	mg/L	1	2/24/2011 06:32 PM
Vinyl chloride	ND		0.0020	mg/L	1	2/24/2011 06:32 PM
Xylenes, Total	ŇD		0.015	mg/L	1	2/24/2011 06:32 PM
Surr: 1,2-Dichloroethane-d4	94.0		70-125	%REC	1	2/24/2011 06:32 PM
Surr: 4-Bromofluorobenzene	95.8		72-125	%REC	1	2/24/2011 06:32 PM
Surr: Dibromofluoromethane	95 .2		71-125	%REC	1	2/24/2011 06:32 PM
Surr: Toluene-d8	97.2		75-125	%REC	1	2/24/2011 06:32 PM
REACTIVE CYANIDE			SW-846			Analyst: HN
Reactive Cyanide	ND		40.0	mg/Kg	1	2/28/2011 10:00 AM
REACTIVE SULFIDE			SW-846			Analyst: HN
Reactive Sulfide	ND		40.0	mg/Kg	1	2/28/2011 10:00 AM
ANIONS			E300			Analyst: TDW
Chloride	410		5.00	· mg/L	10	2/26/2011 01:28 AM
Sulfate	1,510		25.0	mg/L	50	3/2/2011 02:09 AM
Surr: Selenate (surr)	95.0		85-115	%REC	10	2/26/2011 01:28 AM
Surr: Selenate (surr)	103		85-115	%REC	50	3/2/2011 02:09 AM
ALKALINITY			SM2320E	3		Analyst: DM
Alkalinity, Bicarbonate (As CaCO3)	441		5.00	mg/L	1	3/4/2011 09:30 AM
Alkalinity, Carbonate (As CaCO3)	ND		5.00	mg/L	1	3/4/2011 09:30 AM
Alkalinity, Hydroxide (As CaCO3)	ND	-	5.00	mg/L	1	3/4/2011 09:30 AM
Alkalinity, Total (As CaCO3)	441		5.00	mg/L	1	3/4/2011 09:30 AM
SPECIFIC CONDUCTIVITY			M2510 B			Analyst: DM
Specific Conductivity	6,270		1.00	µmhos/cr	n 1	3/7/2011 09:00 AM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

AR Page 3 of 4

Date: 08-Mar-11

Client:	Navajo Refining Comp	any			· · · ·			
Project:	Injection Well Quarterl	у			· V	Vork Order:	1102690	
Sample ID:	Effluent					Lab ID:	1102690-01	
Collection Date:	2/23/2011 08:50 AM					Matrix:	WATER	
Analyses		Result	Qual	Report Limit	Units	Dilution Factor	· · · · · · · · · · · · · · · · · · ·	Date Analyzed
IGNITIBILITY				SW1010)			Analyst: JKP
Ignitability		> 212		50.	0 °F	1	:	3/4/2011 10:00 AM
PH	,			E150.1				Analyst: DM
pН		7.40	Н	0.10	0 pH units	s 1	:	3/2/2011 01:00 PM
TOTAL DISSOLV	ED SOLIDS			M2540C	;			Analyst: JKP
Total Dissolved S Filterable)	Solids (Residue,	3,310		10.	0 mg/L	. 1	:	3/1/2011 03:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

AR Page 4 of 4

QC BATCH REPORT

Client:	Navajo Refining Company
ork Order:	1102690
oject:	Injection Well Quarterly

Batch ID: 50	340 instrument ID ICPMS03	•	Method:	SW602	20					
MBLK	Sample ID: MBLKW1-022511-50340			_	Units: mg/	L	Analy	sis Date: 2	/25/2011 0	3:53 PM
Client ID:	R	un ID: ICPMS	03_110225A		SeqNo: 229	0830	Prep Date: 2/2	25/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	ND	0.010								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Beryllium	ND	0.0020								
Boron	0.01716	0.050								J
Cadmium	ND	0.0020								
Calcium	ND	0.50								
Chromium	ND	0.0050								
Cobalt	ND	0.0050								
Copper	ND	0.0050								
Iron	ND	0.20								
Lead	ND	0.0050								
Magnesium	ND	0.20								
Manganese	ND	0.0050		_						
Molybdenum	ND	0.0050								
Nickel	ND	0.0050								
ssium	ND	0.20			•					
anium	ND	0.0050								
Silver	ND	0.0050								
Sodium	ND	0.20	ż			<u>.</u>				·
Vanadium	ND	0.0050								
Zinc	ND	0.0050	·							

See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 20

Client:Navajo Refining CompanyWork Order:1102690

QC BATCH REPORT

Project: Injection Well Quarterly

atch ID: 50	340 Instrument ID ICPMS03		Method	SW602	:0						
LCS	Sample ID: MLCSW1-022511-50340		<u> </u>		ι	Jnits: mg/		Analy	sis Date: 2	/25/2011 0	3:58 PM
Client ID:	Rur	n ID: ICPMS	03_110225A		Se	qNo: 229 0)831	Prep Date: 2/2	5/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1065	0.010	0.1		0	106	80-120)		
Arsenic	0.04971	0.0050	0.05		0	99.4	80-120	0)		
Barium	0.05105	0.0050	0.05		0	102	80-120	Ċ)		
Beryllium	0.05071	0.0020	0.05		0	101	80-120)		
Boron	0.5158	0.050	0.5		0	103	80-120	C)		
Cadmium	0.05049	0.0020	0.05		0	101	80-120)		
Calcium	5.162	0.50	5		0	103	80-120	C	j		•
Chromium	0.04908	0.0050	0.05		0	98.2	80-120)		
Cobalt	0.04995	0.0050	0.05		0	99.9	80-120	C)		
Copper	0.0506	0.0050	0.05		0	101	80-120)		
Iron	4.942	0.20	5		0	98.8	80-120	C			
Lead	0.05038	0.0050	0.05		0	101	80-120)		
Magnesium	5.035	0.20	5		0	101	80-120	C)		
Manganese	0.05085	0.0050	0.05		0	102	80-120).		
Molybdenum	0.04969	0.0050	0.05		0	99.4	80-120	C)		
Nickel	0.05028	0.0050	0.05		0	101	80-120	0)		
Potassium	5.067	0.20	5		0	101 -	80-120	C)		
'enium	0.04992	0.0050	0.05		0	99.8	80-120	C	I		
۲	0.05021	0.0050	0.05		0	100	80-120	c)		
Judium	5.035	0.20	5		0.	101	80-120				
Vanadium	0.04847	0.0050	0.05		0	96.9	80-120	C			
Zinc	0.05204	0.0050	0.05		0	104	80-120	C)		

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Navajo Refining Company Work Order: 1102690

QC BATCH REPORT

Project: Injection Well Quarterly

atch ID: 50340	Instrument ID ICPMS03		Metho	d: SW6020						
MS Sampl	e ID: 1102716-01DMS				Units: mg/	<u>– </u>	Analys	is Date: 2	/25/2011 (04:24 PM
Client ID:	Run	ID: ICPMS	03_110225/	A S	eqNo: 229	0836	Prep Date: 2/25	/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.383	0.010	0.1	1.317	66	80-120	0			so
Arsenic	0.05555	0.0050	0.05	0.004552	102	80-120	0			
Barium	0.1866	0.0050	0.05	0.1391	95	80-120	0			
Beryllium	0.05096	0.0020	0.05	0.0002062	102	80-120	0			
Boron	0.6296	0.050	0.5	0.1208	102	80-120	0			
Cadmium	0.05097	0.0020	0.05	0.00001532	102	80-120	, 0			
Calcium	27.29	0.50	5	22.66	92.6	80-120	0			0
Chromium	0.05251	0.0050	0.05	0.003365	98.3	80-120	0			
Cobalt	0.05036	0.0050	0.05	0.0003329	100	80-120	0			
Copper	0.05437	0.0050	0.05	0.004448	99.8	80-120	0		1	
iron	5.848	0.20	5	0.9871	97.2	80-120	. 0			
Lead	0.05417	0.0050	0.05	0.003855	101	80-120	0			
Magnesium	7.581	0.20	5	2.835	94.9	80-120	· 0			
Manganese	0.08381	0.0050	0.05	0.03486	97.9	80-120	0			
Molybdenum	0.0538	0.0050	0.05	0.002954	102	80-120	0			
Nickel	0.0514	0.0050	0.05	0.001801	99.2	80-120	Ō			
Potassium	37.47	0.20	5	33.6	77.4	80-120	0			SO
'enium	0.05219	0.0050	0.05	0.0008471	103	80-120	0			
)r	0.04987	0.0050	0.05	-0.0001762	100	80-120	0			
പdium	51	0.20	5	47.13	77.4	80-120	0			SO
Vanadium	0.05334	0.0050	0.05	0.004668	97.3	80-120	0			
Zinc	0.07856	0.0050	0.05	0.02639	104	80-120	0			

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Navajo Refining Company 1102690

Work Order:

"roject: Injection Well Quarterly

QC BATCH REPORT

	340 Instrument ID ICPM	S03	Metho	d: SW6020						•• .
MSD	Sample ID: 1102716-01DMSD				Units: mg/	Ľ	Analys	is Date: 2/	25/2011 0	4:29 PM
Client ID:		Run ID: ICPM	S03_110225#	. s	eqNo: 229	0837	Prep Date: 2/25	/2011	DF: 1	
Analyte	Res	ult PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.6	02 0.010	0.1	1.317	285	80-120	1.383	14.7	15	SO
Arsenic	0.057	02 0.0050	0.05	0.004552	105	80-120	0.05555	2.61	15	
Barium	0.1	93 0.0050	0.05	0.1391	108	80-120	0.1866	3.37	15	
Beryllium	0.051	14 0.0020	0.05	0.0002062	102	80-120	0.05096	0.353	15	_
Boron	0.64	42 0.050	0.5	0.1208	105	80-120	0.6296	2.29	15	
Cadmium	0.051	62 0.0020	0.05	0.00001532	103	80-120	0.05097	1.27	15	
Calcium	27.	63 0.50	5	22.66	99.4	80-120	27.29	1.24	15	0
Chromium	0.053	23 0.0050	0.05	0.003365	99.7	80-120	0.05251	1.36	15	
Cobalt	0.050	94 0.0050	0.05	0.0003329	101	80-120	0.05036	1.15	15	
Copper	0.055	58 0.0050	0.05	0.004448	102	80-120	0.05437	2.2	15	
Iron	6.0	06 0.20	5	0.9871	100	80-120	5.848	2.67	15	
Lead	0.054	41 0.0050	0.05	0.003855	101	80-120	0.05417	0.442	15	
Magnesium	7.6	26 0.20	5	2.835	95.8	80-120	7.581	0.592	15	
Manganese	0.084	81 0.0050	0.05	0.03486	99.9	80-120	0.08381	1.19	15	
Molybdenum	0.053	82 0.0050	0.05	0.002954	102	80-120	0.0538	0.0372	15	
Nickel	0.052	74 0.0050	0.05	0.001801	102	80-120	0.0514	2.57	15	
Potassium	37.	91 0.20	5	33.6	86.2	80-120	37.47	1.17	15	0
'enium	0.053	45 0.0050	0.05	0.0008471	105	80-120	0.05219	2.39	15	
ar i	0.050	51 0.0050	0.05	-0.0001762	101	80-120	0.04987	1.28	15	
Jodium	50.	87 0.20	5	47.13	74.8	80-120	51	0.255	15	SO
Vanadium	0.054	87 0.0050	0.05	0.004668	100	80-120	0.05334	2.83	15	
Zinc	0.078	32 0.0050	0.05	0.02639	104	80-120	0.07856	0.306	15	

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 4 of 20

Client: Navajo Refining Company Work Order: 1102690

QC BATCH REPORT

"roject: Injection Well Quarterly

.atch ID: 503	40 Instrument ID ICPMS03		Method:	SW6020						
DUP	Sample ID: 1102716-01DDUP				Units: mg/	 L	Analysi	s Date: 2/	25/2011 0	4:14 PM
Client ID:	Ru	n ID: ICPMS	03_110225A	s	eqNo: 229	0834	Prep Date: 2/25	/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.274	0.010	0	0	0	0-0	1.317	3.32	25	
Arsenic	0.00439	0.0050	0	0	0	0-0	0.004552	0	25	J
Barium	0.1384	0.0050	0	0	0	0-0	0.1391	0.505	25	
Beryllium	ND	0.0020	0	0	0	0-0	0.0002062	. 0	25	
Boron	0.1168	0.050	0	Ó	0	0-0	0.1208	3.37	25	
Cadmium	ND	0.0020	0	0	0	0-0.	0.00001532	. 0	25	
Calcium	22.29	0.50	· 0	0	· 0	0-0	22.66	1.65	25	
Chromium	0.003164	0.0050	0	0	0	0-0	0.003365	0	. 25	J
Cobalt	ND	0.0050	0	0	0	0-0	0.0003329	0	25	
Copper	0.004629	0.0050	0	0	0	0-0	0.004448	0	25	J
Iron	0.9153	0.20	0	0	0	0-0	0.9871	7.55	25	
Lead	0.003715	0.0050	00	0	0	0-0	0.003855	0	25	J
Magnesium	2.779	0.20	0	<i>,</i> 0	0	0-0	2.835	2	25	
Manganese	0.03395	0.0050	0	0	0	0-0	0.03486	2.64	25	
Molybdenum	0.00302	0.0050	0	0	0	0-0	0.002954	0	25	J
Nickei	0.00147	0.0050	0	0	0	0-0	0.001801	0	25	J
Potassium	33.35	0.20	0	0	0	0-0	33.6	0.747	25	
'enium	ND	0.0050	0	0	0	0-0	0.0008471	0	25	
٦٤	ND	0.0050	0	0	0	0-0 ,	-0.0001762	0	25	
Jodium	46.96	0.20	0	0	0	0-0	47.13	0.361	25	
Vanadium	0.00459	0.0050	0	0	0	0-0	0.004668	0	25	J
Zinc	0.02171	0.0050	0	0	. 0	0-0	0.02639	19.5	25	

The following samples were analyzed in this batch:

- -3

1102690-01B

See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 5 of 20

Client: Navajo Refining Company

Work Order: 1102690

QC BATCH REPORT

`roject: Injection Well Quarterly

Jatch ID: 5	0423 Instrument ID Mercury		Metho	od: SW747	70		·				
MBLK	Sample ID: GBLKW2-030111-50423				U	Inits: mg/	/L	Analys	is Date: 3	/1/2011 03	8:09 PM
Client ID:	Ru	n ID: MERC	CURY_11030	1A	Se	qNo: 229	4808	Prep Date: 3/1/	2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020)								
LCS	Sample ID: GLCSW2-030111-50423				U	nits: mg/	<u></u>	Analys	is Date: 3	/1/2011 03	8:11 PM
Client ID:	Rur	n ID: MERC	URY_11030	1A	Se	qNo: 229	4810	Prep Date: 3/1/	2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00509	0.00020	0.005		0	102	85-115	0			
MS	Sample ID: 1102798-02CMS				U	nits: mg/	<u>ل</u> ــــــــــــــــــــــــــــــــــــ	Analys	is Date: 3	/1/2011 03	8:17 PM
Client ID:	Rur	n ID: MERC	URY_11030	1A	Se	qNo: 229	4815	Prep Date: 3/1/	2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0051	0.00020	0.005	-0.00000	04	102	85-115	0			
MSD	Sample ID: 1102798-02CMSD				U	nits: mg/	<u> </u>	Analys	is Date: 3	/1/2011 03	:19 PM
Client ID:	Rur	n ID: MERC	URY_11030	1A	Sec	qNo: 229	4817	Prep Date: 3/1/	2011	DF: 1	
⊿lyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00512	0.00020	0.005	-0.00000	04	102	85-115	0.0051	0.391	20	
DUP	Sample ID: 1102798-02CDUP				U	nits: mg/	L	Analysi	is Date: 3	1/2011 03	:15 PM
Client ID:	Rur	n ID: MERC	URY_11030	1A	Sec	qNo: 229 4	4813	Prep Date: 3/1/2	2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Vaiue	%RPD	RPD Limit	Qual
Mercury	ND	0.00020	0		0	0	0-0	-0.000004	0	20	
The followi	ng samples were analyzed in this hatch		102690-01B								

See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company 1102690

QC BATCH REPORT

'nject: Injection Well Quarterly

Work Order:

Jaion ID: 30321		<u>. </u>		u. 377827		· · · ·					_
MBLK Sample ID: SI	BLKW2-110224-50327				U	nits: µg/l	_	Analy	sis Date: 2	/25/2011	10:32 AM
Client ID:	Run II	D: SV-3_1	10225C		Sec	No: 229	1908	Prep Date: 2/24/2011		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	•	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	ND	5.0	· '								· .
2,4,5-Trichlorophenol	ND	5.0									
2,4,6-Trichlorophenol	ND	5.0									
2-Methylnaphthalene	ND	5.0			_						in
2-Methylphenol	ND	5.0									
2-Nitroaniline	ND	5.0									
2-Nitrophenol	ND	5.0									
3&4-Methylphenol	ND	5.0									
3-Nitroaniline	ND	5.0									
4-Nitroaniline	ND	5.0									
4-Nitrophenol	ND	5.0									
Acenaphthene	ND	5.0									
Acenaphthylene	ND	5.0									
Aniline	ND	5.0			_						
Anthracene	ND	5.0									
Benz(a)anthracene	ND	5.0				·					
Benzidine	ND	5.0						. •			
xachloroethane	ND	5.0									
eno(1,2,3-cd)pyrene	ND	5.0						-			
Isophorone	ND	5.0									
Naphthalene	ND	5.0									
Nitrobenzene	ND	5.0									
N-Nitrosodimethylamine	ND	5.0									
N-Nitrosodi-n-propylamine	ND	5.0	-								
N-Nitrosodiphenylamine	ND	5.0									
Pentachlorophenol	ND	5.0									
Phenanthrene	ND	5.0									
Phenol	ND	5.0									
Pyrene	ND	5.0						-			
Surr: 2,4,6-Tribromopheno	1 81.73	5.0	100		0	81.7	42-124)		
Surr: 2-Fluorobiphenyl	73.83	5.0	100		0	73.8	48-120	, ()		
Surr: 2-Fluorophenol	60.73	5.0	100		0	60.7	20-120	() · · ·		
Surr: 4-Terphenyl-d14	73.03	5.0	100		0	73	51-135)		
Surr: Nitrobenzene-d5	74.66	5.0	100		0	74.7	41-120	. ()		
Surr: Phenol-d6	59.28	5.0	100		0	59.3	20-120	. ()		

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Client: Navajo Refining Company Work Order: 1102690

QC BATCH REPORT

"roject: Injection Well Quarterly

_atch ID: 50327	Instrument ID SV-3		Metho	d: SW827	70						
LCS Sample ID: S	SLCSW2-110224-50327				ι	Jnits: µg/l	_	Analys	is Date: 2	/25/2011	10:54 AM
Client ID:	. Run	ID: SV-3_1	10225C		Se	qNo: 229	1909	Prep Date: 2/2	4/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1 2 4-Trichlorobenzene	44 79	50	50		0	89.6	50-120	0			
2.4.5-Trichlorophenol	84.75	5.0	100		0	84.7	50-120	0			
2.4.6-Trichlorophenol	85.29	5.0	100		0	85.3	50-120	0			
2-Methvinaphthalene	41.56	5.0	50		0	83.1	55-120	0			
2-Methylphenol	68.6	5.0	100		0	68.6	50-120	0			
2-Nitroaniline	52.28	5.0	50		0	105	55-120	0			
2-Nitrophenol	82.98	5.0	100		0	83	55-120	0			
3&4-Methylphenol	96.02	5.0	150		0	64	55-120	0			
3-Nitroaniline	30	5.0	50		0	60	40-120	0			
4-Nitroaniline	40.02	5.0	50		0	80	50-120	0			
4-Nitrophenol	89.22	5.0	100		0	89.2	45-120	0			
Acenaphthene	45.48	5.0	50		0	91	55-120	. 0			
Acenaphthylene	46.5	5.0	50		0	93	55-120	0			
Aniline	27.95	5.0	50	···· · · · · · · · · · · · · · · · · ·	0	55.9	30-120	. 0			· ·
Anthracene	48.71	5.0	50		0	97.4	55-120	0			
Benz(a)anthracene	47.13	5.0	50		0	94.3	55-120	0			
Benzidine	16.98	5.0	50		0	34	10-120	0			
rachloroethane	40.36	5.0	50		0	80.7	55-120	0			
no(1,2,3-cd)pyrene	45.46	5.0	50		0	90.9	55-120	0			
isophorone	39.57	5.0	50		0	79.1	55-120	0			· · · · ·
Naphthalene	44.72	5.0	50		0	89.4	55-120	0			
Nitrobenzene	42.54	5.0	50		0	85.1	55-120	0			
N-Nitrosodimethylamine	39.75	5.0	50		0	79.5	45-120	0			
N-Nitrosodi-n-propylamine	33.44	5.0	50		0	66.9	50-120	0			
N-Nitrosodiphenylamine	46.83	5.0	50		0	93.7	55-120	0			
Pentachlorophenol	84.94	5.0	100		0	84.9	55-120	0			
Phenanthrene	48.94	5.0	50		0	97.9	55-120	0			
Phenol	68.93	5.0	100		0	68. 9	50-120	0			
Pyrene	47.24	5.0	50		0	94.5	55-120	0			
Surr: 2,4,6-Tribromophen	ol 81.04	5.0	100		0	81	42-124	0			
Surr: 2-Fluorobiphenyl	. 89.76	5.0	100		0	. 89.8	48-120	. 0			
Surr: 2-Fluorophenol	77.84	5.0	100		0	77.8	20-120	0			
Surr: 4-Terphenyl-d14	79.75	5.0	100		0	79.7	51-135	0			
Surr: Nitrobenzene-d5	79.22	5.0	100		0	79.2	41-120	0			
Surr: Phenol-d6	67.25	5.0	100		0	67.3	20-120	. 0			

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Client: Navajo Refining Company Work Order: 1102690

QC BATCH REPORT

"roject: Injection Well Quarterly

.⊲tch ID: 50327	Instrument ID SV-3		Metho	d: SW8270						
LCSD Sample ID: SI	_CSDW2-110224-50327				Units: µg/l		Analysi	s Date: 2/	25/2011 1	1:16 AM
Client ID:	Run II	D: SV-3_1	10225C	. S	eqNo: 229	1910	Prep Date: 2/24	/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1.2.4-Trichlorobenzene	41:51	5.0	50	0	83	50-120	44,79	7.6	20	
2.4.5-Trichlorophenol	82.32	5.0	100	0	82.3	50-120	84.75	2.91	20	
2.4.6-Trichlorophenol	80.71	5.0	100	0	80.7	50-120	85.29	5.52	20	
2-Methylnaphthalene	42.23	5.0	50	0	84.5	55-120	41.56	1.59	20	······································
2-Methylphenol	78.54	5.0	100	. 0	78.5	50-120	68.6	13.5	20	
2-Nitroaniline	50.52	5.0	50	0	101	55-120	52.28	3.41	20	
2-Nitrophenol	80.36	5.0	100	0	80.4	55-120	82.98	3.22	20	
3&4-Methylphenol	112.7	5.0	150	0	75.1	55-120	96.02	16	20	
3-Nitroaniline	29.25	5.0	50	0	58.5	40-120	30	2.51	20	
4-Nitroaniline	39.11	5.0	50	0	78.2	50-120	40.02	2.3	20	
4-Nitrophenol	86.48	5.0	100	0	86.5	45-120	89.22	3.12	20	
Acenaphthene	43.56	· 5.0	50	0	87.1	55-120	45.48	4.32	20	
Acenaphthylene	43.76	5.0	50	0	87.5	55-120	46.5	6.07	20	
Aniline	31.63	5.0	50	0	63.3	30-120	27.95	12.3	20	
Anthracene	47.13	5.0	50	0	94.3	55-120	48.71	3.29	20	
Benz(a)anthracene	44.23	5.0	50	0	88.5	55-120	47.13	6.35	20	
Benzidine	19.98	5.0	50	0	40	10-120	16.98	16.2	20	
vachloroethane	39.19	5.0	50	0	78.4	55-120	40.36	2.95	20	
no(1,2,3-cd)pyrene	44.35	5.0	50	0	88.7	55-120	45.46	2.46	20	
sophorone	40.56	5.0	50	0	81.1	55-120	39.57	2.47	20	
Naphthalene	42.6	5.0	50	0	85.2	55-120	44.72	4.85	20	
Nitrobenzene	39.59	5.0	50	0	79.2	55-120	42.54	7.18	20	
N-Nitrosodimethylamine	36.14	5.0	50	0	72.3	45-120	39.75	9.5	20	
N-Nitrosodi-n-propylamine	38.81	5.0	50	0	77.6	50-120	33.44	14.9	20	
N-Nitrosodiphenylamine	43.82	5.0	50	0	87.6	55-120	46.83	6.63	20	
Pentachlorophenol	83.9	5.0	100	0	83.9	55-120	84.94	1.24	20	
Phenanthrene	45.45	5.0	50	0	90.9	55-120	48.94	7.38	20	
Phenol	75.63	5.0	100	0	75.6	50-120	68.93	9.27	20	
Pyrene	46.15	5.0	50	0	92.3	55-120	47.24	2.33	20	
Surr: 2,4,6-Tribromopheno	I 81.86	5.0	100	0	81.9	42-124	81.04	1	20	
Surr: 2-Fluorobiphenyl	80.35	5.0	100	0	80.3	48-120	89.76	11.1	20	
Surr: 2-Fluorophenol	78.92	5.0	100	0	78.9	20-120	77.84	1.38	20	
Surr: 4-Terphenyl-d14	78.76	5.0	100	0	78.8	51-135	79.75	1.25	20	
Surr: Nitrobenzene-d5	75.41	5.0	100	0	75.4	41-120	79.22	4.93	20	
Surr: Phenol-d6	73.58	5.0	100	. 0	73.6	20-120	67.25	8.99	20	

The following samples were analyzed in this batch:

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1102690-01F

See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company 1102690

QC BATCH REPORT

^Droject: Injection Well Quarterly

Work Order:

⊿tch ID: R105900 Instrument ID VOA1 Method: SW8260 Sample ID: VBLKW-022411-R105900 MBLK Units: µg/L Analysis Date: 2/24/2011 11:47 AM Client ID: Run ID: VOA1_110224B SeqNo: 2290447 Prep Date: DF: 1 RPD SPK Ref Control **RPD** Ref Limit Value Limit Value Analyte Result PQL SPK Val %REC %RPD Qual 1,1,1-Trichloroethane ND 5.0 1,1,2,2-Tetrachloroethane ND 5.0 1,1,2-Trichloroethane ND 5.0 ND 1,1-Dichloroethane 5.0 1,1-Dichloroethene ND 5.0 1,2-Dichloroethane ND 5.0 2-Butanone ND 10 2-Chloroethyl vinyl ether ND 10 ND 10 2-Hexanone 4-Methyl-2-pentanone ND 10 ND Acetone 10 Benzene ND 5.0 Bromodichloromethane ND 5.0 Bromoform ND 5.0 Bromomethane ND 5.0 Carbon disulfide ND 10 Carbon tetrachloride ND 5.0 ND Vorobenzene 5.0 roethane ND 5.0 unloroform ND 5.0 Chloromethane ND 5.0 cis-1,3-Dichloropropene ND 5.0 ND 5.0 Dibromochloromethane Ethylbenzene ND 5.0 m,p-Xylene ND 10 0.5954 Methylene chloride 10 .1 Styrene ND 5.0 ND Tetrachloroethene 5.0 ND 5.0 Toluene trans-1,3-Dichloropropene ND 5.0 Trichloroethene ND 5.0 Vinyl acetate ND 10 Vinyl chloride ND 2.0 ND Xylenes, Total 15 Surr: 1,2-Dichloroethane-d4 49.97 5.0 50 0 99.9 70-125 0 Surr: 4-Bromofluorobenzene 50 0 48.32 5.0 96.6 0 72-125 Surr: Dibromofluoromethane 5.0 50 0 0 48.9 97.8 71-125 50 Surr: Toluene-d8 50.18 5.0 0

0

100

75-125

See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company

1102690 Work Order:

_atch ID: R105900

LCS

Client ID:

Injection Well Quarterly `~oject:

QC BATCH REPORT

Analysis Date: 2/24/2011 10:56 AM

Prep Date:

DF: 1

Method: SW8260 Instrument ID VOA1 Sample ID: VLCSW-022411-R105900 Units: µg/L Run ID: VOA1_110224B SeqNo: 2290445 SPK Ref Contr

			001010	SPK Ref		Control	RPD Ref		RPD Limit	01
Analyte	Result	PQL	SPK Vại		%REC			%RPD		
1,1,1-Trichloroethane	46.14	5.0	50	0	92.3	80-120	0			
1,1,2,2-Tetrachloroethane	52.1	5.0	50	0	104	72-120	. 0			
1,1,2-Trichloroethane	44.96	5.0	50	、 O´	89.9	80-120	0			
1,1-Dichloroethane	47.54	5.0	50	0	95.1	76-120	. 0			
1,1-Dichloroethene	47.56	5.0	50	0	95.1	73-124	0			
1,2-Dichloroethane	51.36	5.0	50	0	103	78-120	0			
2-Butanone	95.28	10	100	0	95.3	58-132	0			
2-Chloroethyl vinyl ether	112.4	10	100	0	112	74-120	· 0		_	
2-Hexanone	108.8	10	100	Ö	109	61-130	0			
4-Methyl-2-pentanone	103.5	10	100	0	104	65-127	0			
Acetone	99.99	10	100	0	100	59-137	0			
Benzene	51.93	5.0	50	0	104	73-121	. 0			
Bromodichloromethane	53.26	5.0	50	0	107	80-120	0			
Bromoform	49.92	5.0	50	0	.99.8	79-120	0			
Bromomethane	61.91	5.0	50	0	124	66-137	0			
Carbon disulfide	96.68	10	100	0	96.7	68-141	0			
Carbon tetrachloride	49.7	5.0	50	0	99.4	75-124	0			
orobenzene	46 ·	5.0	50	0	92	80-120	0			
proethane	39.82	5.0	50	0	79.6	76-121	0			
chloroform	48.93	5.0	50	. 0	97.9	80-120	0			
Chloromethane	39.52	5.0	50	0	79	67-123	0			
cis-1,3-Dichloropropene	52.54	5.0	50	0	105	80-120	0			
Dibromochloromethane	46.26	5.0	50	0	92.5	80-120	0			
Ethylbenzene	46.88	5.0	50	0	93.8	80-120	0			
m,p-Xylene	92.51	10	100	0	92.5	78-121	Ò			
Methylene chloride	48.62	10	50	0	97.2	65-133	0			
Styrene	43.05	5.0	50	0	86.1	80-120	0			
Tetrachloroethene	47.77	5.0	50	0	95.5	7 9 -120	0			
Toluene	43.26	5.0	50	0	86.5	80-120	0	. – .		
trans-1,3-Dichloropropene	54.52	5.0	50	0	109	80-120	0	·		
Trichloroethene	54.74	5.0	50	0	109	80-120	. 0			
Vinyl acetate	93.83	10	100	. 0	93.8	67-139	0			
Vinyl chloride	43.29	2.0	50	0	86.6	70-127	0			
Xylenes, Total	136.1	15	150	0	90.7	80-120	. 0			
Surr: 1,2-Dichloroethane-d4	45.82	5.0	50	0	91.6	70-125	0			
Surr: 4-Bromofluorobenzene	45.9	5.0	50	0	91.8	72-125	0			
Surr: Dibromofluoromethane	47.55	5.0	50	0	95.1	71-125	0			
Surr: Toluene-d8	46.36	5.0	50	0	92.7	75-125	0			

See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 11 of 20

Client: Navajo Refining Company Work Order: 1102690

QC BATCH REPORT

~oject: Injection Well Quarterly

atch ID: R105900	Instrument ID V	OA1		Metho	d: SW82 6	0						
MS Sample ID:	1102658-01ZMS		· _ · · · · · · · · · · · · · · · · · ·		·	l	Units: µg/L		Analy	sis Date:	2/24/2011)1:28 PN
Client ID:		Run	ID: VOA1_1	10224B		Se	eqNo: 229	0458	Prep Date:		DF: 1	
Analyte		Result	PQL	.SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1 1 1-Trichloroethane		46 53	50	50		0	93.1	80-120		0		
1 1 2 2-Tetrachloroethane		50 16	5.0	50		õ	100	72-120		0		
1 1 2-Trichloroethane		47.43	5.0	50		ů n	94.9	80-120		<u>.</u> 0	· · · · · · · · · · ·	
1 1-Dichloroethane		49.87	5.0	50		ñ	99.7	76-120		o n		
1 1-Dichloroethene		44.61	5.0	50		0 0	89.2	73-124		<u> </u>		
1 2-Dichloroethane		49.5	5.0	50		ñ	99	78-120		n		
2-Butanone	· · · · · · · · · · · · · · · · · · ·	107	10	100	•	0	107	58-132		0		
2-Chloroethyl vinyl ether		ND	10	100		ñ	.0,	74-120		0		s
2-Hexanone	·	102.8	10	100	.	n n	103	61-130		n		
4-Methyl-2-pentanone		110	10	100		ñ	110	65-127		0 0		
		96.87	10	100		0	06.0	50-127		0		
Benzono		49.06	50	50		0 0	90.9	72 101		0 n		
Bromodichloromothana	·····	40.00 52.90	5.0	50		0	106	90 120		<u> </u>		·
Bromotorm		51 47	5.0	50		0 A	100	70.120		n		
		62 72	5.0	50		0	103	66 127		<u> </u>	· · · ·	·
Corbon disulfido		00.72	10	100		0 ^	00 7	60 141		n		
Carbon totrachloride	· · · · · · · · · · · · · · · · · · ·	00.75	i0	50		0	80.1	75 124		<u> </u>		
'arebestano		44.33	5.0	50		0 A	09.1	10-124				
roothana	<u> </u>	47.07	5.0	50		0	79.0	70 120		<u>.</u>		
		39.30	5.0	50		0	/0.0 00.7	10-121				
	·	49.87	5.0	50		0	99.7	80-120		<u>,</u>		
		40.61	5.0	50		0	81.2	67-123	l) >		
cis-1,3-Dichloropropene		51.17	5.0	50	····	0	102	80-120) 		
		48.96	5.0	50		0	97.9	80-120	()		
thylbenzene	<u> </u>	45.76	5.0	50		0	91.5	80-120) 		
n,p-Xylene		91.18	10	100		0	91.2	78-121	(3		
Methylene chloride		48.76	10	50		0	97.5	65-133)	····· • •=	
Styrene		43.63	5.0	50		0	87.3	80-120	()		
etrachloroethene	<u> </u>	43.42	5.0	50		0	86.8	79-120	()		
oluene		43.11	5.0	50		0	86.2	80-120	()		
rans-1,3-Dichloropropene		52.96	5.0	50		0	106	80-120	. ()		, `
richloroethene		51.89	5.0	50		0	104	80-120	()		
/inyl acetate		97.23	10	100		0	97.2	67-139	()		
/inyl chloride		39.73	2.0	50		0	79.5	70-127	(2		
(ylenes, Total		136	15	150		0	90.7	80-120	()	·	
Surr: 1,2-Dichloroethane	-d4	48.17	5.0	50		0	96.3	70-125	()		
Surr: 4-Bromofluorobenz	ene	50.33	5.0	50		0	101	72-125)		
Surr: Dibromofluorometh	ane	48.7	5.0	50		0	97.4	71-125	()		
Surr: Toluene-d8		47.29	5.0 ⁻	50		0	94.6	75-125	(Ĵ		

See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company

1102690

QC BATCH REPORT

oject: Injection Well Quarterly

Work Order:

_atch ID: R105900	Instrument ID VOA1		Method	l: SW826	50			•			
MSD Sample ID:	1102658-01ZMSD				ι	Jnits: µg/L	_	Analysi	s Date: 2/2	24/2011 0	1:54 PM
Client ID:	Rur	ID: VOA1_	110224B		Se	qNo: 229	0459	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1.1.1-Trichloroethane	45.91	5.0	50		0	91:8	80-120	46.53	1.34	20	
1,1,2,2-Tetrachloroethane	52.15	5.0	50		0	104	72-120	50.16	3.88	20	•
1,1,2-Trichloroethane	47.7	5.0	50		0	95.4	80-120	47.43	0.585	20	
1,1-Dichloroethane	47.86	5.0	50		0	95.7	76-120	49.87	4.1	20	
1,1-Dichloroethene	44.92	5.0	50		0	89.8	73-124	44.61	0.7	20	·
1,2-Dichloroethane	47.81	5.0	50		0	95.6	78-120	49.5	3.47	20	
2-Butanone	107.5	10	100		0	108	58-132	107	0.476	20	
2-Chloroethyl vinyl ether	ND	[`] 10	100		0	0	74-120	0	0	20	S
2-Hexanone	117	10	100		0	117	61-130	102.8	12.9	20	
4-Methyl-2-pentanone	116.1	İ0	100		0	116	65-127	110	5.39	20	
Acetone	100.8	10	100		0	101	59-137	96.87	4	20	
Benzene	46.51	5.0	50		0	93	73-121	48.06	3.28	20	
Bromodichloromethane	49.1	5.0	50		0	98.2	80-120	52.89	7.44	20	
Bromoform	51.63	5.0	50		0	103	79-120	51.47	0.311	20	
Bromomethane	64.13	5.0	50		0	128	66-137	63.72	0.639	20	
Carbon disulfide	88.45	10	100		0	88.4	68-141	88.75	0.334	20	
Carbon tetrachloride	42.34	5.0	50		0	84.7	75-124	44.55	5.07	20	
`orobenzene	46.98	5.0	50		0	94	80-120	47.07	0.191	20	
Jroethane	40.26	5.0	50		0	80.5	76-121	39.38	2.23	20	
Chloroform	48.96	5.0	50		0	97.9	80-120	49.87	1.86	20	
Chloromethane	37.91	5.0	50		0	75.8	67-123	40.61	6.85	20	
cis-1,3-Dichloropropene	49.94	5.0	50		0	99.9	80-120	51.17	2.44	20	
Dibromochloromethane	51.34	5.0	50		0	103	80-120	48.96	4.75	20	
Ethylbenzene	47.87	5.0	50		0	95.7	80-120	45.76	4.53	20	
m,p-Xylene	94.72	10	100		Ò	94.7	78-121	91.18	3.81	20	
Methylene chloride	51.97	10	50		0	104	65-133	48.76	6.37	20	
Styrene	46.67	5.0	50		0	93.3	80-120	43.63	6.72	20	
Tetrachloroethene	44.16	5.0	50		0	88.3	79-120	43.42	1.68	20	·
Toluene	47.88	5.0	50		0	95.8	80-120	43.11	10.5	20	
trans-1,3-Dichloropropene	51.45	5.0	50		0	103	80-120	52.96	2.9	20	
Trichloroethene	51	5.0	50		0	102	80-120	51.89	1.73	20	
Vinyl acetate	90.65	10	100		0	90.6	67-139	97.23	7.01	20	
Vinyl chloride	39.63	2.0	50		0	79.3	70-127	39.73	0.243	20	
Xylenes, Total	143.8	15	150		0	95.9	80-120	136	.5.55	20	
Surr: 1,2-Dichloroethane	-d4 47.15	5.0	50		0	94.3	70-125	48.17	2.14	20	
Surr: 4-Bromofluorobenz	ene 52.08	5.0	50		0	104	72-125	50.33	3.41	20	
Surr: Dibromofluorometh	ane 49.5	5.0	50		0	99	71-125	48.7	1.64	20	
Surr: Toluene-d8	48.69	5.0	50		0	97.4	75-125	47.29	2.92	20	

The following samples were analyzed in this batch:

1102690-01A

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See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 13 of 20

EPORT

Client: Work Or `~oject:	der:	Navajo Refining C 1102690 Injection Well Qua	Company							QC	BATC	HRE	PORT
_atch ID: R	R106075	Instrument ID	ICS3K2		Metho	d: E300							
MBLK	Sampl	e ID: WBLKW1-0225	11-R106075			·······	l	Units: mg/	L	Analys	is Date: 2	25/2011	2:05 PM
Client ID:			Run I	D: ICS3K2	_110225A		Se	eqNo: 229	5380	Prep Date:		DF: 1	
Analyte		· .	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride				0.50				·					
Sulfate			ND	0.50									
Surr: Sel	lenate (su	rr)	4.932	0.10	5		0	98.6	85-115	0			
LĊS	Sampl	e ID: WLCSW1-0225	11-R106075			· · · · · · · · · · · · · · · · · · ·	ι	Units: mg/	L	Analys	is Date: 2	25/2011 1	2:27 PM
Client ID:			Run I	D: ICS3K2	_110225A		Se	qNo: 229	5381	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride			19.96	0.50	20		0	99.8	90-110				
Sulfate			18.83	0.50	20 20		0	94.2	90-110	0			
Surr: Sel	lenate (su	rr)	5.106	0.10	5		0	102	85-115	0			
LCSD	Sampl	e ID: WLCSDW1-022	511-R10607	5			- ι	Units: mg/	L	Analys	is Date: 2	25/2011 1	12:48 PM
Client ID:			Run il	D: ICS3K2	_110225A		Se	qNo: 229	5382	Prep Date:		DF: 1	
						SPK Ref			Control	RPD Ref		RPD	
Analyte	<u>.</u>		Result	PQL	SPK Vai	Value		%REC	Limit	Value	%RPD	Limit	Qual
oride			19.95	0.50	20		0	99.7	90-110	19.96	0.0601	20	
ate			18.8	0.50	20		0	94	90-110	18.83	0.175	20	
Surr: Sel	lenate (su	rr)	5.09	0.10	5		0	102	85-115	5.106	0.314	20	
MS	Sampl	e ID: 1102742-01DM	3	_			ι	Jnits: mg/	L	Analysi	is Date: 2/	25/2011 0	1:32 PM
Client ID:			Rùn II	D: ICS3K2	_110225A		Se	qNo: 229	5384	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride			3390	0.50	10	346	62	-715	80-120	0			SEO
Sulfate			183	0.50	10	180	.3	26.6	80-120	0			SEO
Surr: Sel	lenate (su	rr)	5.55	0.10	5		0	111	85-115	0			
MS	Sampl	e ID: 1102725-01BMS	 \$				ί	Jnits: mg/		Anaiys	is Date: 2/	26/2011 0	2:11 AM
Client ID:			Run II	D: ICS3K2	110225A		Se	aNo: 2295	5419	Prep Date:		DF: 1	

Olicit ID.	, itali i	. 1000112			NI IO. EEO	0410	ricp Date.		51.1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	366.4	0.50	10	365.1	13.4	80-120	(D		SEO
Sulfate	1706	0.50	10	1733	-260	80-120) .		SEO
Surr: Selenate (surr)	5.403	0.10	5	0	108	85-115	(D		

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 14 of 20

Navajo Refining Company **Client:** 1102690

QC BATCH REPORT

Injection Well Quarterly "roject:

Work Order:

atch ID: R106075 Instrument ID ICS3K2

Method: E300

Prep Date: DF: 1 DI RPD Ref Value RPD %RPD RPD Limit Qual 20 3390 0.26 20 SEO 20 183 2.36 20 SEO 20 183 2.36 20 SEO 25 5.55 1.65 20 SEO Analysis Date: 2/26/2011 02:33 AM Prep Date: DF: 1 DI RPD Ref RPD Limit Qual 20 366.4 0.165 20 SEO 20 366.4 0.165 20 SEO 20 366.4 0.185 20 SEO 20 1706 0.185 20 SEO 25 5.403 3.96 20 SEO Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100 SEO
RPD Ref RPD Limit Qual 10 3390 0.26 20 SEO 10 3390 0.26 20 SEO 10 183 2.36 20 SEO 15 5.55 1.65 20 SEO 15 5.55 1.65 20 SEO Analysis Date: 2/26/2011 02:33 AM Prep Date: DF: 1 10 RPD Ref RPD 10 366.4 0.165 20 SEO 10 366.4 0.165 20 SEO 10 366.4 0.185 20 SEO 10 1706 0.185 20 SEO 15 5.403 3.96 20 SEO Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100 SEO
20 3390 0.26 20 SEO 20 183 2.36 20 SEO 25 5.55 1.65 20 SEO Analysis Date: 2/26/2011 02:33 AM Prep Date: DF: 1 DI RPD Ref RPD Value %RPD Limit Qual 10 366.4 0.165 20 SEO 10 366.4 0.165 20 SEO 10 366.4 0.165 20 SEO 10 1706 0.185 20 SEO 10 1706 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM
20 183 2.36 20 SEO 25 5.55 1.65 20 20 Analysis Date: 2/26/2011 02:33 AM Prep Date: DF: 1 Di RPD Ref RPD Value %RPD Limit Qual 20 366.4 0.165 20 SEO 30 366.4 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100 DF: 100 DF: 100 DF: 100 DF: 100
5 5.55 1.65 20 Analysis Date: 2/26/2011 02:33 AM Prep Date: DF: 1 DI RPD Ref RPD Value %RPD Limit Qual 20 366.4 0.165 20 SEO 20 366.4 0.165 20 SEO 20 1706 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100 DF: 100 DF: 100 DF: 100 DF: 100
Analysis Date: 2/26/2011 02:33 AM Prep Date: DF: 1 DI RPD Ref RPD Value %RPD Limit Qual 10 366.4 0.165 20 SEO 10 1706 0.185 20 SEO 15 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100
Prep Date: DF: 1 of RPD Ref Value RPD %RPD RPD Limit Qual 00 366.4 0.165 20 SEO 00 1706 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100
RPD Ref RPD %RPD RPD Limit Qual 00 366.4 0.165 20 SEO 00 1706 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100 100 100 100 100 100
0 366.4 0.165 20 SEO 0 1706 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM DF: 100
0 1706 0.185 20 SEO 5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100
5 5.403 3.96 20 Analysis Date: 2/26/2011 07:15 AM Prep Date: DF: 100
Analysis Date: 2/26/2011 07:15 AM
Prep Date: DF: 100
· · · · · · · · · · · · · · · · · · ·
ol RPD Ref RPD Value %RPD ^{Limit} Qual
0 0
0 0
5 0
Analysis Date: 2/26/2011 01:00 PM
Prep Date: DF: 100
N RPD Ref RPD Value %RPD Limit Qual
0 1472 0.109 20
0 1186 6.16 20
5 477.4 6.55 20

Client:	Navajo Refining Company
Work Order:	1102690

QC BATCH REPORT

roject: Injection Well Quarterly

atch ID: R106123 Instrument ID WetChem Method: E150,1

LCS	Sample ID: WLCSW1-03021	1-R106123				ι	Jnits: pH (units	Analy	sis Date: 3/	2/2011 01	:00 PM
Client ID:		Run II	D: WETCH	IEM_11030	2C	Se	qNo: 229	6106	Prep Date:		DF: 1	
Analyte	·	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
рH		6.06	0.10	6		0	101	90-110	()		
DUP	Sample ID: 1102682-01DDU	P	_		•	ί	Units: pH 1	units	Analy	sis Date: 3/	2/2011 01	:00 PM
Client ID:		Run I	: WETCH	IEM_11030	2C	Se	qNo: 229	6134	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
рН		7.8	0.10	0		0	0	0-0	7.75	0.643	20	н
			<u>,,,,,</u>			_						

See Qualifiers Page for a list of Qualifiers and their explanation.

1977 1977 1977

QC Page: 16 of 20

Work Ore	der:	1102690 Injection Well Qua	arterly						QC.			
_atch ID: R	106143	Instrument ID	Balance1		Metho	d: M2540	c					
MBLK	Sampl	e ID: BLANK-R10614	13				Units: mg	/L	Analy	vsis Date: 3	/1/2011 0	3:00 PM
Client ID:			Run	ID: BALAN	CE1_11030	01H	SeqNo: 229	6281	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Tótal Dissol	ved Solid	ls (Residue, Fil	ND	10						•		
LCS	Sample	e ID: LCS-R106143					Units: mg	L	Analy	sis Date: 3	/1/2011 0	3:00 PM
Client ID:			Run	id: Balan	CE1_11030	01H	SeqNo: 229	6282	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissol	ved Solid	ls (Residue, Fil	1080	10	1000		0 108	85-115		0		
DUP	Sample	e ID: 1102690-01EDL	JP				Units: mg	Ľ	Analy	sis Date: 3	/1/2011 0	3:00 PM
Client ID: Ei	ffluent		Run	D: BALAN	CE1_11030	01Н	SeqNo: 229	6271	Prep Date:		DF: 1	

The following samples were analyzed in this batch:

3592

Total Dissolved Solids (Residue, Fil

Navajo Refining Company

Client:

1

:

1102690-01E

0

0

0

0-0

3312

8.11

20

10

QC Page: 17 of 20

QC BATCH REPORT

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Navajo Refining Company 1102690 Work Order:

QC BATCH REPORT

Injection Well Quarterly `roject:

atch ID: R	106268	Instrument ID V	VetChem		Metho	d: SW101	0							
LCS	Sample ID	LCS-030411-R10	6268				ι	Jnits: °F		Ana	alysis D	ate: 3/	4/2011 10	:00 AM
Client ID:		•	Run II	D: WETCH	IEM_11030	4A	Se	qNo: 229	8963	Prep Date:			DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%	RPD	RPD Limit	Qual
Ignitability			83	50	83		0	100	80-120		0		·	
LCSD	Sample ID:	LCSD-030411-R1	06268				ι	Jnits: °F		Ana	alysis D	ate: 3/	4/2011 10	:00 AM
Client ID:			Run II	D: WETCH	IEM_11030	4A	Se	qNo: 229	8965	Prep Date:			DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%	RPD	RPD Limit	Qual
Ignitability			83	50	83	•	0	100	80-120		83	0	25	
DUP	Sample ID:	1103077-01ADU	,,				ι	Jnits: °F	<u>.</u>	Ana	alysis D	ate: 3/	4/2011 10	:00 AM
Client ID:			Run II	D: WETCH	IEM_11030	4A	Se	qNo: 229	8968	Prep Date:			DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%	RPD	RPD Limit	Qual
Ionitability			116	50	0		0	0	0-0	1	14	1.74	25	

The following samples were analyzed in this batch:

1102690-01D

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 18 of 20

Client: Navajo Refining Company Work Order: 1102690

nject: Injection Well Quarterly

QC BATCH REPORT

atch ID: R106313 Instrument	ID WetChem		Metho	d: SM232	0B						
MBLK Sample ID: WBLKW1-03	0411-R106313				Ur	nits: mg/l	L	Analysi	is Date: 3/	4/2011 09	:30 AN
Client ID:	Run ID	WETCH	IEM_11030	4G	G SeqNo)322	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Quai
Alkalinity, Bicarbonate (As CaCO3)	ND	5.0									
Alkalinity, Carbonate (As CaCO3)	ND	5.0									
Alkalinity, Hydroxide (As CaCO3)	ND	5.0									
Alkalinity, Total (As CaCO3)	ND	5.0									
LCS Sample ID: WLCSW1-03	0411-R106313			-	Un	nits: mg/l		Analysi	is Date: 3/	4/2011 09	:30 AN
Client ID:	Run ID	WETCH	4G	Seq	No: 2300)323	Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
Alkalinity, Bicarbonate (As CaCO3)	1015	5.0	1000		0	102	80-120	0			
Alkalinity, Total (As CaCO3)	1015	5.0	1000		0	102	80-120	0			
OUP Sample ID: 1102638-10B	DUP				Un	nits: mg/ I	L	Analysi	s Date: 3/	4/2011 09	:30 AN
Client ID:	Run ID		IEM_11030	4G	Seq	No: 2300)340	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qua
linity, Bicarbonate (As CaCO3)	616.2	5.0	0		0	0	0-0	615.2	0.166	20	_
Inity, Carbonate (As CaCO3)	ND	5.0	0		0	0	0-0	0	0	20	
Alkalinity, Hydroxide (As CaCO3)	ND	5.0	0		0	0	0-0	0	0	20	
Walinity Total (As CaCO3)	616.2	5.0	٥		^	0	0.0	615 2	0 166	20	

The following samples were analyzed in this batch:

1102690-01E

See Qualifiers Page for a list of Qualifiers and their explanation.

and the second s

Navajo Refining Company **Client:**

1102690 Work Order:

QC BATCH REPORT

Injection Well Quarterly "roject:

atch ID: F	106351	Instrument ID WetChem		Metho	d: M2510	B			•						
MBLK	Sample ID:	WBLKW1-030711-R106351				ť	Inits: µmh	ios/cm	Analy	sis Date: 3	/7/2011 09	:00 AM			
Client ID:		Run IĎ	WETCH	IEM_11030	7A	Se	qNo: 230 (0764	Prep Date:		DF: 1				
Analyte	·	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Specific Co	nductivity	ND	1.0												
LCS	Sample ID:	WLCSW1-030711-R106351	· ·	Units: µmhos/cm					Analy	sis Date: 3	/7/2011 09	7/2011 09:00 AM			
Client ID: Run ID		WETCH	IEM_11030	7A	Se	Control RPD Ref R %REC Limit Value %RPD L Units: µmhos/cm Analysis Date: 3/7/2 SeqNo: 2300765 Prep Date: Control RPD Ref R %REC Limit Value %RPD L 0 97.7 80-120 0 Units: µmhos/cm Analysis Date: 3/7/2 SecNo: 2200776 Prep Date:				DF: 1					
Anaiyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Specific Co	nductivity	1380	1.0	1413		0	97.7	80-120)					
DUP	Sample ID:	1102690-01EDUP	<u></u>			ι	Inits: µmh	os/cm	Analy	sis Date: 3	7/2011 09	:00 AM			
Client ID: E	ffluent	Run ID:	WETCH	IEM_11030	7A	Se	qNo: 2300	776	Prep Date:		DF: 1				
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Specific Co	nductivity	6260	1.0	0		0	0	,	6270	0.16	20				
The follow	ing samples	were analyzed in this batch:	11	02690-01E						· ,					

QC Page: 20 of 20

See Qualifiers Page for a list of Qualifiers and their explanation.

:

Date: 08-Mar-11

ALS Environmental

Client:	Navajo Refining Company	OUAT IFIFDS
Project:	Injection Well Quarterly	A CHONYME UNITE
WorkOrder:	1102690	
Qualifier	Description	
*	Value exceeds Regulatory Limit	
а	Not accredited	
В	Analyte detected in the associated Method Blank above the	he Reporting Limit
E	Value above quantitation range	
Н	Analyzed outside of Holding Time	
J	Analyte detected below quantitation limit	
M	Manually integrated, see raw data for justification	
n ND	Not offered for accreditation	
	Not Detected at the Reporting Limit Sample amount is > 4 times amount spiked	
P	Dual Column results percent difference $> 40\%$	
R	RPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
U	Analyzed but not detected above the MDL	
<u>Acronym</u>	Description	
DCS	Detectability Check Study	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MQL	Method Quantitation Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Spike	
PQL	Practical Quantitation Limit	
SD	Serial Dilution	
SDL	Sample Detection Limit	
TRRP	Texas Risk Reduction Program	
Units Reported	d Description	
°F	Farenheit degrees	· · · · ·
µmhos/cm		· ·
mg/Kg	Milligrams per Kilogram	
mg/L	Milligrams per Liter	
pH units	•	



🗹 ALS Laboratory Group 10450 Stancliff Rd., Suite 210

Houston, Texas 77099

Tel. +1 281 530 5656

Fax. +1 281 530 5887

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Page

🗌 ALS Laboratory *j*oup

3352 128th Ave. Holland, MI 49424-9263 Tel: +1 616 399 6070 Fax: +1 616 399 6185

·		·····································	ALS Project N	Manager:	·小田田市 (1) 「小田市市市 「小田市市市市市市市市市市市市市市市市市市市市市市市市市市市市市	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	· · · · · · · · · · · · · · · · · · ·	ALS	Work	Order	#	<u>(10)</u>	76(10
Customer Information		Project Inform	ation				Para	meter/M	ethod	Reque	st for a	Analys	sis	
Ruchase Order	Project Name	Injection Well Q	uarterly		A	VOC (8260) Se	elect						
Work Order	Project Number				B	svoc	(8270) \$	Select			•			
Company Name Navajo Refining Company	Bill To Company	Navajo Refining	Company		AC .	G Total Metals (6020/7000) Select								
Send Report To: Azon Strange	Invoice Attn	Aaron Strange			D	RCI Pr	rofile							
PC Box 159	· 或在於時間帶所有,此,加強,加強,加強,加強,加強,加強,加強,加強,加強,加強,加強,加強,加強,	PO Box 159			Ë	Anions	(300) C	:I, SO4						
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City/State/Zip Aresia, NM 88211	· City/State/Zip	Artesia, NM 88211			G.	pН								
(575) 748-6733	A RANGE Phones	Phone (575) 748-6733			H.	Conductivity								
(576) 746-5421	·····································	(575) 748-5421			* 2	TDS								
e-Mail Address	e-Mall Address				- 11 m - 11 m								·····	
No.	Date	Time Matrix	Pres.	#Bottles	A	64 B. 1	. C .	DEE	\$. .	* G *	H . +	***	* 2 J	Hold
Efflaent	2-23-1108	350 L	Y		X	X	X	XX	-		X	X		
2 THID BLAME							•							
Temp Blank														
				<u></u>		ŀ								
4.4 4.4 2.5														
2 4 4 5 0 D 5 6 5														
9 0 0 7 1											1	[
8 8			·		1						1			
									-		1	· · ·		
10														
Sampler(s) Please Print & Sign AAFDD 774V044	Shipment Me	thod R FX	lequired Turnaro	und Time: (Days	Check	Box) Daýs) Olher 2 WK	Days.] 24 Hoi	1	Results	Due Da	110: 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	·····································
Reinquished by:	Time: 615 Rece	eived by:	- to the second s		Notes:	11	0 Day T/	AT.				`		, <u></u> idda
Relinquished by:	Time: Reco	elved by (Laboratory):	2/1/1/1	18957	Cod	ler ID	Cooler	Temp.	C Pácka	je: (Che	ck One E	lox Belo	w) # # # #	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Logged by (Laboratory):	Time: youther Che	cked By (Enboratory):				2 日本的代表。 2 日本的日本 2 日本日本 2 日本日本 2 日本日本 2 日本 2 日本 2 日本 2		11. 御史 (· · · · · · · · · · · · · · · · · ·		el II Std el III Std el IV SM	QC QC/Ray /846/CLI	v Deta P		RP CheckLisi RP Level N
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-Na	OH 5-Na ₂ S ₂ O ₃	6-NaHSO, 7-O	ther 8-4°C	9-5035	1.4.4.4.4	1111 11 11 11 11 11 11 11 11 11 11 11 1	14. 16. 16 万月	11.11111111111111111111111111111111111	[] Olh	er / EDC)(

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Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group. 2. Unless otherwise agreed in a formal contract, services provided by ALS Laboratory Group are expressly limited to the terms and conditions stated on the reverse. 3. The Chain of Custody is a legal document. All information must be completed accurately.

Sample Receipt Checklist

Client Name: NAVAJO REFINING		Date/Time	Received: <u>24-Feb-11 (</u>	<u>)8:50</u>
Work Order: <u>1102690</u>		Received b	y: <u>RDH</u>	
Checklist completed by Salvador D. Yanux esignature	24-Feb-11 Date	Reviewed by:	Lay Lynn F. Thibas eSignature	ult 24-Feb-11 Date
Matrices: <u>Water</u> Carrier name: <u>FedEx</u>				
Shipping container/cooler in good condition?	Yes 🗹	No 🗖	Not Present	
Custody seals intact on shipping container/cooler?	Yes 🗹		Not Present	
Custody seals intact on sample bottles?	Yes 🗌	No 🗌	Not Present	
Chain of custody present?	Yes 🗹	No 🗌		
Chain of custody signed when relinquished and received?	Yes 🗹	No 🗌		
Chain of custody agrees with sample labels?	Yes 🗹	No 🗌		
Samples in proper container/bottle?	Yes 🗹	No 🗆		
Sample containers intact?	Yes 🗹	No 🗌		
Sufficient sample volume for indicated test?	Yes 🗹	No 🗔		
All samples received within holding time?	Yes 🗹	No 🗋		·
Container/Temp Blank temperature in compliance?	Yes 🗹	No 🗌		
Femperature(s)/Thermometer(s):	<u>1.9c</u>		002	
Cooler(s)/Kit(s):	<u>1948</u>			
Water - VOA vials have zero headspace?	Yes 🗹	No 🗌	No VOA vials submitted	
Water - pH acceptable upon receipt?	Yes 🗹	No 🗌	N/A	
pH adjusted? pH adjusted by:	Yes 🗌	No 🗌	N/A 🗹	
Login Notes:				
			· · · · · · · · · · · · · · · · · · ·	
		 <u></u>	· · · · · · · · · · · · · · · · · · ·	

Client Contacted: Contacted By:		Date Contacted: Regarding:	Person Contacted:		
comments:		· <u></u> ,			
mectiveAction:			 		

SRC Page 1 of 1

110 26010



ALS Environmental 10450 Stanciliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887

CUST Date: 2-23-1(Name: <u>Aavan 7</u> Company: <u>Mava</u>

DDY SEAL	Sezi Bloken By:
Time: 1615	al date of a
REFINITO	2124

and the second second second second second second second second second second second second second second second

Date: 01-Mar-11

Client:	ALS Environmental		 		· · · · ·			
Project:	1102690			Work C)rder	Sampl	e Sumr	narv
Work Order:	1102577					F -		J
	·							

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	Collection Date	Date Received	<u>Hold</u>
1102577-01	1102690-01C	Water		2/23/2011 08:50	2/25/2011 14:45	

SS Page 1 of 1

Date: 01-Mar-11

Client: Project: WorkOrder:	ALS Environmental 1102690 1102577	QUALIFIERS, ACRONYMS, UNITS
<u>Qualifier</u>	Description	
*	Value exceeds Regulatory Limit	
а	Not accredited	
В	Analyte detected in the associated Method Blank above th	e Reporting Limit
E	Value above quantitation range	
Н	Analyzed outside of Holding Time	
J	Analyte detected below quantitation limit	
n ND	Not offered for accreditation	
	Not Detected at the Reporting Limit	
P	Sample amount is > 4 times amount spiked Dual Column results percent difference $> 40\%$	
R	RPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
Ŭ	Analyzed but not detected above the MDL	
Acronym	Description	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MOL	Method Quantitation Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Snike	
POL	Practical Quantitation I imit	
SD	Serial Dilution	
TDI	Target Detection Limit	
Unite Dana-ta	Description	·
unis Reported		

QF Page 1 of 1

Date: 01-Mar-11

Client:	ALS Environmental				•		
Project:	1102690				W	ork Order: 11025	77
Sample ID:	1102690-01C					Lab ID: 11025	577-01
Collection Date:	2/23/2011 08:50 AM					Matrix: WAT	ER
Analyses		Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, REAC Cyanide, Reactive	TIVE	ND		SW7.3 40.0	3.2 mg/Kg	1	Analyst: NZ 2/28/2011 10:00 AM
SULFIDE, REAC Sulfide, Reactive	ΓΙνε	NŅ		SW7.3 . 40.0	4.2 mg/Kg	1	Analyst: NZ 2/28/2011 10:00 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 1

Client:	ALS Environmental
'ork Order:	1102577
oject:	1102690

Date: 01-Mar-11

QC BATCH REPORT

Batch ID: R87453 Instrument ID WETCHEM			1	Metho	d: SW7.3 .	.4.2						
MBLK	Sample ID	: WBLKW1-110228-R87453	-			Units: mg/	Kg	Analy	sis Date: 2	2/28/2011	10:00 AM	
Client ID:		Run	ID: WETCH	IEM_11022	8M	SeqNo: 1566	6858	Prep Date:		2/28/2011 10:00 AM DF: 1 RPD Limit Qual		
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Sulfide, Rea	active	ND	40								-	

The following samples were analyzed in this batch:

1102577-01A



See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 2

.

Client:	ALS Environmental
Work Order:	1102577

QC BATCH REPORT

Work Order: Proje

voluel.	1102577
et:	1102690

_atch ID: R	87454	Instrument ID WETCHEM		Metho	d: SW7.3	.3.2			. •			
MBLK	Sample ID:	WBLKW1-110228-R87454				ł	Jnits: mg/	Kg	Analys	is Date: 2	2/28/2011 1	0:00 AM
Client ID:		Run ID:	WETCH	IEM_11022	8N	Se	eqNo: 156	6874	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	eactive	ND	40									
LCS	Sample ID:	WLCSW1-110228-R87454	<u>.</u>			l	Jnits: mg/	Kg	Analys	sis Date: 2	/28/2011 1	0:00 AM
Client ID:		Run ID:	WETCH	IEM_11022	8N	Se	eqNo: 156	6875	Prep Date:		DF: 1	·
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	eactive	249.6	40	250		0	99.8	75-125	0		<u> . . </u>	
LCSD	Sample ID:	WLCSDW1-110228-R87454				ι	Jnits: mg/	 Kg	Analys	is Date: 2	/28/2011 1	0:00 AM
Client ID:		Run ID:	WETCH	IEM_11022	8N	Se	qNo: 156	6883	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	active	249.6	40	250	_	0	99.8	75-125	249.6	() 35	
MS	Sample ID:	1102577-01A MS		• •		ι	Jnits: mg/	Kg	Analys	is Date: 2	/28/2011 1	0:00 AM
Client ID: 11	102690-01C	Run ID:	WETCH	EM_11022	8N	Se	qNo: 156	6881	Prep Date:		DF: 1	
alyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	active	249.6	40	250		0	99.8	50-150	0			
MSD	Sample ID:	1102577-01A MSD	·			l	Jnits: mg/l	Kg	Analys	is Date: 2	/28/2011 1	0:00 AM
Client ID: 11	02690-01C	Run ID:	WETCH	EM_11022	BN	Se	qNo: 1566	6882	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Rea	active	249.6	40	250		0	99.8	50-150	249.6) 35	
The followin	ng samples w	ere analyzed in this batch:	11	02577-01A								

j.

WO# 110257



-1

 Subcontractor:

 ALS Laboratory Group

 3352 128th Ave.

 TEL:
 (616) 399-6070

 FAX:
 (616) 399-6185

 Holland, Mi 49424
 Acct #:

CHAIN-OF-CUSTODY RECORD

 Date:
 24-Feb-11

 COC ID:
 10101

 Due Date
 24.11

Page 1 of 1

Due Date 04-Mar-11

Customer Information Project Information Parameter/Method Request for Analysis Purchase Order 10-2120271 Project Name 1102690 A Reactive Cyanide (SW-846) Work Order Project Number B Reactive Sulfide (SW-846) Company Name ALS Group USA, Corp. **Bill To Company** ALS Group USA, Corp. C Send Report To JayLynn F Thibault Inv Attn Accounts Payable D Address 10450 Stancliff Rd, Suite 210 Address 10450 Stancliff Rd, Suite 210 Ε F City/State/Zip G Houston, Texas 77099-4338 City/State/Zip Houston, Texas 77099-4338 Phone (281) 530-5656 H Phone (281) 530-5656 Fax (281) 530-5887 Fax I (281) 530-5887 eMail Address eMail CC Ĵ jaylynn.thibault@alsenviro.com Sample ID Matrix **Collection Date 24hr** Bottle A . B C D Ε F G Η J. 1 1102690-01C (Effluent) Water 23/Feb/2011 8:50 (1) 1LPNEAT Х Х

Comments: <u>Please analyze fo</u>	or RCI. CC:glenda,ramo	s@alsglobal.com & mary.knowles@	alsglobal.com			
Folly	z/z4/n FeelEs	21	2/25/11 1445			
Relinquished by:	Date/Time	Received by:	Dâte/Time	Cooler IDs	Std	ha
				·		¥

Sample Receipt Checklist

Client Name: ALS - HO	DUSTON			Date/Time R	leceived:	<u>25-Feb-1</u>	1 14:45	
Work Order: <u>1102577</u>	· · ·			Received by	:	<u>KRW</u>		
Checklist completed by	Keith Warenga Signature	25-Feb-11 Date	R	Reviewed by:	Bill Carry eSignature			28-Feb-11 Date
Matrices: <u>Water</u> Carrier name: <u>FedEx</u>								
Shipping container/cooler	in good condition?	Yes	\checkmark	No 🗌	Not Prese	ent 🗆		
Custody seals intact on s	hipping container/cooler?	Yes [No 🗌	Not Prese	ent 🗹		
Custody seals intact on s	ample bottles?	Yes [No 🗔	Not Prese	ent 🗹		
Chain of custody present	?	Yes	✓	No 🗔				
Chain of custody signed w	when relinquished and received?	Yes	✓	No 🗌				
Chain of custody agrees	with sample labels?	Yes	✓					
Samples in proper contain	ner/bottle?	Yes		No 🗌				
Sample containers intact	?	Yes 🗄	\[\] \[\[\] \[No 🗔				
Sufficient sample volume	for indicated test?	Yes	¥	No 🗌				
All samples received with	in holding time?	Yes		No 🗌				
Container/Temp Blank ter	mperature in compliance?	Yes	✓	No 🗍				
emperature(s)/Thermom	eter(s):	<u>3.2 C</u>]	
Cooler(s)/Kit(s):]	
Water - VOA vials have z	ero headspace?	Yes [No 🗌 I	No VOA vials	submitted		
Water - pH acceptable up	on receipt?	Yes		No 🗌 1	N/A 🗌			
pH adjusted? pH adjusted by:		Yes []	No 🗹 I	N/A 🗌			
Login Notes:								

Client Contacted:		Date Contacted:	Person Contacted:	Person Contacted:		
Contacted By:		Regarding:				
Comments:	. <u> </u>		· · · · · · · · · · · · · · · · · · ·			
prrectiveAction:						
(· · · · · · · · · · · · · · · · · · ·		SRC Pa		

SRC Page 1 of 1





505C1/82C2/8847



08-Jun-2011

Aaron Strange Navajo Refining Company PO Box 159 Artesia, NM 88211

Tel: (575) 748-3311 Fax: (575) 746-5421

Re: Injection Well Quarterly

Work Order: 1105823

Dear Aaron,

ALS Environmental received 2 samples on 25-May-2011 09:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 37.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Chris £

Electronically approved by: Mary K. Knowles

Chris Bryson Project Manager



Certificate No: T104704231-09A-TX

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77099-4338 | PHONE (281) 530-5656 | FAX (281) 530-5887 ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

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www.alsglobal.com

NICHT SOLUTIONS MULTI PANTIER

Date: 08-Jun-11

Client:	Navajo Refining Company				
Project:	Injection Well Quarterly	Work Order Sample Summary			
Work Order:	1105823	Work Order Sumple Summ			

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	Collection Date	Date Received	<u>Hold</u>
1105823-01	Effluent	Water		5/24/2011 10:50	5/25/2011 09:15	
1105823-02	Trip Blank	Water		5/24/2011	5/25/2011 09:15	

SS Page 1 of 1
Date: 08-Jun-11

CN Page 1 of 1

Client:	Navajo Refining Company				
Project:	Injection Well Quarterly	•	(Case Narrati	ive
Work Order:	1105823			-	

As the pH analyses were performed in the laboratory, the results are H-flagged as appropriate.

Batch 52874, Metals, Sample 1105925-04 : MS/MSD is for an unrelated sample.

Batch 52774, Semivolatile Organics : LCSD RPD was above the control limits for Benzidine. The individual recoveries were in control.

Batch R110726, Volatile Organics, Sample 1105756-46 : MS/MSD is for an unrelated sample.

Batch R110849, Anions, Sample 1106102-02 : MSD is for an unrelated sample.

The analysis for Reactive Cyanide and Reactive Sulfide was subcontracted to ALS Laboratory Group in Holland, MI.

Client:	Navajo Refining Comp	any					
Project:	Injection Well Quarterl	y			,	Work Order: 1105823	
Sample ID:	Effluent	-				Lab ID: 1105823-0	1
Collection Date:	5/24/2011 10:50 AM					Matrix: WATER	-
Analyses	· · · · · · · · · · · · · · · · · · ·	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY				SW7470		Prep Date: 5/31/2011	Analyst: JCJ
Mercury		· ND		0.000200) mg/L	1	5/31/2011 05:01 PM
METALS				SW6020		Prep Date: 6/2/2011	Analyst: ALR
Aluminum		0.438		0.0200) mg/L	2	6/6/2011 07:26 PM
Arsenic		0.0198	*	0.00500) mg/L	1	6/3/2011 11:34 PM
Barium		0.0541		0.00500) mg/L	1	6/3/2011 11:34 PM
Boron		0.353		.0.100) mg/L	2	6/6/2011 07:26 PM
Cadmium		ND		0.00200) mg/L	1	6/3/2011 11:34 PM
Chromium		ND		0.00500) mg/L	1	6/3/2011 11:34 PM
Copper		0.00715		0.00500) mg/L	1	6/3/2011 11:34 PM
Lead		ND		0.00500) mg/L	1	6/3/2011 11:34 PM
Manganese		0.0239		0.00500) mg/L	1	6/3/2011 11:34 PM
Molybdenum		0.168		0.00500) mg/L	1	6/3/2011 11:34 PM
Nickel	<i>,</i>	0.00605		0.00500) mg/L	. t	6/3/2011 11:34 PM
Selenium		0.646	*	0.00500) mg/L	1	6/3/2011 11:34 PM
Silver		ND		0.00500) mg/L	1	6/3/2011 11:34 PM
Zinc		0.0884		0.00500	mg/L	1	6/3/2011 11:34 PM
SEMIVOLATILES				SW8270		Prep Date: 5/26/2011	Analyst: ACN
1,2,4-Trichloroben	zene	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
2,4,5-Trichlorophe	nol	ND		0.0050) mg/L	· 1	6/1/2011 01:51 PM

SW0Z/U	Prep Date: 5/20/2011	Analyst: ACN
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	· 1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1 .	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
0.0050 mg/L	[°] 1	6/1/2011 01:51 PM
0.0050 mg/L	1	6/1/2011 01:51 PM
	SW02/0 0.0050 mg/L 0.0050 mg/L </td <td>SW02/10 mg/L 1 0.0050 mg/L 1 0.0050</td>	SW02/10 mg/L 1 0.0050 mg/L 1 0.0050

Note: See Qualifiers Page for a list of qualifiers and their explanation.

AR Page 1 of 4

Date:	08-Jun-	1	1
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Client:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:EffluentCollection Date:\$/24/2011 10:50 AM

Work Order: 1105823

Lab ID: 1105823-01

Matrix:	WATER
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Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isophorone	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
N-Nitrosodi-n-propylamine	ND		0.0050) mg/L '	1	6/1/2011 01:51 PM
N-Nitrosodimethylamine	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
N-Nitrosodiphenylamine	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
Naphthalene	ND		0.0050	mg/L	1	6/1/2011 01:51 PM
Nitrobenzene	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
Pentachlorophenol	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
Phenanthrene	ND		0.0050	mg/L	1	6/1/2011 01:51 PM
Phenol	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
Pyrene	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
Pyridine	ND		0.0050) mg/L	1	6/1/2011 01:51 PM
Surr: 2,4,6-Tribromophenol	67.9		42-124	%REC	1	6/1/2011 01:51 PM
Surr: 2-Fluorobiphenyl	57.5		48-120	%REC	1	6/1/2011 01:51 PM
Surr: 2-Fluorophenol	47.5		20-120	%REC	1	6/1/2011 01:51 PM
Surr: 4-Terphenyl-d14	63.3		51-135	%REC	1	6/1/2011 01:51 PM
Surr: Nitrobenzene-d5	53.6		41-120	%REC	1	6/1/2011 01:51 PM
Surr: Phenol-d6	53.9		20-120	%REC	1	6/1/2011 01:51 PM
JOLATILES			SW8260			Analyst: PC
1,1,1-Trichloroethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
1,1,2,2-Tetrachloroethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
1,1,2-Trichloroethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
1,1-Dichloroethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
1,1-Dichloroethene	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
1,2-Dichloroethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
2-Butanone	ND		0.010	mg/L	1	6/1/2011 03:42 PM
2-Chloroethyl vinyl ether	ND		0.010	mg/L	1	6/1/2011 03:42 PM
2-Hexanone	ND		0.010	mg/L	1	6/1/2011 03:42 PM
4-Methyl-2-pentanone	ND		0.010	mg/L	, 1	6/1/2011 03:42 PM
Acetone	ND		0.010	mg/L	1	6/1/2011 03:42 PM
Benzene	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Bromodichloromethane	. ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Bromoform	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Bromomethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Carbon disulfide	ND		0.010	mg/L	1	6/1/2011 03:42 PM
Carbon tetrachloride	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Chlorobenzene	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Chloroethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Chloroform	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
Chloromethane	ND		0.0050	mg/L	1	6/1/2011 03:42 PM
cis-1,3-Dichloropropene	ND		0.0050	mg/L	1	6/1/2011 03:42 PM

Note:

See Qualifiers Page for a list of qualifiers and their explanation.

Date: 08-Jun-11

Client:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:Effluent

Collection Date: 5/24/2011 10:50 AM

Work	Order:	1105823

Lab ID: 1105823-01

Matrix: WATER

Analyses	Result	Qual	Limit	Units	Dilution Factor	Date Analyzed
Dibromochloromethane	ND		0.0050) mg/L	1	6/1/2011 03:42 PM
Ethylbenzene	ND		0.0050) mg/L	1	6/1/2011 03:42 PM
m,p-Xylene	ND		0.010) mg/L	1	6/1/2011 03:42 PM
Methylene chloride	ND		0.010) mg/L	1	6/1/2011 03:42 PM
Styrene	ND	,	0.0050) mg/L	1	6/1/2011 03:42 PM
Tetrachloroethene	ND		0.0050) mg/L	1	6/1/2011 03:42 PM
Toluene	ND		0.0050) mg/L	1	6/1/2011 03:42 PM
trans-1,3-Dichloropropene	ND		0.0050) mg/L	1	6/1/2011 03:42 PM
Trichloroethene	ND		0.0050) mg/L	1	6/1/2011 03:42 PM
Vinył acetate	ND		0.010) mg/L	1	6/1/2011 03:42 PM
Vinyl chloride	ND		0.0020) mg/L	1	6/1/2011 03:42 PM
Xylenes, Total	ND		0.015	5 mg/L	1	6/1/2011 03:42 PM
Surr: 1,2-Dichloroethane-d4	98.2		70-125	5 %REC	1	6/1/2011 03:42 PM
Surr: 4-Bromofluorobenzene	95.1		72-125	5 %REC	1	6/1/2011 03:42 PM
Surr: Dibromofluoromethane	107		71-125	5 %REC	1	6/1/2011 03:42 PM
Surr: Toluene-d8	92.3		75-125	5 %REC	1	6/1/2011 03:42 PM
REACTIVE CYANIDE			SW-846			Analyst: SUB
Reactive Cyanide	ND		40.0) mg/Kg	1	5/27/2011 12:30 PM
REACTIVE SULFIDE			SW-846			Analyst: SUB
Reactive Sulfide	ND		40.0) mg/Kg	1	5/27/2011 12:30 PM
ANIONS - EPA 300.0 (1993)			E300			Analyst: TDW
Chloride	213		5.00	mg/L	10	6/3/2011 03:19 PM
Sulfate	2,240		25.0) mg/L	50	6/6/2011 04:33 PM
Surr: Selenate (surr)	103		85-11 5	%REC	10	6/3/2011 03:19 PM
Surr: Selenate (surr)	98 .5		85-115	%REC	50	6/6/2011 04:33 PM
ALKALINITY			SM2320	В		Analyst: DM
Alkalinity, Bicarbonate (As CaCO3)	243		5.00	mg/L	1	5/31/2011 02:30 PM
Alkalinity, Carbonate (As CaCO3)	ND		5.00) mg/L	1	5/31/2011 02:30 PM
Alkalinity, Hydroxide (As CaCO3)	ND		5.00) mg/L	1	5/31/2011 02:30 PM
Alkalinity, Total (As CaCO3)	243		5.00	mg/L	1	5/31/2011 02:30 PM
SPECIFIC CONDUCTIVITY			M2510 B	i		Analyst: DM
Specific Conductivity	4,680		1.00) µmhos/cn	n 1	5/26/2011 10:15 AM
IGNITIBILITY			SW1010			Anaiyst: KAH
Ignitability	> 212		50.0	۴	1	6/3/2011 03:00 PM
PH			SW9040			Analyst: DM
pH	7.85	н	0.100	pH units	1 .	5/26/2011 11:30 AM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Date: 08-Jun-11

Client:	Navajo Refining Comp	any						
Project:	Injection Well Quarterl	у				Work Order:	1105823	
Sample ID:	Effluent					Lab ID:	1105823-01	
Collection Date:	5/24/2011 10:50 AM		,			Matrix:	WATER	
Analyses		Result	Qual	Report Limit	Units	Dilution Factor		Date Analyzed
TOTAL DISSOLV Total Dissolved S Filterable)	ED SOLIDS Solids (Residue,	3,400		M25400 10	C .0 mg/L	1		Analyst: JKP 5/31/2011 10:35 AM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Date: 08-Jun-11

QC BATCH REPORT

oject:	Injection Well Q	uarterly				-		_		_		
Batch ID: 5	i2816 Instrument	D Mercury		Metho	d: SW74 7	70						
MBLK	Sample ID: GBLKW2-053	8111-52816		<u> </u>		L	Units: mg/	L	Analys	is Date: 5	/31/2011 ()4:27 PM
Client ID:		Rur	ID: MERCURY_110531A S		Se	SeqNo: 2407056		Prep Date: 5/3	1/2011	DF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		ND	0.00020									
LCS	Sample ID: GLCSW2-053	111-52816				ι	Jnits: mg/	L	Analys	is Date: 5	/31/2011 ()4:29 PM
Client ID:		Run	ID: MERCURY_110531A			Se	qNo: 240	7060	Prep Date: 5/3	ÞF: 1		
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Controi Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.00538	0.00020	0.005		0	108	85-115	0			
MS	Sample ID: 1105864-08C	MS						L	Analys	is Date: 5	/31/2011 ()4:35 PM
Client ID:		Run	ID: MERCURY_110531A			Se	SeqNo: 2407068		Prep Date: 5/31/2011		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.00502	0.00020	0.005	-0.0000	03	100	85-115	0			
MSD	Sample ID: 1105864-08C	MSD	<u>.</u>			Units: mg/L			Analysis Date: 5/31/2011 04:37 PM			
ent ID:		Run	ID: MERCU	JRY_11053	1A	Se	qNo: 240	7069	Prep Date: 5/31	I/2011	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.00505	0.00020	0.005	-0.0000	03	101	85-115	0.00502	0.596	20	
DUP	Sample ID: 1105864-08C	OUP				ι	Jnits: mg/		Analys	is Date: 5/	31/2011 0	4:33 PM
Client ID:		Run	ID: MERCU	JRY_11053	1A [.]	Se	qNo: 2407	7067	Prep Date: 5/31	/2011	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	<u> </u>	ND	0.00020	0		0	0	0-0	-0.000003	0	20	
The followi	ing samples were analyzed	in this batch	: 11	05823-01F								

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Navajo Refining Company

Work Order: 1105823

QC BATCH REPORT

•oject: Injection Well Quarterly

atch ID: 528م	Instrument ID ICPMS03		Metho	d: SW602	20					
MBLK	Sample ID: MBLKW2-060211-52874				Units: mg/	L ·	Analy	vsis Date: 6	/6/2011 03	:12 PM
Client ID:	Rur	n ID: ICPMS()3_110606A	\	SeqNo: 2413	3608	Prep Date: 6/2	2/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	ND	0.010								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Boron	0.02016	0.050								J
Cadmium	ND	0.0020								
Chromium	ND	0.0050								
Copper	ND	0.0050		,				•		
Lead	ND	0.0050								
Manganese	ND	0.0050								
Molybdenum	0.002082	0.0050								J
Nickel	ND	0.0050								
Selenium	ND	0.0050								
Silver	ND	0.0050								
Zinc	NĎ	0.0050								

LUS	Sample ID: MLCSW2-060211-52874	1		Units: mg/L				Analysis Date: 6/6/2011 03:04 PM			
Client ID:	, F	03_110606A	_110606A			SeqNo: 2413607		2011	DF: 1		
alyte	Resul	t PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09684	0.010	0.1		0	96.8	80-120	0			
Arsenic	0.05093	0.0050	0.05		0	102	80-120	0			
Barium	0.04904	0.0050	0.05		0	98.1	80-120	0			
Boron	0.4566	0.050	0.5		0	91.3	80-120	0			
Cadmium	0.04988	0.0020	0.05		0	99.8	80-120	0			
Chromium	0.04946	0.0050	0.05		0	98. 9	80-120	0			
Copper	0.04973	0.0050	0.05		0	99.5	80-120	0			
Lead	0.04928	0.0050	0.05		0	98.6	80-120	0			
Manganese	0.05148	0.0050	0.05		0	103	80-120	0			
Molybdenum	0.04824	0.0050	0.05		0	96.5	80-120	0			
Nickel	0.04964	0.0050	0.05		0	99.3	80-120	0			
Selenium	0.05265	0.0050	0.05		0	105	80-120	0			
Silver	0.04987	0.0050	0.05		0	99.7	80-120	0			
Zinc	0.05136	0.0050	0.05		0	103	80-120	0			

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Navajo Refining Company **Client:** 1105823

QC BATCH REPORT

Injection Well Quarterly ~oject:

Work Order:

_atch ID: 5287	4 Instrument ID IC	PMS03		Method	: SW6020						
MS S	Sample ID: 1105925-04AMS					Units: mg/	L	Analy	sis Date: 6	5/6/2011 O4	4:48 PM
Client ID:		Run II	D: ICPMS(3_110606A	s	SeqNo: 2413	3951	Prep Date: 6/2	/2011	DF: 5	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	,	0.2092	0.050	0.1	0.08945	120	80-120	. (b		
Arsenic		0.0607	0.025	0.05	0.008105	105	80-120	()		
Barium	i	D.1019	0.025	0.05	0.0517	100	80-120	()		
Boron		4.238	0.25	0.5	3.702	107	80-120	()		0
Cadmium		0.0509	0.010	0.05	0.00186	98.1	80-120	(
Chromium		0.0521	0.025	0.05	0.0007795	103	80-120	()		
Copper	0.	04693	0.025	0.05	-0.001476	96.8	80-120)		
Lead	0.	05195	0.025	0.05	0.000925	102	80-120	()		
Manganese		10.75	0.025	0.05	10.65	200	80-120	Ì)		SEO
Molybdenum	0	09915	0.025	0.05	0.04766	103	80-120	()		-
Nickel).0 9 23	0.025	0.05	0.04406	96.5	80-120	()		
Selenium	0.	06155	0.025	0.05	0.005515	112	80-120	()		
Silver	0.	04716	0.025	0.05	0.0004823	93.3	80-120	()		
Zinc		0.053	0.025	0.05	0.00974	86.5	80-120	() ·		
MSD S	ample ID: 1105925-04AMSD			-		Units: mg/	L	Analy	sis Date: 6	6/2011 04	4:53 PM
Client ID:		Run II): ICPMS(3_110606A	<u>,</u> S	eqNo: 2413	3952	Prep Date: 6/2	/2011	DF: 5	
√lyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

lyte	Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qual
Aluminum	0.2022	0.050	0.1	0.08945	113	80-120	0.2092	3.38	15	
Arsenic	0.06255	0.025	0.05	0.008105	10 9	80-120	0.0607	3	15	
Barium	0.1041	0.025	0.05	0.0517	105	80-120	0.1019	2.14	15	
Boron	4.362	0.25	0.5	3.702	132	80-120	4.238	2.88	15	SO
Cadmium	0.0504	0.010	0.05	0.00186	97.1	80-120	0.0509	0.987	15	
Chromium	0.0537	0.025	0.05	0.0007795	106	80-120	0.0521	3.02	15	
Copper	0.04882	0.025	0.05	-0.001476	101	80-120	0.04693	3.96	15	
Lead	0.05245	0.025	0.05	0.000925	103	80-120	0.05195	0.958	15	
Manganese	11.08	0.025	0.05	10.65	860	80-120	10.75	3.02	15	SEO
Molybdenum	0.09665	0.025	0.05	0.04766	98	80-120	0.09915	2.55	15	
Nickel	0.09645	0.025	0.05	0.04406	105	80-120	0.0923	4.4	15	
Selenium	0.0611	0.025	0.05	0.005515	111	80-120	0.06155	0.734	15	
Silver	0.04754	0.025	0.05	0.0004823	<u>94.1</u>	80-120	0.04716	0.813	15	
Zinc	0.0673	0.025	0.05	0.00974	115	80-120	0.053	23.8	15	R

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Client: Navajo Refining Company 1105823

QC BATCH REPORT

oject: Injection Well Quarterly

Work Order:

Instrument ID ICPMS03 Method: SW6020

_atch ID: 52	874	Instrument ID ICPMS03		Method	SW6020						
DUP	Sample ID:	1105925-04ADUP				Units: mg/		Analysi	s Date: 6/	6/2011 04	:25 PM
Client ID:		Run	ID: ICPMS)3_110606A	s	SeqNo: 241	3947	Prep Date: 6/2/2	2011	DF: 5	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum		0.09685	0.050	0	0	0	0-0	0.08945	7.94	25	
Arsenic		0.007515	0.025	0	0	0	0-0	0.008105	0	25	J
Barium		0.05165	0.025	0	0	0	0-0	0.0517	0.0968	25	
Boron		3.873	0.25	0	0	0	0-0	3.702	4.5	25	
Cadmium		ND	0.010	0	0	0	0-0	0.00186	0.	25	
Chromium		ND	0.025	0	0	0	0-0	0.0007795	0	25	
Copper		ND	0.025	0	0	0	0-0	-0.001476	0	25	
Lead		ND	0.025	0	0	0	0-0	0.000925	0	25	
Molybdenum	1	0.04683	0.025	0	. 0	· 0	0-0	0.04766	1.77	25	
Nickel		0.04412	0.025	0	0	Q	0-0	0.04406	0.147	25	
Selenium		ND	0.025	0	0	0	0-0	0.005515	0	25	
Silver		ND	0.025	0	0	0	0-0	0.0004823	0	25	
Zinc		ND	0.025	. 0	0	0	0-0	0.00974	0	25	
DUP	Sample ID:	1105925-04ADUP				Units: mg/	L	Analysi	s Date: 6/	6/2011 09	:06 PM
Client ID:		Run	ID: ICPMS	3_110606A	s	eqNo: 2414	1081	Prep Date: 6/2/2	2011	DF: 10	D

lyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
.anganese	10.25	0.50	0		0	. 0	0-0	10.75	4.76	25	
The following samples we	re analyzed in this batch:	11	05823-01F		-				1		

The following samples were analyzed in this batch:

See Qualifiers Page for a list of Qualifiers and their explanation. e:

QC Page: 4 of 20

Navajo Refining Company **Client:**

1105823 Work Order:

Injection Well Quarterly ·oject:

QC BATCH REPORT

_atch ID: 52774	Instrument ID SV-5		Metho	d: SW827	70					
MBLK Sample ID	: SBLKW1-110526-52774				Units: µg/l	L	Analy	sis Date: 5	/27/2011 0	01:09 PM
Client ID:	Runil	D: SV-5_1	10527B		SeqNo: 240	6655	Prep Date: 5/2	6/2011	DF: 1	
				SPK Ref		Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qual
1,2,4-Trichlorobenzene	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0						<u></u>	•	
2,4-Dinitrotoluene	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	5.0								
2-Nitrophenol	ND	5.0								
3&4-Methylphenol	ŃD	5.0					· ·			
3-Nitroaniline	ND	5.0							•	
4-Nitroaniline	ND	5.0								
4-Nitrophenol	ND	5.0								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Aniline	ND	5.0								
Anthracene	ND	5.0								
Benz(a)anthracene	ND	5.0								
nzidine	ND	5.0							·	
achlorobenzene	ND	5.0						-		
Hexachloroethane	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0						•		
Isophorone	ND	5.0								
N-Nitrosodi-n-propylamin	e ND	5.0								
N-Nitrosodimethylamine	ND	5.0								
N-Nitrosodiphenylamine	ND	5.0								
Naphthalene	ND	5.0								
Nitrobenzene	ND	5.0	•				•			
Pentachlorophenol	ND ND	5.0				,				
Phenanthrene	ND	5.0								
Phenol	ND	5.0								
Pyrene	ND	5.0								
Pyridine	ND	5.0								
Surr: 2,4,6-Tribromoph	ienol 75.9	5.0	100		0 75.9	42-124	C)		
Surr: 2-Fluorobiphenyl	68.71	5.0	100		0 68.7	48-120)		
Surr: 2-Fluorophenol	58.32	5.0	100		0 58.3	20-120	່ເ)	• •	
Surr: 4-Terphenyl-d14	71.17	5.0	100		0 71.2	51-135)		
Surr: Nitrobenzene-d5	73.03	5.0	100		0 73	41-120	C)		
Surr: Phenol-d6	64.89	5.0	100		0 64.9	20-120	C			

See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

5/27/2011 03:09 PM DF: 1

roject: Injection Well Quarterly

_atch ID: 52774

LCS

e:

Client ID:

_	· · · · · · · · · · · · · · · · · · ·			•				
74	Instrument ID SV-5		Method	SW827	'0			
Sample	ID: SLCSW1-110526-52774				Units: µg/l		Analy	sis Date:
	Ru	n ID: SV-5_1	10527B		SeqNo: 240	6657	Prep Date: 5/2	6/2011
	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RP[

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2,4-Trichlorobenzene	43.5	5.0	50	0	87	50-120	C	•		
2,4,5-Trichlorophenol	81.63	5.0	100	0	81.6	50-120	C	1		
2,4,6-Trichlorophenol	81.96	5.0	100	0	82	50-120	0)		
2,4-Dinitrotoluene	40.7	5.0	50	0	81.4	50-120	0	F		
2-Methylnaphthalene	45.07	5.0	50	0	90.1	55-120	C)		
2-Methylphenol	80.62	.5.0	100	0	80.6	50-120	0)		
2-Nitroaniline	40.84	5.0	50	0	81.7	55-120	0)		
2-Nitrophenol	82.91	5.0	100	. 0	82.9	55-120	0)		
3&4-Methylphenol	116.7	5.0	150	0	77.8	55-120	0)		
3-Nitroaniline	30	5.0	50	0	60	40-120	0	1		
4-Nitroaniline	30.99	5.0	50	0	62	50-120	0)		
4-Nitrophenol	75.64	5.0	100	0	75.6	45-120	0)		
Acenaphthene	42.84	5.0	50	. 0	85.7	55-120	0)		
Acenaphthylene	42.77	5.0	50	0	85.5	55-120	٥) 		
Aniline	25.15	5.0	50	0	50.3	30-120	0			
Anthracene	44.26	5.0	50	0	88.5	55-120	0	1		
Benz(a)anthracene	43.32	5.0	50	. 0	86.6	55-120	0)		
nzidine	11.34	5.0	50	0	22.7	10-120	. 0	1		
achlorobenzene	43.74	5.0	50	0	87.5	55-120	0			
Hexachloroethane	42.54	5.0	50	0	85.1	55-120	0			
indeno(1,2,3-cd)pyrene	39.68	5.0	50	0	79.4	55-120	0			
Isophorone	41.64	5.0	50	0	83.3	55-120	Q			
N-Nitrosodi-n-propylamine	40.56	5.0	50	0	81.1	50-120	0			
N-Nitrosodimethylamine	39.61	5.0	50	0	79.2	45-120	. 0			
N-Nitrosodiphenylamine	44.49	5.0	50	. 0	89	55-120	0			
Naphthalene	44.11	5.0	50	· 0	88.2	55-120	0			
Nitrobenzene	44.13	5.0	50	0	88.3	55-120	0			
Pentachlorophenol	78.73	5.0	100	0	78.7	55-120	0			
Phenanthrene	42.58	5.0	50	0	85.2	55-120	0			
Phenol	79.27	5.0	100	0	79.3	50-120	0			
Pyrene	44.26	5.0	50	0	88.5	55-120	0	i i i i i i i i i i i i i i i i i i i		
Pyridine	32.5	5.0	50	0	65	35-120	·0			
Surr: 2,4,6-Tribromophenol	71.11	5.0	100	0	71.1	42-124	0			
Surr: 2-Fluorobiphenyl	81.91	5.0	100	· 0	81.9	48-120	0			·
Surr: 2-Fluorophenol	80.91	5.0	100	· 0	80.9	20-120	0			
Surr: 4-Terphenyl-d14	75.75	5.0	100	0	75.8	51-135	0			
Surr: Nitrobenzene-d5	83.44	5.0	100	0	83.4	41-120	0			
Surr: Phenol-d6	76.63	5.0	100.	0	76.6	20-120	0			

QC BATCH REPORT

"roject: Injection Well Quarterly

atch ID: 52774	Instrument ID SV-5		Metho	d: SW827	0		•				
LCSD Sample ID:	SLCSDW1-110526-52774				ι	Jnits: µġ/L	-	Analysi	s Date: 5/	27/2011 0	2:42 PM
Client ID:	Rur	n ID: SV-5_1	10527B		Se	eqNo: 240	6656	Prep Date: 5/26	/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1.2.4-Trichlorobenzene	43.11	5.0	50		0	86.2	50-120	43.5	0.886	20	
2,4,5-Trichlorophenol	82.74	5.0	100		0	82.7	50-120	81.63	1.35	20	
2.4.6-Trichlorophenol	81.32	5.0	100	•	0	81.3	50-120	81.96	0.794	20	
2.4-Dinitrotoluene	44.91	5.0	50		0	89.8	50-120	40.7	9.83	20	
2-Methylnaphthalene	46.29	5.0	50		0	92.6	55-120	45.07	2.66	20	
2-Methylphenol	88,25	5.0	100		0	88.3	50-120	80.62	9.04	20	
2-Nitroaniline	42.59	5.0	50		0	85.2	55-120	40.84	4.2	20	
2-Nitrophenol	83.45	5.0	100		0	83.4	55-120	82.91	0.643	20	
3&4-Methylphenol	129.5	5.0	150		0	86.3	55-120	116.7	10.4	20	
3-Nitroaniline	33.43	5.0	50		0	66.9	40-120	30	10.8	20	
4-Nitroaniline	34.54	5.0	50		0	69.1	50 , 120	30.99	10.8	20	
4-Nitrophenol	86.06	5.0	100		0	86.1	45-120	75.64	12.9	20	
Acenaphthene	42.95	5.0	50		0	85.9	55-120	42.84	0.26	20	
Acenaphthylene	42.16	5.0	50		0	84.3	55-120	42.77	1.44	20	
Aniline	30.09	5.0	50		0	60.2	30-120	25.15	17.9	20	
Anthracene	44.46	5.0	50		0	88.9	55-120	44.26	0.444	20	
Benz(a)anthracene	43.49	5.0	50		0	87	55-120	43.32	0.386	20	
nzidine	14.28	5.0	50		0	28.6	10- <u>120</u>	11.34	23	20	R
achlorobenzene	42.72	5.0	50		0	85.4	55-120	43.74	2.35	20	
nexachloroethane	42.43	5.0	50		0	84.9	55-120	42.54	0.266	20_	
Indeno(1,2,3-cd)pyrene	41.89	5.0	50		0	83.8	55-120	39.68	5.42	20	
Isophorone	43.64	5.0	50		0	87.3	55-120	41.64	4.7	20	
N-Nitrosodi-n-propylamine	45.05	5.0	50		0	90.1	50-120	40.56	10.5	20	
N-Nitrosodimethylamine	38.15	5.0	50		0	76.3	45-120	39.61	3.75	20	
N-Nitrosodiphenylamine	43.77	5.0	50		0	87.5	55-120	44.49	1.61	20	
Naphthalene	43.88	5.0	50		0	87.8	55-120	44.11	0.518	20	
Nitrobenzene	43.66	5.0	50		0	87.3	55-120	44.13	1.06	20	
Pentachlorophenol	80.87	5.0	100		0	80.9	55-120	78.73	2.68	20	
Phenanthrene	42.64	5.0	50		0	85.3	55-120	42.58	0.159	20	
Phenol	85.22	5.0	100		0	85.2	50-120	79.27	7.24	20	
Pyrene	44.62	5.0	50		0	89.2	55-120	44.26	0.811	20	
Pyridine	30.24	5.0	50		0	60.5	35-120	32.5	7.19	20	
Surr: 2,4,6-Tribromophe	enol 77.59	5.0	100		0	77.6	42-124	71.11	8.71	20	
Surr: 2-Fluorobiphenyl	77.13	5.0	100	.	0	77.1	48-120	81.91	6.02	20	·
Surr: 2-Fluorophenol	83.93	5.0	100		0	83.9	20-120	80.91	3.66	20	
Surr: 4-Terphenyl-d14	74.68	5.0	100		0	74.7	51-135	75.75	1.43	20	
Surr: Nitrobenzene-d5	83.15	5.0	100		0	83.1	41-120	83.44	0.35	20	
Surr: Phenol-d6	83.82	5.0	100		0	83.8	20-120	76.63	8.96	20	

The following samples were analyzed in this batch:

1105823-01E

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See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company 1105823

QC BATCH REPORT

Injection Well Quarterly ~roject:

Work Order:

Instrument ID VOA1 Method: SW8260 MBLK Sample ID: VBLKW-060111-R110726 Units: µg/L Analysis Date: 6/1/2011 11:22 AM Run ID: VOA1 110601A Prep Date: DF: 1 Client ID: SeqNo: 2408605 SPK Ref Control RPD Ref RPD Value Limit Value Limit SPK Val %REC %RPD Qual · PQL Analyte Result ND 5.0 1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane ŇD 5.0 ND 1,1,2-Trichloroethane 5.0 1,1-Dichloroethane ND 5.0 1,1-Dichloroethene ND 5.0 ND 1,2-Dichloroethane 5.0 2-Butanone ND 10 2-Chloroethyl vinyl ether ND 10 2-Hexanone ND 10 4-Methyl-2-pentanone ND 10 10 Acetone ND Benzene ND 5.0 Bromodichloromethane ND 5.0 Bromoform ND 5.0 Bromomethane ND 5.0 Carbon disulfide ND 10 Carbon tetrachloride ND 5.0 ND 5.0 'orobenzene roethane ND 5.0 unloroform ND 5.0 Chloromethane ND 5.0 ND cis-1,3-Dichloropropene 5.0 ND 5.0 Dibromochloromethane Ethylbenzene ND 5.0 m,p-Xylene ND 10 Methylene chloride ND 10 ND 5.0 Styrene ND Tetrachloroethene 5.0 Toluene ND 5.0 trans-1,3-Dichloropropene ND 5.0 ND 5.0 Trichloroethene Vinyl acetate ND 10 Vinyl chloride ND 2.0 ND 15 Xylenes, Total Surr: 1,2-Dichloroethane-d4 46.27 5.0 50 0 92.5 70-125 0 Surr: 4-Bromofluorobenzene 5.0 50 0 72-125 0 48.66 97.3 Surr: Dibromofluoromethane 47.13 5.0 50 0 94.3 71-125 0

See Qualifiers Page for a list of Qualifiers and their explanation.

44.65

5.0

50

0

89.3

75-125

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Surr: Toluene-d8

Navajo Refining Company **Client:** 1105823

QC BATCH REPORT

Injection Well Quarterly Project:

Work Order:

_atch ID: R110726	Instrument ID VOA1		Method	d: SW826	50				-	-	
LCS Sample ID:	VLCSW-060111-R110726				ι	Jnits: µg/L	•	Analys	sis Date: 6	/1/2011 1	0:06 AM
Client ID:	Run I	D: VOA1_	110601A		Se	eqNo: 240	8604	Prep Date:		DF: 1	
· · · ·	D., #	DOI		SPK Ref		~ == 0	Control	RPD Ref	~	RPD Limit	Qual
Analyte	Result	PQL.	SPK Var			%REC			%RPD		Qual
1,1,1-Trichloroethane	51.23	5.0	50		0	102	80-120	Q)		
1,1,2,2-Tetrachloroethane	46.09	5.0	50		0	92.2	72-120	0)	·	· · ·
1,1,2-Trichloroethane	46.38	5.0	50		0	92.8	80-120	0	1		
1,1-Dichloroethane	48.29	5.0	50		0	96.6	76-120	0			
1,1-Dichloroethene	48.17	5.0	50		0	96.3	73-124	0)		• •
1,2-Dichloroethane	46.01	5.0	50		0	92	78-120)		
2-Butanone	82.85	10	100		0	82.8	58-132	0	1		
2-Chloroethyl vinyl ether	96.39	10	100		0	96.4	74-120	· 0)		
2-Hexanone	85.87	10	100		0	85.9	61-130	0	l.		
4-Methyl-2-pentanone	87.75	10	100		0	87.8	65-127	0	<u> </u>		
Acetone	82.96	10	100		0	83	59-137	o)		
Benzene	47.73	5.0	50		0	95.5	73-121	0	<u> </u>		
Bromodichloromethane	48.55	5.0	50		0	97.1	80-120	Ċ	1		
Bromoform	46.63	5.0	50		0	93.3	79 -120	. 0			
Bromomethane	56.86	5.0	50		0	114	66-137	0)		
Carbon disulfide	100.4	10	100		0	100	68-141	0) 		
Carbon tetrachloride	51.48	5.0	50		0	103	75-124	O)		
'orobenzene	49.26	5.0	50		0	98.5	80-120	. 0			
proethane	54.15	5.0	50		0	108	76-121	0)		
Chloroform	48.53	5.0	50		0	97.1	80-120	0			
Chloromethane	44.93	5.0	50		0	89.9	67-123	. 0	1		
cis-1,3-Dichloropropene	53.96	5.0	50		0	108	80-120	0			
Dibromochloromethane	51.48	5.0	50		0	103	80-120	0			
Ethylbenzene	50.43	5.0	50		0	101	80-120	0			
m,p-Xylene	100.5	10	100		0	101	78-121	0			
Methylene chloride	50.35	10	50		0	101	65-133	0			
Styrene	51.18	5.0	50		0	102	. 80-120	0			
Tetrachloroethene	46.53	5.0	50		0	93.1	7 9- 120	0			***
Toluene	46.05	5.0	50		0	92.1	80-120	0			
trans-1,3-Dichloropropene	52.76	5.0	50		0	106	80-120	0			·····
Trichloroethene	50.91	5.0	50		0	102	80-120	0			
Vinyl acetate	98.15	10	100		0	98.2	67-139	0	•		
Vinyl chloride	52.04	2.0	50		0	104	70-127	0			
Xylenes, Total	151.8	15	150		0	101	80-120	0			
Surr: 1,2-Dichloroethane	-d4 46.3	5.0	50		0	92.6	70-125	0			·
Surr: 4-Bromofluorobenz	ene 47	5.0	50		0	94.	72-125	0			
Surr: Dibromofluorometh	nane 48.56	5.0	50	• •	0.	97.1	71-125	0			
Surr: Toluene-d8	46.07	5:0	50		0	92.1	75-125	0	· .		

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 9 of 20

Client: Navajo Refining Company 1105823

QC BATCH REPORT

Injection Well Quarterly ~-oject:

Ltch ID: R110726

Work Order:

Instrument ID VOA1

Method: SW8260

MS Sample ID: 1105756-4	6AMS				Units: µg/L	-	Analy	sis Date: 6	/1/2011 0	1:30 PM
Client ID:	Run IC	: VOA1_	110601A	S	eqNo: 240	8609	Prep Date:		DF: 5	
				SPK Ref		Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qual
1,1,1-Trichloroethane	252.9	25	250	0	101	80-120	()		
1,1,2,2-Tetrachloroethane	240.3	25	250	0	96.1	72-120)		
1,1,2-Trichloroethane	246.2	25	250	0	98.5	80-120	C)		
1,1-Dichloroethane	249.2	. 25	250	0	99.7	76-120	, i)		
1,1-Dichloroethene	237.8	25	250	0	95.1	73-124	C)		·
1,2-Dichloroethane	268	25	250	0	107	78-120)		
2-Butanone	464.3	50	500	0	92.9	58-132)		
2-Chloroethyl vinyl ether	37.14	50	500	0	7.43	74-120	. 0)		JS
2-Hexanone	481.3	50	500	0	96.3	61-130	C)		
4-Methyl-2-pentanone	492.4	50	500	0	98.5	65-127	C)		
Acetone	445.7	50	500	0	89.1	59-137	C)		
Benzene	269.4	25	250	0	108	73-121	, . C)		
Bromodichloromethane	287.1	25	250	0	115	80-120	Ċ)		
Bromoform	242.4	25	250	0	96.9	7 9 -120	c)		
Bromomethane	190.6	25	250	0	76.2	66-137	()		
Carbon disulfide	509.7	50	500	0	102	68-141	c)		
Carbon tetrachloride	255	25	250	0	102	75-124	C)		
probenzene	247.6	25	250	0	99.1	80-120	c)		
roethane	260.1	25	250	0	104	76-121	C)		
unloroform	247.8	25	250	0	99.1	80-120	. C)		
Chloromethane	206.9	25	250	0	82.8	67-123	C)		
cís-1,3-Dichloropropene	275	25	250 ´	0	110	80-120	C)		
Dibromochloromethane	264.5	25	250	0	106	80-120	0)		
Ethylbenzene	265.7	25	250	29.08	94.6	80-120	C)		
m,p-Xylene	484.1	50	500	0	96.8	78-121	C)		
Methylene chloride	246.8	50	250	0	98.7	65-133	C	F		
Styrene	250.9	25	250	0	100	80-120	C)		
Tetrachloroethene	237.9	25	250	0	95.2	79-120	O)		
Toluene	245.7	25	250	0	98.3	80-120	0)		
trans-1,3-Dichloropropene	297.7	25	250	0	119	80-120	C)		
Trichloroethene	271.3	25	250	0	109	80-120	0)		
Vinyl acetate	502.3	50	500	. 0	100	67-139	0	1		
Vinyl chloride	234.6	10	250	0	93.9	70-127	0)		
Xylenes, Total	734.8	75	750	0	98	80-120	0)		
Surr: 1,2-Dichloroethane-d4	237.3	25	250	0	94.9	70-125	C			
Surr: 4-Bromofluorobenzene	247.4	25	250	0	99	72-125	0)		
Surr: Dibromofluoromethane	246.8	25	250	0	98.7	71-125	0)		
Surr: Toluene-d8	235.9	25	250	. 0	94.3	75-125	C	L.		

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See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 10 of 20

Navajo Refining Company **Client:** 1105823

QC BATCH REPORT

Injection Well Quarterly ~roject:

Work Order:

atch ID: R110726	Instrument ID VOA1		Method	I: SW826	60						
MSD Sample ID: 1	105756-46AMSD				ι	Jnits: µg/L	-	Analysi	s Date: 6/	1/2011 01	:56 PM
Client ID:	Run ID	VOA1_	110601A		Śe	eqNo: 240	8610	Prep Date:		DF: 5	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limít	RPD Ref Value	%RPD	RPD Limit	Qual
1 1 1 Trichloroethane	220.8	25	250	·	٥	05.0	80.120	252.0	5 22	20	
1,1,1-Thurnoroethane	239.0	25	250		0 0.		72-120	202.9	7.86	20	
1,1,2,2-Tetrachioroethane	252.1	25	250	_	0	101	80-120	246.2	2.58	20	
1,1,2-memoroethane	202.0	25	250		ñ	97.6	76-120	240.2	2.00	20	
1.1-Dichloroethene	237.5	25	250		0	95	73-124	237.8	0 151	20	
1,1-Dichloroethane	249	25	250		ñ	99.6	78-12-1	268	7 32	20	
2-Butanone	480.4	50	500		n n	96.1	58-132	464.3	34	20	
2-Chloroethyl vinvl ether	ND	50	500	·	0	00.1	74-120	37.14	0.1	. 20	s
2-Hexanone	473.4	50	500		0	94.7	61-130	481.3	1.66	20	
4-Methyl-2-pentanone	440.6	50	500		0	88.1	65-127	492.4	11.1	20	
Acetone	433	50	500		0	86.6	59-137	445.7	2.9	20	
Benzene	252.3	25	250		0	101	73-121	269.4	6.57	20	
Bromodichloromethane	248.6	25	250		0	99.4	80-120	287.1	14.4	20	
Bromoform	233.7	25	250		0	93.5	79-120	242.4	3.64	20	
Bromomethane	228.8	25	250		0	91.5	66-137	190.6	18.2	20	
Carbon disulfide	484.7	50	500		0	96.9	68-141	509.7	5.04	20	
Carbon tetrachloride	235.1	25	250		0	94	75-124	255	8.13	20	
'orobenzene	243.1	- 25	250		0	97.2	80-120	247.6	1.86	20	
roethane	230.6	25	250		0	92.2	76-121	260.1	12	20	
Chloroform	247.3	25	250		0	98.9	80-120	247.8	0.204	20	
Chloromethane	192.2	25	250		0	76.9	67-123	206.9	7.34	20	_
cis-1,3-Dichloropropene	263.9	25	250		0	106	80-120	275	4.12	20	
Dibromochloromethane	256.8	25 ·	250		0	103	80-120	264.5	2.95	20	
Ethylbenzene	244.9	_ 25	250	29.0)8	86.3	80-120	265.7	8.15	20	
m,p-Xylene	466.8	50	500		0	93.4	78-121	484.1	3.65	20	
Methylene chloride	239.2	50	250	· .	0	95.7	65-133	246.8	3.11	20	
Styrene	242	25	250		0	96.8	80-120	250.9	3.63	20	
Tetrachloroethene	227.1	25	250		0.	90:8	-79-120	237.9	4.66	20	
Toluene	237	25	250		0	94.8	80-120	245.7	3.58	20	• •
trans-1,3-Dichloropropene	262.2	25	250		0	105	80-120	297.7	12.7	20	_
Trichloroethene	256.2	25	250		0	102	80-120	271.3	5.74	20	
Vinyl acetate	491.2	50	500		0	98.2	67-139	502.3	2.24	20	
Vinyl chloride	233.5	10	250		0	93.4	70-127	234.6	0.461	20	
Xylenes, Total	712.5	75	750	· · · · · · · · · · · · · · · · · · ·	0	95	80-120	734.8	3.09	20	
Surr: 1,2-Dichloroethane-	14 244.5	25	250		0	97.8	70-125	237.3	.2.97	20	
Surr: 4-Bromofluorobenze	n o 230	25	250	·	0	92	72-125	247.4	7.32	20	
Surr: Dibromofluorometha	nə 250.1	25	250		0	100	71-125	246.8	1.33	20	
Surr: Toluene-d8	233.7	25	250		0	93.5	75-125	235.9	0.921	20	

The following samples were analyzed in this batch:

1105823-01A

See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 11 of 20

QC BATCH REPORT

"roject: Injection Well Quarterly

.atch ID: R	R110566	Instrument ID WetChem		Metho	d: SW904	10							
LCS	Sample ID:	WLCSW1-052611-R110566				ι	Jnits: pH ı	units	Anal	ysis C	Date: 5/	26/2011 [·]	11:30 AM
Client ID:		Run II	D: WETCH	IEM_11052	6G	Se	qNo: 240 4	4273	Prep Date:	·		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%	RPD	RPD Limit	Qual
рН		6.1	0.10	6		0	102	90-110		0			
DUP	Sample ID:	1105823-01BDUP				ι	Jnits: pH ı	units	Anal	ysis D	Date: 5/	26/2011	1:30 AM
Client ID: E	ffluent	Run IE	D: WETCH	IEM_11052	6G	Se	qNo: 240 4	4275	Prep Date:			DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%	RPD	RPD Limit	Qual
pH		7.93	0.10	0		0	. 0	0-0	7.8	35	1.01	20	н
The follow	ing samples v	were analyzed in this batch:		05823-01B				·					

Client: Navajo Refining Company

Work Order: 1105823

QC BATCH REPORT

"roject: Injection Well Quarterly

	110567	Instrument ID WetChem	·	Metho	d: M2510	в						
MBLK	Sample ID:	WBLKW1-052611-R110567		<u> </u>		U	nits: µmh	los/cm	Analy	sis Date: 5	26/2011	10:15 AM
Client ID:		Run ID	: WETCH	iEM_11052	6H	Sec	No: 240 4	1278	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	nductivity	ND	1.0									
LCS	Sample ID:	WLCSW1-052611-R110567				Ū	nits: µmh	ios/cm	Analy	sis Date: 5	/26/2011	10:15 AM
Client ID:	·	Run ID	: WETCH	IEM_11052	6H	Sec	No: 240 4	1279	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	nductivity_	1400	1.0	1413		0	99.1	80-120		0		
DUP	Sample ID:	1105823-01BDUP	<u></u>	······		Ū	nits: µmh	ios/cm	Analy	sis Date: 5	26/2011	10:15 AM
Client ID: E	ffluent	Run ID	WETCH	IEM_11052	6H	Sec	No: 240 4	1281	Prep Date:		DF: 1	
Analyte	·	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	nductivity	4670	1.0	0		0	0		468	0 0.214	20	

The following samples were analyzed in this batch:

1105823-01B

QC Page: 13 of 20

QC BATCH REPORT

~oject: Injection Well Quarterly

atch ID: R110694 Instrument	ID WetChem		Metho	d: SM232	0B						
MBLK Sample ID: WBLKW1-05	53111-R110694			-	ι	Inits: mg/ l		Analys	s Date: 5/	31/2011 0	2:30 PM
Client ID:	Run II	D: WETCH	IEM_11053	11	Se	qNo: 240 7	693	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	5.0		-							
Alkalinity, Carbonate (As CaCO3)	ND	5.0									
Alkalinity, Hydroxide (As CaCO3)	ND	5.0									
Alkalinity, Total (As CaCO3)	ND	5.0						·			
LCS Sample ID: WLCSW1-05	3111-R110694				U	Inits: mg/l		Analysi	s Date: 5/	31/2011 0	2:30 PM
Client ID:	Run II	D: WETCH	IEM_11053	11	Se	qNo: 240 7	694	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	989.7	5.0	1000		0	99	80-120	0			
Alkalinity, Total (As CaCO3)	989.7	5.0	1000		0	99	80-120	0			
DUP Sample ID: 1105705-100	DUP				U	Inits: mg/l		Analysi	s Date: 5/	31/2011 0	2:30 PM
Client ID:	Run II	D: WETCH	IEM_11053	11	Se	qNo: 240 7	713	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
linity, Bicarbonate (As CaCO3)	200.9	5.0	0		0	. 0	0-0	201.9	0.492	20	
alinity, Carbonate (As CaCO3)	ND	5.0	0		0	. 0	0-0	0	0	20	
Alkalinity, Hydroxide (As CaCO3)	ND	5.0	0	=•	0	0	0-0	. 0	0	20	
Alkalinity, Total (As CaCO3)	200.9	5.0	0		0	0	0-0	201.9	0.492	20	

The following samples were analyzed in this batch:

1105823-01B

See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company

Work Order: 1105823

QC BATCH REPORT

roject: Injection Well Quarterly

_atch ID: R	110702 Instrument ID	Balance1	:	Metho	d: M2540	С						
MBLK	Sample ID: BLANK-R11070	2				ι	Jnits: mg/	Ľ	Analy	sis Date: 5/	31/2011 1	10:35 AM
Client ID:		Run I	d: Balan	CE1_11053	81F	Se	qNo: 240	B003	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissol	ved Solids (Residue, Fil	ND	10	. '		•						
LCS	Sample ID: LCS-R110702					ι	Jnits: mg/	L .	Analy	sis Date: 5/	31/2011 1	0:35 AM
Client ID:		Run I	D: BALAN	CE1_11053	1F	Se	qNo: 240	3004	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissol	ved Solids (Residue, Fil	1064	10	1000		0	106	85-115	; ()		
DUP	Sample ID: 1105756-34EDL	IP				υ)nits: mg/		Analy	sis Date: 5/	31/2011 1	0:35 AM
Client ID:		Run I	D: Balan	CE1_11053	ИF	Se	qNo: 240 7	7982	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissol	ved Solids (Residue, Fil	2410	10	0		0	0	0-0	2412	2 0.083	20	
DUP	Sample ID: 1105756-46EDU	P		-		U	Inits: mg/	Ļ	Analy	sis Date: 5/	31/2011 1	0:35 AM
Client ID:		Run I	D: BALAN	CE1_11053	ifF	Se	qNo: 240 7	7991	Prep Date:		DF: 1	
alyte	· · · · · · · · · · · · · · · · · · ·	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolv	ved Solids (Residue, Fil	1222	10	0		0	. 0	0-0	1170) 4.35	20	*
The followi	ng samples were analyzed in	this batch:	11	05823-01B								

QC BATCH REPORT

vject: Injection Well Quarterly

uatch ID: R	110849	Instrument ID I	CS2100		Metho	d: E300							
MBLK	Sample ID:	WBLKW3-06021	1-R110849				υ	nits: mg/	L	Anal	ysis Date: 6	3/2011 1):57 AM
Client ID:		·	Run	ID: ICS210	0_110603A		Sec	No: 241	1502	Prep Date:		DF: 1	
			D #	001	opiáscu	SPK Ref			Control	RPD Ref		RPD Limit	Qual
Analyte			Result	PQL	SPK Val			%REC			%RPD		Quai
Chloride			0.35	0.50	_		•		05 445		•		J
Surr: Sele	enate (surr)		5.178	0.10	. 5		0	104	85-115		0		
LCS	Sample ID:	WLCSW3-06021	1-R110849				U	nits: mg/	L	Anal	vsis Date: 6/	3/2011 1 1	:11 AM
Client ID:			Run	D: ICS210	0_110603A		Sec	No: 241	1503	Prep Date:		DF: 1	
						SPK Ref			Control	RPD Ref		RPD	
Analyte			Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Chloride			20.82	0.50	20		0	104	90-110		0		
Surr: Sele	enate (surr)		4.901	0.10	5		0	98	85-115		0		
LCSD	Sample ID:	WLCSDW3-0602	11-R11084	9			U	nits: mg/		Anal	/sis Date: 6/	3/2011 11	:26 AM
Client ID:			Run	D: ICS210	0_110603A		Seq	No: 241	1504	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chlorida			21 49	0.50	20		0	107	00-110	20.9	2 3 10	20	
Surr: Sele	enate (surr)	<u> </u>	5.025	0.10	5		0	100	85-115	4.90	1 2.5	20	
	Samala (D)	4405704 06DM8									reia Data: 61	2/2044 42	-00 DM
Client ID:	Sample ID.	1103104-000003	Run I	D: ICS210	0 110603A		Seo	niis. mg/ 1No: 241	L 1507	Prep Date:	sis Date. 0	DF: 1	
Analyte			Recult	POI	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Oual
			i cesuit					701120			70141 0		
Chloride	nato (surr)		125.4 4 953	0.50	10 5	11	17	84 00 1	80-120		0		FO
			4.000	0.10	U					· · - · - · · · · · ·		<u>.</u>	
MS	Sample ID:	1106102-02CMS					Ui	nits: mg/ l	L	Analy	/sis Date: 6/	3/2011 05	:27 PM
Client ID:			Run !	D: ICS210	0_110603A		Seq	No: 2412	2453	Prep Date:		DF: 10	0
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride			138500	50	1000	13760	00	90.4	80-120		0		EQ
Surr: Sele	nate (surr)	· · · · ·	507.4	10	500		0	101	85-115		0		
MSD	Sample ID:	1105704-06BMSI	D			•	Ur	nits: mg/l	 L	Analy	sis Date: 6/	3/2011 12	:24 PM
Client ID:			Run I	D: ICS210	0_110603A		Seq	No: 241	508	Prep Date:		DF: 1	
						SPK Ref			Control	RPD Ref		RPD	
Analyte	<u> </u>		Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Chloride			125.1	0.50	10	. 11	17	80.7	80-120	125	4 0.263	20	EO
	nate (surr)		4 965	0 10			0	00.3	85-115	4 95	3 0 242	20	

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See Qualifiers Page for a list of Qualifiers and their explanation.

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QC BATCH REPORT

Toject: Injection Well Quarterly

atch ID: R	110849	Instrument ID ICS2100		.`	Method	: E300						
MSD	Sample ID:	1106102-02CMSD					Units: mg/	L	Analys	is Date: 6/	3/2011 05	:41 PM
Client ID:		R	un ID: İCS2	100_	_110603A		SeqNo: 2412	2454	Prep Date:		DF: 10	0
Analyte		Result	PQ	L	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		126500	5	0	1000	13760	0 -1110	80-120	138500	9.07	20	SEO
The followi	ing samples v	402.8 were analyzed in this bate	' :h: [U 110	5823-01B		0 92.0	85-115	507.4	9.2	20	

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 17 of 20

QC BATCH REPORT

oject: Injection Well Quarterly

Jatch ID: R	110875	Instrument ID V	WetChem		Metho	d: SW10 1	Ó							
LCS	Sample ID:	WLCS-060311-R	110875				ι	Jnits: °F		Ana	alysi	s Date: 6	/3/2011 03	8:00 PM
Client ID:			Run II	D: WETCH	IEM_11060	3H	Se	qNo: 241	1828	Prep Date:			DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	•	%RPD	RPD Limit	Qual
Ignitability			84	50	83		0	101	80-120		0			
LCSD	Sample ID:	WLCSD-060311-	R110875				ι	Jnits: °F		Ana	alysi	s Date: 6	/3/2011 03	8:00 PM
Client ID:			Run II	D: WETCH	IEM_11060	3H	Se	qNo: 241	1829	Prep Date:			DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability			83	50	83		0	100	80-120		84	1.2	25	
DUP	Sample ID:	1106074-07FDU	P .				ι	Inits: °F		Ana	alysi	s Date: 6	/3/2011 03	3:00 PM
Client ID:			Run II	D: WETCH	IEM_11060	3H	Se	qNo: 241	1825	Prep Date:			DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability			ND	50	0		0	0	0-0		0	0	25	

The following samples were analyzed in this batch:

1105823-01C

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC BATCH REPORT

~-oject: Injection Well Quarterly

.atch ID: R	110987	Instrument ID	CS3000		Metho	d: E300							
MBLK	Sample ID:	WBLKW1-06061	11-R110987				ι	Jnits: mg/	L	Analy	sis Date: 6	/6/2011 06	6:25 PM
Client ID:			Run IC): ICS300	0_110606A		Se	eqNo: 2414	4849	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate			ND	0.50									
Surr: Sel	enate (surr)		4.522	0.10	5		0	90.4	85-115		0		
LCS	Sample ID:	WLCSW1-06061	1-R110987				ι	Jnits: mg/	L	Analy	sis Date: 6	/6/2011 06	6:46 PM
Client ID:			Run IE): ICS300	0_110606A		Se	qNo: 2414	4850	Prep Date:		DF: 1	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate			20.9	0.50	20		0	İ04	90-110		0		
Surr: Sel	enate (surr)		5.095	0.10	5		0	102	85-115		0		
LCSD	Sample ID:	WLCSDW1-060	611-R110987				ι	Jnits: mg/		Analy	sis Date: 6	6/2011 07	:07 PM
Client ID:			Run IC): ICS300	0_110606A		Se	qNo: 2414	1852	Prep Date:		DF: 1	•
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate			20.85	0.50	20	•	0	104	90-110	20.	9 0.216	20	
Surr: Sel	enate (surr)		5.061	0.10	5		0	101	85-115	5.09	5 0.67	20	
	Sample ID:	1105899-40IMS		····			ι	Jnits: mg/	L	Analy	sis Date: 6	7/2011 12	:44 AM
Client ID:			Run IC): ICS300	0_110606A		Se	qNo: 2414	1887	Prep Date:		DF: 5	
Analyte		· ·	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate			57.42	2.5	50	7.2	55	100	80-120	. (D		
Surr: Sele	enate (surr)		23.66	0.50	25		0	94.6	85-115		0		· · · ·
MS	Sample ID:	1105899-39IMS					ι	Jnits: mg/		Analy	sis Date: 6/	7/2011 10	:21 AM
Client ID:			Run ID	: ICS300	0_110606A		Se	qNo: 2414	1891	Prep Date:		DF: 5	
Analyte			Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate			55.45	2.5	50		0	111	80-120	(D		
Surr: Sele	enate (surr)		24.38	0.50	25		0	97.5	85-115		00		
MSD	Sample ID:	1105899-40IMS					ι	Jnits: mg/l		Analy	sis Date: 6/	7/2011 01	:48 AM
Client ID:			Run (D	: ICS3000	0_110606A		Se	qNo: 2414	1890	Prep Date:		DF: 5	
						SPK Ref			Control	RPD Ref		RPD	
Analyte			Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Sulfate			57.64	2.5	50	7.25	55	101	80-120	57.42	2 0.391	20	
Surr: Sele	nate (surr)		23.65	0.50	25		0	94.6	85-115	23.6	<u> </u>	20	

See Qualifiers Page for a list of Qualifiers and their explanation.

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Work Order:	Crder: 1105823 Injection Well Quarterly R110987 Instrument ID IC\$3000							QCI	BATC	HRE	PORT	
_atch ID: R1109	87 Instrument ID I	CS3000		Metho	d: E300							
MSD Sa	mple ID: 1105899-39IMS			_		Unit	s: mg/		Analysi	is Date: 6/	7/2011 10	:42 AM
Client ID:		Run I	D: ICS300	0_110606A		SeqN	o: 241 4	\$892	Prep Date:		DF: 5	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%	REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate		55.91	2.5	50		0	112	80-120	55.45	0.826	20	
Surr: Selenate	(surr)	24.66	0.50	25		0	98.6	85-115	24.38	1.14	20	-
The fellowing of	males were analyzed in	thic bataby	[14	05823-01B								

The following samples were analyzed in this batch:

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See Qualifiers Page for a list of Qualifiers and their explanation.

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1105823-01B

QC Page: 20 of 20

Date: 08-Jun-11

Client: Project:	Navajo Refining Company	QUALIFIERS,
WorkOrder:	1105823	ACRONYMS, UNITS
Qualifier	Description	· · · · · · · · · · · · · · · · · · ·
*	Value exceeds Regulatory Limit	
a	Not accredited	
В	Analyte detected in the associated Method Blank above the F	Reporting Limit
E	Value above quantitation range	
Н	Analyzed outside of Holding Time	· · · · · · · · · · · · · · · · · · ·
J	Analyte detected below quantitation limit	
Μ	Manually integrated, see raw data for justification	•
n	Not offered for accreditation	
ND	Not Detected at the Reporting Limit	
D	Sample amount is > 4 times amount spiked	
P	BPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
Ŭ	Analyzed but not detected above the MDL	
Acronym	Description	
DCS	Detectability Check Study	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MOL	Method Quantitation Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Spike	
POL	Practical Quantitation Limit	
SD	Serial Dilution	
SDL	Sample Detection Limit	
TRRP	Texas Risk Reduction Program	
Units Reported	d Description	
°F	Farenheit degrees	
µmhos/cm		
mg/Kg	Milligrams per Kilogram	
mg/L	Milligrams per Liter	· ·
pH units		

(ALS)	D ALS Environn 10450 Stancliff Rd., Suite 2 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	rental 210	c	ha Page CC	of Custo <u>of</u> of OC ID: 3 S Project I	ody Fo)/m	-	NAVA	JO R Proj	EFINI	NG: N njectic	58 Navajo on We	2 2 Refi	3 ning C arterly	Compa	any
(Justomer Information		Projec	t Informati		nanayer,	-										·
Purchase Order		Project Nam	o injeg	tion Well Qui	arterly	· · · · ·	A	 VO	C (8260)) Selec		I ISAUL (IAS)	EL MALOL EN	ILA LLUBA I	TERE OMNIE		
Work Order		Project Numbe	er l				в	SVC	C (827	70) Sela	et.						
Company Name	Navajo Refining Company	Bill To Compan	y Nava	jo Refining C	>ompany		c	Tota	ni Meia	ls (6020	0/7000)	Select					
Send Report To	Aaron Strange	Invoice Att	n Aaro	u Strange			D	RCI	Profile								
	PQ Box 159		PC' I	Box 159			E	Anio	ons (30	0) CI, S	0.1						·····
Address		Addres	s				F	Alka	alinity								
City/State/Zip	Artesia, NM 88211	City/State/Zi	> Arte	sia, NM 882	:11		G	pН							<u></u>		
Phone	(575) 748-0793- 33/	Phon	e (575) 748-0732	3311	·····	н	Cor	nductivit	у							
Fax	(575) 746-5424 5451	Fa	x (575) 746-542+	5451	;	1	TD	s .						·		
e-Mail Address		e-Mail Addres	s			·	J						······				
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	В	· C	D	E	F	G	Н	I	J	Hold
1 Ffflu	nent	5-24-11 7	0.50	L	Ý	q	X	X	x	X	x	X	X	ス	X		
2 Thip 3 TOMP	blank blask		· · · · · · · · · · · · · · · · · · ·												 		
4																	
5							1]			1		
6									1								
7			<u></u>			-											
8		· .			1			ŀ	i	1							
9									l i						·		
10																	
Sampler(s) Please I	Print & Sign	Shipment	Method	Req	uired Turnard	ound Time: (Checl	(Box)	Ė] (Other	·		- A	esults	Due Da	ite:	
Halloh 2 Relinguished by:	Date: _ F. CI	Time: LIC R	ereived by: _	<u> </u>	Herald 10 V	NK Days	5 V	VK Days s:	<u>} </u> _2 10 Da	WICOA y TAT.	7.2	<u>1 24 Ho</u>	iur				
Min Belinguished by	Date:	107 Time: R	eceived by 14	of the ,	HENT	551	¥5	dier ID	Coc	ler Temp	p. QC	Packag	e: (Chie	ck One	Box Belo		
Logged by (Laborator	y): Date:	Time: C	hecked by (La	boratory):	1/20	04	5	<u>. </u>				<u>ون کر</u>	vel II Slo VCI III Slo	i ac d QC/R	aw Data	דד [] דד []	RP CheckLis RFP I.evel IV
Preservative Key:	1-HCI 2-HNO 3-H-SO 4-N	aOH 5-Na ₂ S ₂ O ₂	6-NaHSO	7-Othe	8-4°C	9-5035				<u></u>	-1		vehiv St	N346/C	ĹΡ		

ote: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and an alter 3. The Chain of Custody is a local decomposite to the terms and an alter alter and an alter alter and an alter a

Copyright 2010 by ALS Environmental

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Sample Receipt Checklist

Client Name: <u>NAVAJO REFINING</u>	· · ·	Date/Time	Received: <u>25-May-1</u>	<u>1 09:15</u>
Work Order: <u>1105823</u>		Received b	y: <u>DWH</u>	
Checklist completed by David Hightower	25-May-11 Date	Reviewed by:	Chris Bryson eSignature	29-May-11 Date
Matrices: <u>water</u> Carrier name: <u>FedEx</u>				
Shipping container/cooler in good condition?	Yes 🔽	No 🗌	Not Present	
Custody seals intact on shipping container/coole	r? Yes 🗹	No 🗆	Not Present	
Custody seals intact on sample bottles?	Yes 🗋	No 🗌	Not Present	
Chain of custody present?	Yes 🗹	No 🗌		
Chain of custody signed when relinquished and	received? Yes 🗹	No 🗌		
Chain of custody agrees with sample labels?	Yes 🗹	No 🗌		
Samples in proper container/bottle?	Yes 🗹	No 🗌		
Sample containers intact?	Yes 🗹	No 🗌		
Sufficient sample volume for indicated test?	Yes 🗹	No 🗌		
All samples received within holding time?	Yes 🗹	No 🗆		
Container/Temp Blank temperature in compliance	e? Yes 🗹	No 🗌		
Temperature(s)/Thermometer(s):	<u>2.0c</u>	*	002]
Cooler(s)/Kit(s):	<u>3401</u>]
Water - VOA vials have zero headspace?	Yes 🗹	No 🗌	No VOA vials submitted	
Water - pH acceptable upon receipt?	Yes 🗹	No 🗌	N/A	
pH adjusted? pH adjusted by:	Yes	No 🗹	N/A	
Login Notes:	·			I
-				
		<u> </u>		
	·			· · ·
Cliant Contacted	Data Cantastadi	Deces	Constants de	
	Date Contacted:	Person	Contacted:	

Contacted By:				Regar	rding:				
Comments:	· ·				<u>.</u>	 	 	 	
				•,		 			
SorrectiveAction:									
		. <u>.</u>	·				 		

SRC Page 1 of 1

Date: 27-May-11

Client:	ALS Environmental	
Project:	1105823	Work Order Sample Summary
Work Order:	1105675	work order Sample Summary
	,	

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	Tag Number	Collection Date	Date Received Hold
1105675-01	1105823-01D	Water		5/24/2011 10:50	5/27/2011 09:45
				,	
,					

SS Page 1 of 1

Date: 27-May-11

Client: Project:	ALS Environmental 1105823	QUALIFIERS,
WorkOrder:	1105675	ACKON INIS, UNITS
Qualifier	Description	
*	Value exceeds Regulatory Limit	
а	Not accredited	
В	Analyte detected in the associated Method Blank above the R	Leporting Limit
E	Value above quantitation range	
н	Analyzed outside of Holding Time	
J	Analyte detected below quantitation limit	
n	Not offered for accreditation	
ND	Not Detected at the Reporting Limit	
0	Sample amount is > 4 times amount spiked	
Р	Dual Column results percent difference > 40%	
R	RPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
U	Analyzed but not detected above the MDL	
Acronym	Description	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MQL	Method Quantitation Limit	
MS	Matrix Spike	· · · · · ·
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Spike	
PQL	Practical Quantitation Limit	
SD	Serial Dilution	
TDL	Target Detection Limit	
Units Reported	Description	
mg/Kg	Milligrams per Kilogram	

QF Page 1 of 1

Date: 27-May-11

Client:	ALS Environmental						
Project:	1105823				W	ork Order: 11056	575
Sample ID:	1105823-01D					Lab ID: 11056	675-01
Collection Date:	5/24/2011 10:50 AM					Matrix: WAT	ER
Analyses		Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, REACTIVE Cyanide, Reactive		ND		SW7.3 . 40.0	3.2 mg/Kg	· 1	Analyst: CV 5/27/2011 12:30 PM
SULFIDE, REACTIVE				SW7.3.	4.2		Analyst: CV
Sulfide, Reactive		ND		40.0	mg/Kg	1	5/27/2011 12:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	ALS Environmental
ork Order:	1105675
oject:	1105823

Date: 27-May-11

QC BATCH REPORT

Batch ID: F	R90393	Instrument ID WETCHEM		Metho	d: SW7. 3	.3.2						
MBLK	Sample ID:	WBLKW1-110524-R90393		_		ι	Jnits: mg/ l	Kg	Analy	sis Date: 5	/24/2011 1	0:00 AM
Client ID:		Run ID	: WETCH	IEM_11052	4C	Se	qNo: 1633	3537	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, R	leactive	ND	40									
LCS	Sample ID:	WLCSW1-110524-R90393				ŧ	Jnits: mg/ l	Kg	Analy	sis Date: 5	/24/2011 1	0:00 AM
Client ID:		Run ID	: WETCH	IEM_11052	4C	Se	qNo: 1633	3538	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, R	leactive	249.6	40	250		0	99.8	75-125		0		
LCSD	Sample ID:	WLCSDW1-110524-R90393				ι	Jnits: mg/ l	Kg	Analy	sis Date: 5	/24/2011 1	0:00 AM
Client ID:		Run ID	: WETCH	IEM_11052	4C	Se	qNo: 1633	3542	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, R	eactive	249.6	40	250		0	99.8	75-125	249.	6 0	35	
MS	Sample ID:	1105504-02A MS		<u> </u>		ι	Jnits: mg/ l	Kg	Analy	sis Date: 5	/25/2011 0	1:00 PM
ent ID:		Run ID	WETCH	IEM_11052	4C	Se	qNo: 1634	710	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, R	eactive	278.9	40	250		0	112	50-150		0		
MSD	Sample ID:	1105504-02A MSD				ι	Jnits: mg/l	Kg	Analy	sis Date: 5	/25/2011 0	1:00 PM
Client iD:		Run ID	: WETCH	IEM_11052	4C	Se	qNo: 1634	1711	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, R	eactive	249.6	40	250		0	99.8	50-150	278.9	9 11.1	35	
The follow	ing samples v	vere analyzed in this batch:	11	05675-01A			·			7		

The second second second second second second second second second second second second second second second se

Client: Work Order: ject:	ALS Environmental 1105675 1105823						QC	BATC	HRE	PORT
patch ID: R90528	Instrument ID WETCH	IEM	Metho	d: SW7.3 .	4.2					
MBLK Sam	ple ID: WBLKW1-110527-R90	528			Units: mg/	Kg	Analy	sis Date: 5	/27/2011 ·	12:30 PM
Client ID:		Run ID: WETC	HEM_11052	7D	SeqNo: 1636	6809	Prep Date:		DF: 1	
Analyte	Resu	it PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide, Reactive	N	D 40	·							
The following com	also were exclused in this ha	4ab. 1	105675 014			· · · ·				

See Qualifiers Page for a list of Qualifiers and their explanation.

- 14 14

QC Page: 2 of 2



Commente

Subcontractor: ALS Laboratory Group

3352 128th Ave.

Holland, MI 49424

TEL: (616) 399-6070 FAX: (616) 399-6185

Acct #:

CHAIN-OF-CUSTODY RECORD

Date: <u>25-May-11</u> COC ID: <u>10516</u> Due Date: <u>07-Jun-11</u>

Page 1 of 1

Due

Customer Information Parameter/Method Request for Analysis **Project Information** • 5 ° ta a esta ÷ Purchase Order Project Name 1105823 A Reactive Cyanide (SW-846) Work Order Project Number B Reactive Sulfide (SW-846) Company Name ALS Group USA, Corp. **Bill To Company** ALS Group USA, Corp. С Send Report To JayLynn F Thibault Inv Attn Accounts Payable D E Address 10450 Stancliff Rd, Suite 210 Address 10450 Stancliff Rd, Suite 210 F G City/State/Zip Houston, Texas 77099-4338 City/State/Zip Houston, Texas 77099-4338 Phone (281) 530-5656 Phone (281) 530-5656 Н Fax (281) 530-5887 Fax 1 (281) 530-5887 eMail Address eMail CC J jaytynn.thibault@alsenviro.com Sample ID Matrix **Collection Date 24hr** Bottle A B С D E F G .**H**. J 1105823-01D (Effluent) Water 24/May/2011 10:50 (1) 1LPNEAT Х Х

Comments.	Please analyze for Reactive Cyanide	& Sulfide cc:glenda.ramos@alsg	<u>global.com mary.knowles@al</u>	sglobal.com	ye
Relinquished by:	Date/Time	Received by:	. Date/Time	Cooler IDs	Report/QC Level Std
Relinquished by	- TOTA	Reserved by: -7 M	DatefTime 5/27/11 090	45	

4.00

and and a

Client Name:	ALS - H	OUSTON					Date/Time	Receiv	ed: <u>27-</u>	May-11	09:45		
Work Order:	<u>110567</u>	5					Received b	y:	DS				
Checklist compl	leted by	Diane Shaw eSignature		27-1	May-11 Date		Reviewed by:	<i>Bill</i> eSigr	Carey				27-May-11 Date
Matrices: Carrier name:	<u>Water</u> FedEx	: <u>(</u>										·	
Shipping contai	ner/coole	er in good condition?			Yes		No 🗌	N	ot Present				
Custody seals in	ntact on	shipping container/coole	er?		Yes 🛛		No 🗌	N	ot Present				
Custody seals in	ntact on	sample bottles?			Yes [No 🗖	N	ot Present				
Chain of custod	ly presen	t?			Yes	✓	No 🗌						
Chain of custod	ly signed	when relinquished and	received?		Yes 🗄	\checkmark	No 🗌						
Chain of custod	y agrees	with sample labels?			Yes		No 🗌						
Samples in prop	per conta	iner/bottle?			Yes		No 🗌						
Sample contain	ers intac	t?			Yes		No.						
Sufficient sampl	le volume	e for indicated test?			Yes	✓	No 🗆						
All samples rece	eived wit	hin holding time?			Yes		No 🗀						
Container/Temp	o Blank te	emperature in compliand	ce?		Yes	✓	No 🗌						
Temperature(s)	/Thermoi	meter(s):		4	4.0 c								
Cooler(s)/Kit(s):	:	<i>,</i>		[
Water - VOA via	als have :	zero headspace?			Yes [No 🗌	No VC	A vials sub	mitted			
Water - pH acce	eptable u	pon receipt?			Yes [No 🗌	N/A					
pH adjusted? pH adjusted by:				Ĺ	Yes [. No 🗌	N/A _		j			
Login Notes:				E									
3													
				===				==			====	==:	
Client Contacted	l:		Date Contacte	ed:			Person	Contac	ted:				
Contacted By:			Regarding:										
Comments:							· · · · · · · · · · · · · · · · · · ·	<u> </u>					÷
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06-Sep-2011

Aaron Strange Navajo Refining Company PO Box 159 Artesia, NM 88211

Tel: (575) 748-3311 Fax: (575) 746-5421

Re: Injection Well Quarterly

Work Order: 1108743

Dear Aaron,

ALS Environmental received 2 samples on 24-Aug-2011 09:20 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 38.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Chris Bryson

Electronically approved by: Makenzie L. Henderson

Chris Bryson Project Manager



Certificate No: T104704231-09A-TX

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77099-4338 | PHONE (281) 530-5656 | FAX (281) 530-5687 powerup control and the stand of the sta



www.alsglobal.com

RIGHT SOLUTIONS BIGHT PARTNER
Date: 06-Sep-11

Client: Project:	Navajo Refining Company Injection Well Quarterly	Work Order Sample Summary
Work Order:	1108743	

<u>Lab Samp ID</u>	Client Sample ID	<u>Matrix</u>	<u>Tag Number</u>	Collection Date	Date Received	<u>Hold</u>
1108743-01	Injection Well Effluent	Liquid		8/23/2011 09:10	8/24/2011 09:20	
1108743-02	Trip Blank	Water		8/23/2011	8/24/2011 09:20	

SS Page 1 of 1

Date: 06-Sep-11

ALS Environmental

Client:	Navajo Refining Company	
oject:	Injection Well Quarterly	Case Narrative
work Order:	1108743	Cuse I (ul l'ul l'ul l'e
		·

PH, Sample Injection Well Effluent : Analytical results are flagged with an H qualifier for pH.

Batch 54977, Metals, Sample 1108727-01 : MS/MSD is for an unrelated sample.

Batch 54917, Semivolatile Organics : LCSD RPD was above the control limits for 3&4-Methylphenol, Benzidine, and Pyridine. The individual recoveries were in control.

Batch R115435, Volatile Organics, Sample 1108733-07 : MS/MSD is for an unrelated sample.

Batch R115163, pH, Sample Injection Well Effluent : Duplicate result is flagged with an H qualifier for pH.

The analysis for Reactive Cyanide and Reactive Sulfide was subcontracted to ALS Laboratory Group in Holland, MI.

Date: 06-Sep-11

CLIENT:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:Injection Well EffluentCollection Date:8/23/2011 9:10:00 AM

Work Order: 1108743 Lab ID: 1108743-01 Matrix: LIQUID

Analyses	Result	Reg Limit Qual	Report Limit Units	Dilution Factor	Date Analyzed
MERCURY		SW7470	Prep: SW7	470 8/26/11	Analyst: JCJ
Mercury	ND	U	0.000200 mg/L	1	8/26/2011 13:54
METALS		SW6020	Prep: SW3	010A 8/26/11	Analyst: ALR
Aluminum	0.625	0	0.0100 mg/L	1	8/26/2011 19:05
Arsenic	0.0207	0	0.00500 mg/L	1	8/26/2011 19:05
Barium	0.0796	0	0.00500 mg/L	1	8/26/2011 19:05
Boron	0.276	0	0.0500 mg/L	1	8/30/2011 14:01
Cadmium	ND	0	0.00200 mg/L	1	8/26/2011 19:05
Chromium	ND	0	0.00500 mg/L	1	8/26/2011 19:05
Copper	0.00709	0	0.00500 mg/L	1	8/26/2011 19:05
Lead	ND	0	0.00500 mg/L	1	8/26/2011 19:05
Manganese	0.0559	0	0.00500 mg/L	1	8/26/2011 19:05
Molybdenum	0.145	0	0.00500 mg/L	1	8/26/2011 19:05
Nickel	0.00767	0	0.00500 mg/L	1	8/26/2011 19:05
Selenium	0.465	0	0.00500 mg/L	1	8/26/2011 19:05
Silver	ND	0	0.00500 mg/L	1	8/26/2011 19:05
Zinc	0.0983	0	0.00500 mg/L	1	8/26/2011 19:05
SEMIVOLATILES - SW8270D		SW8270	Prep: SW3	510 8/24/11	Analyst: JLJ
1,2,4-Trichlorobenzene	ND	0	0.050 mg/L	10	8/25/2011 22:54
2,4,5-Trichlorophenol	ND	0.4	0.050 mg/L	10	8/25/2011 22:54
2,4,6-Trichlorophenol	ND	0.002	0.050 mg/L	10	8/25/2011 22:54
2,4-Dinitrotoluene	ND	0.00013	0.050 mg/L	10	8/25/2011 22:54
2-Methylnaphthalene	ND	0	0.050 mg/L	10	8/25/2011 22:54
2-Methylphenol	ND	0.2	0.050 mg/L	10	8/25/2011 22:54
2-Nitroaniline	ND	0	0.050 mg/L	10	8/25/2011 22:54
2-Nitrophenol	ND	0	0.050 mg/L	10	8/25/2011 22:54
3&4-Methylphenol	ND	0.2	0.050 mg/L	10	8/25/2011 22:54
3-Nitroaniline	ND	0	0.050 mg/L	10	8/25/2011 22:54
4-Nitroaniline	ND	0	0.050 mg/L	10 ໍ	8/25/2011 22:54
4-Nitrophenol	ND	0	0.050 mg/L	10	8/25/2011 22:54
Acenaphthene	NÐ	0	0.050 mg/L	10	8/25/2011 22:54
Acenaphthylene	ND	0	0.050 mg/L	10	8/25/2011 22:54
Aniline	ND	0	0.050 mg/L	10	8/25/2011 22:54
Anthracene	ND	0	0.050 mg/L	10	8/25/2011 22:54
Benz(a)anthracene	ND	0	0.050 mg/L	10	8/25/2011 22:54
Benzidine	ND	0	0.050 mg/L	10	8/25/2011 22:54
Hexachlorobenzene	ND	0.00013	0.050 mg/L	10	8/25/2011 22:54
Hexachloroethane	ND	0.	0.050 mg/L	10	8/25/2011 22:54
Indeno(1,2,3-cd)pyrene	ND	0	0.050 mg/L	10	8/25/2011 22:54

Date: 06-Sep-11

CLIENT:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:Injection Well EffluentCollection Date:8/23/2011 9:10:00 AM

Work Order: 1108743 Lab ID: 1108743-01 Matrix: LIQUID

Analyses	Result	Reg Limit Qual	Report Limit Units	Dilution Factor	Date Analyzed
Isophorone	ND	0	0.050 mg/L	10	8/25/2011 22:54
Naphthalene	ND	· 0	0.050 mg/L	10	8/25/2011 22:54
Nitrobenzene	ND	0.002	0.050 mg/L	10	8/25/2011 22:54
N-Nitrosodimethylamine	ND	0	0.050 mg/L	10	8/25/2011 22:54
N-Nitrosodi-n-propylamine	ND	0	0.050 mg/L	10	8/25/2011 22:54
N-Nitrosodiphenylamine	ND	0	0.050 mg/L	10	8/25/2011 22:54
Pentachlorophenol	ND	0.1	0.050 mg/L	10	8/25/2011 22:54
Phenanthrene	ND	0	0.050 mg/L	10	8/25/2011 22:54
Phenol	ND	0	0.050 mg/L	10	8/25/2011 22:54
Pyrene	ND	0	0.050 mg/L	10	8/25/2011 22:54
Pyridine	ND	0.005	0.050 mg/L	10	8/25/2011 22:54
Surr: 2,4,6-Tribromophenol	78.3	0	42-124 %REC	10	8/25/2011 22:54
Surr: 2-Fluorobiphenyl	75.3	0	48-120 %REC	10	8/25/2011 22:54
Surr: 2-Fluorophenol	55.3	0	20-120 %REC	10	8/25/2011 22:54
Surr: 4-Terphenyl-d14	73.1	0	51-135 %REC	10	8/25/2011 22:54
Surr: Nitrobenzene-d5	70.5	0	41-120 %REC	10	8/25/2011 22:54
Surr: Phenol-d6	61.6	0	20-120 %REC	10	8/25/2011 22:54
VOLATILES		SW8260	Prep:	•	Analyst: PC
1,1,1-Trichloroethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
1,1,2,2-Tetrachloroethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
1,1,2-Trichloroethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
1,1-Dichloroethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
1,1-Dichloroethene	ND	0.0007	0.0050 mg/L	1	8/31/2011 16:22
1,2-Dichloroethane	ND	0.0005	0.0050 mg/L	1	8/31/2011 16:22
2-Butanone	ND	0	0.010 mg/L	1	8/31/2011 16:22
2-Chloroethyl vinyl ether	ND	0	0.010 mg/L	1	8/31/2011 16:22
2-Hexanone	ND	0	0.010 mg/L	1	8/31/2011 16:22
4-Methyl-2-pentanone	ND	0	0.010 mg/L	1	8/31/2011 16:22
Acetone	ND	0	0.010 mg/L	1	8/31/2011 16:22
Benzene	ND	0.0005	0.0050 mg/L	1	8/31/2011 16:22
Bromodichloromethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
Bromoform	· ND	0	0.0050 mg/L	1	8/31/2011 16:22
Bromomethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
Carbon disulfide	ND	0	0.010 mg/L	1	8/31/2011 16:22
Carbon tetrachloride	ND	0.0005	0.0050 mg/L	1	8/31/2011 16:22
Chlorobenzene	ND	. 0.1	0.0050 mg/L	1	8/31/2011 16:22
Chloroethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
Chloroform	ND	0.006	0.0050 mg/L	1	8/31/2011 16:22
Chloromethane	ND	0	0.0050 mg/L	· 1	8/31/2011 16:22
cis-1,3-Dichloropropene	ND	0	0.0050 mg/L	1	8/31/2011 16:22

Date: 06-Sep-11

CLIENT:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:Injection Well EffluentCollection Date:8/23/2011 9:10:00 AM

Work Order: 1108743 Lab ID: 1108743-01 Matrix: LIQUID

Analyses	Result	Reg Limit Qual	Report Limit Units	Dilution Factor	Date Analyzed
Dibromochloromethane	ND	0	0.0050 mg/L	1	8/31/2011 16:22
Ethylbenzene	ND	0	0.0050 mg/L	1	8/31/2011 16:22
m,p-Xylene	. ND	0	0.010 mg/L	1	8/31/2011 16:22
Methylene chloride	ND	Ó	0.010 mg/L	1	8/31/2011 16:22
Styrene	ND	Ò	0.0050 mg/L	1 ·	8/31/2011 16:22
Tetrachloroethene	ND	0.0007	0.0050 mg/L	1	8/31/2011 16:22
Toluene	ND	0	0.0050 mg/L	1	8/31/2011 16:22
trans-1,3-Dichloropropene	ND	0	0.0050 mg/L	1	8/31/2011 16:22
Trichloroethene	ND	0.0005	0.0050 mg/L	1	8/31/2011 16:22
Vinyl acetate	NÐ	0	0.010 mg/L	1	8/31/2011 16:22
Vinyl chloride	ND	0.0002	0.0020 mg/L	1	8/31/2011 16:22
Xylenes, Total	ND	0	0.015 mg/L	1	8/31/2011 16:22
Surr: 1,2-Dichloroethane-d4	99.5	0	70-125 %REC	1	8/31/2011 16:22
Surr: 4-Bromofluorobenzene	98.0	0	72-125 %REC	1	8/31/2011 16:22
Surr: Dibromofluoromethane	99.3	0	71-125 %REC	1	8/31/2011 16:22
Surr: Toluene-d8	95.0	0	75-125 %REC	1	8/31/2011 16:22
REACTIVE CYANIDE		SW-846	Prep:		Analyst: HN
Reactive Cyanide	ND	0	40.0 mg/Kg	1	9/1/2011 12:00
REACTIVE SULFIDE		SW-846	Prep:		Analyst: HN
Reactive Sulfide	ND	0	40.0 mg/Kg	1	9/1/2011 12:00
ANIONS - EPA 300.0 (1993)		E300	Prep:		Analyst: JBA
Chloride	404	0	5.00 mg/L	10	8/30/2011 13:08
Sulfate	2,290	0	50.0 mg/L	100	8/30/2011 15:18
Surr: Selenate (surr)	113	0	85-115 %REC	10	8/30/2011 13:08
Surr: Selenate (surr)	113	0	85-115 %REC	100	8/30/2011 15:18
ALKALINITY		SM2320B	Prep:		Analyst: DM
Alkalinity, Bicarbonate (As CaCO3)	302	0	5.00 mg/L	1	8/29/2011 11:35
Alkalinity, Carbonate (As CaCO3)	ND	0	5.00 mg/L	1	8/29/2011 11:35
Alkalinity, Hydroxide (As CaCO3)	ND	0	5.00 mg/L	1	8/29/2011 11:35
Alkalinity, Total (As CaCO3)	302	0	5.00 mg/L	1	8/29/2011 11:35
SPECIFIC CONDUCTIVITY		M2510 B	Prep:		Analyst: TDW
Specific Conductivity	7,380	0	1.00 µmhos/cm	1	8/26/2011 14:00
IGNITIBILITY		SW1010	Prep:		Analyst: KAH
Ignitability	> 212	0	50.0 °F	1	8/30/2011 16:00
PH		SW9040	Prep:		Analyst: TDW
рH	8.11	0 H	0.100 pH units	1	8/24/2011 14:00

CLIENT:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:Injection Well EffluentCollection Date:8/23/2011 9:10:00 AM

Date: 06-Sep-11

Work Order: 1108743 Lab ID: 1108743-01 Matrix: LIQUID

Analyses	Result	Reg Limit Qual	Report Limit Units	Dilution Factor	Date Analyzed
TOTAL DISSOLVED SOLIDS		M2540C	Prep:		Analyst: JBA
Total Dissolved Solids (Residue, Filterable)	4,320	0	10.0 mg/L	1	8/30/2011 08:00

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OC BATCH REPORT

Datab ID: 54070	
_oject:	Injection Well Quarterly
ork Order:	1108743
Client:	Navajo Refining Company

Method: SW7470 Batch ID: 54972 Instrument ID Mercury MBLK Sample ID: GBLKW1-082611-54972 Units: mg/L Analysis Date: 8/26/2011 01:25 PM Client ID: Run ID: MERCURY 110826A SeqNo: 2507300 Prep Date: 8/26/2011 DF: 1 RPD SPK Ref RPD Ref Control Limit Value Limit Value Analyte Result PQL SPK Val %REC %RPD Qual ND Mercury 0.00020 Sample ID: GLCSW1-082611-54972 Units: mg/L Analysis Date: 8/26/2011 01:27 PM Client ID: Run ID: MERCURY_110826A SeqNo: 2507301 Prep Date: 8/26/2011 DF: 1 SPK Ref RPD Ref RPD Control Limit Value Limit Value SPK Val Result PQL %REC %RPD Qual Analyte 0.0048 0.00020 0.005 0 0 96 85-115 Mercury Units: mg/L Analysis Date: 8/26/2011 01:36 PM Sample ID: 1108786-01DMS Client ID: Run ID: MERCURY_110826A SeqNo: 2507304 Prep Date: 8/26/2011 DF: 1 SPK Ref **RPD** Ref RPD Control Value Limit Value Limit Analyte Result SPK Val %REC %RPD Qual POL Mercury 0.00483 0.00020 0.005 0.000008 96.4 85-115 0 Sample ID: 1108786-01DMSD Units: mg/L Analysis Date: 8/26/2011 01:38 PM Int ID: Run ID: MERCURY 110826A SegNo: 2507305 Prep Date: 8/26/2011 DF: 1 SPK Ref ŔPD RPD Ref Control Value Limit Value Limit %RPD Qual Analyte Result PQL SPK Val %REC 0.00483 0.000008 0.00020 0.005 96.4 85-115 0.00483 0 20 Mercury

DUP Sample ID: 1108786-01DDUP Units: mg/L Analysis Date: 8/26/2011 01:34 PM SeqNo: 2507303 Client ID: Run ID: MERCURY_110826A Prep Date: 8/26/2011 DF: 1 RPD SPK Ref RPD Ref Control Value Limit Value Limit Analyte Result PQL SPK Val %REC %RPD Qual ND 0.00020 0 0 0 0-0 0.000008 0 Mercury 20 1108743-01B The following samples were analyzed in this batch:

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Client: Work Ord vject:	Navajo Refining Company er: 1108743 Injection Well Quarterly						QC	ВАТС	H RE	PORT
Batch ID: 54	977 Instrument ID ICPMS03		Method	d: SW60 2	20					
MBLK	Sample ID: MBLKW2-082611-54977				Units: mg/	L	Anal	ysis Date: 8	/26/2011 ()3:30 PM
Client ID:	Ru	n ID: ICPMS	03_110826A	۰. ۱	SeqNo: 250	7441	Prep Date: 8/	26/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004147	0.010								J
Arsenic	ND	0.0050								
Barium	0.0009094	0.0050								J
Boron	ND	0.050								
Cadmium	ND	0.0020								
Chromium	ND	0.0050								
Copper	ND	0.0050								
Lead	ND	0.0050								
Manganese	ND	0.0050								
Molybdenum	ND	0.0050								
Nickel	0.001994	0.0050			·					J
Selenium	0.001283	0.0050	,							J
Silver	ND	0.0050								
Zinc	ND	0.0050				·				_:
LCS	Sample ID: MLCSW2-082611-54977	· · · ·			Units: mg/	L	Anal	vsis Date: 8	/26/2011 0)3:36 PM
Client ID:	Ru	n ID: ICPMS	03_110826A		SeqNo: 250	7442	Prep Date: 8/	26/2011	DF: 1	
aluto	Popult	POI		SPK Ref Value	% DEC	Control Limit	RPD Ref Value	. 0/ 885	RPD Limit	Qual

alyte	Resu	It PQL	SPK Val	value	%REC	Limit	value %F	PD Linn	Qual
Arsenic	0.0471	2 0.0050	0.05	. 0	94.2	80-120	0		
Barium	0.0468	2 0.0050	0.05	0	93.6	80-120	. 0		
Boron	0.457	6 0.050	0.5	0	91.5	80-120	.0		
Cadmium	0.0468	4 0.0020	0.05	0	93.7	80-120	. 0		
Chromium	0.0456	3 0.0050	0.05	0	91.3	80-120	0	<u>.</u>	•
Copper	0.0450	9 0.0050	0.05	0	90.2	80-120	0		
Lead	0.0460	9 0.0050	0.05	. 0	92.2	80-120	0.		
Manganese	0.04654	4 0.0050	0.05	. 0	93.1	80-120	0		
Molybdenun	n 0.04699	9 0.0050	0.05	0	94	80-120	0		
Nickel	0.04664	4 0.0050	0.05	. 0	93.3	80-120	0		· · · · ·
Selenium	0.04814	4 0.0050	0.05	0	96.3	80-120	0		
Silver	0.04666	3 0.0050	0.05	0	93.3	80-120	0		
Zinc	0.0499	0.0050	0.05	0	99.8	80-120	0		
LCS	Sample ID: MLCSW2-082611-5497				Jnits: mg/l		Analysis Da	te: 8/29/2011	02:50 PM

Client ID:	Run I	D: ICPMS	03_110829/	4	Se	qNo: 2508	8554	Prep Date: 8/2	rep Date: 8/26/2011		
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1175	0.010	0.1	1	0	118	80-120		0		

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Navajo Refining Company **Client:** 1108743

QC BATCH REPORT

roject: Injection Well Quarterly

Work Order:

Batch ID: 54	977	Instrument ID ICPMS03		Metho	d: SW6020	<u> </u>		<u>.</u>			
MS	Sample ID:	1108727-01CMS	<u>_</u>			Units: mg/	L	Analys	is Date: 8/	26/2011 ()4:22 PM
Client ID:		Run	ID: ICPMS	03_110826	A S	eqNo: 250 7	7645	Prep Date: 8/26	2011	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic		0.05876	0.0050	0.05	0.009833	97.9	80-120	0			
Barium		0.1335	0.0050	0.05	0.09031	86.4	80-120	0			
Boron		0.6128	0.050	0.5	0.1211	98.3	80-120	0			
Cadmium		0.04577	0.0020	0.05	0.00007921	91.4	80-120	0			
Chromium		0.04331	0.0050	0.05	0.0001978	86.2	80-120	. 0			
Copper		0.04711	0.0050	0.05	0.005449	83.3	80-120	0			
Lead		0.04507	0.0050	0.05	0.0006013	88.9	80-120	0			
Manganese		1.393	0.0050	0.05	1.378	30	80-120	0			so
Molybdenum		0.04858	0.0050	0.05	0.005414	86.3	80-120	0			
Nickel		0.04488	0.0050	0.05	0.002782	84.2	80-120	0			
Selenium		0.04823	0.0050	0.05	0.001377	93.7	80-120	0			
Silver		0.04221	0.0050	0.05	-0.00008971	84.6	80-120	0			
Zinc		0.06132	0.0050	0.05	0.008454	106	80-120	0			
MS	Sample ID:	1108727-01CMS	_			Units: mg/	L	Analys	is Date: 8/	29/2011 ()3:13 PM
Client ID:		Run	ID: ICPMS	03_110829/	A S	eqNo: 250	B561	Prep Date: 8/26	¥2011	DF: 1	
					SPK Ref		Control	RPD Ref		RPD	
lyte		Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qual
Aluminum		0.1348	0.010	0.1	0.02636	108	80-120	0			
MSD	Sample ID:	1108727-01CMSD				Units: mg/	L	Analys	is Date: 8/	26/2011 0	4:28 PM
Client ID:		Run	ID: ICPMS	03_110826/	a s	eqNo: 2507	7646	Prep Date: 8/26	2011	DF: 1	
Analuta		Result	POL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	% PPD	RPD Limit	Qual
Arrentia		0.05057	0.0050	0.05	0.000000	00 F	00 400	0.05976	4.27	45	
Arsenic		0.05957	0.0050	0.05	0.009633	99.5	80.420	0.05676	1.37	15	
Banum		0.1364	0.0050	0.05	0.09031	92.2	00-120	0.1335	2.15	10	
Boron		0.0309	0.000	0.5	0.1211	102	80-120	0.0120	2.91	15	
	<u> </u>	0.04040	0.0020	0.05	0.00007921	92.0	00-120	0.04377	1.04	15	
JIIIOIIIIUIII		0.04247	0 0050	0.05	0.0001078	94.6	90.120				
Conner		0.04247	0.0050	0.05	0.0001978	84.5 81 8	80-120	0.04551	1.50	15	
Copper	· · · ·	0.04247	0.0050	0.05	0.0001978	84.5 81.8 80	80-120 80-120 80-120	0.04331	1.67	15 15	
Copper _ead Manganese	·	0.04247 0.04633 0.04511 1 406	0.0050 0.0050 0.0050 0.0050	0.05 0.05 0.05	0.0001978 0.005449 0.0006013 1.378	84.5 <u>81.8</u> 89 56	80-120 80-120 80-120 80-120	0.04331 0.04711 0.04507 1 393	0.0887 0.929	15 15 15	sò
Copper Lead Manganese Molybdenum	· · · ·	0.04247 0.04633 0.04511 1.406 0.04953	0.0050 0.0050 0.0050 0.0050	0.05 0.05 0.05 0.05 0.05	0.0001978 0.005449 0.0006013 1.378 0.005414	84.5 81.8 89 56 88.2	80-120 80-120 80-120 80-120 80-120	0.04331 0.04711 0.04507 1.393 0.04858	1.67 0.0887 0.929 1 94	15 15 15 15	SÓ
Copper Lead Manganese Molybdenum Nickel	· · · · · · · · · · · · · · · · · · ·	0.04247 0.04633 0.04511 1.406 0.04953 0.04487	0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	0.05 0.05 0.05 0.05 0.05 0.05	0.0001978 0.005449 0.0006013 1.378 0.005414 0.002782	84.5 81.8 89 56 88.2 84.2	80-120 80-120 80-120 80-120 80-120 80-120	0.04331 0.04711 0.04507 1.393 0.04858 0.04488	1.30 1.67 0.0887 0.929 1.94 0.0223	15 15 15 15 15	SÓ
Copper Lead Manganese Molybdenum Nickel Selenium	· · · · ·	0.04247 0.04633 0.04511 1.406 0.04953 0.04487 0.0496	0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	0.05 0.05 0.05 0.05 0.05 0.05 0.05	0.0001978 0.005449 0.0006013 1.378 0.005414 0.002782 0.001377	84.5 81.8 89 56 88.2 84.2 96 4	80-120 80-120 80-120 80-120 80-120 80-120 80-120	0.04331 0.04711 0.04507 1.393 0.04858 0.04488 0.04488	1.30 1.67 0.0887 0.929 1.94 0.0223 2.8	15 15 15 15 15 15 15	SÖ
Copper Lead Manganese Molybdenum Nickel Selenium Silver	<u>.</u>	0.04247 0.04633 0.04511 1.406 0.04953 0.04487 0.0496 0.04211	0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050 0.0050	0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05	0.0001978 0.005449 0.0006013 1.378 0.005414 0.002782 0.001377 -0.00008971	84.5 81.8 89 56 88.2 84.2 96.4 84.4	80-120 80-120 80-120 80-120 80-120 80-120 80-120 80-120	0.04331 0.04711 0.04507 1.393 0.04858 0.04858 0.04488 0.04823 0.04221	1.67 1.67 0.0887 0.929 1.94 0.0223 2.8 0.237	15 15 15 15 15 15 15 15	SO

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 3 of 18

Client:	Navaio Refining Company
Cucut.	ruvajo komming company.

QC BATCH REPORT

•oject: Injection Well Quarterly

Work Order:

1108743

atch ID: 549	977 Instrument ID ICP	MS03		Method	: SW602	0				·		
MSD	Sample ID: 1108727-01CMSD		2			.ι	Jnits: mg/		Analysi	is Date: 8/	29/2011 0	3:19 PM
Client ID:	·	Run ID: ICF	MS	03_110829A		Se	qNo: 250	3562	Prep Date: 8/26	/2011	DF: 1	
Analyte	R	esult P	QL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0	.133 0,0	010	0.1	0.0263	36	107	80-120	0.1348	1.34	15	
DUP	Sample ID: 1108727-01CDUP	<u></u>		<u> </u>		ر	Inits: mg/	 L	Analysi	s Date: 8/	26/2011 0	4:10 PM
Client ID:		Run ID: ICF	MS	03_110826A		Se	qNo: 2507	7639	Prep Date: 8/26	/2011	DF: 1	
Analyte	R	esult P	QL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00	9563 0.00)50	0.		0	0	0-0	0.009833	2.78	25	
Barium	0.00	.000)50	0		0	0	0-0	0.09031	1.26	25	
Boron	0.	225 0.0)50	0		0	0	0-0	0.1211	1.15	25	
Cadmium		ND 0.00)20	0		0	0	0-0	0.00007921	0	25	
Chromium		ND 0.00)50	0		0	0	0-0	0.0001978	0	25	
Copper	0.00	595 0.00)50	0		0	0	0-0	0.005449	2.64	25	,
Lead		ND 0.00)50	0		0	0	0-0	0.0006013	0	25	
Manganese	1	.379 0.00)50	0		0	0	0-0	1.378	0.0725	25	
Molybdenum	0.004	876 0.00)50	0		0	0	0-0	0.005414	0	25	J
Nickel	0.002	957 0.00)50	0		0	0	0-0	0.002782	0	25	J
^l enium	0.00	136 0.00)50	0		0 [.]	0	0-0	0.001377	. 0	25	J
۶r		ND 0.00)50	. 0		0	` 0	0-0	-0.00008971	0	25	
nc	0.01	054 0.00)50	0		0	. 0	0-0	0.008454	22	25	
DUP	Sample ID: 1108727-01CDUP			_		U	Inits: mg/l	L	Analysi	s Date: 8/	29/2011 0	3:02 PM
Client ID:		Run ID: ICP	MSC)3_110829A		Se	qNo: 250 8	8557	Prep Date: 8/26	/2011	DF: 1	
Analyte	Re	esult Po	QL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.02	433 0.0	10	0		0	0	0-0	0.02636	8.01	25	
The following	a samples were analyzed in this	batch:	11	08743-01B			<u>. </u>					

Client: Navajo Refining Company

Work Order:

1108743

QC BATCH REPORT

Project: Injection Well Quarterly

_atch ID: 54917	Instrument ID SV-5		Metho	d: SW827	70			.		
MBLK Sample ID: \$	SBLKW1-110824-54917		<u> </u>		Units: µg/I	L	Analy	sis Date: I	B/25/2011 (08:13 PM
Client ID:	Run I	D: SV-5_1	10825A	÷	SeqNo: 250	7391	Prep Date: 8/2	4/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
							•			· ·
1,2,4-1 richlorobenzene	ND	5.0								
	ND	5.0								
2,4,6-1 richiorophenol	NU	5.0								
2,4-Dinitrotoluene		5.0								
2-Methyinaphthaiene	ND	5.0								
2-Methylphenol	<u>ND</u>	5.0	· · · · · · · · · · · · · · · · · · ·						4	
	ND	5.0								
29.4 Mathubanal	ND	5.0								
3&4-Methylphenol	ND	5.0								
	ND	5.0								
4-Nitroannine		5.0								
		5.0								
Acenaphinene		5.0								
Acenaphinylene		5.0								·
Aniine		5.0								
Annacene		5.0								·
Denz(a)anunacene		5.0								
		5.0	· · · · · · · · · · · · · · · · · · ·				· ·			
		5.0					×			
		5.0		<u> </u>						····
Indeno(1,2,3-cd)pyrene		5.0								
Nonhthalene		5.0						<u>.</u>		_
Nitrobanzana		5.0								
N Nitrosodimethylamine		5.0			•					
N-Nitrosodi-n-propylamine	ND	5.0								
N Nitrosodinbenylamine		<u>5.0</u>			<u> </u>					
Dentachloronhenol	ND	5.0					· .			
Phenanthrene	ND	5.0					·			
Phenol	ND	5.0								
Pyrene	ND	5.0				· .			·	
Pyridine	ND	5.0								
Surr: 2.4.6-Tribromonhen	al 81.41	5.0	100	• .	0 81.4	42-124	()	·	
Surr: 2-Fluorobinhenvl	86.14	5.0	100		0 86.1	48-120	()		
Surr: 2-Fluorophenol	75.63	5.0	100		0 75.6	20-120) .		
Surr: 4-Terphenvl-d14	80.92	5.0	100		0 80.9	51-135	()		
Surr: Nitrobenzene-d5	86.09	5.0	100	. , ,	0 86.1	41-120	(
Surr: Phenol-d6	66.83	5.0	100		0 66.8	20-120	ſ)		
					. 00.0			·		

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 5 of 18

Client: Navajo Refining Company

Work Order: 1108743

QC BATCH REPORT

•oject: Injection Well Quarterly

_atch ID: 54917	Instrument ID SV-5		Method	i: SW8270	0			·			
LCS Sample ID	SLCSW1-110824-54917				Uni	ts: µg/L	•	Analysi	s Date: 8	/26/2011	11:23 AM
Client ID:	Run	ID: SV-5_1	10825A		SeqN	lo: 250 7	/393	Prep Date: 8/24	/2011	DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value	9	%REC	Limit	Value	%RPD	Limit	Qual
1,2,4-Trichlorobenzene	44.43	5.0	50	(0	88.9	50-120	0			
2,4,5-Trichlorophenol	103.1	5.0	100		0	103	50-120	0			
2,4,6-Trichlorophenol	95.38	5.0	100		0	95.4	50-120	0			,
2,4-Dinitrotoluene	47.64	5.0	50	(0	95.3	50-120	. 0			•
2-Methylnaphthalene	47.6	5.0	[.] 50	(0	95.2	55-120	0			
2-Methylphenol	96.63	5.0	100	(0	96.6	50-120	0			
2-Nitroaniline	47.77	5.0	50		0	95.5	55-120	0			
2-Nitrophenol	88.99	5.0	100	(0	89	55-120	. 0			
3&4-Methylphenol	147.8	5.0	150		0	98.5	55-120	0			
3-Nitroaniline	29.09	5.0	50	(0.	58.2	40-120	0			
4-Nitroaniline	41.65	5.0	50	(0	83.3	50-120	0			
4-Nitrophenol	94.78	5.0	100	(0	94.8	45-120	0.			
Acenaphthene	47.46	5.0	50	(0	94.9	55-120	0			
Acenaphthylene	46.79	5.0	50	(0	93.6	55-120	0			
Aniline	28.98	5.0	50	(0	58	30-120	0			
Anthracene	48.55	5.0	50	(Ó	97.1	55-120	0			
Benz(a)anthracene	48.27	5.0	50	(0	96.5	55-120	0			
vzidine	10.72	5.0	50	(0	21.4	10-120	0			
achlorobenzene	49.57	5.0	50	(0	99.1	55-120	0			
Hexachloroethane	43.51	5.0	50	(ο.	87	55-120	0			
Indeno(1,2,3-cd)pyrene	48.15	5.0	50	(0	96.3	55-120	0	· - ·	_	
Isophorone	47.42	5.0	50	· (0	94.8	55-120	0			
Naphthalene	47.18	5.0	50		0	94.4	55-120	0			
Nitrobenzene	45.6	5.0	50	, (0	91.2	55-120	Ó			
N-Nitrosodimethylamine	41.32	5.0	50	(0	82.6	45-120	0			
N-Nitrosodi-n-propylamin	e 50.59	5.0	50	(0	101	50-120	0			
N-Nitrosodiphenylamine	46.67	5.0	50	(0	93.3	55-120	0			
Pentachlorophenol	98.83	5.0	100	(0	98.8	55-120	. 0			
Phenanthrene	47.55	5.0	50	(0	95.1	55-120	0		· · ·	
Phenol	100.6	5.0	100	(0	101	50-120	0			
Pyrene	50.35	5.0	50	(0	101	55-120	0			
Pyridine	31.8	5.0	50	. (0	63.6	35-120	. 0			
Surr: 2,4,6-Tribromoph	nenol 93.17	5.0	100	. (0	93.2	42-124	0			
Surr: 2-Fluorobiphenyl	85.96	5.0	. 100	(00	86	48-120	0			
Surr: 2-Fluorophenol	84.74	5.0	100	Ċ	0	84.7	20-120	0			
Surr: 4-Terphenyl-d14	79.69	5.0	. 100	(0	79.7	51-135	0			
Surr: Nitrobenzene-d5	80.18	5.0	100	· (0	80.2	41-120	0			
Surr: Phenol-d6	87,86	5.0	100	. (0	87.9	20-120	0			

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Navajo Refining Company

1108743

QC BATCH REPORT

oject: Injection Well Quarterly

Work Order:

uatch ID: 54917	Instrument ID SV-5		Metho	d: SW827	0	_;					
LCSD Sample ID: S	LCSDW1-110824-54917				ί	Jnits: µg/L	-	Analysi	s Date: 8/	25/2011 0	5:08 PM
Client ID:	Run ID	: SV-5_1	10825A		Se	qNo: 250	7390	Prep Date: 8/24	/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
124-Trichlorohenzene	47 65	5.0	- 50			95.3	50-120	44 43	7	20	
2 4 5-Trichlorophenol	101.2	5.0	100		0	101	50-120	103.1	1.85	20	
2.4.6-Trichlorophenol	94.98	5.0	100		0	95	50-120	95.38	0.415	20	
2.4-Dinitrotoluene	49.49	5.0	50		0	99	50-120	47.64	3.8	20	
2-Methylnaphthalene	45.87	5.0	50		0	91.7	55-120	47.6	3.7	20	
2-Methylphenol	80.73	5.0	100		0	80.7	50-120	96.63	17.9	20	
2-Nitroaniline	49.54	5.0	50		0	99.1	55-120	47.77	3.64	20	
2-Nitrophenol	89.09	5.0	100		0	89.1	55-120	88.99	0.116	20	
3&4-Methviphenol	116.3	5.0	150		0	77.5	55-120	147.8	23.9	20	R
3-Nitroaniline	34.99	5.0	50		0	70	40-120	29.09	18.4	20	
4-Nitroaniline	41.35	5.0	50		0	82.7	50-120	41.65	0.718	20	
4-Nitrophenol	90.42	5.0	100		0	90.4	45-120	94.78	4.71	20	
Acenaphthene	49.38	5.0	50		0	98.8	55-120	47.46	3.96	20	
Acenaphthylene	49.06	5.0	50		0	98.1	55-120	46.79	4.74	20	
Aniline	30.1	5.0	50		0	60.2	30-120	28.98	3.79	20	-
Anthracene	49.62	5.0	50		0	99.2	55-120	48.55	2.18	20	
Benz(a)anthracene	48.91	5.0	50		0	97.8	55-120	48.27	1.33	20	
zidine	6.897	5.0	· 50		0	13.8	10-120	10.72	43.4	20	R
achlorobenzene	50.03	5.0	50		0	100	55-120	49.57	0.931	20	
Hexachloroethane	44.94	5.0	50		0	89.9	55-120	43.51	3.23	20	
Indeno(1,2,3-cd)pyrene	46.95	5.0	50		0	93.9	55-120	48.15	2.53	20	
Isophorone	47.07	5.0	. 50		0	94.1	55-120	47.42	0.742	20	
Naphthalene	48.95	5.0	50		0	97.9	55-120	47.18	3.69	20	
Nitrobenzene	49.55	5.0	50		0	99.1	55-120	45.6	8.29	20	
N-Nitrosodimethylamine	47.19	5.0	50		0	94.4	45-120	41.32	13.3	20	•
N-Nitrosodi-n-propylamine	42.37	5.0	50		0	84.7	50-120	50.59	17.7	20	
N-Nitrosodiphenylamine	49.64	5.0	50		0	99.3	55-120	46.67	6.16	20	
Pentachlorophenol	99.84	5.0	100		0	99.8	55-120	98.83	1.02	20	
Phenanthrene	50.21	5.0	50		0	100	55-120	47.55	5.44	20	
Phenol	88.36	5.0	100		0	88.4	50-120	100.6	12.9	20	
Pyrene	49.35	5.0	50		0	98.7	55-120	50.35	2	20	
Pyridine	41.38	5.0	50		0	82.8	35-120	31.8	26.2	20	R
Surr: 2,4,6-Tribromophene	ol 91.11	5.0	100		0	91.1	42-124	93.17	2.23	20	
Surr: 2-Fluorobiphenyl	91.19	5.0	100		0	91.2	48-120	85.96	5.9	20	
Surr: 2-Fluorophenol	83.72	5.0	100		0	83:7	20-120	84.74	1.21	20	
Surr: 4-Terphenyl-d14	79.96	5.0	100		0	80	51-135	79.69	0.335	20	
Surr: Nitrobenzene-d5	88.06	5.0	100		0	88.1	41-120	80.18	9.37	20	
Surr: Phenol-d6	76.78	5.0	100		0	76.8	20-120	87.86	13.5	20	

The following samples were analyzed in this batch:

1108743-01E

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Client: Work Order:	Nava 1108	ijo Refining Company						QC	BATC	H RE	PORT
oject:	Injec	tion Well Quarterly					-				
⊿atch ID: R115435		Instrument ID VOA1		Metho	od: SW826	50			·· ···································		
		VBI KW-022111-D115435				Unite: ua/		Anah	veis Data: 8	121/2011	11.55 AM
		DLR# 003111-R113433	NOA4	440924 8	•	SocNo: 251	4259	Dron Deto:	isis Date. o		11.55 AW
Chent ID.			. VUAI_	TIVOSTA		Seq110. 231	1230	Prep Date.		DF. I	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethar	ne	ND	5.0								
1,1,2,2-Tetrachloroe	ethane	ND	5.0								
1,1,2-Trichloroethar	ne	NĎ	5.0								
1,1-Dichloroethane		ND	5.0								
1,1-Dichloroethene		ND	5.0								
1,2-Dichloroethane		ND	5.0								
2-Butanone		ND	10								
2-Chloroethyl vinyl e	ether	ND	10								
2-Hexanone		ND	10								
4-Methyl-2-pentano	ne	ND	10								
Acetone		ND	10								
Benzene		ND	5.0								
Bromodichlorometh	ane	ND	5.0								
Bromoform	•	ND	5.0								
Bromomethane		ND	5.0								
Carbon disulfide		ND	10								
Carbon tetrachloride	e	ND	5.0								
probenzene		. ND	5.0								
oroethane		ND	5.0						·		
Chloroform		ND	5.0								
Chloromethane		ND	5.0			•					
cis-1,3-Dichloroprop	bene	ND	5.0								
Dibromochlorometha	ane	ND	5.0								
Ethylbenzene		ND	5.0								
m,p-Xylene		ND	10								
Methylene chloride		ND .	10				-				
Styrene		ND	5.0								
Tetrachloroethene		ND	5.0								
Toluene		ND	5.0								
trans-1,3-Dichloroph	opene	<u>ND</u> .	5.0								
Trichloroethene		ND	5.0								

Vinyl acetate ND 10 ND Vinyl chloride 2.0 Xylenes, Total ND 15 5.0 0 Surr: 1,2-Dichloroethane-d4 49.66 50 0 99.3 70-125 Surr: 4-Bromofluorobenzene 51.53 5.0 50 0 103 72-125 0 5.0 50 0 0 Surr: Dibromofluoromethane 49.76 99.5 71-125 48.97 5.0 50 0 0 Surr: Toluene-d8 97.9 75-125

See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 8 of 18

Client: Navajo Refining Company 1108743

QC BATCH REPORT

'oject: Injection Well Quarterly

Work Order:

Jatch ID: R115435	Instrument ID VOA1		Metho	d: SW826	60						
LCS Sample ID:	VLCSW-083111-R115435				ļ	Units: µg/L		Analy	sis Date: 8	/31/2011	11:02 AM
Client ID:	Rún	ID: VOA1_	110831A		Se	eqNo: 251 1	1257	Prep Date:	· .	DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
Analyte	Result	. PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
1,1,1-Trichloroethane	50.29	5.0	50		0	101	80-120	C)		
1,1,2,2-Tetrachloroethane	50.77	5.0	50		0	102	72-120)		
1,1,2-Trichloroethane	47.32	5.0	50		0	94.6	80-120	· ()		
1,1-Dichloroethane	51.27	5.0	50		0	103	76-120	0	j –		
1,1-Dichloroethene	49.48	5.0	50		0	99	73-124	C)		
1,2-Dichloroethane	49.42	5.0	50		0	98.8	78-120)		
2-Butanone	99.25	10	100		0	99.3	58-132	C)		
2-Chloroethyl vinyl ether	101.8	10	100		0	102	74-120)		
2-Hexanone	98.83	10	100		0	98.8	61-130	C)		
4-Methyl-2-pentanone	97.05	10	100		0	97.1	65-127	C)		
Acetone	100.5	10	100		0	100	59-137	C)		
Benzene	49.07	5.0	50		0	98.1	73-121	C) .		
Bromodichloromethane	50.6	5.0	50		0	101	80-120	C)		
Bromoform	50.03	5.0	50		0	100	79-120	()		
Bromomethane	48.42	5.0	50		0	96.8	66-137	C)		
Carbon disulfide	100.6	10	100		0	101	68-141	c)		
Carbon tetrachloride	51.76	5.0	50		0	104	75-124	0)		
probenzene	45.9	5.0	50		0	91.8	80-120	0)		
oroethane	49.36	5.0	50		0	98.7	76-121	c)		
Chloroform	49.13	5.0	50		0	98.3	80-120	0)		
Chloromethane	46.69	5.0	50		0	93,4	67-123	C)		
cis-1,3-Dichloropropene	47.26	5.0	50		0	94.5	80-120	C)• .		
Dibromochloromethane	49.16	5.0	50		0	98.3	80-120	Ċ)		
Ethylbenzene	48.96	5.0	50		0	97.9	80-120	C)		
m,p-Xylene	100.2	10	100		0	100	78-121	0)		
Methylene chloride	48.86	10	50		0	97.7	65-133	0			
Styrene	49.79	5.0	50		0	99.6	80-120	0)		
Tetrachloroethene	48.61	5.0	50		0	97.2	7 9- 120	0			
Toluene	42.94	5.0	50		0	85.9	80-120	0			
trans-1,3-Dichloropropene	50.83	5.0	50		0	102	80-120	0)		
Trichloroethene	51.23	5.0	50		0	102	80-120	Ċ	ł		
Vinyl acetate	99.99	10	100		0	100	67-139	0)		
Vinyl chloride	51.01	2.0	50		0	102	70-127	C)		
Xylenes, Total	149.9	15	150		0	99.9	80-120	0)		
Surr: 1,2-Dichloroethane	-d4 49.58	5.0	50		0	99.2	70-125	0)		
Surr: 4-Bromofluorobenz	ene 46.4	5.0	. 50		0	92.8		0			
Surr: Dibromofluorometh	ane 47.97	5.0	50		0	95.9	71-125	٥	1		
Surr: Toluene-d8	46.03	5.0	50		0	92.1	75-125	C) .		

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 9 of 18

Client:Navajo Refining CompanyWork Order:1108743

QC BATCH REPORT

oject: Injection Well Quarterly

			wetho	G. 3110200	·					
MS Sample ID: 1	108733-07ZMS				Units: µg/	L	Analys	sis Date: 8	/31/2011	01:41 PM
Client ID:	Run	ID: VOA1_	110831A	:	SeqNo: 251	1356	Prep Date:		DF: 2	50
Analyte	Result	POL	SPK Val	SPK Ref Value	%RFC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
					///////////////////////////////////////	· · · ·	·····			
1,1,1-Trichloroethane	10350	1,200	12500	(82.8	80-120	٥	1		
1,1,2,2-Tetrachloroethane	11540	1,200	12500	(92.3	72-120	Ö			
1,1,2-Trichloroethane	11530	1,200	12500	(92.2	80-120	0	I		
1,1-Dichloroethane	11850	1,200	12500		94.8	76-120	0			
1,1-Dichloroethene	10740	1,200	12500	129.3	3 84.9	73-124	0			
1,2-Dichloroethane	11230	1,200	12500	(89.8	78-120	0			
2-Butanone	23340	2,500	25000	(93.4	58-132	0	I		
2-Chloroethyl vinyl ether	22640	2,500	25000	(90.6	74-120	0			<u>• .</u>
2-Hexanone	22960	2,500	25000	C	91.8	61-130	0			
4-Methyl-2-pentanone	24610	2,500	25000		98.4	65-127	0			
Acetone	20670	2,500	25000	(82.7	59-137	0	1		
Benzene	10760	1,200	12500	() 86.1	73-121	0			
Bromodichloromethane	12320	1,200	12500	(98.6	80-120	0			
Bromoform	11740	1,200	12500	C	93.9	79-120	0			
Bromomethane	10690	1,200	12500) 85.5	66-137	0			
Carbon disulfide	21650	2,500	25000	Ċ) 86.6	68-141	0			
Carbon tetrachloride	9519	1,200	12500	C	76.2	75-124	0			
probenzene	11330	1,200	12500	C	90.6	80-120	0			
oroethane	10940	1,200	12500) 87.5	76-121	0			
Chloroform	11500	1,200	12500	C) 92	80-120	0			
Chloromethane	11120	1,200	12500	<u>_</u>) 88.9	67-123	0			
cis-1.3-Dichloropropene	11670	1,200	12500	C) 93.4	80-120	0			
Dibromochloromethane		1.200	12500	0) 94.3	80-120	0			
Ethvibenzene	10260	1.200	12500	C) 82.1	80-120	0			
m p-Xviene	20570	2,500	25000		82.3	78-121	0			
Methylene chloride	12060	2,500	12500	148 4	95.3	65-133	0			
Styrene	11800	1 200	12500		94.4	80-120	0			
Tetrachloroethene	9166	1,200	12500	0	73.3	79-120	0			S
Toluene	10770	1.200	12500		86.1	80-120	0			
trans-1.3-Dichloropropene	13010	1,200	12500	0	104	80-120	0			
	12350	1 200	12500	2002	82.8	80-120	0		-	
Vinvl acetate	23950	2 500	25000	2002	95.8	67-139	0			
Vinvl chloride		500	12500	1420	82	70-127	0			
Xvienes Total	31060	3 800	37500	1-720	85.2	80-120	0			
Surr 1 2 Dichloroothono a		1 200	12500		404	70 125	<u>_</u>			
Surr A Promofluorobooco	12040 12040	1,200	12500	0	101	70-120	0			
Surr. 4-Dromonuorobenzei		1,200	12000	0	97.3	74 405	0			
Surr: Dibromonuoromethal	12000	1,200	12500	u -	103	71-125	U			
SUTT: 10/06/10-08	. 11680	1.200	72500	0	93.4	/5-725	0	· •		

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Client: Navajo Refining Company

1108743

QC BATCH REPORT

oject: Injection Well Quarterly

Work Order:

	115435	Instrument ID VOA1		Metho	d: SW8260						
MSD	Sample ID: 1	108733-07ZMSD				Units: µg/l	_	Analysi	s Date: 8/	31/2011 0	2:08 PM
Client ID:		Run I	D: VOA1_	110831A	Se	eqNo: 251	1357	Prep Date:		DF: 25	0
Analyte	···-	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1.1.1-Trichle	oroethane	10030	1.200	12500	0	80.2	80-120	10350	3.13	20	
1.1.2.2-Tetr	rachloroethane	11960	1.200	12500	0	95.7	72-120	11540	3.6	20	
1.1.2-Trichl	oroethane	12060	1.200	12500	0	96.4	80-120	11530	4.48	20	
1.1-Dichloro	oethane	11630	1.200	12500	0	93.1	76-120	11850	1.85	20	
1.1-Dichloro	pethene	10730	1,200	12500	129.3	84.8	73-124	10740	0.125	20	
1.2-Dichlord	bethane	12510	1,200	12500	0	100	78-120	11230	10.8	20	
2-Butanone	;	24010	2,500	25000	0	96.1	58-132	23340	2.84	20	× ·
2-Chloroeth	nyl vinyl ether	22350	2,500	25000	0	89.4	74-120	22640	1.3	20	
2-Hexanone	e	23170	2,500	25000	0	92.7	61-130	22960	0.89	20	
4-Methyl-2-	pentanone	24240	2.500	25000	0	97	65-127	24610	1.51	20	
Acetone		20860	2.500	25000	0	83.4	59-137	20670	0.909	20	
Benzene		11760	1.200	12500	0	94.1	73-121	10760	8.94	20	
Bromodichl	oromethane	12820	1.200	12500	0	103	80-120	12320	3.96	20	
Bromoform		12670	1,200	12500	0	101	79-120	11740	7.59	20	
Bromometh	ane	11950	1,200	12500	0	95.6	66-137	10690	11.1	20	
Carbon disu	ulfide	20600	2,500	25000	0	82.4	68-141	21650	4.97	20	
Carbon tetra	achloride	9831	1,200	12500	0	78.6	75-124	9519	3.22	20	······
'orobenz	ene	11170	1,200	12500	0	89.3	80-120	11330	1.43	20	
oroethar	ne	11590	1,200	12500	0	92.7	76-121	10940	5.73	20	
Chloroform		11770	1,200	12500	0	94.2	80-120	11500	2.37	20	
Chlorometh	ane	11680	1,200	12500	0	93.4	67-123	11120	4.91	20	
cis-1,3-Dich	nioropropene	13270	1,200	12500	0	106	80-120	11670	12.8	20	
Dibromochl	oromethane	12380	1,200	12500	0	99.1	80-120	11790	4.92	20	
Ethylbenzer	ne	10850	1,200	12500	0	86.8	80-120	10260	5.57	20	
m.p-Xylene		21540	2,500	25000	0	86.2	78-121	20570	4.62	20	
Methylene	chloride	11780	2,500	12500	148.4	93.1	65-133	12060	2.32	20	
Styrene		12190	1,200	12500	0	97.5	80-120	11800	3.23	20	
Tetrachloro	ethene	9624	1,200	12500	0	77	79-120	9166	4.88	20	S
Toluene		10860	1,200	12500	0	86.9	80-120	10770	0.907	20	
trans-1,3-Di	ichloropropene	12940	1,200	12500	0	103	80-120	13010	0.574	20	
Trichloroeth	ene	13590	1,200	12500	2002	92.7	80-120	12350	9.54	20	
Vinyl acetat	e	24650	2,500	25000	0	98.6	67-139	23950	2.87	20	
Vinyl chlorid	le	11990	500	12500	1420	84.6	70-127	11670	2.67	20	
Xylenes, To	tal	33470	3,800	37500	0	89.2	80-120	31960	4.62	20	
Surr: 1,2-	Dichloroethane-	d4 12170	1,200	12500	0	97.3	70-125	12640	3.8	20	
Surr: 4-Br	romofluorobenze	ne 12660	1,200	12500	0	101	72-125	12160	4.05	20	
Surr: Dibr	romofluorometha	ne 12040	1,200	12500	0	96.3	71-125	12860	6.59	20	
Surr: Tolu	lene-d8	12010	1,200	12500	0	96.1	75-125	11680	2.85	20	

The following samples were analyzed in this batch:

1108743-01A

See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 11 of 18

Client:Navajo Refining CompanyWork Order:1108743

QC BATCH REPORT

oject: Injection Well Quarterly

I5163 Instrument	ID WetChem		Metho	d: SW904	10						
Sample ID: WLCSW1-08	2411-R115163				U	Inits: pH u	units	Analys	sis Date: 8	/24/2011 0	2:00 PM
	Run I	D: WETCH	IEM_11082	4P	Se	qNo: 250 !	5871	Prep Date:		DF: 1	
,	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	6.02	0.10	6		0	100	90-110	C	I		
Sample ID: 1108743-01D	DUP		•		U	Jnits: pH ι	inits	Analys	sis Date: 8	/24/2011 0	2:00 PM
ction Well Effluent	Run i	D: WETCH	IEM_11082	4P	Se	qNo: 250	5873	Prep Date:		DF: 1	
	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	8.15	0.10	. 0		0	0	0-0	8.11	0.492	20	н
	Sample ID: WLCSW1-08 Sample ID: 1108743-01E	Sample ID: WLCSW1-082411-R115163 Run I Result 6.02 Sample ID: 1108743-01DDUP ection Well Effluent Run I Result 8.15	Sample ID: WLCSW1-082411-R115163 Run ID: WETCH Result PQL 6.02 0.10 Sample ID: 1108743-01DDUP Action Well Effluent Run ID: WETCH Result PQL 8.15 0.10	Sample ID: WLCSW1-082411-R115163 Run ID: WETCHEM_11082 Result PQL SPK Val 6.02 0.10 6 Sample ID: 1108743-01DDUP Run ID: WETCHEM_11082 Result Run ID: WETCHEM_11082 Result PQL SPK Val Result Run ID: WETCHEM_11082 Result PQL SPK Val Result PQL SPK Val Result PQL SPK Val 8.15 0.10 0 0 0 0 0	Sample ID: WLCSW1-082411-R115163 Run ID: WETCHEM_110824P SPK Ref Result PQL SPK Val Value 6.02 0.10 6 Sample ID: 1108743-01DDUP Action Well Effluent Run ID: WETCHEM_110824P SPK Ref Result PQL SPK Val Value 8.15 0.10 0	Sample ID: WLCSW1-082411-R115163 L Run ID: WETCHEM_110824P Se SPK Ref SPK Ref Value 6.02 0.10 6 0 Sample ID: 1108743-01DDUP L ection Well Effluent Run ID: WETCHEM_110824P Se Semple ID: 1108743-01DDUP L Settion Well Effluent Run ID: WETCHEM_110824P Se SPK Ref Result PQL SPK Ref Value 8.15 0.10 0 0	Sample ID: WLCSW1-082411-R115163 Units: pH u Run ID: WETCHEM_110824P SeqNo: 250 SPK Ref Result PQL SPK Val Value %REC 6.02 0.10 6 0 100 Sample ID: 1108743-01DDUP Units: pH u ection Well Effluent Run ID: WETCHEM_110824P SeqNo: 250 SeqNo: 250 SPK Ref Value %REC Sample ID: 1108743-01DDUP Units: pH u SeqNo: 250 SPK Ref SeqNo: 250 Sample ID: 1108743-01DDUP Units: PH u SeqNo: 250 SPK Ref SeqNo: 250 Result PQL SPK Val Value %REC 8.15 0.10 0 0 0 0	Sample ID: WLCSW1-082411-R115163 Units: pH units Run ID: WETCHEM_110824P SeqNo: 2505871 SPK Ref Control Limit 6.02 0.10 6 0 100 90-110 Sample ID: 1108743-01DDUP Units: pH units ection Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Sequence Result PQL SPK Ref Control Limit 6.02 0.10 6 0 100 90-110 Sample ID: 1108743-01DDUP Units: pH units Units: pH units ection Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Result PQL SPK Val Value %REC Limit 8.15 0.10 0 0 0 0 0	Sample ID: WLCSW1-082411-R115163 Units: pH units Analys Run ID: WETCHEM_110824P SeqNo: 2505871 Prep Date: SPK Ref Control RPD Ref Result PQL SPK Val Value 6.02 0.10 6 0 100 90-110 0 Sample ID: 1108743-01DDUP Units: pH units Analys ection Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Prep Date: SPK Ref Control RPD Ref Limit Value Value 0 Sample ID: 1108743-01DDUP Units: pH units Analys Netton Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Prep Date: Result PQL SPK Val Value Value 8.15 0.10 0 0 0-0 8.11	Sample ID: WLCSW1-082411-R115163 Units: pH units Analysis Date: 8 Run ID: WETCHEM_110824P SeqNo: 2505871 Prep Date: SPK Ref Control RPD Ref Value %REC Limit Value %RPD 6.02 0.10 6 0 100 90-110 0 Sample ID: 1108743-01DDUP Units: pH units Analysis Date: 8 Action Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Prep Date: 8 Action Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Prep Date: 8 8.15 0.10 0 0 0 0 0 0 0.00 8.11 0.492	Sample ID: WLCSW1-082411-R115163 Units: pH units Analysis Date: 8/24/2011 0 Run ID: WETCHEM_110824P SeqNo: 2505871 Prep Date: DF: 1 SPK Ref Control RPD Ref RPD Limit 6.02 0.10 6 0 100 90-110 0 Sample ID: 1108743-01DDUP Units: pH units Analysis Date: 8/24/2011 0 Sample ID: 1108743-01DDUP Units: pH units Analysis Date: 8/24/2011 0 Sample ID: 1108743-01DDUP Units: pH units Analysis Date:: 8/24/2011 0 Section Well Effluent Run ID: WETCHEM_110824P SeqNo: 2505873 Prep Date: DF: 1 Result PQL SPK Ref Control RPD Ref RPD Result PQL SPK Val Value %REC Limit Value %RPD 8.15 0.10 0 0 0 0 0 0 0 0 0

See Qualifiers Page for a list of Qualifiers and their explanation.

**2:

Client: Navajo Refining Company

Work Order: 1108743

Injection Well Quarterly 'oject:

QC BATCH REPORT

Batch ID:	R115248	Instrument ID WetChem	•	Metho	d: M2510	B						
MBLK	Sample ID:	WBLKW1-082611-R115248				U	nits: µmh	ios/cm	Analy	sis Date: 8	/26/2011 0	2:00 PM
Client ID:		Run ID	: WETCH	IEM_11082	6B	Sec	No: 250 7	7383	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific C	onductivity	ND	1.0		.							
LCS	Sample ID:	WLCSW1-082611-R115248	·			U	nits: µmh	os/cm	Analy	sis Date: 8	/26/2011 0	2:00 PM
Client ID:		Run ID	WETCH	IEM_11082	6B	Sec	aNo: 250 7	384	Prep Date:	•	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific C	onductivity	1460	1.0	1413		0	103	80-120	()	•	
DUP	Sample ID:	1108743-01DDUP				ບ	nits: µmh	os/cm	Analy	sis Date: 8	/26/2011 0	2:00 PM
Client ID:	Injection Well I	E ffluent Run ID	WETCH	IEM_11082	6 B	Sec	No: 2507	387	Prep Date:		DE: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific C	onductivity	7410	1.0	0		0	0		7380) 0.406	20	
The follow	wing samples w	vere analyzed in this batch:	[11	08743-01D								

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 13 of 18

Client: Navajo Refining Company Work Order: 1108743

QC BATCH REPORT

oject: Injection Well Quarterly

Batch ID: R115296 Instrument	ID WetChem		Metho	d: SM232	0B						
MBLK Sample ID: WBLKW1-08	2911-R115296	<u>.</u>	<u></u>	· · · ·	U	Jnits: mg/	L	Analys	is Date: 8/	29/2011 1	1:35 AM
Client ID:	Run ID	WETCH	IEM_11082	9 B	Se	qNo: 250	8254	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	5.0									
Alkalinity, Carbonate (As CaCO3)	ND	5.0									
Alkalinity, Hydroxide (As CaCO3)	ND	5.0									_
Alkalinity, Total (As CaCO3)	ND	5.0						·····			
LCS Sample ID: WLCSW1-08	2911-R115296	-	·		Ū	Jnits: mg/	L	Analys	is Date: 8/	29/2011 1	1:35 AM
Client ID:	Run ID	: WETCH	IEM_11082	9B	Se	qNo: 250 8	8255	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	982.6	5.0	1000		0	98.3	80-120	0			
DUP Sample ID: 1108713-028	BDUP				U	Jnits: mg/	L .	Analys	is Date: 8/	29/2011 1	1:35 AM
Client ID:	Run ID	WETCH	IEM_11082	9B	Se	qNo: 250 8	8277	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
`'valinity, Bicarbonate (As CaCO3)	61.86	5.0	0		0	0	0-0	61.29	0.926	20	
linity, Carbonate (As CaCO3)	ND	5.0	.0		0	0	0-0	. 0	0	20	
alinity, Hydroxide (As CaCO3)	ND	5.0	0		0	0	0-0	0	0	20	
Alkalinity, Total (As CaCO3)	61.86	5.0	0		0	. 0	0-0	61.29	0.926	20	

The following samples were analyzed in this batch:

1108743-01C

Client: Navajo Refining Company Work Order: 1108743

Injection Well Quarterly oject:

QC BATCH REPORT

Batch ID: R	115381	Instrument ID WetCl	hem		Method	I: SW10	10							
LCS	Sample ID:	WLCS-083011-R1153	81				ι	Jnits: °F		An	alysi	s Date: 8	/30/2011	04:00 PM
Client ID:			Run ID:	WETCH	HEM_110830)F	Se	qNo: 250	9821	Prep Date:			DF: 1	
Analyte		Res	ult	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability		8	83	50	83		0	100	80-120		0			
LCSD	Sample ID:	WLCSD-083011-R115	381				ι	Jnits: °F		Ana	alysi	s Date: 8	/30/2011	04:00 PM
Client ID:			Run ID:	WETCH	HEM_110830)F	Se	qNo: 250	9826	Prep Date:			DF: 1	
Analyte	·	Res	ult	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability		ł	83	50	83		0	100	80-120	•	83	C) 25	
DUP	Sample ID:	1108774-03DDUP					ι	Jnits: °F		An	alysi	s Date: 8	/30/2011	04:00 PM
Client ID:			Run ID:	WETCH	HEM_110830	F	Se	qNo: 250	9827	Prep Date:			DF: 1	
Analyte		Res	ult	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability		Ň	ID	50	0		0	0	0-0	- ,	0	· () 25	
		ware enabyzed in this b	etch:	14	09742 010									i

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 15 of 18

Client: Navajo Řefining Company

Work Order: 1108743

vject: Injection Well Quarterly

QC BATCH REPORT

Batch ID: R	115391	Instrument ID ICS3000		Metho	d: E300		·····					
MBLK	Sample ID:	WBLKW1-083011-R115391		· · · · · · · · · · · · · · · · · · ·	·	ι	Jnits: mg /	Ľ	Analy	sis Date: 8	/30/2011	04:22 PM
Client ID:		Run ID	: ICS300	0_110830A		Se	eqNo: 251	0041	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chlorida		ŇD	0.50									· · ·
Sulfate			0.50				· · · · · · · · · · · · · · · · · · ·		· · · ·			· · ·
Surr: Sel	enate (surr)	5.229	0.10	5		0	105	85-115		0		
LCS	Sample ID:	WLCSW-083011-R115391				ι	Jnits: ma/		Analy	sis Date: 8	/30/2011	04:43 PM
Client ID:	·	Run ID	: ICS300	0 <u>110830A</u>		Se	qNo: 251	0042	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		20.68	0.50	20		0	103	90-110		0		
Sulfate		18.54	0.50	20		0	92.7	90-110		0		
Surr: Sele	enate (surr)	5.359	0.10	5	•	Ò	107	85-115		Ó		
LCSD	Sample ID:	WLCSDW-083011-R115391				ι	Jnits: mg/	L	Analy	sis Date: 8	/30/2011	05:29 PM
Client ID:		Run ID	: ICS300	0_110830A		Se	qNo: 251	0321	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
ride		20.72	0.50	20		0	104	90-110	20.6	8 0.179	20	
Jufate		18.17	0.50	20		0	90.9	90-110	18.5	4 2.03	20	
Surr: Sele	enate (surr)	5.359	0.10	5		0	107	85-115	5.35	90	20	
MS	Sample ID:	1108713-01BMS				U	Jnits: mg/	` L	Analy	sis Date: 8/	30/2011	07:28 PM
Client ID:		Run ID	ICS300	0_110830A		Se	qNo: 251 (0322	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		11.79	0.50	10	1.70)2	101	80-120		D		
Sulfate		18.1	0.50	10	8.77	'6	93.3	80-120	•	0		
Surr: Sele	enate (surr)	5.721	0.10	5		0	114	85-115		0		
MS	Sample ID:	1108948-01AMS				U	Inits: mg /l	L	Analy	sis Date: 8/	30/2011	09:27 PM
Client ID:		Run ID:	ICS300	0_110830A		Se	qNo: 251(327	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chlorida		19.5	0.50	10	Q 40	6	· 104	80, 120		<u>-</u>		
Sulfate		29.75	0.50	10	19.8	5 1	99.5	80-120		5 D -		·····
Surr: Sele	onate (surr)	5.659	0.10	5		0	113	85-115		0		

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QC Page: 16 of 18

Client:Navajo Refining CompanyWork Order:1108743

QC BATCH REPORT

oject: Injection Well Quarterly

Batch ID: R	115391	Instrument ID ICS30	00		Method	: E300			·			
MSD	Sample ID:	1108713-01BMSD				1	Units: mg/		Analysi	s Date: 8/	30/2011 0	7:49 PM
Client ID:			Run ID: IC:	S 300	0_110830A	SeqNo: 2510323			Prep Date:	DF: 1		
Analyte		Res	ult F	QL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		12.0	07 0	.50	· 10	1.702	104	80-120	11.79	2.36	20	
Sulfate		18.0	63 0	.50	.10	8.776	98.5	80-120	18.1	2.85	20	
Surr: Sel	lenate (surr)	. 5.50	68 0	.10	5	0	111	85-115	5.721	2.71	20	
MSD	Sample ID:	1108948-01AMSD	• •				Units: mg/	Ľ	Analysi	s Date: 8/	30/2011 0	9:48 PM
Client ID:			Run ID: IC:	5300	0_110830A	S	eqNo: 251()328	Prep Date:		DF: 1	
Analyte		Res	ult <u>P</u>	QL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		18.3	38 0	.50	10	8.106	103	80-120	18.5	0.634	20	
Sulfate		29.0	64 0	.50	10	19.81	<u>98.4</u>	80-120	29.75	0.367	20	
Surr: Sel	lenate (surr)	5.6	19 . 0	.10	5	0	. 112	85-115	5.659	0.709	20	
The follow	ing samples v	vere analyzed in this b	patch:	1	108743-01C							

See Qualifiers Page for a list of Qualifiers and their explanation.

***:

Client:	Navajo Refining Company
Work Order:	1108743

QC BATCH REPORT

oject: Injection Well Quarterly

Batch ID: R	115420 Instrument ID	Balance1		Metho	d: M2540	c		<u> </u>				
MBLK	Sample ID: BLANK-R11542	0				U	Inits: mg/	L	Anal	ysis Date: 8	/30/2011	MA 00:80
Client ID:		Run I	d: Bal an	CE1_11083	0B	Se	qNo: 251	1071	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	Ived Solids (Residue, Fil	ND	10	· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·	<u> </u>		
LCS	Sample ID: LCS-R115420	• •				Ū	nits: mg/		Anal	ysis Date: 8	/30/2011	08:00 AM
Client ID:		Run I	D: BALAN	CE1_11083	30B	Se	qNo: 251	1072	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	Ived Solids (Residue, Fil	1050	10	1000		0	105	85-115	·	0		
DUP	Sample ID: 1108743-01CDL	IP				U	inits: mg/	L	Anal	ysis Date: 8	/30/2011	MA 00:80
Client ID: Ir	njection Well Effluent	Run i	d: Balan	CE1_11083	30B	Se	qNo: 251 ′	1070	Prep Date:		DF: 1	
Analyte	·	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	Ived Solids (Residue, Fil	4180	10	0		0	Q	0-0	432	20 3.29	20	
The followi	ing samples were analyzed in	this batch	11	08743-010								

See Qualifiers Page for a list of Qualifiers and their explanation.

®e:

mg/L pH units Date: 06-Sep-11

Client: Project:	Navajo Refining Company Injection Well Quarterly	QUALIFIERS,
WorkOrder:	1108743	ACRONYMS, UNITS
Qualifier	Description	
*	Value exceeds Regulatory Limit	
а	Not accredited	
В	Analyte detected in the associated Method Blank above the	e Reporting Limit
Е	Value above quantitation range	
H	Analyzed outside of Holding Time	
J	Analyte detected below quantitation limit	
M	Manually integrated, see raw data for justification	
ņ ND	Not Detected at the Reporting Limit	
	Sample amount is > 4 times amount sniked	
Р	Dual Column results percent difference > 40%	
R	RPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
U	Analyzed but not detected above the MDL	
Acronym	Description	
DCS	Detectability Check Study	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MQL	Method Quantitation Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Spike	
PQL	Practical Quantitation Limit	
SD	Serial Dilution	
SDL	Sample Detection Limit	
TRRP	Texas Risk Reduction Program	
Units Reported	Description	
°F	Farenheit degrees	
µmhos/cm	· · · · · · · · · · · · · · · · · · ·	
mg/Kg	Milligrams per Kilogram	
mg/L	Milligrams per Liter	

QF Page 1 of 1

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ALS Laboratory Group 10450 Stancliff Rd. #210 Houston, Texas 77099 (Tel) 281.530.5656 (Fax) 281.530.5887

Chain of C ວdy Form

Page 1 of - 1

110874?

NAVAJO REFINING: Navajo Refining Company

Project: Injection Well Quarterly

|--|

		ALS Project Ma	nager: Chr	is Brysor	l				T						R#II XIAN	8 (6) (96)
Customer Information		Project Info	rmation					Par	amet	er/Meth	od Re	quest	for An	alysis		
Purchase Order	Project N	ame Injection V	Vell Quarte	rly		A	VOC (8260) Select									
Work Order	Project Nun	nber				в	SVOC (8270) Select									
Company Name Navajo Refining Company	Bill To Com	oany Navajo Re	fining Com	npany		С	Total Metals (6020 / 7000) Select									
Send Report To Aaron Strange	invoice /	Attn. Aaron Stra	inge		_	D	R.C.I. Pro	file								
Address P. O. Boy 159	Add	FOI Fact N	lain			E	Anions (3	00) CI,	SO4							
	Auu	Iess JUT Edst N				F	F Alkalinity									
City/State/Zip Artesia, New Mexico 88211-0159	City/State	Zip Artesia, N	ew Mexico	88210		Ģ	рН									
Phone (575) 748-3311	PI	none (575) 748-	3311			Н	Conductiv	vity								
Fax (575) 746-5451		Fax (575) 746-	5451			i	TDS									
e-Mail Address A.Strange@hollyfrontier.com	e-Mail Add	ress A.Strange(@hollyfronti	er.com		J										
No. Sample Description	Date	Time	Matrix	Pres.	# Bottles		A B	с	D	E	F	G	н	1.	L	Hold
1 Injection Well Effluent	8/23/11	9:10	Liquid	Yes	9		x x	X	X	X	x	X	x	X		
2 Trip Blank									1	1		-	<u> </u>	1		
3 Temperature Blank	·					Τ										
4.																1
5																
6																
7									<u> </u>				ļ	ļ		
8					ļ	1				·	ļ	-	ļ	ļ	ļ	
<u>.</u>				ļ	ļ			ļ	<u> </u>		ļ			ļ	ļ	
10		ant Mathodu		L	marcund		<u></u>		[·		Culte Di	L Dete	<u> </u>	<u> </u>
Sampler(s): Please Print & sign	Fe	deral Express		l STD 10 Wk	Davs		Wk Davs			ier	A Hour	I.V.	suits Di	de Dare		
Relinquished by:	Time:	Received by:	<u></u>				Notes:									· : . ·
Jour Star 82311	1615	1)-					ľ									
Relinquished by: Date:	Time:	Received by (Labo	oratory):	~.			Cooler Te	in C	C Pac	kage: (C	heck E	lox Belo	w)			
		<u> </u>	- 24 . 11	<u> </u>	25.					evel II:	Stand	ard QC		TF	RP-Ch	ecklist
Logged by (Laboratory): Date:	l me:	CRECKED by (Labo	ratory):							evel III	Std Q	C + Ra	w Data	╞╌┛╨	RP Le	vel IV
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-I	INAOH 5-Na2S2C	J 3 6-NaHSO4	7-Othe	r 8-4 d	earees C	<u> </u>)-5035		+ ^µ			TV CLF	-DIVE	-{		
									C)ther:						

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.

Copyright 2008 by ALS Laboratory Group

Sample	Receipt	Checklist
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Client Name: NAVAJO REFINING		Date/Time	Received: <u>24-A</u>	ug-11 09:20	
Work Order: <u>1108743</u>		Received b	y: <u>PMG</u>	2	
Checklist completed by <u>Raymond N Gamboa</u> esignature	24-Aug-11 Date	Reviewed by:	Chris Brysion eSignature		24-Aug-11 Date
Matrices: <u>Liquid</u> Carrier name: <u>FedEx</u>					•
Shipping container/cooler in good condition?	Yes 🗹	No 🗌	Not Present		
Custody seals intact on shipping container/cooler?	Yes 🗹	No 🗌	Not Present		
Custody seals intact on sample bottles?	Yes 🗌	No 🗌	Not Present		
Chain of custody present?	Yes 🗹	No 🗔			
Chain of custody signed when relinquished and received?	Yes 🗹	No 🗌			
Chain of custody agrees with sample labels?	Yes 🗹	No 🗌			
Samples in proper container/bottle?	Yes 🗹	No 🗌			
Sample containers intact?	Yes 🗹	No 🗌			·
Sufficient sample volume for indicated test?	Yes 🗹	No 🗌			
All samples received within holding time?	Yes 🗹	No 🗌			
Container/Temp Blank temperature in compliance?	Yes 🗹	No 🗌			
emperature(s)/Thermometer(s):	<u>1.4c</u>		002		
Cooler(s)/Kit(s):	3486				
Water - VOA vials have zero headspace?	Yes 🗹	No 🗆	No VOA vials subm	nitted	
Water - pH acceptable upon receipt?	Yes 🗹	No 🗌	N/A		
pH adjusted? pH adjusted by:	Yes 🗌	No 🗌	N/A		
Login Notes:					·

Client Contacted:		Date Contacted:	Person Contacted:
Contacted By:		Regarding:	
Comments:	· · · · · · · · · · · · · · · · · · ·	<u></u>	
orrectiveAction:			· · · · · · · · · · · · · · · · · · ·
	·		

SRC Page 1 of 1

ALS	ALS Environmental 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	Date: <u>8/3</u> Name: <u>c</u> Company: <u>é</u>	CUSTODY SEAL 3/11 Time: 1620 3lun flooden for darm Stronge NAVAJO REFINING CO.	Seal Broken By:



1108786-01 1108743-01F

Date: 06-Sep-11

8/23/2011 09:10 8/25/2011 10:00

Client:	ALS Environmental					
Project:	1108743			Work Order S	Sample Sum	narv
Work Order:	1108786				umpie Sum	IIIII J
Lab Samp ID (Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold

Liquid

SS Page 1 of 1

í.

Date: 06-Sep-11

Client:	ALS Environmental	OUALIFIERS.					
Project:	1108743	ACRONYMS LINITS					
WorkOrder:	1108786						
<u>Oualifier</u>	Description						
*	Value exceeds Regulatory Limit						
а	Not accredited						
В	Analyte detected in the associated Method Blank above th	e Reporting Limit					
E	Value above quantitation range						
н	Analyzed outside of Holding Time						
J	Analyte detected below quantitation limit						
n	Not offered for accreditation						
ND	Not Detected at the Reporting Limit						
0	Sample amount is > 4 times amount spiked	r					
Р	Dual Column results percent difference > 40%						
ĸ	RPD above laboratory control limit						
5 • 11	A palyzed but not detected above the MDI						
Acronym	Description						
DUP	Method Duplicate						
LCS	Laboratory Control Sample						
LCSD	Laboratory Control Sample Duplicate						
MBLK	Method Blank						
MDL	Method Detection Limit						
MQL	Method Quantitation Limit						
MS	Matrix Spike						
MSD	Matrix Spike Duplicate						
PDS	Post Digestion Spike						
PQL	Practical Quantitation Limit						
SD .	Serial Dilution	· •					
TDL	Target Detection Limit						
<u>Units Reporte</u>	<u>d Description</u>						
mg/Kg	Milligrams per Kilogram						

Sulfide, Reactive

Date: 06-Sep-11

1

9/1/2011 12:00 PM

Client:	ALS Environmental			····			
Project:	1108743				W	ork Order: 11087	786
Sample ID:	1108743-01F					Lab ID: 1108	786-01
Collection Date:	8/23/2011 09:10 AM					Matrix: LIQU	ID.
Analyses	·	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, REAC Cyanide, Reactive	TIVE	ND		SW7.3 . 40.0	3.2 mg/Kg	1	Analyst: EE 9/1/2011 12:00 PM
SULFIDE, REACT	ΓΙνε			SW7.3.	4.2		Analyst: EE

40.0

mg/Kg

ND

Note: See Qualifiers page for a list of qualifiers and their definitions.

AR Page 1 of 1

Client:	ALS Environmental
ork Order:	1108786
oject:	1108743

Date: 06-Sep-11

QC BATCH REPORT

Batch ID: R94168	Instrument ID WETCHEM	·	Metho	d: SW7.3	.4.2					
MBLK Sample	ID: WBLKW1-090111-R94168	-			Units: mg/	Kg	Analy	sis Date: 9	/1/2011 1	2:00 PM
Client ID:	· Run ID	: WETCH	IEM_11090	1E	SeqNo: 172	3562	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	. Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide, Reactive	ND	40								
The following sample	es were analyzed in this batch:	11	08786-01A			·				

See Qualifiers Page for a list of Qualifiers and their explanation.

•

Client:	ALS Environmental

QC BATCH REPORT

Work Order: 1108786

`nject: 1108743

Jutch ID: R	194169	Instrument ID WETCHEM		Metho	d: SW7.3	.3.2						
MBLK	Sample ID:	WBLKW1-090111-R94169	-			ι	Jnits: mg/	Kg	Analys	is Date: 9	/1/2011 12	2:00 PM
Client ID:		Run ID:	WETCH	IEM_11090	1F	Se	qNo: 172 :	3570	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	eactive	ND	40									
LCS	Sample ID:	WLCSW1-090111-R94169				ι	Inits: mg/	Kg	Analys	sis Date: 9	/1/2011 12	2:00 PM
Client ID:		Run ID:	WETCH	IEM_11090	1F	. Se	qNo: 172 :	3571	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	eactive	234.9	40	250		0	94	75-125	0	·		
LCSD	Sample ID:	WLCSDW1-090111-R94169				ι	Inits: mg/	Kg	Analys	is Date: 9	/1/2011 12	2:00 PM
Client ID:		Run ID:	WETCH	IEM_11090	1F	Se	qNo: 172	3579	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Quai
Cyanide, Re	eactive	234.9	40	250		0	94	75-125	234.9	() 35	
MS	Sample ID:	1108786-01A MS		• .		U)nits: mg/	Kg	Analys	is Date: 9	/1/2011 12	2:00 PM
Client ID: 1	108743-01F	Run ID:	WETCH	IEM_11090	1F	Se	qNo: 172:	3575	Prep Date:		DF: 1	
alyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	eactive	234.9	40	250		0	94	50-150	0			
MSD	Sample ID:	1108786-01A MSD				U	 Inits: mg/	Kg	Analys	is Date: 9	/1/2011 12	.:00 PM
Client ID: 1	108743-01F	Run ID:	WETCH	IEM_11090	1F	Se	qNo: 172:	8576	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Re	eactive	234.9	40	250		0	94	50-150	234.9	C	35	
The followi	ng samples v	vere analyzed in this batch:	11	08786-01A					· · · · ·			

1

	Subcontractor: ALS Laboratory Group 3352 128th Ave.	- TEL: FAX:	(616) 399-6070 (616) 399-6185	CHAIN-OF-CUSTODY RECORD Page 1 of 1	Date: COC ID: Due Date	24-Aug-11 10871 306-Sep-11
(ALS)	Holland, MI 49424	Acct#:				
	Salesperson	Jeffrey L Croston				

YAZE TO ALL Y. COU	stomerilnformation	· · · · · · · · · · · · · · · · · · ·	Project information	(4) 等。	
Purchase Order	10-*2121547	Project Name	1108743	A	Reactive Cyanide (SW-846)
Work Order		Project Number		B.	Reactive Sulfide (SW-846)
Company Name	ALS Group USA, Corp.	Bill To Company	ALS Group USA, Corp.	iC,	
Send Report To	Chris Bryson	Inv Attn	Accounts Payable	D.	
Address	10450 Stancliff Rd, Suite 210	Address	10450 Stancliff Rd, Suite 210	Æ	
		· ·			
City/State/Zip	Houston, Texas 77099-4338	City/State/Zip	Houston, Texas 77099-4338	G	
Phone	(281) 530-5656	Phone	(281) 530-5656	H.	
Fax	(281) 530-5887	Fax	(281) 530-5887	a.	
eMail Address	chris.bryson@alsglobal.com	eMail CC	mary.knowles@alsglobal.com	3	
Sample ID		Matrix Collecti	on Date 24hr Bottle	31	A BA C D E F G A G A G A G A G A G A G A G A G A G
1108743-01F (Inje	ction Well Effluent)	Liquid 23/Au	/2011 9:10 (1) 1LPNEAT		x x I I I I I I I I I I I I I I I I I I

Comments:

Please analyze for Reactive Cyanide and Reactive Sulfide. Report is due on 9/6/11. Send report to Chris Bryson, chris.bryson@alsglobal.com, and CC: results to Glenda Ramos, glenda.ramos@alsglobal.com and Mary Knowles, mary.knowles@alsglobal.com

M Date/Time Date/Time Cooler IDs Report/QC Level Relin 1000 Std 24 Date/Time Received by: Date/Time Relinquished by:




ALS Group USA, Corp

Client Name: ALS - HOUSTON	Date/Time Received: 25-Aug-11 10:00						
Work Order: <u>1108786</u>		Received by	y:	<u>DS</u>			
Checklist completed by Diane Shaw eSignature	25-Aug-11 Date	Reviewed by:	Bill Carey eSignature		·····	26-Aug-11 Date	
Matrices: Liquid Carrier name: FedEx							
Shipping container/cooler in good condition?	Yes 🗹	No 🗔	Not Prese	ent 🗌			
Custody seals intact on shipping container/cooler?	Yes 🗌	No 🗆	Not Prese	ent 🗹		•	
Custody seals intact on sample bottles?	Yes 🗌	No 🗌	Not Prese	ent 🗹			
Chain of custody present?	Yes 🗹	No 🗌	•				
Chain of custody signed when relinquished and received?	Yes 🗹	No 🗌					
Chain of custody agrees with sample labels?	Yes 🗹	No 🗔					
Samples in proper container/bottle?	Yes 🗹	No 🗌					
Sample containers intact?	Yes 🗹	No 🗆					
Sufficient sample volume for indicated test?	Yes 🗹	No 🗖					
All samples received within holding time?	Yes 🗹	No 🗆					
Container/Temp Blank temperature in compliance?	Yes 🗹	No 🗆					
emperature(s)/Thermometer(s):	<u>2.6 c</u>		<u></u>				
Cooler(s)/Kit(s):			······				
Water - VOA vials have zero headspace?	Yes 🗌	No 🗌	No VOA vials	submitted			
Water - pH acceptable upon receipt?	Yes 🗌	· No 🗔	N/A 🗹				
pH adjusted? pH adjusted by:	Yes	No 🗌	N/A 🗹				
Login Notes:							

Client Contacted:	Date Contacted:	Person Contacted:
Contacted By:	Regarding:	
Comments:		
	· · · · · · · · · · · · · · · · · · ·	
`orrectiveAction:		
		······

SRC Page 1 of 1



19-Jan-2012

Aaron Strange Navajo Refining Company PO Box 159 Artesia, NM 88211

Tel: (575) 748-3311 Fax: (575) 746-5421

Re: Injection Well Quarterly

Work Order: 1111583

Dear Aaron,

ALS Environmental received 2 samples on 17-Nov-2011 09:20 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 30.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

atricia L. Lynch

Electronically approved by: Hector Coronad Patricia L. Lynch Project Manager



Certificate No: T104704231-09A-TX

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77099-4338 | PHONE (281) 530-5656 | FAX (281) 530-5887 ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

WWW.alsglobal.com

ient:	Navajo Refining Company	
∡oject: Work Order:	Injection Well Quarterly 1111583	Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	Collection Date	Date Received	<u>Hold</u>
1111583-01	Wastewater Effluent	Water		11/16/2011 09:55	11/17/2011 09:2	0
1111583-02	Trip Blank - 081911-19	Water		11/16/2011	11/17/2011 09:2	0

SS Page 1 of 1

Date: 20-Jan-12

Client:	Navajo Refining Company		
Project:	Injection Well Quarterly		Case Narrative
Work Order:	1111583		
· ·			

As the pH analyses were performed in the laboratory, the results are H-flagged as appropriate.

Batch 57057, Metals, Sample 1111390-08 : MS/MSD is for an unrelated sample.

Batch 57057, Metals, Sample 1111390-08 : Duplicate RPD is for an unrelated sample.

Batch R119531, Volatile Organics, Sample 1111486-07 : MS/MSD is for an unrelated sample.

Batch R119835, Anions, Sample 1010159-05 : MS/MSD is for an unrelated sample.

CN Page 1 of 1

Date: 19-Jan-12

Client: Navajo Refining Company oject: Injection Well Quarterly Sample ID:

Wastewater Effluent

Collection Date: 11/16/2011 09:55 AM

Work Order: 1111583 Lab ID: 1111583-01

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
MERCURY			SW747	70			Analyst: JCJ
Mercury	ND		0.00020	0 mg/L	1	11/21/2011	11/21/2011 04:27 PM
METALS			SW602	20	:		Analyst: ALR
Aluminum	0.752		0.010	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Arsenic	0.0365		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Barium	0.0182		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Boron	0.243		0.050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Cadmium	ND		0.0020	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Chromium	ND		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Copper	ND		0.0050	0 mg/L	[·] 1	11/18/2011	11/22/2011 12:18 PM
Lead	ND		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Manganese	0.0213		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Molybdenum	0.0443		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Nickel	ND		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Selenium	0.990		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Silver	ND		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
Zinc	0.0120		0.0050	0 mg/L	1	11/18/2011	11/22/2011 12:18 PM
MIVOLATILES - SW8270D			SW827	0			Analyst: JLJ
,,2,4-Trichlorobenzene	ND		0.005) mg/L	1 ·	11/22/2011	11/26/2011 05:52 PM
2,4,5-Trichlorophenol	ND		0.0050) mg/L	ĺ	11/22/2011	11/26/2011 05:52 PM
2,4,6-Trichlorophenol	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
2,4-Dinitrotoluene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
2-Methylnaphthalene	0.040		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
2-Methylphenol	0.29		0.050) mg/L	10	11/22/2011	11/28/2011 02:41 PM
2-Nitroaniline	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
2-Nitrophenol	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
3&4-Methylphenol	0.52		0.050) mg/L	10	11/22/2011	11/28/2011 02:41 PM
3-Nitroaniline	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
4-Nitroaniline	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
4-Nitrophenol	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Acenaphthene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Acenaphthylene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Aniline	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Anthracene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Benz(a)anthracene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Benzidine	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Hexachlorobenzene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Hexachloroethane	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
Indeno(1,2,3-cd)pyrene	ND		0.0050) mg/L	1	11/22/2011	11/26/2011 05:52 PM
· · · · · ·				-			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Navajo Refining Company

lient: Injection Well Quarterly

oject:

Sample ID: Wastewater Effluent

Collection Date: 11/16/2011 09:55 AM

Date: 19-Jan-12

Work Order: 1111583 Lab ID: 1111583-01 `

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
Isophorone	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
Naphthalene	0.038		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
Nitrobenzene	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
N-Nitrosodimethylamine	ND		0.0050	mg/Ĺ	1	11/22/2011	11/26/2011 05:52 PM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
Pentachlorophenol	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
Phenanthrene	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
Phenol	0.99		0.050	mg/L	10	11/22/2011	11/28/2011 02:41 PM
Pyrene	ND		0.0050	mg/L	. 1	11/22/2011	11/26/2011 05:52 PM
Pyridine	ND		0.0050	mg/L	1	11/22/2011	11/26/2011 05:52 PM
Surr: 2,4,6-Tribromophenol	67. 3		42-124	%REC	1	11/22/2011	11/26/2011 05:52 PM
Surr: 2,4,6-Tribromophenol	71.1		42-124	%REC	10	11/22/2011	11/28/2011 02:41 PM
Surr: 2-Fluorobiphenyl	81.2		48-120	%REC	10	11/22/2011	11/28/2011 02:41 PM
Surr: 2-Fluorobiphenyl	61.3		48-120	%REC	1	11/22/2011	11/26/2011 05:52 PM
Surr: 2-Fluorophenol	64.9		20-120	%REC	10	11/22/2011	11/28/2011 02:41 PM
Surr: 2-Fluorophenol	60.3		20-120	%REC	1	11/22/2011	11/26/2011 05:52 PM
Surr: 4-Terphenyl-d14	62.6		51-135	%REC	1	11/22/2011	11/26/2011 05:52 PM
Surr: 4-Terphenyl-d14	84.7		51-135	%REC	10	11/22/2011	11/28/2011 02:41 PM
Surr: Nitrobenzene-d5	78.1		41-120	%REC	10	11/22/2011	11/28/2011 02:41 PM
Surr: Nitrobenzene-d5	69.3		41-120	%REC	1	11/22/2011	11/26/2011 05:52 PM
Surr: Phenol-d6	64.0		20-120	%REC	. 1	11/22/2011	11/26/2011 05:52 PM
Surr: Phenol-d6	73.8		20-120	%REC	10	11/22/2011	11/28/2011 02:41 PM
VOLATILES			SW826	D			Analyst: PC
1,1,1-Trichloroethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
1,1,2,2-Tetrachloroethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
1,1,2-Trichloroethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
1,1-Dichloroethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
1,1-Dichloroethene	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
1,2-Dichloroethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
2-Butanone	0.010		0.010	mg/L	1		11/18/2011 04:11 PM
2-Chloroethyl vinyl ether	ND ·		0.010	mg/L	1		11/18/2011 04:11 PM
2-Hexanone	ND		0.010	mg/L	1		11/18/2011 04:11 PM
4-Methyl-2-pentanone	ND		0.010	mg/L	1		11/18/2011 04:11 PM
Ácetone	0.20		0.010	mg/L	1		11/18/2011 04:11 PM
Benzene	0.20		0.0050	mg/L	1		11/18/2011 04:11 PM
Bromodichloromethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Bromoform	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Bromomethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Carbon disulfide	ND		0.010	mg/L	1		11/18/2011 04:11 PM

See Qualifiers Page for a list of qualifiers and their explanation. Note:

Client: Navajo Refining Company

oject: Injection Well Quarterly

Sample ID: Wastewater Effluent

Collection Date: 11/16/2011 09:55 AM

Work Order: 1111583 Lab ID: 1111583-01 Matrix: WATER

			Report		Dilution		
Analyses	Result	Qual	Limit	Units	Factor	Date Prep	Date Analyzed
Carbon tetrachloride	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Chlorobenzene	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Chloroethane	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Chloroform	ND		0.0050) mg/L	1		11/18/2011 04:11 PM
Chloromethane	ND		0:0050) mg/L	1		11/18/2011 04:11 PM
cis-1,3-Dichloropropene	ND		0.0050) mg/L	1		11/18/2011 04:11 PM
Dibromochloromethane	NÐ		0.0050) mg/L	1		11/18/2011 04:11 PM
Ethylbenzene	0.19		0.025	mg/L	5		11/20/2011 02:55 PM
m,p-Xylene	0.36		0.050	mg/L	5		11/20/2011 02:55 PM
Methylene chloride	ND		0.010) mg/L	1		11/18/2011 04:11 PM
Styrene	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Tetrachloroethene	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Toluene	0.51		0.025	mg/L	5		11/20/2011 02:55 PM
trans-1,3-Dichloropropene	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Trichloroethene	ND		0.0050	mg/L	1		11/18/2011 04:11 PM
Vinyl acetate	ND		0.010	mg/L	1		11/18/2011 04:11 PM
Vinyl chloride	ND		0.0020	mg/L	1		11/18/2011 04:11 PM
Xylenes, Total	0.56		0.075	mg/L	5		11/20/2011 02:55 PM
Surr: 1,2-Dichloroethane-d4	98.9		70-125	%REC	1		11/18/2011 04:11 PM
Surr: 1,2-Dichloroethane-d4	105		70-125	%REC	5		11/20/2011 02:55 PM
Surr: 4-Bromofluorobenzene	99.2		72-125	%REC	1		11/18/2011 04:11 PM
Surr: 4-Bromofluorobenzene	104		72-125	%REC	5		11/20/2011 02:55 PM
Surr: Dibromofluoromethane	95.1		71-125	%REC	1		11/18/2011 04:11 PM
Surr: Dibromofluoromethane	96.3		71-125	%REC	5		11/20/2011 02:55 PM
Surr: Toluene-d8	104		75-125	%REC	1		11/18/2011 04:11 PM
Surr: Toluene-d8	96.6		75-125	%REC	5		11/20/2011 02:55 PM
REACTIVE CYANIDE			SW-846	5			Analyst: HN
Reactive Cyanide	ND		40.0	mg/Kg	1		11/28/2011 11:00 AM
REACTIVE SULFIDE			SW-846	i			Analyst: HN
Reactive Sulfide	ND		40.0	mg/Kg	1		11/28/2011 11:00 AM
ANIONS - EPA 300.0 (1993)			E300				Analyst: JKP
Chloride	332		5.00	mg/L	10		11/26/2011 07:07 PM
Sulfate	2,350		500	mg/L	1000		11/26/2011 07:21 PM
Surr: Selenate (surr)	101		85-115	%REC	10		11/26/2011 07:07 PM
Surr: Selenate (surr)	103		85-115	%REC	1000		11/26/2011 07:21 PM
ALKALINITY			SM2320	B			Analyst: DM
Alkalinity, Bicarbonate (As CaCO3	217		5.00	mg/L	1		11/23/2011 07:55 AM
Alkalinity, Carbonate (As CaCO3)	ND		5.00	mg/L	1		11/23/2011 07:55 AM
Alkalinity, Hydroxide (As CaCO3)	ND		5.00	mg/L	1		11/23/2011 07:55 AM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

`'lient: Navajo Refining Company

oject: Injection Well Quarterly

Sample ID: Wastewater Effluent

Collection Date: 11/16/2011 09:55 AM

Work Order: 1111583 Lab ID: 1111583-01 Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
Alkalinity, Total (As CaCO3)	217		5.	00 mg/L	1		11/23/2011 07:55 AM
SPECIFIC CONDUCTIVITY Specific Conductivity	5,430		M251 1.	0 B 00 µmhos/cm	1		Analyst: TDW 11/17/2011 11:00 AM
IGNITIBILITY Ignitability	> 212		SW10 50)10 D.0 °F	1		Analyst: KAH 11/22/2011 02:00 PM
PH pH	7.52	н	SW9 (0.1)40 00 pH units	1		Analyst: TDW 11/17/2011 05:00 PM
TOTAL DISSOLVED SOLIDS Total Dissolved Solids (Residue, Filterable)	4,840		M254 10	0C).0 mg/L	1		Analyst: TDW 11/22/2011 01:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Navajo Refining Company
ork Order:	1111583
rroject:	Injection Well Quarterly

QC BATCH REPORT

Date: 19-Jan-12

Batch ID: 57	057 Instrume	nt ID ICP7500		Method	: SW602	20						
MBLK	Sample ID: MBLKW2-	111811-57057	•			ι	Jnits: mg/	L	Analy	sis Date:	11/22/2011	10:34 AM
Client ID:		Run	ID: ICP750	0_111121A		Se	qNo: 260 !	5832	Prep Date: 11	/18/2011	DF: 1	
					SPK Ref			Control	RPD Ref		RPD	
Analyte		Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD		Qual
Aluminum		ND	0.010									
Arsenic		ND	0.0050									
Barium		ND	0.0050									
Boron		ND	0.050									
Cadmium		ND	0.0020									
Chromium		ND	0.0050									
Copper		ND	0.0050									
Lead		ND	0.0050									
Manganese	·····	ND	0.0050									
Molybdenum	I	ND	0.0050									
Nickel	,	ND	0.0050				·····					
Selenium		ND	0.0050									
Silver		ND	0.0050							<u></u>		
Zinc		ND	0.0050									
' CS	Sample ID: MLCSW2-	111811-57057				ι	Jnits: mg/	L	Analy	sis Date:	11/22/2011	10:41 AM
nt ID:		Run	ID: ICP750	0_111121A		Se	qNo: 260	5833	Prep Date: 11	/18/2011	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum		0.08542	0.010	0.1		0	85.4	80-120		0		
Arsenic		0.04772	0.0050	0.05		0	95.4	80-120		0		
Barium		0.04664	0.0050	0.05		0	93.3	80-120		0		
Boron		0.4456	0.050	0.5		0	89.1	80-120		0		
Cadmium		0.04654	0.0020	0.05		0	93.1	80-120		0		
Chromium		0.04816	0.0050	0.05		0	96.3	80-120		0		
Copper		0.04947	0.0050	0.05		0	98.9	80-120		0		
Lead		0.04699	0.0050	0.05		0	94	80-120		0		
Manganese		0.04675	0.0050	0.05		0	93.5	80-120		0		
Molvbdenum	1	0.04685	0.0050	0.05		0	937	80-120		0		

S

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Nickel

Silver

Zinc

Selenium

See Qualifiers Page for a list of Qualifiers and their explanation.

0.04932

0.04761

0.04781

0.0496

0.0050

0.0050

0.0050

0.0050

0.05

0.05

0.05

0.05

0

0

0

0

98.6

95.2

95.6

99.2

80-120

80-120

80-120

80-120

0

0

0

0

Client:Navajo Refining CompanyWork Order:1111583'roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: 57057

Instrument ID ICP7500

Method: SW6020

MS	Sample ID: 1111390-08AMS					Units: mg/	L	Analys	sis Date: "	11/22/2011	11:05 AM
Client ID:		Runl	D: ICP7500	_111121A	S	eqNo: 260 !	5837	Prep Date: 11/	18/2011	DF: 1	
Analyte	R	esult	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1	.244	0.010	0.1	0.9386	305	80-120	C)		so
Arsenic	0.0	4959	0.0050	0.05	0.0003986	98.4	80-120	C	۱		
Barium	0.1	1512	0.0050	0.05	0.09717	108	80-120	C)		
Boron	0.9	5634	0.050	0.5	0.0937	93.9	80-120	C)		
Cadmium	0.1	0498	0.0020	0.05	-0.00005398	99.7	80-120	C)		
Chromium	0.0	5153	0.0050	0.05	0.002447	98.2	80-120	C)		
Copper	0.0	0508	0.0050	0.05	0.0001189	101	80-120	C)		
Lead	0.0	5001	0.0050	0.05	0.0005021	99	80-120	C)		
Manganese	0.0	7247	0.0050	0.05	0.02521	94.5	80-120)		
Molybdenum	0.0	5705	0.0050	0.05	0.008842	96.4	80-120	C)		
Nickel	0.0	5106	0.0050	0.05	0.001692	98.7	80-120	C)		
Selenium	0.	0478	0.0050	0.05	-0.0002051	96	80-120	0)		
Silver	0.0	4711	0.0050	0.05	-0.00001074	94.2	80-120	C)		
Zinc	0.0	7134	0.0050	0.05	0.0102	122	80-120)		S
MSD	Sample ID: 1111390-08AMSD		_			Units: ma/	L	Analys	sis Date: ·	11/22/2011	11:11 AM

Run ID: ICP7500_111121A Client ID: SeqNo: 2605838 Prep Date: 11/18/2011 DF: 1 RPD SPK Ref **RPD** Ref Control Value Value Limit Limit . .nalyte Result PQL SPK Val %REC %RPD Qual 1.257 0.010 SO Aluminum 0.1 0.9386 318 80-120 1.244 1.04 15 0.04691 0.0050 Arsenic 0.05 0.0003986 93 80-120 0.04959 5.55 15 9.64 15 Barium 0.1373 0.0050 0.05 0.09717 80.3 80-120 0.1512 0.531 0.050 5.92 15 Boron 0.5 87.5 80-120 0.5634 0.0937 Cadmium 0.04426 0.0020 0.05 -0.00005398 88.6 80-120 0.0498 11.8 15 0.04706 0.0050 9.07 Chromium 0.05 0.002447 89.2 80-120 0.05153 15 0.0050 0.05 10.3 15 Copper 0.04582 0.0001189 91.4 80-120 0.0508 0.04571 0.0050 0.05 0.0005021 90.4 0.05001 8.98 15 Lead 80-120 0.06794 0.0050 0.05 85.5 80-120 0.07247 6.45 15 Manganese 0.02521 Molybdenum 0.05391 0.0050 0.05 0.008842 90.1 80-120 0.05705 5.66 15 Nickel 0.04777 0.0050 0.05 0.001692 92.2 80-120 0.05106 6.66 15 Selenium 0.04411 0.0050 0.05 88.6 80-120 8.03 15 -0.0002051 0.0478 Silver 0.04425 0.0050 0.05 -0.00001074 88.5 80-120 0.04711 6.26 15 0.08208 0.0050 15 0.05 0.0102 144 80-120 0.07134 14 s Zinc

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Client:Navajo Refining CompanyWork Order:1111583

QC BATCH REPORT

'roject: Injection Well Quarterly

Batch ID: 57057

Instrument ID ICP7500 Method: SW6020

DUP Sar	mple ID: 1111390-08ADUP			4	Jnits: mg/	L	Analysi	is Date: 11	/22/2011	10:53 AM
Client ID:	Ru	n ID: ICP750	0_111121A	Se	qNo: 260	5835	Prep Date: 11/1	8/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.8653	0.010	0	0	. 0	0-0	0.9386	8.13	25	
Arsenic	ND	0.0050	0	0	0	0-0	0.0003986	0	25	
Barium	0.09977	0.0050	0	0	0	0-0	0.09717	2.64	25	
Boron	0.09386	0.050	0	0	0	0-0	0.0937	0.171	25	
Cadmium	ND	0.0020	0	0	0	0-0	-0.00005398	0	25	
Chromium	0.001914	0.0050	0	0	0	0-0	0.002447	0	25	J
Copper	ND	0.0050	0	0	0	0-0	0.0001189	0	25	
Lead	ND	0.0050	0	0	0	0-0	0.0005021	0	25	
Manganese	0.02533	0.0050	0	0	0	0-0	0.02521	0.475	25	
Molybdenum	0.008869	0.0050	0	´ 0	0	0-0	0.008842	0.305	25	
Nickel	0.001596	0.0050	0	0	0	0-0	0.001692	0	25	J
Selenium	ND	0.0050	0	0	0	0-0	-0.0002051	0	25	
Silver	ND	0.0050	0	0	0	0-0	-0.00001074	0	25	
Zinc	0.007601	0.0050	0	0	0	0-0	0.0102	29.2	25	R

The following samples were analyzed in this batch:

1111583-01B

See Qualifiers Page for a list of Qualifiers and their explanation.

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Batch ID: 570	092 Instrument ID Mercury		Method	t: SW747	0						
MBLK	Sample ID: GBLKW1-112111-57092				ι	Jnits: mg/	L	Analys	is Date: 1	1/21/2011	03:41 PN
Client ID:	Ru	n ID: MERCL	JRY_111121	A	Se	qNo: 260 4	1989	Prep Date: 11/2	1/2011	DF: 1	
Anabra	Desult	POI	SDK Val	SPK Ref Value		%PEC	Control Limit	RPD Ref Value	%PPD	RPD Limit	Qual
	Result	FQL	SFR Vai			MREC			7014-10		Glubi
Mercury	ND	0.00020									
LCS	Sample ID: GLCSW1-112111-57092				ι	Inits: mg/	L	Analys	is Date: 1	1/21/2011	03:43 PN
Client ID:	Ru	ID: MERCL	JRY_111121	A	Se	qNo: 260 4	1990	Prep Date: 11/2	1/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0051	0.00020	0.005		0	102	85-115	0			
MS	Sample ID: 1111650-06CMS				ι	Jnits: mg/		Analys	is Date: 1	1/21/2011	03:52 PN
Client ID:	Ru	ID: MERCI	JRY_11112	A	Se	qNo: 260 4	1993	Prep Date: 11/2	21/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00495	0.00020	0.005	0.0000	03	98.9	85-115	0			
MSD	Sample ID: 1111650-06CMSD				-ι	Jnits: mg/	L	Analys	is Date: 1	1/21/2011	03:54 PM
∩lient ID:	Ru	in ID: MERCU	JRY_11112	1A	Se	qNo: 260	1994	Prep Date: 11/2	21/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00494	0.00020	0.005	0.0000	03	98.7	85-115	0.00495	0.202	20	
DUP	Sample ID: 1111650-06CDUP				ι	Jnits: mg/		Analys	is Date: 1	1/21/2011	03:50 PM
Client ID:	Ru	in ID: MERCI	JRY_11112	1A	Se	qNo: 260 4	1992	Prep Date: 11/2	1/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020	0		0	0	0-0	0.000003	0	20	
The followin	a samples were analyzed in this batr	:h: 1'	111583-01B	······							

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Navajo Refining Company

Injection Well Quarterly

1111583

Client: Work Order:

`roject:

See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

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Client: Navajo Refining Company Work Order: 1111583

roject: Injection Well Quarterly

QC BATCH REPORT

Batch ID: 57144

Instrument ID SV-3

Method: SW8270

MBLK Sample ID: SBLKW2-1	111122-57144				Units: µg/	L	Analy	sis Date: 1	1/26/2011	12:20 PM
Client ID:	Run ID): SV-3_1	11126A		SeqNo: 261	0980	Prep Date: 11/	/22/2011	DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
124-Trichlorobenzene	ND	50								
2.4.5-Trichlorophenol		5.0								
24.6-Trichlorophenol	ND	5.0								
2.4-Dinitrotoluene	ND	5.0					· · · · · · · · · · · · · · · · · · ·			
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	50								
2-Nitroaniline	ND	5.0								
2-Nitrophenol	ND	5.0			··	·				
3&4-Methviphenol	ND	5.0								
3-Nitroaniline	ND	5.0								
4-Nitroaniline	ND	5.0								
4-Nitrophenol	ND	5.0				··				
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Aniline	ND	5.0								
Anthracene	ND	5.0					· · · · · · · · · · · · · · · · · · ·			
Tenz(a)anthracene	ND	5.0								
Izidine	ND	5.0							·	
exachlorobenzene	ND	5.0								
Hexachloroethane	ND	5.0	,							
Indeno(1.2.3-cd)pyrene	ND	5.0								
Isophorone	ND	5.0								
Naphthalene	ND	5.0								
Nitrobenzene	ND	5.0						· · · · · · · · · · · · · · · · · · ·		
N-Nitrosodimethylamine	ND	5.0								
N-Nitrosodi-n-propylamine	ND	5.0		·			su:			
N-Nitrosodiphenylamine	ND	5.0								
Pentachlorophenol	ND	5.0	,							
Phenanthrene	ND	5.0								
Phenol	ND	5.0								
Pyrene	ND	5.0								
Pyridine	ND	5.0								
Surr: 2,4,6-Tribromophenol	63.24	5.0	100		0 63.2	42-124	!	0		
Surr: 2-Fluorobiphenyl	69.15	5.0	100		0 69.1	48-120)	0		
Surr: 2-Fluorophenol	63.19	5.0	100		0 63.2	20-120)	0		
Surr: 4-Terphenyl-d14	74.18	5.0	100		0 74.2	51-135	;	0		
Sur: Nitrobenzene-d5	79.25	5.0	100		0 79.2	41-120)	0		
Sur: Phenol-d6	64.16	5.0	100		0 64.2	20-120)	0		-

Client:Navajo Refining CompanyWork Order:1111583

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: 5714	Instrument ID SV-3

Method: SW8270

LCS Sample ID: SLCSW2-1	11122-57144				ι	Jnits: µg/L		Analysi	is Date: 1	1/26/2011	12:44 PM
Client ID:	Run ID): SV-3_1	11126A		Se	qNo: 2610	981	Prep Date: 11/2	2/2011	DF: 1	
		_		SPK Ref			Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
1,2,4-Trichlorobenzene	43.7	5.0	50		0	87.4	50-120	0			
2,4,5-Trichlorophenol	76.5	5.0	100		0	76.5	50-120	0			
2,4,6-Trichlorophenol	73.36	5.0	100		0	73.4	50-120	0			
2,4-Dinitrotoluene	44.89	5.0	50		0	89.8	50-120	0			
2-Methylnaphthalene	44.2	5.0	50		0	88.4	55-120	0			
2-Methylphenol	81.1	5.0	100		0	81.1	50-120	0			
2-Nitroaniline	48.86	5.0	50		0	97.7	55-120	0			
2-Nitrophenol	81.31	5.0	100		0	81.3	55-120	0			
3&4-Methylphenol	118.5	5.0	150		0	79	55-120	0			
3-Nitroaniline	35.31	5.0	50		0	70.6	40-120	0			
4-Nitroaniline	40.52	5.0	50		0	81	50-120	0			
4-Nitrophenol	107.2	5.0	100		0	107	45-120	0			
Acenaphthene	47.07	5.0	50		0	94 .1	55-120	0			
Acenaphthylene	44.62	5.0	50		0	89.2	55-120	0			
Aniline	19.65	5.0	50		0	39.3	30-120	0			
Anthracene	49.81	5.0	50		0	99.6	55-120	0			
Penz(a)anthracene	45.96	5.0	50		0	91.9	55-120	0			
zidine	15.78	5.0	50		0	31.6	10-120	0			
_xachlorobenzene	43.44	5.0	50		0	86.9	55-120	0			
Hexachloroethane	47.28	5.0	50		0	94.6	55-120	0			•
Indeno(1,2,3-cd)pyrene	47.86	5.0	50		0	95.7	55-120	0			
Isophorone	46.51	5.0	50		0	93	55-120	0			
Naphthalene	45.36	5.0	50		0	90.7	55-120	0			
Nitrobenzene	48.59	5.0	50		0	97.2	55-120	0			
N-Nitrosodimethylamine	41.92	5.0	50		0	83.8	45-120	0			
N-Nitrosodi-n-propylamine	38.49	5.0	50		0	77	50-120	0			
N-Nitrosodiphenylamine	50.64	5.0	50		0	101	55-120	0			
Pentachlorophenol	75.27	5.0	100		0	75.3	55-120	0			
Phenanthrene	47.17	5.0	50		0	94.3	55-120	0			
Phenol	79.61	5.0	100		0	79.6	50-120	. 0			
Pyrene	48.99	5.0	50		0	98	55-120	0			
Pyridine	33.5	5.0	50		0	67	35-120	0			
Sur: 2,4,6-Tribromophenol	65.97	5.0	100		0	66	42-124	0			
Surr: 2-Fluorobiphenyl	73.06	5.0	100		0	73.1	48-120	0			
Sur: 2-Fluorophenol	80.4	5.0	100		0	80.4	20-120	0			
Surr: 4-Terphenyl-d14	69.78	5.0	100		0	69.8	51-135	0			
Sur: Nitrobenzene-d5	84.41	5.0	100		0	84.4	41-120	0			
Surr: Phenol-d6	75.11	5.0	100		0	75.1	20-120	0			

B. /

Client: Navajo Refining Company Work Order: 1111583

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: 57144

Instrument ID SV-3

Method: SW8270

LCSD Sample ID: SLCSDW2-111	122-57144				ί	Inits: µg/L		Anatysi	s Date: 11	/26/2011	01:55 PM
Client ID:	Runl	D: SV-3_1	11126A		Se	qNo: 261(982	Prep Date: 11/2	2/2011	DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
1,2,4-Trichlorobenzene	44.14	5.0	50		0	88.3	50-120	43.7	1.01	20	
2,4,5-Trichlorophenol	81.01	5.0	100		0	81	50-120	76.5	5.73	20	
2,4,6-Trichlorophenol	73.32	5.0	100		0	73.3	50-120	73.36	0.0553	20	
2,4-Dinitrotoluene	41.89	5.0	50		0	83.8	50-120	44.89	6.92	20	
2-Methylnaphthalene	43.62	5.0	50		0	87.2	55-120	44.2	1.33	20	
2-Methylphenol	80.35	5.0	100		0	80.4	50-120	81.1	0.932	20	
2-Nitroaniline	48	5.0	50		0	96	55-120	48.86	1.79	20	
2-Nitrophenol	80.26	5.0	100		0	80.3	55-120	81.31	1.29	20	
3&4-Methylphenol	115.5	5.0	150		0	77	55-120	118.5	2.57	20	
3-Nitroaniline	31.72	5.0	50		0	63.4	40-120	35.31	10.7	20	
4-Nitroaniline	39.87	5.0	50		0	79.7	50-120	40.52	1.63	20	
4-Nitrophenol	91.52	5.0	100		0	91.5	45-120	107.2	15.8	20	
Acenaphthene	46	5.0	50		0	92	55-120	47.07	2.28	20	
Acenaphthylene	43.81	5.0	50		0	87.6	55-120	44.62	1.84	20	
Aniline	20.19	5.0	50		0	40.4	30-120	19.65	2.7	20	
Anthracene	49.76	5.0	50		0	99.5	55-120	49.81	0.0999	20	
³ enz(a)anthracene	44.47	5.0	50		0	88.9	55-120	45.96	3.31	20	
Izidine	18.44	5.0	50		0	36.9	10-120	15.78	15.6	20	
axachiorobenzene	43.97	5.0	50		0	87. 9	55-120	43.44	1.19	20	
Hexachloroethane	48.09	5.0	50		0	96.2	55-120	47.28	1.7	20	
Indeno(1,2,3-cd)pyrene	50.61	5.0	50		0	101	55-120	47.86	5.59	20	
Isophorone	45.94	5.0	50		0	91.9	55-120	46.51	1.23	20	
Naphthalene	45.79	5.0	50		0	91.6	55-120	45.36	0.941	20	
Nitrobenzene	48.04	5.0	50		0	96.1	55-120	48.59	1.13	20	
N-Nitrosodimethylamine	41.76	5.0	50		0	83.5	45- <u>120</u>	41.92	0.379	20	
N-Nitrosodi-n-propylamine	39.98	5.0	50		0	80	50-120	38.49	3.8	20	
N-Nitrosodiphenylamine	51.99	5.0	50		0	104	55-120	50.64	2.62	20	
Pentachlorophenol	75.11	5.0	100		0	75.1	55-120	75.27	0.209	20	
Phenanthrene	47.52	5.0	50		0	95	55-120	47.17	0.75	20	
Phenol	79.27	5.0	100		0	79.3	50-120	79.61	0.433	20	
Pyrene	44.21	5.0	50		0	88.4	<u>55-120</u>	48.99	10.3	20	
Pyridine	32.9	5.0	50		0	65.8	35-120	33.5	1.81	20	
Sur: 2,4,6-Tribromophenol	63.56	5.0	100		0	63.6	42-124	65.97	3.72	20	
Surr: 2-Fluorobiphenyl	76.86	5.0	100		0	76.9	48-120	73.06	5.07	20	
Surr: 2-Fluorophenol	81.88	5.0	100		0	81.9	20-120	80.4	1.81	20	
Surr: 4-Terphenyl-d14	67.27	5.0	100		0	67.3	51-135	69.78	3.66	20	
Surr: Nitrobenzene-d5	83.57	5.0	100		0	83.6	41-120	84.41	0.997	20	
Surr: Phenol-d6	74.67	5.0	100		0	74.7	20-120	75.11	0.58	20	
The following samples were analyzed i	in this batch:	11	11583-01E								

1111583-01E

4

Client: Navajo Refining Company Work Order: 1111583

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: R119531	Instrument ID VOA1		Metho	d: SW826	0					
MBLK Sample ID: V	/BLKW-111811-R119531				Units: µg	/L	Analy	sis Date: 1	1/18/2011	11:30 AM
Client ID:	Run II	: VOA1_	111118A		SeqNo: 26	03465	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control	RPD Ref Value	%RPD	RPD Limit	Qual
1.1.1-Trichloroethane	ND	5.0								
1,1,2,2-Tetrachloroethane	ND	5.0						-		
1,1,2-Trichloroethane	. ND	5.0								
1.1-Dichloroethane	ND	5.0	A.4.4							
1,1-Dichloroethene	ND	5.0								
1.2-Dichloroethane	ND	5.0						_		
2-Butanone	ND	10								
2-Chloroethyl vinyl ether	ND	10								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Acetone	ND	10								
Benzene	ND	5.0		····				-		
Bromodichloromethane	ND	5.0								
Bromoform	ND	5.0								
Bromomethane	ND	5.0								
Carbon disulfide	ND	10	· · ·	*****						
Arbon tetrachloride	ND	5.0								
orobenzene	ND	5.0								
loroethane	ND	5.0								
Chloroform	ND	5.0						_		
Chloromethane	ND	5.0								
cis-1,3-Dichloropropene	ND	5.0								
Dibromochloromethane	ND	5.0								
Methylene chloride	ND				· · · · · · · · · · · · · · · · · · ·					
Styrene	ND	5.0								
Tetrachloroethene	ND	5.0								
trans-1,3-Dichloropropene	ND	5.0								
Trichloroethene	ND	5.0								
Vinyl acetate	ND	10								
Vinyl chloride	ND	2.0						_		
Surr: 1,2-Dichloroethane	-d4 52.89	5.0	50		0 106	70-125	;	0		
Surr: 4-Bromofluorobenz	ene 47.57	5.0	50		0 95.1	72-125	;	0		
Surr: Dibromofluorometh	ane 49.37	5.0	50		0 98.7	<u>71-125 7</u>	5	0		
Surr: Toluene-d8	50.55	5.0	50		0 101	75-125	;	0		

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Client:Navajo Refining CompanyWork Order:1111583

instrument ID VOA1

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: R119531

Method: SW8260

LCS Sample ID: VLCSW-11	1811-R119531				ι	Jnits: µg/L		Anal	ysis	Date: 1	1/18/201	1 10:39 AM
Client ID:	Run ID	: VOA1_	111118A		Se	qNo: 2603	3464	Prep Date:			DF: 1	
							Control				RPD	
Analyte	Result	PQL	SPK Val	Value		%REC	Limit	Value		%RPD	Limit	Qual
1,1,1-Trichloroethane	48.08	5.0	50		0	96.2	80-120		0			
1,1,2,2-Tetrachloroethane	47.11	5.0	50		0	94.2	72-120		0			
1,1,2-Trichloroethane	48.34	5.0	50		0	96.7	80-120		0			
1,1-Dichloroethane	52.07	5.0	50		0	104	76-120		0			
1,1-Dichloroethene	51.37	5.0	50	6	0	103	73-124		0			
1,2-Dichloroethane	49.44	5.0	50		0	98.9	78-120		0			
2-Butanone	94.48	10	100		0	94.5	58-132		0			
2-Chloroethyl vinyl ether	95.22	10	100		0	95.2	74-120		0			
2-Hexanone	90.38	10	100		0	90.4	61-130		0			
4-Methyl-2-pentanone	102.4	10	100		0	102	65-127		0			
Acetone	80.79	10	100		0	80.8	59-137		0			
Benzene	48.71	5.0	50		0	97.4	73-121		0			
Bromodichloromethane	49.34	5.0	50		0	98.7	80-120		0			
Bromoform	46.9	5.0	50		0	93.8	79-120		0			
Bromomethane	51.42	5.0	50		0	103	66-137		0			
Carbon disulfide	99.99	10	100		0	100	68-141		0			
Carbon tetrachloride	48.22	5.0	50		0	96.4	75-124		0			
orobenzene	48.41	5.0	50		0	96.8	80-120		0			
	53.54	5.0	50		0	107	76-121		0			
Chloroform	51.08	5.0	50		0	102	80-120		0			
Chloromethane	45.6	5.0	50		0	91.2	67-123		0			
cis-1,3-Dichloropropene	52.66	5.0	50		0	105	80-120		0			
Dibromochloromethane	53.64	5.0	50		0	107	80-120		0			
Methylene chloride	44.96	10	50		0	89.9	65-133		0			
Styrene	50.95	5.0	50		0	102	80-120		0			
Tetrachloroethene	48.08	5.0	50		0	96.2	79-120		0			
trans-1,3-Dichloropropene	46.09	5.0	50		0	92.2	80-120		0			
Trichloroethene	49.24	5.0	50		0	98.5	80-120		0			
Vinyl acetate	97.51	10	100		0	97.5	67-139		0			
Vinyl chloride	47.95	2.0	50		0	95.9	70-127		0			
Sur: 1,2-Dichloroethane-d4	48.56	5.0	50		0	9 7.1	70-125		0	•		
Surr: 4-Bromofluorobenzene	49.45	5.0	50		0	98.9	72-125		0			
Sur: Dibromofluoromethane	49.06	5.0	50		0	<u>98.1</u>	71-125		0			
Sun: Toluene-d8	51.1	5.0	50		0	102	75-125		0			

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Client:Navajo Refining CompanyWork Order:1111583roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: R119531 Instrument ID VOA1

Method: SW8260

MS Sample ID: 1	111486-07AMS			·			Jnits: µg/L		Anal	ysis Date	11/18/20	11 02:03 PM
Client ID:		Ru	n ID: VOA1	111118A		Se	qNo: 2603	470	Prep Date:	-	DF:	1
			-		CDV D-f		•	Control			000	
Analyte		Result	PQL	SPK Val	Value		%REC	Limit	Value	%RP	D Limit	Qual
1,1,1-Trichloroethane		45.49	5.0	50		0	91	80-120		0		
1,1,2,2-Tetrachloroethane		47.57	5.0	50		0	95.1	72-120		0		
1,1,2-Trichloroethane		51.12	5.0	50		0	102	80-120		0		
1,1-Dichloroethane		50.47	5.0	50		0	101	76-120		0		
1,1-Dichloroethene		43.64	5.0	50		0	87.3	73-124		0		
1,2-Dichloroethane		50.25	5.0	50		0	100	78-120		0		
2-Butanone		92.2	10	100		0	92.2	58-132		0		
2-Chloroethyl vinyl ether		ND	10	100		0	0	74-120		0		S
2-Hexanone		96.22	10	100		0	96.2	61-130		0		
4-Methyl-2-pentanone		110.5	10	100		0	110	65-127	1	0		
Acetone		70.04	10	100		0	70	59-137		0		
Benzene		49	5.0	50		0	98	73-121		0		
Bromodichloromethane		51.57	5.0	50		0	103	80-120		0		
Bromoform		47.36	5.0	50		0	94.7	79-120		0		
Bromomethane		38.91	5.0	50		0	77.8	66-137		0		
Carbon disulfide		90.98	10	100		0	91	68-141		0		
Carbon tetrachloride		43.95	5.0	50		0	87.9	75-124		0		
probenzene	, <u>, , , , , , , , , , , , , , , , , , </u>	46.83	5.0	50		0	93.7	80-120		0		
loroethane		45.49	5.0	50		0	91	76-121		0		
Chloroform		51.98	5.0	50		0	104	80-120		0		
Chloromethane		42.62	5.0	50		0	85.2	67-123		0		
cis-1,3-Dichloropropene		51.24	5.0	50		0	102	80-120		0		
Dibromochloromethane		52.88 ⁻	5.0	50		0	106	80-120		0		
Methylene chloride		48.91	10	50		0	97.8	65-133		0	•	
Styrene		51.07	5.0	50		0	102	80-120		0		
Tetrachloroethene		45.21	5.0	50		0	90.4	79-120		0		
trans-1,3-Dichloropropene		45.32	5.0	50		0	9 0.6	80-120		0		
Trichloroethene		49.06	5.0	50		0	98.1	80-120		0		
Vinyl acetate		99.24	10	100		0	99.2	67-139		0		
Vinyl chloride		44.28	2.0	50		0	88.6	70-127		0		
Surr: 1,2-Dichloroethane	-d4	51.74	5.0	50		0	103	70-125		0		
Sur: 4-Bromofluorobenz	ene	50.48	5.0	50		0	101	72-125		0		
Surr. Dibromofluorometh	ane	<u>51.01</u>	5.0	50		0	102	71-125		0		
Surr: Toluene-d8		48.63	5.0	50		0	97.3	75-125		0		

4

Client: Navajo Refining Company Work Order: 1111583

QC BATCH REPORT

`roject: Injection Well Quarterly

Batch ID: R119531

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Instrument ID VOA1

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Method: SW8260

MSD Sample ID: 1111486-07AM	ASD				Uni	ts:µg/L		Analysi	s Date: 11	/18/2011	02:29 PM
Client ID:	Run II	D: VOA1_	111118A		SeqN	lo: 260 3	471	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	9	6REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1.1.1-Trichloroethane	48.74	5.0	50		0	97.5	80-120	45.49	6.88	20	
1,1,2,2-Tetrachloroethane	48.94	5.0	50		0	97.9	72-120	47.57	2.83	20	n.
1,1,2-Trichloroethane	51.1	5.0	50	I	0	102	80-120	51.12	0.0563	20	
1,1-Dichloroethane	53.13	5.0	50	· · · - · · · · · · · · · · · · · · · ·	0	106	76-120	50.47	5.12	20	
1,1-Dichloroethene	48.9	5.0	50		0	97.8	73-124	43.64	11.4	20	
1,2-Dichloroethane	50.75	5.0	50		0	102	78-120	50.25	1	20	
2-Butanone	89	10	100		0	89	58-132	92.2	3.53	20	
2-Chloroethyl vinyl ether	ND	10	100		0	0	74-120	0	0	20	S
2-Hexanone	95.51	10	10 0		0	95.5	61-130	96.22	0.74	20	
4-Methyl-2-pentanone	110.3	10	100		0	110	65-127	110.5	0.208	20	
Acetone	69.56	10	100		0	69.6	59-137 ⁻	70.04	0.686	20	
Benzene	48.98	5.0	50		0	98	73-121	49	0.0449	20	-
Bromodichloromethane	51.44	5.0	50		0	103	80-120	51.57	0.257	20	
Bromoform	47.7	5.0	50		0	95.4	79-120	47.36	0.719	20	
Bromomethane	47.39	5.0	50		0	94.8	66-137	38.91	19.7	20	
Carbon disulfide	98.16	10	100		0	98.2	68-141	90.98	7.59	20	
Carbon tetrachloride	47.55	5.0	50		0	95.1	75-124	43.95	7.87	20	
lorobenzene	50.29	5.0	50		0	101	80-120	46.83	7.14	20	
nloroethane	50.05	5.0	50		0	100	76-121	45.49	9.54	20	
Chloroform	50.43	5.0	50		0	101	80-120	51.98	3.03	20	
Chloromethane	43.85	5.0	50		0	87.7	67-123	42.62	2.86	20	
cis-1,3-Dichloropropene	52.56	5.0	50		0	105	80-120	51.24	2.54	20	
Dibromochloromethane	53.58	5.0	50	_	0	107	80-120	52.88	1.31	20	
Methylene chloride	48.7	10	50		0	97.4	65-133	48.91	0.434	20	
Styrene	51.58	5.0	50		0	103	80-120	51.07	0.997	20	
Tetrachloroethene	48.19	5.0	50		0	96.4	79-120	45.21	6.38	20	
trans-1,3-Dichloropropene	48.66	5.0	50		0	97.3	80-120	45.32	7.1	20	
Trichloroethene	47.91	5.0	50		0	95.8	80-120	49.06	2.37	20	
Vinyl acetate	104.3	10	100		0	104	67-139	99.24	4.99	20	
Vinyl chloride	46.25	2.0	50		0	92.5	70-127	44.28	4.35	20	
Surr: 1,2-Dichloroethane-d4	51.88	5.0	50	-	0	104	70-125	51.74	0.281	20	
Surr: 4-Bromofluorobenzene	50.71	5.0	50		0	101	72-125	50.48	0.461	20	
Surr: Dibromofluoromethane	51.28	5.0	50		0	103	71-125	51.01	0.514	20	
Sur: Toluene-d8	50.04	5.0	50		0	100	75-125	48.63	2.85	20	
The following samples were analyzed	in this batch:	11	111583-01A								

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Client:Navajo Refining CompanyWork Order:1111583'roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: R1	19544	nstrument ID VOA6		Metho	d: SW826	i0			<u>.</u>		
MBLK	Sample ID: VE	LKW-112011-R119544				Units: µg/		Analy	sis Date: 1	1/20/2011	12:42 PM
Client ID:		Run I	D: VOA6_	111120A		SeqNo: 260	3885	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylbenzene	1	ND	5.0								
m,p-Xylene		ND	10								-
o-Xylene		ND	5.0								
Toluene		ND	5.0								
Xylenes, Tota	al 👘	ND	15								_
Surr: 1,2-D	ichloroethane-c	14 54.48	5.0	50		0 109	70-125		0		
Surr: 4-Bro	mofluorobenzei	ne 52.03	5.0	50		0 104	72-125		0		_
Surr. Dibro	mofluorometha	n o 49.01	5.0	50		0 98	71-125		0		
Surr: Tolue	ane-d8	49.03	5.0	50		<u>0</u> 98.1	75-125		0		
LCS	Sample ID: VL	.CSW-112011-R119544	-			Units: µg/	L	Analy	ysis Date: 1	1/20/2011	11:50 AM
Client ID:		Run		444420.4		Sechia: 260	2004	Pron Data:			

		-		21.1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylbenzene	46.04	5.0	50	0	92.1	80-120		0		
m,p-Xylene	91.66	10	100	· 0	91.7	78-121	()		,
Xylene	45.82	5.0	50	0	91.6	80-120	(כ		
uene	46.25	5.0	50	0	92.5	80-120		0		
Xylenes, Total	137.5	15	150	0	91.7	80-120		0		
Surr. 1,2-Dichloroethane-d4	50.48	5.0	50	0	101	70-125	()		
Surr: 4-Bromofluorobenzene	51.71	5.0	50	0	103	72-125		00		
Surr: Dibromofluoromethane	47.84	5.0	50	0	95.7	71-125	(5		
Sur: Toluene-d8	48.55	5.0	50	0	97.1	75-125	()		

MS Sample ID: 11	111481-01ZMS				Uni	its: µg/L		Analysis Date: 11/20/2011 02:02 PN				
Client ID:	Run ID	: VOA6_	111120A		SeqN	lo: 260 3	8888	Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	Q	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Ethylbenzene	44.88	5.0	50		0	89.8	80-120		00			
m,p-Xylene	90.2	10	100	1	0	90.2	78-121	1	0			
o-Xylene	45.02	5.0	50	1	0	90	80-120		0			
Toluene	45.08	5.0	50	-	0	90.2	80-120		ō			
Xylenes, Total	135.2	15	150	1	0	90.1	80-120		0			
Surr: 1,2-Dichloroethane-	d4 51.1	5.0	50	I	0	102	70-125		0			
Surr: 4-Bromofluorobenze	ne 51.96	5.0	50		0	104	72-125		0		-	
Surr: Dibromofluorometha	ne 47.94	5.0	50		0	95.9	71-125		0			
Surr: Toluene-d8	48.69	5.0	50		0	97.4	75-125		0			

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See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Navajo Refining Company Work Order: 1111583 Injection Well Quarterly roject:

QC BATCH REPORT

Batch ID: R119544 Instrument ID VOA6

Method: SW8260

MSD Sample ID: 1111481	-01ZMSD				Units: µg/L	-	Analysis Date: 11/20/2011 02:28 PM				
Client ID:	Run II	Run ID: VOA6_111120A			eqNo: 260	3889	Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Ethylbenzene	44.03	5.0	50	0	88.1	80-120	44.88	1.91	20		
m,p-Xylene	87.66	10	100	0	87.7	78-121	90.2	2.85	20		
o-Xylene	44.45	5.0	50	0	88.9	80-120	45.02	1.28	20		
Toluene	45	5.0	50	0	90	80-120	45.08	0.171	20		
Xylenes, Total	132.1	15	150	0	88.1	80-120	135.2	2.32	20		
Surr: 1,2-Dichloroethane-d4	51.4	5.0	50	0	103	70-125	51.1	0.585	20		
Surr: 4-Bromofluorobenzene	51.23	5.0	50	0	102	72-125	51.96	1.4	20		
Surr: Dibromofluoromethane	48.14	5.0	50	0	96.3	71-125	47.94	0.414	20		
Surr: Toluene-d8	48.74	5.0	50	0	97.5	75-125	48.69	0.102	20		

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client:	Navajo Refining Company
Work Order:	1111583
roject:	Injection Well Quarterly

QC BATCH REPORT

Batch ID: R	119462	Instrument ID WetChem		Metho	d: M2510	в						
	Sample ID	: WBLKW1-111711-R119462		UEM 11111	75	L Se	Inits: µmh	108/cm	Anal Pren Date:	lysis Date:	11/17/2011	11:00 AM
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	nductivity	ND	1.0									
LCS	Sample ID	WLCSW1-111711-R119462		·		L	Jnits: µmh	nos/cm	Ana	lysis Date:	11/17/2011	11:00 AM
Client ID:		Run ID	: WETC	HEM_11111	7F	Se	qNo: 260 '	1280	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC_	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	onductivity	1450	1.0	1413		0	103	80-120		0		
DUP	Sample ID	: 1111560-01BDUP				ι	Jnits: µmh	nos/cm	Ana	lysis Date:	11/17/2011	11:00 AM
Client ID:		Run ID	: WETC	HEM_11111	7F	Se	qNo: 260 '	1306	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	-	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	onductivity	624	1.0	0		0	0		6	16 1.2	9 20	
The follow	ring samples	were analyzed in this batch:	1	111583-01D								

<u>.</u>**

Client:Navajo Refining CompanyWork Order:1111583'roject:Injection Well Quarterly

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QC BATCH REPORT

Batch ID: R	119505	Instrument ID WetChem		Method	SW904	0					. <u> </u>	
LCS	Sample ID	E WLCSW1-111711-R119505				ι	Jnits: pH u	units	Anal	sis Date:	11/17/2011	05:00 PM
Client ID:		Run I	D: WETC	HEM_111117	I	Se	qNo: 260 2	2234	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pН		6.04	0.10	6		0	101	90-110		0		
DUP	Sample ID	: 1111611-01ADUPZ				ι	Jnits: pH ı	units	Anat	sis Date:	11/17/2011	05:00 PM
Client ID:		Run I	D: WETC	HEM_111117	1	Se	qNo: 2602	2239	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
рН		8.36	0.10	0		0	. 0	0-0	8.4	3 0.83	4 20	н
The follow	ing samples	were analyzed in this batch:	1	111583-01D								

See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: R	119643	Instrument ID WetChem		Metho	d: SW101	0							
LCS	Sample ID	WLCS-112211-R119643				. (Jnits: °F		Ana	lysis	Date: 11	/22/2011	02:00 PM
Client ID:		Run I	D: WETCH	HEM_11112	2G	Se	eqNo: 260	6058	Prep Date:			DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability		86	50	83		0	104	80-120	<u> </u>	0			
LÇSD	Sample ID	: WLCSD-112211-R119643				l	Jnits: °F		Ana	iysis	Date: 11	/22/2011	02:00 PM
Client ID:		Run I	D: WETCH	HEM_11112	2G	Se	qNo: 260	6066	Prep Date:			DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability		85	50	83		0	102	80-120	· · · · · · · · · · · · · · · · · · ·	86	1.17	25	
DUP	Sample ID	: 1111664-01DDUP					Units: °F		Ana	lysis	Date: 11	1/22/2011	02:00 PM
Client ID:		Run I	D: WETCH	HEM_11112	2G	Se	eqNo: 260	6067	Prep Date:			DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value		%RPD	RPD Limit	Qual
Ignitability		123	50	0		0	0	0-0	1	24	0.81	25_	
The follow	ing samples	were analyzed in this batch:	1	111583-01D	· · · · · · · · · · · · · · · · · · ·								

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client:	Navajo Refining Company
Work Order:	1111583
`roject:	Injection Well Quarterly

QC BATCH REPORT

Batch ID: R119716 Instrume	ent ID WetChem		Metho	d: SM232	0B						
MBLK Sample ID: WBLKW1	-112311-R119716				ι	Jnits: mg/ l		Analys	is Date: 1	1/23/2011	07:55 AM
Client ID:	Run ID	WETCH	IEM_11112	3A	Se	qNo: 2606	6956	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	5.0									
Alkalinity, Carbonate (As CaCO3)	ND	5.0									
Alkalinity, Hydroxide (As CaCO3)	ND	5.0									
Alkalinity, Total (As CaCO3)	ND	5.0							<u> </u>		
LCS Sample ID: WLCSW1	-112311-R119716				ι	Jnits: mg/	<u></u>	Analys	is Date: 1	1/23/2011	07:55 AM
Client ID:	WETCH	iEM_11112	3A	SeqNo: 2606957			Prep Date:	DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1046	5.0	1000		0	105	80-120				
DUP Sample ID: 1111583-	D1CDUP				ι	Jnits: mg/		Analys	is Date: 1	1/23/2011	07:55 AM
Client ID: Wastewater Effluent	Run ID	: WETCH	IEM_11112	3A	Se	qNo: 260	6981	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
* kalinity, Bicarbonate (As CaCO3)	223.8	5.0	0		0	0	0-0	217.2	3	3 20	
alinity, Carbonate (As CaCO3)	ND	5.0	0		0	0	0-0	0	(20	
«kalinity, Hydroxide (As CaCO3)	ND	5.0	0		0	0	0-0	0) 20	
Alkalinity, Total (As CaCO3)	223.8	5.0	. 0		0	0	0-0	217.2	3	3 20	
The following samples were analy	zed in this batch:	11	11583-01C						·		

See Qualifiers Page for a list of Qualifiers and their explanation.

Client:Navajo Refining CompanyWork Order:1111583'roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: R	Instrument ID	Balance1		Metho	d: M2540	c					<u> </u>	
MBLK	Sample ID: BLANK-R11973	18				ι	Jnits: mg/	L	Anaty	sis Date: 1	1/22/2011	01:00 PM
Client ID:		Runll	D: BALAN	ICE1_11112	22C	Se	qNo: 260 7	7823	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	lved Solids (Residue, Filt	ND	10									
LCS	Sample ID: LCS-R119738					ι	Jnits: mg/	L	Analy	sis Date: 1	1/22/2011	01:00 PM
Client ID:		Run II	D: BALAN	ICE1_11112	22C	Se	qNo: 260	7824	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	lved Solids (Residue, Filt	1016	10	1000	·	0	102	85-115	()		
DUP	Sample ID: 1111630-12ADL	JP				τ.	Jnits: mg/	L	Analy	sis Date: 1	1/22/2011	01:00 PM
Client ID:		Runli	D: BALAN	ICE1_11112	22C	Se	qNo: 260	7806	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Valúe		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	lived Solids (Residue, Filt	1396	10	0		0	0	0-0	1312	2 6.2	20	
DUP	Sample ID: 1111679-01BDI	JP				ι	Jnits: mg/	L	Analy	sis Date: 1	1/22/2011	01:00 PM
∩lient ID:		Runl	D: BALAN	ICE1_11112	22C	Se	qNo: 260	7821	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Disso	lved Solids (Residue, Filt	1230	10	0		0	0	0-0	121:	2 1.47	20	
The follow	ing samples were analyzed in	n this batch:	1	111583-01C								

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client:	Navajo Refining Company
Work Order:	1111583
roject:	Injection Well Quarterly

QC BATCH REPORT

		· · · · · · · · · · · · · · · · · · ·										
Batch ID: R	119835	Instrument ID ICS2100	······	Method	E300							
MBLK	Sample ID:	WBLKS1-112611-R119835				U	Inits: mg/l	L	Analys	is Date: 11	/26/2011	04:12 PM
Client ID:		Run ID:	ICS210	0_111126A		Se	qNo: 261()644	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		ND	0.50									
Sulfate		ND	0.50									
Surr: Sel	lenate (surr)	4.527	0.10	5		0	90.5	85-115	0			
LCS	Sample ID:	WLCSS1-112611-R119835				U	Inits: mg/l	L	Analys	is Date: 11	/26/2011	04:27 PM
Client ID:		Run ID:	ICS210	0_111126A		Se	qNo: 2610	645	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		20.79	0.50	20		0	104	90-110	0			•······
Sulfate		21.22	0.50	20		0	106	90-110	0			
Surr: Sel	lenate (surr)	4.853	0.10	5	17 1 II II II II II	0	97.1	85-115	0			
LCSD	Sample ID:	WLCSDS1-112611-R119835)nits: ma/		Analys	is Date: 11	/26/2011	04:41 PM
Client ID:	y Run ID: ICS21			0_111126A		Se	qNo: 261()647	Prep Date:		DF: 1	
Anakte		Result	POI	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Oual
					<u></u>		/01/12/0					
		20.68	0.50	20		0	103	90-110	20.79	0.535	20	
Sum Sei	lenate (sum)	4.672	0.50	20 5		0	93.4	85-115	4.853	0.200	20 20	
	0 1 10											
MS Client ID/	Sample ID:	1111407-01EMS	109240	0 44442EA		ں جم	nits: mg/	L)640	Analys Bron Data:	is Date: 11	DE: 40	05:11 PM
		Ruind.	169210	0_1111204		36	4140. 20 1 4	7049	Fiep Date.		UF. 10	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		394.3	5.0	100	2	55	139	80-120	0			S
Sulfate		104.4	5.0	100	2.2	66	102	80-120	0			
Surr: Sel	lenate (surr)	48.02	1.0	50		0	96	85-115	0		·	
MSD	Sample ID:	1111407-01EMSD				L	Jnits: mg/	L	Analys	is Date: 11	/26/2011	05:25 PM
Client ID:		Run ID:	ICS210	0_111126A		Se	qNo: 261 (0650	Prep Date:		DF: 10	
Analvte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		305 4	5.0	100		55	140	80-120	204 3	0 273	20	
Sulfate		104.5	5.0	100	22	66 66	102	80-120	104.4	0.0651	20	<u> </u>
Surr: Sel	lenate (surr)	49.57	1.0	50		0	99.1	85-115	48.02	3.19	20	
				· · · · · · · · · · · · · · · · · · ·								

The following samples were analyzed in this batch:

1111583-01C

e: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Project: WorkOrder:	Navajo Refining Company Injection Well Quarterly 1111583	QUALIFIERS, ACRONYMS, UNITS					
Oualifier	Description						

<u>Qualifier</u>	Description
*	Value exceeds Regulatory Limit
а	Not accredited
В	Analyte detected in the associated Method Blank above the Reporting Limit
E.	Value above quantitation range
Н	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
М	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
ĸ	RPD above laboratory control limit
5	Spike Recovery outside laboratory control limits
	Analyzed but not detected above the MDL
Асголут	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program
Units Reported	Description
°F	Farenheit degrees
µmhos/cm	
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
pH units	

	 ALS Laboratory Group 10450 Stancliff Rd. #210 Houston, Texas 77099 (Tel) 281.530.5656 (Fax) 281.530.5887 		Ch	ain of (Page _1_	of	dy Fo	-	NAV	/AJ(D R Proj	11 EFIN	ING: njecti	15 Navaj on W	o Refi	3 ning C arterly	ompa	iny	OP LD
ALS)		S Project J	lanager: Chi			Γ.											TIN
Cust	omer Information		Project In	formation			-	s de las	i i p	ara	métér	/Métř	od Re	iquëst	for An	alysis		
Purchase Order		Project Na	me Injection	Well Quarte	rly		A	VOC (82	60) S	elec	t							
Work Order		Project Num	ber				в	SVOC (8	270)	Sele	ct						• • • •	
Company Name	Navajo Refining Company	Bill To Comp	any Navajo I	Refining Con	ipany		С	Total Me	tals	(602)	D / 700	0) Sete	ct		· · · · ·			
Send Report To	Aaron Strange	Invoice A	ttn. Aaron S	trange			D	R.C.I. Pr	ofile									
Address	P. O. Box 159	Addr	ess 501 Eas	t Main		E Anions (300) Cl, SO4												
City/State/Zio	Artesia, New Mexico 88211-0159	Cltv/State	Zin Artesia.	New Mexico	88210		G	nH										
Phone	(575) 748-3311	Ph	one (575) 74	B-3311			H Conductivity											
Fax	(575) 746-5451		Fax (575) 74	6-5451														
e-Mail Address	A.Strange@hollyfrontier.com	e-Mail Addr	ess <u>A Stranc</u>	e@hoilyfronti	er.com		J											
o.	Sample Description	Date	Time	Matrix	Pres.	# Bottles		AB		c	D	Ε	F	G	н	i i	J	Hold
Wastewater	Effluent	11/16/11	9:55	Liquid	Yes	9		x x		x	X	X	X	X	X	X	1	
Trip Blank						2							1	1		1	1	1
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Sample	Receipt	Checklist
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Client Name: NAVAJO REFINING		Date/Time f	Received:	<u>17-Nov-1</u>	<u>1 09:20</u>	
Work Order: <u>1111583</u>		Received by	y:	RNG		
Checklist completed by Paresh M. Giza	17-Nov-11 Date	 Reviewed by:	Mary K eSignature	Krow	les	18-Nov-11 Date
Matrices: <u>Water</u> Carrier name: <u>FedEx</u>						
Shipping container/cooler in good condition?	Yes	No 🗌	Not Prese	nt 🗆		
Custody seals intact on shipping container/cooler?	Yes	No 🗌	Not Prese	nt 🗆		
Custody seals intact on sample bottles?	Yes	No 🗆	Not Prese	nt 🗹		
Chain of custody present?	Yes	No 🗌				
Chain of custody signed when relinquished and received?	Yes	No 🗌				
Chain of custody agrees with sample labels?	Yes	No 🗖				
Samples in proper container/bottle?	Yes	No 🗌				
Sample containers intact?	Yes	No 🗌				
Sufficient sample volume for indicated test?	Yes	No 🗌				
All samples received within holding time?	Yes	No 🗌				
Container/Temp Blank temperature in compliance?	Yes	No 🗌				
Femperature(s)/Thermometer(s):	<u>1.5</u>		002]	
Cooler(s)/Kit(s):	<u>3897</u>	 · · · · · · · · · · · · · · · · · · ·]	
Water - VOA vials have zero headspace?	Yes	No 🗌	No VOA vials	submitted		
Water - pH acceptable upon receipt?	Yes	No 🗌	N/A			
pH adjusted? pH adjusted by:	Yes _	No 🗹	N/A]	

Login Notes:

Client Contacted:

Date Contacted:

Regarding:

Person Contacted:

Contacted By:

Comments:

Contantonito.

prrectiveAction:

SRC Page 1 of 1



08-Mar-2012

Aaron Strange Navajo Refining Company PO Box 159 Artesia, NM 88211

Tel: (575) 748-3311 Fax: (575) 746-5421

Re: Injection Well Quarterly

Work Order: 1202979

Dear Aaron,

ALS Environmental received 2 samples on 29-Feb-2012 09:10 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 37.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Chris £

Electronically approved by: Yvan K. Ty

Chris Bryson Project Manager



Certificate No: T104704231-09A-TX

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77090-4338 [PHONE (281) 530-5656 [FAX (281) 530-5687 Distant Rev (3010 drz (1940) hole owied). Janker man glaters and with the environment (weight to complete the owied).

www.alsglobal.com

BIGHT SOLUTIONS ABORT PAILTDEN

1202979-01 Injection Well Effluent

1202979-02 Trip Blank - 110711-11

Date: 08-Mar-12

2/29/2012 09:10

2/28/2012 09:40 2/29/2012 09:10

2/28/2012

Lab Samp ID (Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	<u>Hold</u>
Work Order:	1202979			work Order Sample Summ		
Project:	Injection Well Quarterly			Work Order S	Samnla Sumi	marw
Client:	Navajo Refining Company					

Water Water

SS Page 1 of

Date: 08-Mar-12

Client:	Navajo Refining Company
Project:	Injection Well Quarterly
Work Order:	1202979

Case Narrative

As the pH analyses were performed in the laboratory, the results are H-flagged as appropriate.

Sample was received outside of holding time for pH.

Batch 59229, Metals, Sample 1202950-04 : MS/MSD is for an unrelated sample.

Batch 59263, Semivolatile Organics, Insufficient sample to perform MS/MSD. LCS/LCSD provided as batch quality control.

Batch 59263, Semivolatile Organics : LCSD RPD was above the control limits for several analytes. The individual recoveries were in control.

Batch R124295, Volatile Organics, Sample 1202919-01 : MS/MSD is for an unrelated sample.

Batch R124295, Volatile Organics : CCV %D was above the control limits for Acetone. The associated sample results are Non Detect.

The analysis for Reactive Sulfide and Reactive Cyanide was subcontracted to ALS Laboratory Group, Inc. in Holland, MI.

Client:Navajo Refining CompanyProject:Injection Well QuarterlySample ID:Injection Well EffluentCollection Date:2/28/2012 09:40 AM

Work Order: 1202979 Lab ID: 1202979-01

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor		Date Analyzed
MERCURY	· · · · · · · · · · · · · · · · · · ·		SW7470)	Prep Date:	3/2/2012	Analyst: JCJ
Mercury	ND		0.00020	0 mg/L	1		3/2/2012 02:14 PM
METALS			SW6020)	Prep Date:	2/29/2012	Analyst: IGF
Aluminum	1.87		0.10	0 mg/L	10		3/2/2012 12:04 AM
Arsenic	0.141		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Barium	0.0282		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Boron	0.335		0.050	0 mg/L	1		3/1/2012 11:24 AM
Cadmium	ND		0.0020	0 mg/L	1		3/1/2012 11:24 AM
Chromium	0.00598		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Copper	0.0117		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Lead	ND		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Manganese	0.0555		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Molybdenum	0.0987		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Nickel	0.106		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Selenium	0.312		0.0050	0 ma/L	1		3/1/2012 11:24 AM
Silver	ND		0.0050	0 mg/L	1		3/1/2012 11:24 AM
Zinc	0.0746		0.0050	0 mg/L	1		3/1/2012 11:24 AM
SEMIVOLATILES - SW8270D			SW8270)	Prep Date:	3/2/2012	Analyst: JLJ
2,4-Trichlorobenzene	ND		0.005	0 mg/L	·1		3/3/2012 06:22 PM
2,4,5-Trichlorophenol	ND		0.005	0 _{⊭i} mg/L	1		3/3/2012 06:22 PM
2,4,6-Trichlorophenol	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
2,4-Dinitrotoluene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
2-Methylnaphthalene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
2-Methylphenol	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
2-Nitroaniline	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
2-Nitrophenol	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
3&4-Methylphenol	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
3-Nitroaniline	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
4-Nitroaniline	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
4-Nitrophenol	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Acenaphthene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Acenaphthylene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Aniline	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Anthracene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Benz(a)anthracene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Benzidine	ND		0.005	0 mg/L	· 1		3/3/2012 06:22 PM
Hexachlorobenzene	. ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Hexachloroethane	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM
Indeno(1,2,3-cd)pyrene	ND		0.005	0 mg/L	1		3/3/2012 06:22 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Date: 26-Apr-12

Client:	Navajo Refining Company		
Project:	Injection Well Quarterly	Work Order:	1202979
Sample ID:	Injection Well Effluent	Lab ID:	1202979-01
Collection Date:	2/28/2012 09:40 AM	Matrix:	WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isophorone	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Naphthalene	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Nitrobenzene	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
N-Nitrosodimethylamine	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Pentachlorophenol	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Phenanthrene	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Phenol	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Pyrene	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Pyridine	ND		0.0050	mg/L	1	3/3/2012 06:22 PM
Surr: 2,4,6-Tribromophenol	80.7		42-124	%REC	1	3/3/2012 06:22 PM
Surr: 2-Fluorobiphenyl	71.4		48-120	%REC	1	3/3/2012 06:22 PM
Surr: 2-Fluorophenol	56.2		20-120	%REC	1	3/3/2012 06:22 PM
Surr: 4-Terphenyl-d14	84.5		51-135	%REC	1	3/3/2012 06:22 PM
Surr: Nitrobenzene-d5	69.8		41-120	%REC	1	3/3/2012 06:22 PM
Surr: Phenol-d6	60.0		20-120	%REC	1	3/3/2012 06:22 PM
VOLATILES			SW8260			Analyst: PC
1,1,1-Trichloroethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
1,1,2,2-Tetrachloroethane	. ND		0.0050	mg/L	1	3/2/2012 01:16 PM
1,1,2-Trichloroethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
1,1-Dichloroethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
1,1-Dichloroethene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
1,2-Dichloroethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
2-Butanone	ND		0.010	mg/L	1	3/2/2012 01:16 PM
2-Chloroethyl vinyl ether	ND		0.010	mg/L	1	3/2/2012 01:16 PM
2-Hexanone	ND		0.010	mg/L	1	3/2/2012 01:16 PM
4-Methyl-2-pentanone	ND		0.010	mg/L	1	3/2/2012 01:16 PM
Acetone	0.12		0.010	mg/L	1	3/5/2012 08:40 PM
Benzene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Bromodichloromethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Bromoform	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Bromomethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Carbon disulfide	ND		0.010	mg/L	1	3/2/2012 01:16 PM
Carbon tetrachloride	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Chlorobenzene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Chloroethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Chloroform	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Chloromethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
cis-1,3-Dichloropropene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.
Client:Navajo Refining CompanyProject:Injection Well QuarterlyWork Order: 1202979Sample ID:Injection Well EffluentLab ID: 1202979-01Collection Date:2/28/2012 09:40 AMMatrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Dibromochloromethane	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Ethylbenzene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
m,p-Xylene	ND		0.010	mg/L	1	3/2/2012 01:16 PM
Methylene chloride	ND		0.010	mg/L	1	3/2/2012 01:16 PM
Styrene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Tetrachloroethene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Toluene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
trans-1,3-Dichloropropene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Trichloroethene	ND		0.0050	mg/L	1	3/2/2012 01:16 PM
Vinyl acetate	ND		0.010	mg/L	1	3/2/2012 01:16 PM
Vinyl chloride	ND		0.0020	mg/L	1	3/2/2012 01:16 PM
Xylenes, Total	ND		0.015	mg/L	1	3/2/2012 01:16 PM
Surr: 1,2-Dichloroethane-d4	91.8		70-125	%REC	1	3/2/2012 01:16 PM
Surr: 1,2-Dichloroethane-d4	94.6		70-125	%REC	1	3/5/2012 08:40 PM
Surr: 4-Bromofluorobenzene	97.9		72-125	%REC	1	3/2/2012 01:16 PM
Surr: 4-Bromofluorobenzene	101	· ·	72-125	%REC	1	3/5/2012 08:40 PM
Surr: Dibromofluoromethane	95.8		71-125	%REC	1	3/2/2012 01:16 PM
Surr: Dibromofluoromethane	97.3		71-125	%REC	1	3/5/2012 08:40 PM
Surr: Toluene-d8	99.5		75-125	%REC	1	3/2/2012 01:16 PM
Surr: Toluene-d8	106		75-125	%REC	1	3/5/2012 08:40 PM
REACTIVE CYANIDE			SW-846			Analyst: HN
Reactive Cyanide	ND		40.0	mg/Kg	1	3/2/2012 11:30 AM
REACTIVE SULFIDE			SW-846			Analyst: HN
Reactive Sulfide	ND		40.0	mg/Kg	1	3/2/2012 11:30 AM
ANIONS - EPA 300.0 (1993)			E300			Analyst: JKP
Chioride	519		50.0	mg/L	100	3/6/2012 06:51 AM
Sulfate	1,870		50.0	mg/L	100	3/6/2012 06:51 AM
Surr: Selenate (surr)	110		85-115	%REC	100	3/6/2012 06:51 AM
ALKALINITY			SM23208	8		Analyst: DM
Alkalinity, Bicarbonate (As CaCO3)	466		5.00	mg/L	1	3/6/2012 04:36 PM
Alkalinity, Carbonate (As CaCO3)	ND		5.00	mg/L	1	3/6/2012 04:36 PM
Alkalinity, Hydroxide (As CaCO3)	ND		5.00	mg/L	1	3/6/2012 04:36 PM
Alkalinity, Total (As CaCO3)	466		5.00	mg/L	1	3/6/2012 04:36 PM
SPECIFIC CONDUCTIVITY			M2510 B			Analyst: TDW
Specific Conductivity	5,990		1.00	µmhos/cn	n 1	2/29/2012 04:00 PM
IGNITIBILITY			SW1010			Analyst: KAH
Ignitability	> 212		50.0	°F	1	3/6/2012 05:00 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Date: 26-Apr-12

Client:	Navajo Refining Compa	ny						
Project:	Injection Well Quarterly	,			•	Work Order:	1202979	
Sample ID:	Injection Well Effluent					Lab ID:	1202979-01	
Collection Date:	2/28/2012 09:40 AM					Matrix:	WATER	
Analyses		Result	Qual	Report Limit	Units	Dilution Factor		Date Analyzed
PH pH		7.30	ннн	SW9040 0.10) 0 pH unii	ts 1		Analyst: TDW 2/29/2012 03:00 PM
TOTAL DISSOLV Total Dissolved S Filterable)	/ED SOLIDS Solids (Residue,	3,890		M2540C 10.(0 mg/L	1		Analyst: KAH 3/5/2012 07:30 PM

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client:	Navajo Refining Company
/ork Order:	1202979
Project:	Injection Well Quarterly

QC BATCH REPORT

Date: 08-Mar-12

Batch ID: 592	229 Instrument ID IC	PMS04		Method	: SW602	:0						
MBLK	Sample ID: MBLKW2-022912	-59229				Unit	s: mg/	L	Analy	vsis Date: 3	/1/2012 05	:17 AM
Client ID:		Run	ID: ICPMS0	4_120229A		SeqN	o: 270 4	4057	Prep Date: 2/2	29/2012	DF: 1	
					SPK Ref			Control	RPD Ref		RPD	
Analyte		Result	PQL	SPK Val	Value	%	REC	Limit	Value	%RPD	Limit	Qual
Boron		ND	0.050									
MBLK	Sample ID: MBLKW2-022912	-59229				Unit	s: mg/	L	Analy	sis Date: 3	/1/2012 03	:20 PM
Client ID:		Run	ID: ICPMSC)4_120229A		SeqN	o: 270 4	4747	Prep Date: 2/	29/2012	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%	REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum		ND	0.010									
Arsenic		ND	0.0050									
Barium		ND	0.0050									
Cadmium		ND	0.0020		÷-							
Chromium		ND	0.0050									
Copper		ND	0.0050									~
Lead		ND	0.0050									
Manganese		ND	0.0050								_	
**olybdenum		ND	0.0050									
cel		ND	0.0050									
elenium		ND	0.0050									
Silver		ND	0.0050									
Zinc		ND	0.0050									
LCS	Sample ID: MLCSW2-022912	-59229			<u>.</u> .	Unit	s: mg/	L	Analy	vsis Date: 3	/1/2012 05	:24 AM
Client ID:		Run	ID: ICPMS	04_120229A		SeqN	o: 270 -	4058	Prep Date: 2/	29/2012	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	- ý	REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic		0 0488	0 0050	0.05		n	97.6	80-120		0		, /h
Barium	n	.05138	0.0050	0.05		0	103	80-120		0		
Boron		0.4962	0.050	0.5		0	99.2	80-120		0	• • • • • • • • • • • • • • • • • • • •	
Cadmium	(0.0483	0.0020	0.05		0	96.6	80-120		0		
Chromium	0.	.04778	0.0050	0.05		0	95.6	80-120		0		
Copper	0.	.04836	0.0050	0.05		0	96.7	80-120		0		
Lead	· · · · · · · · · · · · · · · · · · ·	0.048	0.0050	0.05		0	96	80-120		0		
Manganese	0.	.04857	0.0050	0.05		0	97.1	80-120		0		
Molybdenum	0.	.04679	0.0050	0.05		0	93.6	80-120		0		

Selenium

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Silver

Zinc

See Qualifiers Page for a list of Qualifiers and their explanation.

0.04774

0.04807

0.05356

0.0050

0.0050

0.0050

0.05

0.05

0.05

0

0

0

95.5

96.1

107

80-120

80-120

80-120

0 0

0

QC Page: 1 of 18

Client: Navajo Refining Company Work Order: 1202979

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: 592	229	Instrument ID ICPMS04		Method	SW602	0						
LCS	Sample ID: I	MLCSW2-022912-59229				Ur	nits: mg/	L	Analysi	s Date: 3/	1/2012 06	:13 PM
Client ID:		Run	ID: ICPMS	04_120229A		Seq	No: 270	5146	Prep Date: 2/29	/2012	DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum		0.1038	0.010	0.1		0	104	80-120	0			
Nickel		0.04988	0.0050	0.05		0	99.8	80-120	0			
MS	Sample ID:	1202950-04DMS				Ur	nits: mg/	L	Analys	is Date: 3/	2/2012 05	:51 PM
Client ID:		Run	ID: ICPMS	04_120302A		Seq	No: 270	6306	Prep Date: 2/29	/2012	DF: 5	
					SPK Ref			Control	RPD Ref		RPD	
Analyte		Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Aluminum		0.09861	0.050	0.1	0.00200	7	05 G	80-120	 0			
Arsenic		0.05556	0.000	0.05	0.00293	,, ,,	107	80-120	0			
Barium		0 1618	0.025	0.05	0.00102	14	116	80-120		····		
Boron		3.21	0.25	0.5	2.51	17	138	80-120	0			so
Cadmium		0.05037	0.010	0.05	0.00004	\$7	101	80-120	0			
Chromium		0.04882	0.025	0.05	0.00013	32	97.4	80-120	0			
Copper		0.04803	0.025	0.05	0.00078	33	94.5	80-120	0	-		
Lead	· :	0.05087	0.025	0.05	0.00034	18 . 🖕	. 101	80-120	0			
Manganese	,	2.699	0.025	0.05	2.62	28	143	80-120	0			so
lybdenum		0.05442	0.025	0.05	0.00552	27	97.8	80-120	0			
;kel		0.06232	0.025	0.05	0.01	17	90.6	80-120	0			
Selenium		0.0567	0.025	0.05	0.00187	73	110	80-120	0			
Silver		0.04727	0.025	0.05	-0.00091	16	96.4	80-120	0			
Zinc		0.0523	0.025	0.05	0.0163	37	71.9	80-120	0			S
MSD	Sample ID:	1202950-04DMSD				U	nits: mg/		Analys	is Date: 3/	2/2012 05	:58 PM
Client ID:		Run	ID: ICPMS	04_120302A		Seq	No: 270	6307	Prep Date: 2/29	V2012	DF: 5	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	/=====	0.09298	0.050	0.1	0.00299	ə7	90	80-120	0.09861	5.88	. 15	
Arsenic		0.05498	0.025	0.05	0.00182	22	106	80-120	0.05556	1.05	15	
Barium		0.153	0.025	0.05	0.10)4	97.9	80-120	0.1618	5.63	15	
Boron		3.068	0.25	0.5	2.51	17	110	80-120	3.21	4.5	15	о
Cadmium	<u>-</u>	0.04955	0.010	0.05	0.00004	47	99	80-120	0.05037	1.64	15	
Chromium		0.047	0.025	0.05	0.00013	32	93.7	80-120	0.04882	3.8	15	
Соррег		0.04538	0.025	0.05	0.00078	33	89.2	80-120	0.04803	5.67	15	۲.
Lead		0.0477	0.025	0.05	0.00034	48	94.7	80-120	0.05087	6.43	15	
Manganese		2.5	0.025	0.05	2.62	28	-255	80-120	2.699	7.66	15	so
Molybdenum		0.05147	0.025	0.05	0.00552	27	91.9	80-120	0.05442	5.56	15	
Nickel		0.05891	0.025	0.05	0.01	17	83.8	80-120	0.06232	5.62	15	

0.025

0.025

0.025

0.05922

0.04563

0.04801

0.05

0.05

0.05

0.001873

-0.000916

0.01637

115

93.1

63.3

80-120

80-120

80-120

0.0567

0.04727

0.0523

See Qualifiers Page for a list of Qualifiers and their explanation.

Selenium

4

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Silver

Zinc

s

15

15

15

4.34

3.54

8.55

Client: Navajo Refining Company 1202979 Work Order:

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: 59229 Instrument ID ICPMS04 Method: SW6020 DUP Sample ID: 1202950-04DDUP Units: mg/L Analysis Date: 3/2/2012 05:38 PM Client ID: Run ID: ICPMS04_120302A SeqNo: 2706299 Prep Date: 2/29/2012 DF: 5 SPK Ref RPD Ref RPD Control Limit Value Limit Value %RPD Result SPK Val %REC Qual Analyte PQL ND 0.050 0 0-0 0 25 0 0 0.002997 Aluminum ND 0.025 0 0 0 0-0 0.001822 0 25 Arsenic 0 0.09946 0.025 0 0-0 25 Barium 0 0.104 4.51 2.473 0 0-0 2.517 Boron 0.25 0 0 1.79 25 Cadmium 0.010 0 0 0 25 ND 0-0 0.000047 0 0 0 Chromium ND 0.025 0 0-0 0.000132 0 25 Copper ND 0.025 0 0 0 0-0 0.000783 0 25 ND 0.025 0 0 0 0-0 0 25 Lead 0.000348 Manganese 2.536 0.025 0 0 0 0-0 2.628 3.54 25 0 0 25 Molybdenum ND 0.025 0 0-0 0.005527 0 0.01368 0 0 0 25 J Nickel 0.025 0 0-0 0.017 0 Selenium ND 0.025 0 0 0-0 0.001873 0 25 0 Silver ND 0.025 0 0 0-0 -0.000916 0 25 Zinc ND 0.025 0 0 0 0-0 0.01637 0 25 1202979-01B The following samples were analyzed in this batch:

See Qualifiers Page for a list of Qualifiers and their explanation.

2:

QC Page: 3 of 18

Work Ord roject:	ler:	1202979 Injection Well Quarterly										
Batch ID: 59	9276	Instrument ID Mercury		Metho	d: SW747	70						
MBLK	Sam	ple ID: GBLKW1-030212-59276				ι	Jnits: mg/	L	Analys	is Date: 3	/2/2012 01	:33 PM
Client ID:		Ri	un ID: MER	CURY_12030	2A	Se	qNo: 270	6040	Prep Date: 3/2/	2012	DF: 1	
Analyte		Result	PQ	L SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		ND	0.0002	0								
LCS	Sam	ple ID: GLCSW1-030212-59276				ι	Jnits: mg/	L	Analys	is Date: 3	/2/2012 01	:39 PM
Client ID:		R	un ID: MER	CURY_12030	2A	Se	qNo: 270	6041	Prep Date: 3/2/	2012	DF: 1	
Analyte		Result	PQ	L SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.00502	0.0002	0 0.005	<i>•</i> ·	0	100	85-115	0			
MS	Sam	ple ID: 12021005-01BMS		<u></u>		ι	Jnits: mg/	L	Analys	is Date: 3	/2/2012 01	:47 PM
Client ID:		R	un ID: MER	CURY_12030	2A	Se	qNo: 270	6044	Prep Date: 3/2/	2012	DF: 1	
Analyte		Result	PQ	L SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.00486	0.0002	0 0.005	0.0001	52	94.2	85-115	0			
MSD	Sam	ple ID: 12021005-01BMSD				ι	Jnits: mg/	1	Analys	is Date: 3	/2/2012 01	1:49 PM
"ient ID:		R	un ID: MER	CURY_12030	2A	Se	qNo: 270	6045	Prep Date: 3/2/	2012	DF: 1	
Analyte		Result	PQ	L SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.00488	0.0002	0 0.005	0.0001	52	94.6	85-115	0.00486	0.411	20	
DUP	Sam	ple ID: 12021005-01BDUP				ί	Jnits: mg/	L	Analys	is Date: 3	/2/2012 01	:45 PM
Client ID:		R	un ID: MER	CURY_12030	2A	Se	qNo: 270	6043	Prep Date: 3/2/	2012	DF: 1	
Analyte		Result	PQ	L SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury		0.000152	0.0002	20 0		0	0	0-0	0.000152		20	J
The followi	ing san	nples were analyzed in this bat	ch: [1202979-01B								<u>*</u>

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Navajo Refining Company

1202979

Client:

QC BATCH REPORT

Client:Navajo Refining CompanyWork Order:1202979'roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: 59263 Instrum

Instrument ID SV-5

Method: SW8270

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MBLK Sample ID: SBLKW1-	-120302-59263				Units: µg/l	-	Analy	sis Date: 3	/2/2012 06	:03 PM
Client ID:	Run IC): SV-5_1	20302B		SeqNo: 270	6512	Prep Date: 3/2	2/2012	DF: 1	
				SPK Ref		Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qual
1,2,4-Trichlorobenzene	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0				· · ·				
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0							~~	
2-Nitroaniline	ND	5.0								
2-Nitrophenol	ND	5.0								
3&4-Methylphenol	ND	5.0								
3-Nitroaniline	ND	5.0								
4-Nitroaniline	ND	5.0								
4-Nitrophenol	ND	5.0								
Acenaphthene	NÐ	5.0								
Acenaphthylene	ND	5.0								
Aniline	ND	5.0								
Anthracene	ND	5.0			······					
Renz(a)anthracene	ND	5.0								
vzidine	ND	5.0								
Jxachlorobenzene	ND	5.0								
Hexachloroethane	ND	5.0								
Indeno(1,2,3-cd)pyrene	ND	5.0								
Isophorone	ND	5.0							······	
Naphthalene	ND	5.0								
Nitrobenzene	ND	5.0		-						
N-Nitrosodimethylamine	ND	5.0								
N-Nitrosodi-n-propylamine	ND	5.0								
N-Nitrosodiphenytamine	ND	5.0								
Pentachlorophenol	ND	5.0								
Phenanthrene	ND	5.0								
Phenol	ND	5.0			······					
Pyrene	ND	5.0								
Pyridine	ND	5.0		······································						
Surr: 2,4,6-Tribromophenol	87.1	5.0	100		0 87.1	42-124		0		
Surr: 2-Fluorobiphenyl	92.22	5.0	100	<u></u> .	0 92.2	48-120		0		
Surr: 2-Fluorophenol	83.39	5.0	100		0 83.4	20-120		0		
Surr: 4-Terphenvl-d14	97.18	5.0	100		0 97.2	51-135		0		-
Surr: Nítrobenzene-d5	99.51	5.0	100		0 99.5	41-120		0		
Surr: Phenol-d6	88.38	5.0	100		0 88.4	20-120)	0		

Client: Navajo Refining Company Work Order: 1202979

QC BATCH REPORT

roject: Injection Well Quarterly

Batch ID: 59263	Instrument ID SV-5		Metho	d: SW827	70						
LCS Sample ID:	SLCSW1-120302-59263				ι	Jnits: µg/L	_	Analysis	s Date: 3	/3/2012 0	3:21 PM
Client ID:	Run	ID: SV-5_1	20302B		Se	qNo: 270	6514	Prep Date: 3/2/2	012	DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
1,2,4-Trichlorobenzene	45.27	5.0	50		0	90.5	50-120	0			
2,4,5-Trichlorophenol	92.16	5.0	_100		0	92.2	50-120	0			
2,4,6-Trichlorophenol	90.96	5.0	100		0	91	50-120	0			
2,4-Dinitrotoluene	38.29	5.0	50		0	76.6	50-120	0			
2-Methylnaphthalene	39.61	5.0	50		0	79.2	55-120	0			
2-Methylphenol	74.26	5.0	100		0	74.3	50-120	0			
2-Nitroaniline	52.63	5.0	50		0	105	55-120	0			
2-Nitrophenol	87.28	5.0	100		0	87.3	55-120	0			
3&4-Methylphenol	105.2	5.0	150		0	70.1	55-120	0			
3-Nitroaniline	27.71	5.0	50		0	55.4	40-120	0			
4-Nitroaniline	36.86	5.0	50		0	73.7	50-120	0			
4-Nitrophenol	84.36	5.0	100		0	84.4	45-120	0			
Acenaphthene	44.06	5.0	50		0	88.1	55-120	0			
Acenaphthylene	45.54	5.0	50		0	91.1	55-120	0			
Aniline	26.29	5.0	50		0	52.6	30-120	0			
Anthracene	40.62	5.0	50	-	0	81.2	55-120	0			
Penz(a)anthracene	43.63	5.0	50		0	87.3	55-120	0			
zidine	11.44	5.0	50		0	22.9	10-120	0			
axachlorobenzene	39.92	5.0	50		0	79.8	55-120	0			
Hexachloroethane	39.99	5.0	50		0	80	55-120	0			
Indeno(1,2,3-cd)pyrene	47.75	5.0	50		0	95.5	55-120	0			
Isophorone	42.35	5.0	50		0	84.7	55-120	0			
Naphthalene	43.74	5.0	50		0	87.5	55-120	0			
Nitrobenzene	42.17	5.0	50	•	0	84.3	55-120	0			
N-Nitrosodimethylamine	41.7	5.0	50		0	83.4	45-120	0			
N-Nitrosodi-n-propylamine	32.06	5.0	50		0	64.1	50-120	0			
N-Nitrosodiphenylamine	40.45	5.0	50		0	80.9	55-120	0			
Pentachlorophenol	87.63	5.0	100		0	87.6	55-120	0			
Phenanthrene	40.23	5.0	50		0	80.5	55-120	0			
Phenol	74.23	5.0	100		0	74.2	50-120	0			
Pyrerie	46.04	5.0	50		0	92.1	55-120	0			
Pyridine	34.85	5.0	50		0	69.7	35-120	0			
Surr: 2,4,6-Tribromophe	anol 84.73	5.0	100		0	84.7	42-124	0			
Surr: 2-Fluorobiphenyl	99.43	5.0	100		0	99.4	48-120	0			-
Surr: 2-Fluorophenol	85.9	5.0	100		0	85.9	20-120	0			
Surr: 4-Terphenyl-d14	103.1	5.0	100		0	103	51-135	0			
Surr: Nitrobenzene-d5	88.42	5.0	100		0	88.4	41-120	0			
Surr: Phenol-d6	74.58	5.0	100		0	74.6	20-120	0			

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Client: Navajo Refining Company Work Order: 1202979

QC BATCH REPORT

oject: Injection Well Quarterly

Batch ID: 59263	Instrument ID SV-5		Method	SW827	0						
LCSD Sample ID	SLCSDW1-120302-59263				L	Jnits: µg/L	<u> </u>	Analysi	s Date: 3/	2/2012 06	:49 PM
Client ID:	Run	ID: SV-5 1	20302B		Se	aNo: 270	6513	Prep Date: 3/2/2	012	DF: 1	
				SPK Ref		1	Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	value		%REC	Limit	value	%RPD		Qual
1,2,4-Trichlorobenzene	41.89	5.0	50		0	83.8	50-120	45.27	7.76	20	
2,4,5-Trichlorophenol	80.69	5.0	100		0	80.7	50-120	92.16	13.3	20	
2,4,6-Trichlorophenol	77.47	5.0	100		0	77.5	50-120	90.96	16	20	
2,4-Dinitrotoluene	42.66	5.0	50		0	85.3	50-120	38.29	10.8	20	
2-Methylnaphthalene	42.33	5.0	50		0	84.7	55-120	39.61	6.65	20	
2-Methylphenol	91.95	5.0	100		0	91.9	50-120	74.26	21.3	20	R
2-Nitroaniline	56.76	5.0	50		0	114	55-120	52.63	7.54	20	
2-Nitrophenol	84.86	5.0	100		0	84.9	55-120	87.28	2.81	20	
3&4-Methylphenol	138.1	5.0	150		0	92.1	55-120	105.2	27	20	R
3-Nitroaniline	44.32	5.0	50		0	88.6	40-120	27.71	46.1	20	R
4-Nitroaniline	37.54	5.0	50		0	75.1	50-120	36.86	1.83	20	
4-Nitrophenol	86.49	5.0	100		0	86.5	45-120	84.36	2.49	20	
Acenaphthene	42.96	5.0	50		0	85.9	55-120	44.06	2.52	20	
Acenaphthylene	44.33	5.0	50		0	88.7	55-120	45.54	2.69	20	
Aniline	30.73	5.0	50		0	61.5	30-120	26.29	15.5	20	
Anthracene	43.85	5.0	50		0	87.7	55-120	40.62	7.64	20	
nz(a)anthracene	43.62	5.0	50		0	87.2	55-120	43.63	0.00412	20	
zidine	17.59	5.0	50		0	35.2	10-120	11.44	42.4	20	R
1exachlorobenzene	40.72	5.0	50		0	81.4	55-120	39.92	1.98	20	
Hexachloroethane	43.3	5.0	50		0	86.6	55-120	39.99	7.95	20	
Indeno(1,2,3-cd)pyrene	39.89	5.0	50		0	79.8	55-120	47.75	17.9	20	
Isophorone	46.75	5.0	50		0	93.5	55-120	42.35	9.88	20	
Naphthalene	41.93	5.0	50		0	83.9	55-120	43.74	4:22	20	
Nitrobenzene	44.79	5.0	50		0	89.6	55-120	42.17	6.04	20	
N-Nitrosodimethylamine	41.58	5.0	50		0	83.2	45-120	41.7	0.296	20	
N-Nitrosodi-n-propylamir	ne 42.78	5.0	50		0	85.6	50-120	32.06	28.6	20	R
N-Nitrosodiphenylamine	42.93	5.0	50		0	85.9	55-120	40.45	5.95	20	
Pentachlorophenol	82.5	5.0	100		0	82.5	55-120	87.63	6.04	20	
Phenanthrene	42.58	5.0	50		0	85.2	55-120	40.23	5.69	20	
Phenol	94.54	5.0	100		0	94.5	50-120	74.23	24.1	20	R
Pyrene	46.57	5.0	50		0	93.1	55-120	46.04	1.14	20	
Pyridine	31.79	5.0	50		0	63.6	35-120	34.85	9.19	20	
Surr: 2,4,6-Tribromopl	henol 75.93	5.0	100		0	75.9	42-124	84.73	11	20	
Surr: 2-Fluorobipheny	I 83.5	5.0	100		0	83.5	48-120	99.43	17.4	20	
Surr: 2-Fluorophenol	88.37	5.0	100		0	88.4	20-120	85.9	2.83	20	
Surr: 4-Terphenyl-d14	90.74	5.0	100		0	90.7	51-135	103.1	12.8	20	
Surr: Nitrobenzene-d5	87.53	5.0	100		0	87.5	41-120	88.42	1.01	20	
Surr: Phenol-d6	93.3	5.0	100		0	93.3	20-120	74.58	22.3	20	R

The following samples were analyzed in this batch:

1202979-01E

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Client:Navajo Refining CompanyWork Order:1202979roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: R124295 Instrument ID VOA1

Method: SW8260

MBLK Sample ID: VBLKW-03	0212-R124295	95			Units: µg/l	-	Analy	3/2/2012 11:05 AM		
Client ID:	Run II	D: VOA1_	120302A	SeqNo: 2706973		Prep Date:	DF: 1			
				SPK Ref		Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qua
1,1,1-Trichloroethane	ND	5.0								
1,1,2,2-Tetrachloroethane	ND	5.0								
1,1,2-Trichloroethane	ND	5.0								
1,1-Dichloroethane	ND	5.0								
1,1-Dichloroethene	ND	5.0								
1,2-Dichloroethane	ND	5.0								
2-Butanone	NĎ	10								
2-Chloroethyl vinyl ether	ND	10								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Benzene	ND	5.0								
Bromodichloromethane	ND	5.0								
Bromoform	ND	5.0								
Bromomethane	ND	5.0								
Carbon disulfide	ND	10								
Carbon tetrachloride	ND	5.0								
^hlorobenzene	ND	5.0								_
oroethane	ND	5.0								
_nloroform	ND	5.0								
Chloromethane	ND	5.0								
cis-1,3-Dichloropropene	ND	5.0								
Dibromochloromethane	ND	5.0	לידי יידי							
Ethylbenzene	ND	5.0								
m,p-Xyle∩e	ND	10								
Methylene chloride	ND	10								
Styrene	ND	5.0								
Tetrachloroethene	ND	5.0								
Toluene	ND	5.0								
trans-1,3-Dichloropropene	ND	5.0								
Trichloroethene	ND	5.0								
Vinyl acetate	ND	10						<u> </u>		
Vinyt chloride	ND	2.0								
Xylenes, Total	ND	15								
Surr: 1,2-Dichloroethane-d4	45.76	5.0	50		0 91.5	70-125		D		
Surr: 4-Bromofluorobenzene	45.65	5.0	50		0 91.3	72-125		0		
Surr: Dibromofluoromethane	49.47	5.0	50		0 98.9	71-125	;	D		
Surr: Toluene-d8	50.92	5.0	50		0 102	75-125	i	0		

Client:Navajo Refining CompanyWork Order:1202979

QC BATCH REPORT

:oject: Injection Well Quarterly

Batch ID: R124295	Instrument ID VOA1		Metho	d: SW826	0			-			
LCS Sample ID: N	/LCSW-030212-R124295				ι	Jnits: µg/L		Analys	is Date: 3	/2/2012 1	1:31 AM
Client ID:	Run	ID: VOA1_	120302A		Se	qNo: 270	6974	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1 1 1-Trichlomethane	48.34	5.0	50		0	96.7	80-120				
1 1 2 2-Tetrachlomethane	47.47	5.0	50		0	94.9	72-120				
1 1 2-Trichloroethane	50.06	5.0	50		0	100	80-120	(
1.1-Dichloroethane	46.7	5.0	50		0	93.4	76-120				
1 1-Dichloroethene	48 45	5.0	50		0 0	96.9	73-124	(
1.2-Dichloroethane	48.43	5.0	50		0	96.9	78-120				
2-Butanone	115.5	10	100		0	116	58-132	(
2-Chloroethyl vinyl ether	100.3	10	100		0	100	74-120		_		
2-Hexanorie	104.3	10	100		0	104	61-130	()		
4-Methyl-2-pentanone	104.3	10	100		0	104	65-127)		
Benzene	49.34	5.0	50		0	98.7	73-121		}		
Bromodichloromethane	49.78	5.0			0	99.6	80-120				
Bromoform	51.85	5.0	50		0	104	79-120	C)		
Bromomethane	46.68	5.0	50		0	93.4	66-137)		
Carbon disulfide	91.46	10	100		0	91.5	68-141	()		
Carbon tetrachloride	49.44	5.0	50		0	98.9	75-124	(),		
^hlorobenzene	48.66	5.0	50		0	97.3	80-120	C)		
proethane	48.59	5.0	50		0	97.2	76-121	()		
loroform	46.27	5.0	50		0	92.5	80-120	Ċ)		
Chloromethane	42.5	5.0	50		0	85	67-123				
cis-1,3-Dichloropropene	49.7 🚙	5.0	50		0	99.4	80-120	C)		
Dibromochloromethane	50.25	5.0	50		0	100	80-120) .		
Ethylbenzene	50.31	5.0	50		0	101	80-120	C)		
m,p-Xylene	106.4	10	100		0	106	78-121)		
Methylene chloride	46.29	10	50		0	92.6	65-133	C)		
Styrene	50.6	5.0	50		0	101	80-120	()		· · · · · · · · · · · · · · · · · · ·
Tetrachloroethene	53.03	5.0	50		0	106	79-120	C)		
Toluene	51.14	5.0	50		0	102	80-120	()		
trans-1,3-Dichloropropene	47.71	5.0	50		0	95.4	80-120	C)		
Trichloroethene	50.72	5.0	50		0	101	80-120)		
Vinyl acetate	96.6	10	100		0	96.6	67-139)		
Vinyl chloride	48.68	2.0	50		0	97.4	70-127	()		
Xylenes, Total	157.5	15	150		0	105	80-120)		
Surr: 1,2-Dichloroethane	-d4 46.36	5.0	50		0	92.7	70-125	(
Surr: 4-Bromofluorobenz	rene 45.51	5.0	50		0	91	72-125)		
Surr: Dibromofluorometh	iane 48.29	5.0	50		0	96.6	71-125	()		
Surr: Toluene-d8	50.53	5.0	50		0	101	75-125	()		

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Client: Navajo Refining Company Work Order: 1202979

roject: Injection Well Quarterly

QC BATCH REPORT

Batch ID: R124295 Instrument ID VOA1

Method: SW8260

MS Sample ID: 1202919-01	AMS				Units: µg/l	-	Analys	sis Date: 3	/2/2012 0	5:40 PM
Client ID:	Run II	D: VOA1_	120302A	s	eqNo: 270	6987	Prep Date:		DF: 5	
				SPK Ref		Control	RPD Ref		RPD	
Analyte	Result	PQL	SPK Val	Value	%REC	Limit	Value	%RPD	Limit	Qual
1,1,1-Trichloroethane	245.2	25	250	0	98.1	80-120	0)		
1,1,2,2-Tetrachloroethane	235.7	25	250	0	94.3	72-120	C)		
1,1,2-Trichloroethane	252.6	25	250	0	101	80-120	C)		
1,1-Dichloroethane	247.9	25	250	0	99.2	76-120	C)		
1,1-Dichloroethene	247.7	25	250	0	99.1	73-124)		
1,2-Dichloroethane	229.1	25	250	0	91.7	78-120	()		
2-Butanone	491.1	50	500	0	98.2	58-132)		
2-Chloroethyl vinyl ether	13.89	50	500	0	2.78	74-120	()		JS
2-Hexanone	503.1	50	500	0	101	61-130	C)		
4-Methyl-2-pentanone	546.8	50	500	0	109	65-127	Ċ)		
Benzene	231.6	25	250	0	92.6	73-121	()		
Bromodichloromethane	245.5	25	250	0	98.2	80-120	()		
Bromoform	256	25	250	0	102	79-120	C)		
Bromomethane	233.1	25	250	· 0	93.2	66-137	()		
Carbon disulfide	469.2	50	500	0	93.8	68-141	C)		
Carbon tetrachloride	232.8	25	250	0	93.1	75-124)		
Chlorobenzene	235.7	25	250	0	94.3	80-120	()		
proethane	244.7	25	250	0	97.9	76-121	()		
_nloroform	235.3	25	250	0	94.1	80-120	()		
Chloromethane	236.2	25	250	0	94.5	67-123)		
cis-1,3-Dichloropropene	250.5	25	250	0	100	80-120	()		
Dibromochloromethane	244	25	250	0	97.6	80-120	()		
Ethylbenzene	270.4	25	250	0	108	80-120	C)		
m,p-Xylene	509.1	50	500	0	102	78-121	()		
Methylene chloride	239.2	50	250	0	95.7	65-133	C)		
Styrene	251.4	25	250	0	101	80-120	()		
Tetrachloroethene	257.9	25	250	0	103	79-120	()		
Toluene	249.8	25	250	0	99.9	80-120)		
trans-1,3-Dichloropropene	249.9	25	250	0	100	80-120	()		
Trichloroethene	266	25	250	19.06	98.8	80-120	()		
Vinyl acetate	504.2	50	500	0	101	67-139	C)		
Vinyl chloride	311.6	10	250	63.38	99.3	70-127	()		
Xylenes, Total	765.9	75	750	0	102	80-120	()		
Surr: 1,2-Dichloroethane-d4	236.9	25	250	0	94.8	70-125	()		
Surr: 4-Bromofluorobenzene	243.9	25	250	0	97.6	72-125	()		
Surr: Dibromofluoromethane	254.3	25	250	0	102	71-125	()		
Surr: Toluene-d8	245	25	250	0	98	75-125	;()(

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Client: Navajo Refining Company Work Order: 1202979

QC BATCH REPORT

Injection Well Quarterly roject:

				· · ·							
MSD Sample ID: 12029	19-01AMSD				ι	Inits: µg/l	-	Analysi	is Date: 3/	2/2012 06	:06 PM
Client ID:	Run II	D: VOA1_	120302A		Se	qNo: 270	69 88	Prep Date:		DF: 5	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	209	25	250		0	83.6	80-120	245.2	15.9	20	
1,1,2,2-Tetrachloroethane	238.7	25	250		0	95.5	72-120	235.7	1.3	20	
1,1,2-Trichloroethane	234.6	25	250		0	93.8	80-120	252.6	7.41	20	
1,1-Dichloroethane	242.7	25	250		0	97.1	76-120	247.9	2.12	20	
1,1-Dichloroethene	242.5	25	250		0	97	73-124	247.7	2.13	20	
1,2-Dichloroethane	217.3	25	250		0	86.9	78-120	229.1	5.31	20	
2-Butanone	500.3	50	500		0	100	58-132	491.1	1.86	20	
2-Chloroethyl vinyl ether	ND	50	500		0	0	74-120	13.89	0	20	S
2-Hexanone	493.5	50	500		0	98.7	61-130	503.1	1.93	20	
4-Methyl-2-pentanone	553	50	500		0	111	65-127	546.8	1.14	20	
Benzene	223.9	25	250		0	89.6	73-121	231.6	3.37	20	
Bromodichloromethane	227	25	250		0	90.8	80-120	245.5	7.83	20	
Bromoform	244.1	25	250		0	97.6	79-120	256	4.74	20	
Bromomethane	243.7	25	250		0	97.5	66-137	233.1	4.47	20	
Carbon disulfide	437	50	500		0	87.4	68-141	469.2	7.11	20	
Carbon tetrachloride	207	25	250		0	82.8	75-124	232.8	11.8	20	
<u>^hlorobenzene</u>	223.4	25	250		0	89.4	80-120	235.7	5.35	20	
proethane	230.6	25	250		0	92.2	76-121	244.7	5.96	20	
	218.6	25	250		0	87.4	80-120	235.3	7.39	20	
Chloromethane	212.5	25	250		0	85	67-123	236.2	10.6	20	
cis-1,3-Dichloropropene	227	25	250		0	90.8	80-120	250.5	9.84	20	
Dibromochloromethane	241.5	25	250		0	96.6	80-120	244	1.03	20	
Ethylbenzene	229.4	25	250		0	91.7	80-120	270.4	16.4	20	
m,p-Xylene	471.2	50	500		0	94.2	78-121	509.1	7.74	20	
Methylene chloride	228.2	50	250		0	91.3	65-133	239.2	4.71	20	
Styrene	221.8	25	250		0	88.7	80-120	251.4	12.5	20	
Tetrachloroethene	227.9	25	250		0	91.2	79-120	257.9	12.4	20	
Toluene	235.5	25	250		0	94.2	80-120	249.8	5.9	20	
trans-1,3-Dichloropropene	215.2	25	250		0	86.1	80-120	249.9	14.9	20	
Trichloroethene	255.9 .	25	250	19.	06	94.7	80-120	266	3.85	20	
Vinyl acetate	489.3	50	500		0	97.9	67-139	504.2	3	20	
Vinyl chloride	291.3	10	250	63.	38	91.2	70-127	311.6	6.72	20	
Xylenes, Total	705.9	75	750		0	94.1	80-120	765.9	8.15	20	
Surr: 1,2-Dichloroethane-d4	229	25	250		0	91.6	70-125	236.9	3.42	20	
Surr: 4-Bromofluorobenzene	233.3	. 25	250		0	93.3	72-125	243.9	4.47	20	
Surr: Dibromofluoromethane	237.5	25	250		0	95	71-125	254.3	6.83	20	
Sur: Toluene-d8	246	25	250		۵	08.4	75-125	245	0 431	20	

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See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 11 of 18

Client: Navajo Refining Company Work Order: 1202979

QC BATCH REPORT

`roject: Injection Well Quarterly

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ID: VBLKW-03	0512-R124374		÷		ι	Jnits: µg/L		Analys	is Date: 3/	5/2012 01	:12 PM
	Run II	D: VOA6_	120305A		Se	qNo: 2708	3657	Prep Date:		DF: 1	
	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	. ND	10									
thang_dA	ND 46.97	50	50		٥	02.0	70-125	ſ	1		
henzene	40.57	5.0	50		0	93.9	72-125	0	·		
omethane	43.1	5.0	50		ñ	95.2	71-125	0	' I		
	51.92	5.0	50	er anne e com la clar a a com, a a an	0	104	75-125	0		······································	
D: VLCSW-03	0512-R124374				- ι	Jnits: µa/L		Analys	sis Date: 3	5/2012 01	:38 PM
	Run Il	D: VOA6_	120305A		Se	qNo: 270	8660	Prep Date:		DF: 1	
	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	89.15	10	100		0	89.2	59-137				
thane-d4	45.74	5.0	50		0	91.5	70-125	- ··C			
obenzene	51.35	5.0	50		0	103	72-125)		
omethane	48.18	5.0	50		0	96.4	71-125	C	1		
	50.13	5.0	50		0	100	75-125	C)	<i>`</i>	
ID: 1203095-0	1AMS				ι	Jnits: µg/L	-	Analys	sis Date: 3	5/2012 03	3:24 PM
	Run II	D: VOA6_	120305A		Se	qNo: 270	8667	Prep Date:		DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
	Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
	65.81	10	100		0	65.8	59-137	C)		
thane-d4	45.57	5.0	50		0	91.1	70-125	C	ŀ		
obenzene	51.48	5.0	50		0	103	72-125	C)		
omethane	48.3	5.0	50		0	96.6	71-125	C			
	50.11	5.0	50		0	100	75-125	C)		
D: 1203095-01	AMSD				ι	Jnits: µg/L	-	Analys	sis Date: 3	5/2012 03	3:50 PM
	Run II	D: VOA6_	120305A		Se	qNo: 270	8669	Prep Date:		DF: 1	
				SPK Ref			Control	RPD Ref		RPD	
	Result	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
	62.66	10	100		0	62.7	5 9 -137	65.81	4.9	20	
thane-d4	44.77	5.0	50		0	89.5	70-125	45.57	1.78	. 20	
obenzene	51.89	5.0	50		0	104	72-125	51.48	0.796	20	
omethane	47.44	5.0	50		0	94.9	71-125	48.3	1.81	20	
			50		-		75 405				
	ID: VBLKW-03	ID: VBLKW-030512-R124374 Run II Result ND thane-d4 46.97 benzene 49.1 methane 47.94 51.92 ID: VLCSW-030512-R124374 Run II Result 89.15 thane-d4 45.74 benzene 51.35 methane 48.18 50.13 ID: 1203095-01AMS Run II Result 65.81 thane-d4 45.57 benzene 51.48 methane 48.3 50.11 ID: 1203095-01AMSD Run II Result 65.81 thane-d4 45.57 benzene 51.48 methane 48.3 50.11 ID: 1203095-01AMSD Run II Result 62.66 thane-d4 44.77 benzene 51.89 methane 47.44	ID: VBLKW-030512-R124374 Run ID: VOA6_ Result PQL ND 10 thane-d4 46.97 5.0 benzene 49.1 5.0 pmethane 47.94 5.0 51.92 5.0 ID: VLCSW-030512-R124374 Run ID: VOA6_ Result PQL 89.15 10 thane-d4 45.74 5.0 benzene 51.35 5.0 pmethane 48.18 5.0 50.13 5.0 ID: 1203095-01AMS Run ID: VOA6_ Result PQL 65.81 10 thane-d4 45.57 5.0 pbenzene 51.48 5.0 pbenzene 51.69 5.0 pbenzene 51.69 5.0 pbenzene 47.44 5.0	ID: VBLKW-030512-R124374 Run ID: VOA6_120305A Result PQL SPK Val ND 10 thane-d4 46.97 5.0 50 obenzene 49.1 5.0 50 omethane 47.94 5.0 50 51.92 5.0 50 ID: VLCSW-030512-R124374 Run ID: VOA6_120305A Result PQL SPK Val 89.15 10 100 thane-d4 45.74 5.0 50 obenzene 51.35 5.0 50 50.13 5.0 50 ID: 1203095-01AMS Run ID: VOA6_120305A Result PQL SPK Val 65.81 10 100 thane-d4 45.57 5.0 50 obenzene 51.48 5.0 50 obenzene 51.48 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.48 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0 50 Dobenzene 51.89 5.0	ID: VBLKW-030512-R124374 Run ID: VOA6_120305A SPK Ref Value ND 10 thane-d4 46.97 5.0 50 Sobenzene 49.1 5.0 50 Sobenzene 49.1 5.0 50 51.92 5.0 50 ID: VLCSW-030512-R124374 Run ID: VOA6_120305A SPK Ref Result PQL SPK Val 89.15 10 100 thane-d4 45.74 5.0 50 Sobenzene 51.35 5.0 50 Sobenzene 51.35 5.0 50 Sobenzene 51.48 5.0 50 SPK Ref Result PQL SPK Val SPK Ref Result PQL SPK Val SPK Ref SPK ID: VBLKW-030512-R124374 L Run ID: VOA6_120305A Se Result PQL SPK Val SPK Ref ND 10 SPK Ref Value Ibenzene 49.1 5.0 50 0 ibenzene 49.1 5.0 50 0 ibenzene 47.94 5.0 50 0 iD: VLCSW-030512-R124374 U Se Se Run ID: VOA6_120305A Se Se Se Result PQL SPK Val Value Se 1D: VLCSW-030512-R124374 U Se Se Result PQL SPK Val Se Se Result PQL SPK Val Se Se 1D: 100 100 0 0 thane-d4 45.7 5.0 50 0 Se Run ID: VOA6_120305A Se Se Result PQL SPK V	ID: VBLKW-030512-R124374 Units: µg/L SeqNo: 2704 Run ID: VOA6_120305A SeqNo: 2704 Result PQL SPK Val Value %REC ND 10 %REC %REC ihane-d4 46.97 5.0 50 0 93.9 ibenzene 49.1 5.0 50 0 98.2 imethane 47.94 5.0 50 0 95.9 51.92 5.0 50 0 96.2 104 ID: VLCSW-030512-R124374 Units: updl %REC Result PQL SPK Val SeqNo: 2704 fbmethane 45.74 5.0 50 0 91.5 ibberzene 51.35 5.0 50 0 91.5 ibberzene 51.35 5.0 50 0 100 iD: 1203095-01AMS Units: µµ/ %REC SeqNo: 2704 <td>ID: VBLKW-030512-R124374 Units: µg/L Run ID: VOA6_120305A SeqNo: 2708657 Result PQL SPK Val SPK Ref Control ND 10 %REC Limit thane-d4 46.97 5.0 50 0 93.9 70-125 bbenzene 49.1 5.0 50 0 96.2 72-125 bbenzene 47.94 5.0 50 0 96.2 72-125 iD: VLCSW-030512-R124374 Units: µg/L SeqNo: 2708660 Run ID: VOA6_120305A SeqNo: 2708660 SPK Ref Control thane-d4 45.74 5.0 50 0 10.3 72-125 sbenzene 51.35 5.0 50 0 10.3 72-125 bbenzene 51.35 5.0 50 0 10.3 72-125 sbenzene 51.35 5.0 50 0 10.0</td> <td>ID: VBLKW-030512-R124374 Units: µµ/L Analys Run ID: VOA6_120305A SeqNo: 2708657 Prep Date: ND 10 SPK Val SeqNo: 2708657 Prep Date: ND 10 SPK Val %REC Limit RD RPD Ref ND 10 50 93.9 70-125 0 sbenzene 49.1 5.0 50 0 98.2 72-125 0 methane 47.94 5.0 50 0 96.9 71-125 0 iD: VLCSW-030512-R124374 Units: µµL Analys Run ID: VOA6_120305A SeqNo: 2708660 Prep Date: 89.15 10 100 0 89.2 59-137 0 thane-d4 45.74 5.0 50 0 96.4 71-125 0 sbenzene 51.35 5.0 50 0 100 75-125 0 ibanzede 48.18 5.0 50</td> <td>ID: VBLKW-030512-R124374 Units: µg/L Analysis Date: 3/ SeqNo: 2708657 Prep Date: Run ID: VOA6_120305A SeqNo: 2708657 Prep Date: SPK Ref Control RPD Ref Value %,RPD ND 10 SPK Ref Control RPD Ref Value %,RPD thane-d4 46.97 5.0 50 0 93.9 70-125 0 benzene 49.1 5.0 50 0 98.2 72-125 0 Sinsethane 47.94 5.0 50 0 104 75-125 0 ID: VLCSW-030512-R124374 Units: Units: µg/L Analysis Date: 3J Run ID: VOA6_120305A SeqNo: 2708660 Prep Date: 34,8PD bibanzene 51.35 5.0 50 0 103 72-125 0 thane-d4 45.75 5.0 50 0 103 72-125 0 ibbanzene 51.13</td> <td>ID: VBLKW-030512-R124374 Units: µµ/L Analysis Date: 3/5/2012 01 Run ID: VOA6_120305A SeqNo: 2708657 Prep Date: DF: 1 ND 10 SPK Kef SPK Kef Control RPD Ref %RPD ihane-d4 46.97 5.0 50 0 93.9 70-125 0 ibenzene 49.1 5.0 50 0 95.9 71-125 0 ibenzene 49.1 5.0 50 0 95.9 71-125 0 iD: VLCSW-030512-R124374 Units: µµ/L Analysis Date: 3/5/2012 01 Run ID: VOA6_120305A SeqNo: 2708660 Prep Date: DF: 1 Mane-d4 45.74 5.0 50 0 97.5 70-125 0 ibanzene 51.35 5.0 50 0 97.5 70-125 0 ibanzene 51.35 5.0 50 0 96.6 71-125 0</td>	ID: VBLKW-030512-R124374 Units: µg/L Run ID: VOA6_120305A SeqNo: 2708657 Result PQL SPK Val SPK Ref Control ND 10 %REC Limit thane-d4 46.97 5.0 50 0 93.9 70-125 bbenzene 49.1 5.0 50 0 96.2 72-125 bbenzene 47.94 5.0 50 0 96.2 72-125 iD: VLCSW-030512-R124374 Units: µg/L SeqNo: 2708660 Run ID: VOA6_120305A SeqNo: 2708660 SPK Ref Control thane-d4 45.74 5.0 50 0 10.3 72-125 sbenzene 51.35 5.0 50 0 10.3 72-125 bbenzene 51.35 5.0 50 0 10.3 72-125 sbenzene 51.35 5.0 50 0 10.0	ID: VBLKW-030512-R124374 Units: µµ/L Analys Run ID: VOA6_120305A SeqNo: 2708657 Prep Date: ND 10 SPK Val SeqNo: 2708657 Prep Date: ND 10 SPK Val %REC Limit RD RPD Ref ND 10 50 93.9 70-125 0 sbenzene 49.1 5.0 50 0 98.2 72-125 0 methane 47.94 5.0 50 0 96.9 71-125 0 iD: VLCSW-030512-R124374 Units: µµL Analys Run ID: VOA6_120305A SeqNo: 2708660 Prep Date: 89.15 10 100 0 89.2 59-137 0 thane-d4 45.74 5.0 50 0 96.4 71-125 0 sbenzene 51.35 5.0 50 0 100 75-125 0 ibanzede 48.18 5.0 50	ID: VBLKW-030512-R124374 Units: µg/L Analysis Date: 3/ SeqNo: 2708657 Prep Date: Run ID: VOA6_120305A SeqNo: 2708657 Prep Date: SPK Ref Control RPD Ref Value %,RPD ND 10 SPK Ref Control RPD Ref Value %,RPD thane-d4 46.97 5.0 50 0 93.9 70-125 0 benzene 49.1 5.0 50 0 98.2 72-125 0 Sinsethane 47.94 5.0 50 0 104 75-125 0 ID: VLCSW-030512-R124374 Units: Units: µg/L Analysis Date: 3J Run ID: VOA6_120305A SeqNo: 2708660 Prep Date: 34,8PD bibanzene 51.35 5.0 50 0 103 72-125 0 thane-d4 45.75 5.0 50 0 103 72-125 0 ibbanzene 51.13	ID: VBLKW-030512-R124374 Units: µµ/L Analysis Date: 3/5/2012 01 Run ID: VOA6_120305A SeqNo: 2708657 Prep Date: DF: 1 ND 10 SPK Kef SPK Kef Control RPD Ref %RPD ihane-d4 46.97 5.0 50 0 93.9 70-125 0 ibenzene 49.1 5.0 50 0 95.9 71-125 0 ibenzene 49.1 5.0 50 0 95.9 71-125 0 iD: VLCSW-030512-R124374 Units: µµ/L Analysis Date: 3/5/2012 01 Run ID: VOA6_120305A SeqNo: 2708660 Prep Date: DF: 1 Mane-d4 45.74 5.0 50 0 97.5 70-125 0 ibanzene 51.35 5.0 50 0 97.5 70-125 0 ibanzene 51.35 5.0 50 0 96.6 71-125 0	

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Client:	Navajo Refining Company
Work Order:	1202979
roject:	Injection Well Quarterly

QC BATCH REPORT

Batch ID: R	124101	Instrument ID WetChem		Method	I: SW904	0						
LCS	Sample ID:	WLCSW1-120229-R124101				ι	Jnits: pH u	units	Analys	is Date: 2/	29/2012 0	3:00 PM
Client ID:		Run ID:	WETCH	IEM_12022)	Se	qNo: 270 3	3606	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pН		6	0.10	6		0	100	90-110	0			
DUP	Sample ID:	1202991-04A dup				ι	Jnits: pH u	units	Analys	is Date: 2/	29/2012 0	3:00 PM
Client ID:		Run ID:	WETCH	IEM_12022	H	Se	qNo: 270 3	3776	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pН		6.29	0.10	0		0	0	0-0	6.28	0.159	20	н
The follow	ing samples v	vere analyzed in this batch:	1:	202979-01D								

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2: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 13 of 18

Client:	Navajo Refining Company
Work Order:	1202979
roject:	Injection Well Quarterly

QC BATCH REPORT

Batch ID: R	R124103	Instrument ID WetChem		Method	: M2510	8						
MBLK	Sample ID: W	/BLKW1-120229-R124103			· · ·	L	Jnits: µmh	ios/cm	Analy	sis Date: 2	29/2012 (04:00 PM
Client ID:		Run ID:	WETC	HEM_12022	BJ	Se	qNo: 270 ;	3614	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	onductivity	ND	1.0									
LCS	Sample ID: V	/LCSW1-120229-R124103				ι	Jnits: µmh	ios/cm	Analy	sis Date: 2	/29/2012 (04:00 PM
Client ID:		Run ID:	WETC	HEM_12022	ยา	Se	qNo: 270 :	3615	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	onductivity	1420	1.0	1413		0	100	80-120		0		
DUP	Sample ID: 1	202979-01DDUP		<u></u>		ι	- Jnits: µmh	ios/cm	Analy	vsis Date: 2	/29/2012 (04:00 PM
Client ID: I	njection Well Ef	fluent Run ID:	WETC	HEM_12022	9J	Se	qNo: 270	3645	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Co	onductivity	6030	1.0	0		0	0		599	0 0.666	20	
The follow	ring samples we	ere analyzed in this batch:	[1202979-01D								

See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Work Order: roject:	Navajo Refining 1202979 Injection Well Q	Company uarterly							QCI	BATC	H RE	PORT
Batch ID: R124408	Instrument	D Balance1		Metho	d: M2540	С						
MBLK Sam	ple ID: WBLK-03051	2-R124408				ι	Jnits: mg/	L	Analysi	s Date: 3/	5/2012 07	:30 PM
Client ID:		Run II	D: BALAN	CE1_12030)5E	Se	qNo: 270	9353	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Sol	lids (Residue, Fil	ND	10									
LCS Sam	ple ID: WLCS-03051	2-R124408				ι	Jnits: mg/	L	Analys	is Date: 3/	5/2012 07	:30 PM
Client ID:		Run II	D: BALAN	CE1_12030)5E	Se	qNo: 270	9354	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Sol	lids (Residue, Fil	984	10	1000	· · · · · · · · · · · · · · · · · · ·	0	98.4	85-115	0			
DUP Sam	ple ID: 12021002-09	DDUP				ι	Jnits: mg/	L	Analys	is Date: 3/	- 5/2012 07	7:30 PM
Client ID:		Run I	D: BALAN	ICE1_1203)5E	Se	qNo: 270	9332	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved So	lids (Residue, Fil	4040	10	0	w.#	0	0	0-0	4020	0.496	20	
DUP Sam	ple ID: 1203052-04D	DUP				ι	Jnits: mg/	 L	Analys	is Date: 3/	5/2012 07	7:30 PM
^{∩lient} ID:		Run I	D: Balan	ICE1_1203)5E	Se	qNo: 270	9378	Prep Date:		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved So	lids (Residue, Fil	1692	10	0		0	0	0-0	1720	1.64	.20	
The following sam	ples were analyzed	in this batch:	12	202979-010								

Navajo Refining Company

Client:

2:

roject:	Inj	ection Well Quarterly	у										
Batch ID: R	124409	Instrument ID ICS3	K2		Metho	d: E300							
MBLK	Sample ID	: WBLKW1-030512-R1	24409	•			(Jnits: mg/	L	Analysi	is Date: 3/	5/2012 06	5:53 PM
Client ID:			Run	ID: ICS3K2	_120305A		Se	qNo: 27.09	9381	Prep Date:		DF: 1	
Analyte		Re	sult	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride			0.4	0.50									J
Sulfate		0.:	301	0.50									J
Surr: Sek	ənatə (surr)	5.4	473	0.10	5		0	109	85-115	0			
LCS	Sample ID	: WLCSW1-030512-R1	24409)			1	Units: mg/	L	Analysi	is Date: 3/	5/2012 07	':15 PM
Client ID:			Run	ID: ICS3K2	_120305A		Se	eqNo: 2709	9355	Prep Date:		DF: 1	
						SPK Ref			Control	RPD Ref		RPD	
Analyte		Re	sult	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Chloride		18	3.32	0.50	20		0	91.6	90-110	0			
Sulfate		18	8.76	0.50	20		0	93.8	90-110	0			
Surr: Sek	enate (surr)	5.	392	0.10	5		0	108,	85-115	0			
LCSD	Sample ID	: WLCSDW1-030512-F	R1244	09			I	Units: mg/	L	Analysi	is Date: 3/	/5/2012 07	':37 PM
Client ID:			Run	ID: ICS3K2	_120305A		Se	eqNo: 270 9	9356	Prep Date:		DF: 1	
		- <u>-</u>				SPK Ref			Control	RPD Ref		RPD	
Analyte		Re	sult	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
oride		18	8.37	0.50	20		0	91.9	90-110	18.32	0.311	20	
Julfate		18	8.76	0.50	20		0	93.8	90-110	18.76	0.016	20	
Surr: Sek	enate (surr)	5.	368	0.10	5		0	107	85-115	5.392	0.446	20	
MS	Sample IC	: 1202769-01EMS					(Units: mg/	L	Analysi	is Date: 3/	6/2012 02	:52 AM
Client ID:			Run	ID: ICS3K2	_120305A	•	Se	eqNo: 270 9	9371	Prep Date:		DF: 10	
Analyte		Re	sult	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride		23	35.4	5.0	100	135	5.3	100	80-120	0			
Sulfate		11	7.7	5.0	100	22.	67	95	80-120	0			
Surr: Sek	enate (surr)		1.24	1.0	50		0	108	85-115	0			
MSD	Sample ID	: 1202769-01EMSD				-	ł	Units: mg/	L	Analysi	is Date: 3/	6/2012 03	:14 AM
Client ID:			Run	ID: ICS3K2	_120305A		Se	eqNo: 270	9373	Prep Date:		DF: 10	
						SPK Ref			Control	RPD Ref		RPD	
Analyte		Re	sult	PQL	SPK Val	Value		%REC	Limit	Value	%RPD	Limit	Qual
Chloride		23	32.1	5.0	100	135	5.3	96.8	80-120	235.4	1.4	20	
Sulfate		11	5.5	5.0	100	22.	67	92.8	80-120	117.7	1.87	20	
Surr: Sek	enate (surr)	53	3.19	1.0	50		0	106	85-115	54.24	1.95	20	
The followi	ng samples	were analyzed in this	batch	ı: <u>12</u>	02979-01C				-				

See Qualifiers Page for a list of Qualifiers and their explanation.

Client:

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Work Order:

Navajo Refining Company

1202979

QC Page: 16 of 18

QC BATCH REPORT

Client:	Navajo Refining Company
Work Order:	1202979

'roject: Injection Well Quarterly

QC BATCH REPORT

Units: °F SeqNo: 27095 %REC 0 101 Units: °F SeqNo: 27095	537 P Control Limit 80-120 547 P Control	Ana Prep Date: RPD Ref Value Ana Prep Date: RPD Ref	Ilysis Date: : %RPD 0 Ilysis Date: :	5/6/2012 05: DF: 1 RPD Limit 5/6/2012 05: DF: 1	Qual
SeqNo: 27095 %REC 0 101 Units: °F SeqNo: 27095	537 P Control Limit 80-120 547 P Control	Prep Date: RPD Ref Value Ana Prep Date: RPD Ref	%RPD 0	DF: 1 RPD Limit 0/6/2012 05: DF: 1	Qual
%REC 0 101 Units: °F SeqNo: 27095	Control Limit 80-120 9547 P Control	RPD Ref Value Ana Prep Date: RPD Ref	%RPD 0	RPD Limit 0/6/2012 05: DF: 1	Qual
0 101 Units: °F SeqNo: 27095	80-120 9547 P Control	Ana Prep Date: RPD Ref	0 Nysis Date: :	DF: 1	00 PM
Units: °F SeqNo: 27095 (9 547 P Control	Ana Prep Date: RPD Ref	Ilysis Date: :	DF: 1	00 PM
SeqNo: 27095 (6547 P Control	Prep Date: RPD Ref		DF: 1	
(Control	RPD Ref		880	
%REC	Limit	Value	%RPD	Limit	Qual
0 104	80-120		84 2.3	5 25	
Units: °F	· · ·	Ana	Ilysis Date: :	3/6/2012 05	:00 PM
SeqNo: 27095	9 548 P	Prep Date:		DF: 1	
%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
	0-0		78	0 25	
f	SeqNo: 2709 f %REC 0 0	SeqNo: 2709548 f Control %REC Limit	SeqNo: 2709548 Prep Date: f Control RPD Ref %REC Limit Value	SeqNo: 2709548 Prep Date: f Control RPD Ref %REC Limit Value %RPD 0 0 0-0 78	SeqNo: 2709548 Prep Date: DF: 1 f Control RPD Ref RPD %REC Limit Value %RPD Limit 0 0 0-0 78 0 25

:

Client:Navajo Refining CompanyWork Order:1202979'roject:Injection Well Quarterly

QC BATCH REPORT

Batch ID: R124421 Instrumer	nt ID WetChem		Method	: SM232	0B						
MBLK Sample ID: WBLKW1-0	030612-R124421			····	U	nits: mg/	L.	Analys	is Date: 3/	6/2012 04	:36 PM
Client ID:	Run ID:	WETCH	IEM_12030	6H	Sec	qNo: 270 9	9574	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	5.0									
Alkalinity, Carbonate (As CaCO3)	ND	5.0									
Alkalinity, Hydroxide (As CaCO3)	ND	5.0									
Alkalinity, Total (As CaCO3)	ND	5.0									
LCS Sample ID: WLCSW1-(030612-R124421				U	nits: mg/	L,	Analys	is Date: 3/	6/2012 04	:36 PM
Client ID:	Run ID	WETCH	IEM_12030	6H	Se	qNo: 270	9575	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1056	5.0	1000		0	106	80-120	C	l		
DUP Sample ID: 1202769-01	IEDUP				U	Inits: mg/	<u></u>	Analys	sis Date: 3/	6/2012 04	:36 PM
Client ID:	Run ID	WETCH	IEM_12030	6H	Se	qNo: 270	9587	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
* kalinity, Bicarbonate (As CaCO3)	191	5.0	0		0	0	0-0	190.4	0.315	20	
alinity, Carbonate (As CaCO3)	ND	5.0	0		0	0	0-0	C	0	20	
ukalinity, Hydroxide (As CaCO3)	ND	5.0	0		0	0	0-0		0	20	
Alkalinity, Total (As CaCO3)	191	5.0	0		0	0	0-0	190.4	0.315	20	

The following samples were analyzed in this batch:

1202979-01C

See Qualifiers Page for a list of Qualifiers and their explanation.

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Date: 08-Mar-12

<u></u>	· · · · · · · · · · · · · · · · · · ·	
Client:	Navajo Refining Company	QUALIFIERS,
Project: WorkOrdory	Injection well Quarterly	ACRONYMS, UNITS
workOruer:	12029/9	
<u>Qualifier</u>	Description	
*	Value exceeds Regulatory Limit	
а	Not accredited	
В	Analyte detected in the associated Method Blank above the	e Reporting Limit
E	Value above quantitation range	
н	Analyzed outside of Holding Time	
Ţ	Analyte detected below quantitation limit	
М	Manually integrated, see raw data for justification	
n	Not offered for accreditation	
ND	Not Detected at the Reporting Limit	
0	Sample amount is > 4 times amount spiked	
Р	Dual Column results percent difference > 40%	
ĸ	RPD above laboratory control limit	
5	Spike Recovery outside laboratory control limits	
U	Analyzed but not detected above the MDL	
Acronym	Description	
DCS	Detectability Check Study	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MQL	Method Quantitation Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Spike	
PQL	Practical Quantitation Limit	
SD	Serial Dilution	
SDL	Sample Detection Limit	
TRRP	Texas Risk Reduction Program	
Units Reported	Description	
°F	Farenheit degrees	
µmhos/cm		
mg/Kg	Milligrams per Kilogram	
mg/L	Milligrams per Liter	
pH units		

Sample Receipt Checklist

Client Name: NAVAJO REFINING		Date/Time Received: 29-Feb-12 09:10									
Work Order: 1202979		Received by	y: R I	<u>NG</u>							
Checklist completed by Paresh M. Giga eSignature	29-Feb-12 Date	Reviewed by:	Mary K. 9 eSignature	Knowles	29-Feb-12 Date						
Matrices: Water Carrier name: FedEx											
Shipping container/cooler in good condition?	Yes 🗹	No 🗔	Not Present								
Custody seals intact on shipping container/cooler?	Yes 🗹	No 🗌	Not Present								
Custody seals intact on sample bottles?	Yes 🗌	No 🗌	Not Present								
Chain of custody present?	Yes 🗹	No 🗌									
Chain of custody signed when relinquished and received?	Yes 🗹	No 🗌									
Chain of custody agrees with sample labels?	Yes 🗹	No 🗆									
Samples in proper container/bottle?	Yes 🖌	No 🗌									
Sample containers intact?	Yes 🗹	No 🗌									
Sufficient sample volume for indicated test?	Yes 🗹	No 🗔									
All samples received within holding time?	Yes 🗹	No 🗌									
Container/Temp Blank temperature in compliance?	Yes 🗹	No 🗌									
Temperature(s)/Thermometer(s):	2.2		002								
Cooler(s)/Kit(s):	<u>4246</u>										
Water - VOA vials have zero headspace?	Yes 🗹	No 🗆	No VOA vials su	ıbmitted 🗌							
Water - pH acceptable upon receipt?	Yes 🗹	No 🗌	N/A								
pH adjusted? pH adjusted by:	Yes 🗌	No 🗹	N/A								

Login Notes:

Client Contacted:	Date Contacted:	Person Contacted:	
Contacted By:	Regarding:		
. .			
Comments:			
orrectiveAction:			
			S

SRC Page 1 of 1



ALS Laboratory Group 10450 Stancliff Rd. #210 Houston, Texas 77099 (Tel) 281.530.5656 (Fax) 281.530.5887

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Page 1		of	1	7

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NAVAJO REFINING: Navajo Refining Company



Project: Injection Well Quarterly



				ALS Project M	anager: Ch	ris Bryso	n 🦂											
Purchase Order		<u></u>	Project	Name Injection	Well Quart	eriv	<u></u>		VOC (82	60) Sela	act		-					<u></u>
Work Order			Project Ni	Project Number							B SVOC (8270) Select							
Company Name	Navajo Refining Compa	ny	Bill To Con	Sill To Company Navajo Refining Company C					C Total Metals (6020 / 7000) Select									
Send Report To	Aaron Strange		łnvołce	Attn. Aaron Str	ange		··	D	R.C.I, Pr	ofile		•						
								E	Anions (300) CI	SO4							
Address	P. O. Box 159		Ad	dress 501 East	Main			F	Alkalinit	y								
City/State/ZIP	Artesia, New Mexico 88	211-0159	Gity/Sta	te/Z)p Artesia, N	ew Mexico	88210		G	pH									
Phone	(575) 748-3311			2hone (575) 748	3311			н	Conduct	ivity					 .			
Fax	(575) 746-5451			Fax (575) 746	5451			1	TDS							· ·		·····
e-Mail Address	A.Strange@hoilvfrontier.c	com	e-Mall:Ad	dress A Strange	@hollyfront	ier.com]	·······									
No.	Sample Description		Date	Time	Matrix	Pres,	4 Bottles	A	В	c	D	E	F	G	. н	1	J	Hold
1 Injection We	ell Effluent	<u></u>	2/28/11	01411	Liquid	Yes	9	X	X	X	X	X	X	X	X	X	<u> </u>	
2 Trip Blank								\uparrow	-			1	1					
3 Temperatur	e Blank				Ŧ							ľ.	1					
4																		
5												<u> </u>						
6					_		L					L		<u> </u>	L		L	
7					L	L	ļ			-		I	ļ		L			
8.0							ļ	<u> </u>			 	ļ	ļ				<u> </u>	
9										-	<u> </u>		ļ			ļ	ļ	<u> </u>
Sampley(s) Bloose P	rint & Sinn		Shin	vent Method:	l IRec	uiced Tu	maround	Time	<u>. </u>			l	L		t Evilte Di	ie Data	<u> </u>	<u> </u>
Aaron Strange			Fe	deral Expres	. 🛛	STD 10 Wk	Days (⊐sw	k Days	Ūzw	1k Days	0 24	Hour			v vale.		
Relinquished by:	non Z	te: -29-12	Time: 16:15	Received by:					Notes:			<u> </u>					<u></u>	<u></u>
Relinquished by:	Da	te:	Time:	Received by (Labo	(JACTY)	M	2/29	12	Cooler T		C Pack	age: (C	heck B	x Belo	w)::::::			
1. Ave	The second second second second second second second second second second second second second second second s		Tinini	hand	O_{1}	<u> </u>	- 69'	ίυ			Lc	vel II:	Standa	rd QC	~	TR	RP-Che	cklist
Logged by (Laboratory):				- INCKEQ OY (LADO	atory)	3				- Ele		vel III:	Std QC	: + Rav	v Data	TR	RP Leve	el IV
Preservative Key	1.HCL 2.HNO3 3-H	2SO4 4-N	OH 5-Na2S2	03 6-NaHSO4	7:Othe	7	legrees.C		-5035	NJASAN Lintanov		her:						

Note: Any changes must be made in writing once samples and COC Form have been submitted to AL8 Laboratory Group.

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 CUSTODY SEAL
 Register for the search of the se

Sec. 1

Date: 06-Mar-12

Client: Project: Work Order:	ALS Environmental 1202979			Work Order S	Sample Sum	nary
Lab Samp ID (Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold

1203018-01 1202979-01F

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Water

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 Collection Date
 Date Received
 Hold

 2/28/2012 09:40
 3/1/2012 10:30
 □

Date: 06-Mar-12

Client:	ALS Environmental	OUAL IFIFPS
Project:	1202979	ACDONIZAG IDUTTO
WorkOrder:	1203018	ACRONYMS, UNITS
Qualifier	Description	
•	Value exceeds Regulatory Limit	
а	Not accredited	
В	Analyte detected in the associated Method Blank above the Reporting Limit	
Е	Value above quantitation range	
н	Analyzed outside of Holding Time	
J	Analyte detected below quantitation limit	
n	Not offered for accreditation	
ND	Not Detected at the Reporting Limit	
0	Sample amount is > 4 times amount spiked	
Р	Dual Column results percent difference > 40%	
R	RPD above laboratory control limit	
S	Spike Recovery outside laboratory control limits	
U	Analyzed but not detected above the MDL	
Acronym	Description	
DUP	Method Duplicate	
LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicate	
MBLK	Method Blank	
MDL	Method Detection Limit	
MQL	Method Quantitation Limit	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
PDS	Post Digestion Spike	
PQL	Practical Quantitation Limit	
RPD	Relative Percent Difference	. Constanting of the second second second second second second second second second second second second second
SD	Serial Dilution	
TDL	Target Detection Limit	
Units Reporte	d Description	
mg/Kg	Milligrams per Kilogram	

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QF Page I of I

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Date: 06-Mar-12

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Client: Project: Sample ID: Collection Date:	ALS Environmental 1202979 1202979-01F 2/28/2012 09:40 AM				W	ork Order: 12030 Lab ID: 12030 Matrix: WAT	018 018-01 ER
Analyses		Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
CYANIDE, REAC Cyanide, Reactive	TIVE	ND		SW7.3 40.0	3.2 mg/Kg	1	Analyst: NZ 3/2/2012 11:30 AM
SULFIDE, REACT Sulfide, Reactive	ΓΙνε	ND		SW7.3 40.0	4.2 mg/Kg	1	Analyst: NZ 3/2/2012 11:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client:	ALS Environmental
'ork Order:	1203018
Project:	1202979

QC BATCH REPORT

Date: 06-Mar-12

Batch ID: R101907	Instrument ID WETCHEM		Metho	d: SW7.3.	4.2					
MBLK Sample I	D: MB-R101907-R101907				Units: mg/l	Kg	Analy	sis Date: 3	/2/2012 1	1:30 AM
Client ID:	Run ID	WETCH	IEM_12030	2F	SeqNo: 1913	3904	Prep Date:		DF: 1	
Anatyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide, Reactive	ND	40								
The following samples	s were analyzed in this batch:	12	03018-01A							

The following samples were analyzed in this batch:

See Qualifiers Page for a list of Qualifiers and their explanation.

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QC Page: 1 of 2

Client: Work Order: roject:	ALS 1203 1202	Environmental 3018 2979								QCI	BATC	H REI	PORT	
Batch ID: R1019	09	Instrument ID WETC	HEM		Method	I: SW7.3.	3.2							
MBLK Sa	mple ID:	WBLKW1-120301-R1	01909				ι	Inits: mg/	Kg	Analys	is Date: 3	/2/2012 11	:30 AM	
Client ID:			Run ID: WE	тсн	EM_120302	2G	Se	qNo: 191:	3931	Prep Date:		DF: 1		
Analyte		Res	sult F	QL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Cyanide, Reactiv	'e		ND	40									•	
LCS Sa	mple ID:	WLCSW1-120301-R1	01909				L	Inits: mg/	Kg	Analys	is Date: 3	/2/2012 11	:30 AM	
Client ID:			Run ID: WE	тсн	EM_120302	2G	Se	qNo: 191 :	3946	Prep Date:		DF: 1		
Analyte		Re	sult F	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Cyanide, Reactiv	/e	24	9.6	40	250		0	99.8	75-125	0				
LCSD Sa	Sample ID: WLCSDW1-120301-R1019				· · · · ·		ι	Jnits: mg/	Kg	Analys	is Date: 3	/2/2012 11	:30 AM	
Client ID:			Run ID: WI	ЕТСН	EM_120302	2G	SeqNo: 1913958			Prep Date:		DF: 1		
Analyte		Re	sutt F	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Cyanide, Reactiv	<i>r</i> e	24	9.6	40	250		0	99.8	75-125	249.6	C) 35		
MS Sa	mple ID:	1202727-01A MS					ι	Jnits: mg/	Kg	Analys	is Date: 3	/2/2012 11	:30 AM	
Client ID:		۰.	Run ID: WI	ЕТСН	IEM_120302	2G	Se	qNo: 191	3948	Prep Date:		DF: 1		
Analyte		Re	sult F	PQL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Cyanide, Reactiv	<i>r</i> e	24	9.6	40	250		0	99.8	50-150	0				
MSD Sa	mple ID:	1202727-01A MSD					Ľ	Jnits: mg/	Kg	Analys	is Date: 3	/2/2012 11	:30 AM	
Client ID:			Run ID: WI	ЕТСН	EM_120302	2G	Se	qNo: 191	3949	Prep Date:		DF: 1		
Analyte		Re	sult F	QL	SPK Val	SPK Ref Value		%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Cyanide, Reactiv	<i>r</i> e	24	9.6	40	250		0	99.8	50-150	249.6	C) 35		
The following sa	amples w	ere analyzed in this I	batch:	12	03018-01A									

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See Qualifiers Page for a list of Qualifiers and their explanation.

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Subcontractor: ALS Laboratory Group 3352 128th Ave.

Holland, MI 49424

TEL: (616) 399-6070 (616) 399-6185 FAX: Acct #:

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CHAIN-OF-CUSTODY RECORD

Date:	<u>29-Feb-12</u>
COC ID:	<u>11546</u>
Due Date	06-Mar-12

Page 1 of 1

2:

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Salesperson Jeffrey L Croston

Ci	ustomer Information	P	roject Information				Par	ameter	Method	Reques	t for Ana	l ysis		
Purchase Order		Project Name	1202979	A	Reac	tive Cy	anide (SW-846	5)					
Work Order		Project Number		В	Reac	tive Su	lfide (S	W-846)						
Company Name	ALS Group USA, Corp.	Bill To Company	ALS Group USA, Corp.	C										
Send Report To	Patricia L. Lynch	Inv Attn	Accounts Payable	D										
Address	10450 Stancliff Rd, Suite 210	Address	10450 Stancliff Rd, Suite 210	E								_		
				F										
City/State/Zip	Houston, Texas 77099-4338	City/State/Zip	Houston, Texas 77099-4338	G										
Phone	(281) 530-5656	Phone	(281) 530-5656	Н										
Fax	(281) 530-5887	Fax	(281) 530-5887	T										
eMail Address	pat.lynch@alsglobal.com	eMail CC		J							·····			
Sample ID		Matrix Collection	Date 24hr Bottie		A	8	С	D	E	. F	G	H	1	J
1202979-01F (Inje	ction Well Effluent)	Water 28/Feb/2	Q12 9:40 (1) 1LPNEAT		x	X								

Comments: Please analyze for reactive cyanide & reactive sulfide. cc Mary.knowles & Yvan.ty@alsglobal.com Date/Time 1030 Cooler IDs 4.3°C Date/Time Report/QC Level Relinquished by: Reserved by: Bar 2/27/12-(2Dir متحد Std Received by: Date/Time Relinquished by: Date/Time

Date/Time Received: 01-Mar-12 10:30 **Client Name:** ALS - HOUSTON Work Order: Received by: <u>JB</u> 1203018 Bell Care Checklist completed by Lessica Bacon 01-Mar-12 01-Mar-12 Reviewed by: Date Signature Date Matrices: <u>water</u> Carrier name: FedEx Yes 🗹 No 🗌 Not Present Shipping container/cooler in good condition? Yes 🗹 Not Present Custody seals intact on shipping container/cooler? Custody seals intact on sample bottles? Yes 🗌 No 🗌 Not Present Yes 🗹 Chain of custody present? No 🗌 Chain of custody signed when relinquished and received? Yes 🗹 Yes 🗹 Chain of custody agrees with sample labels? Yes 🗹 Samples in proper container/bottle? Yes 🗹 Sample containers intact? No 🗌 Yes 🗹 Sufficient sample volume for indicated test? Yes 🗹 All samples received within holding time? Yes 🗹 Container/Temp Blank temperature in compliance? 4.2 C Temperature(s)/Thermometer(s): Cooler(s)/Kit(s): Yes 🗌 No 🗌 No VOA vials submitted 🗹 Water - VOA vials have zero headspace? Yes 🗹 Water - pH acceptable upon receipt? Yes 🗌 No 🗹 N/A pH adjusted? pH adjusted by: Login Notes:

Sample Receipt Checklist

SRC Page 1 of 1



APPENDIX E

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FLUIDS AND PRESSURE CALCULATIONS

APPENDIX E-1

HISTORICAL INJECTION RATE AND SURFACE INJECTION PRESSURE

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Historical Injection Rates and Surface Injection Pressures Navajo Refining Company, L.L.C. Artesia, New Mexico

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	WDW-1		WDW-2			WDW-3		
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	Ì
12/22/00	247.39	I 301.38 İ	133.21	340.57		1		•
12/23/00	247.39	301.38	133.21	340.57				
12/24/00	245.43	298.88	132.60	343.28				
12/25/00	216 37	244 75	118.89	293.54				
12/26/00	205.00	268 31	110.00	314 73				
12/27/00	246 65	330 05	218 50	304 81				
12/28/00	290.00	112 22	210.00	307 06				
12/20/00	204.01	272 62	150 25	27/ 10				
12/20/00	209.20	217 40	147 20	222 14				
12/30/00	207.01	210.49	147.29	000.14				
01/01/01	240.02	252 54	140.00	00.07				
01/01/01	200.04	202.04	140.09	003.39				
01/02/01	190.40	220.00	10.00	200.70				
01/03/01	213.30	202 22	120.04	020.92			•	
01/04/01		003.23	124.03	002.92			•	
	219.32	293.21	131.00	340.00				
	207.70		124.20	309.94				
01/07/01	220.15	280.53	129.51	335.89				
01/08/01	221.79	294.00	129.79	350.21				
01/09/01	217.30	207.02	125.50	344.04				
01/10/01	220.07	305.20	131.11	302.01				
01/11/01		290.04	121.10	340.24				
01/12/01	084.91	118.50	144.40	441.50				
01/13/01	110.59	099.81	104.37	327.97				
01/14/01	218.03	162.39	050.45	150.08				
01/15/01	148.39		129.08	374.57				
01/16/01	317.66	194.30	105.15	260.97				
01/17/01	297.76	164.24	101.80	232.42				
01/18/01	257.36	127.62	083.25					
01/19/01	292.31	145.25	000.88	000.65				
01/20/01	235.38	146.03	071.80	242.09				
01/21/01	287.67	187.20	094.63	246.83				
01/22/01	272.21	154.15	0/4.36	194.41		•		
01/23/01		132.72	000.83	184.09				
01/24/01	208.03	188.38	078.78	248.18				
01/25/01	218.40	138.08	059.42	184.75				
01/26/01	239.49	165.40	070.51	215.64				
01/27/01	223.07	099.14	000.10	130.13				
01/20/01	200.03	00.00		015.37				
01/29/01	249.94	162.00	000.02	199.34				
01/30/01	207.02	00.00	025.00	223.34				
01/31/01	290.01	102 56	035.00	077 46				
02/01/01	200.04	103.00	122 20	124 60				
02/02/01	200.02	200.01		000.01				
02/03/01	250.49	196 67	000.72		l			
02/04/01	202.10	116 72	1/6 70	1400.14	1			
02/06/04	200.09	110.73	140.70	1 140.07	1			
02/07/04	213.39	164 45						
02/07/01	234.12	104.40			l			
	200.01	201.51		009.20				
02/09/01	290.20	200.23						
	201.31	240.48						
02/11/01	283.16	240.05						
02/12/01	293.91	277.74	000.47	00.00				

Historical Injection Rates and Surface Injection Pressures Navajo Refining Company, L.L.C. Artesia, New Mexico

	WDW-	.1	WDW-2			WDW-3	
Date I	Rate	Pres	Rate	Pres	Date	Rate	Pres
10/30/00 2	47.39	301.38	133.21	340.57		• •	
10/31/00 2	47.39 İ	301.38	133.21	340.57			
11/01/00 2	47.39	301.38	133.21	340.57			
11/02/00 2	47.39 İ	301.38	133.21	340.57			
11/03/00 2	47.39 İ	301.38	133.21	340.57			
11/04/00 2	47.39 İ	301.38	133.21	340.57			
11/05/00 2	47.39 İ	301.38 İ	133.21	340.57			
11/06/00 2	47.39 i	301.38	133.21	340.57		÷	
11/07/00 2	47.39 İ	301.38	133.21	340.57			
11/08/00 2	47.39 i	301.38	133.21	340.57			
11/09/00 2	47.39	301.38	133.21	340.57			
11/10/00 2	47.39 i	301.38	133.21	340.57			
11/11/00 2	47.39	301.38	133.21	340.57			
11/12/00 2	47.39	301.38	133.21	340.57			
11/13/00 2	47.39 İ	301.38	133.21	340.57		,	
11/14/00 2	47.39	301.38	133.21	340.57			
11/15/00 2	47.39	301.38	133.21	340.57			
11/16/00 2	47.39	301.38	133.21	340.57			
11/17/00 2	47.39	301.38	133.21	340.57			
11/18/00 2	47.39	301.38	133.21	340.57			
11/19/00 2	47.39	301.38	133.21	340.57			
11/20/00 2	47.39	301.38	133.21	340.57			
11/21/00 2	47.39	301.38	133.21	340.57			
11/22/00 2	47.39	301.38	133.21	340.57			
11/23/00 2	47.39	301.38	133.21	340.57			
11/24/00 2	47.39	301.38	133.21	340.57			
11/25/00 2	47.39	301.38	133.21	340.57			
11/26/00 2	47.39	301.38	133.21	340.57			
11/27/00 2	47.39	301.38	133.21	340.57			
11/28/00 2	47.39	301.38	133.21	340.57			
11/29/00 2	47.39	301.38	133.21	340.57			
11/30/00 2	47.39	301.38	133.21	340.57			
12/01/00 2	47.39 j	301.38	133.21	340.57			
12/02/00 2	47.39 j	301.38	133.21	340.57			
12/03/00 2	47.39	301.38	133.21	340.57			
12/04/00 2	47.39	301.38	133.21	340.57			
12/05/00 2	47.39	301.38	133.21	340.57			
12/06/00 2	47.39	301.38	133.21	340.57			
12/07/00 2	47.39	301.38	133.21	340.57	ļ		
12/08/00 2	47.39	301.38	133.21	340.57			
12/09/00 2	47.39	301.38	133.21	340.57			
12/10/00 2	47.39	301.38	133.21	340.57			
12/11/00 2	47.39	301.38	133.21	340.57			
12/12/00 2	47.39	301.38	133.21	340.57			
12/13/00 2	47.39	301.38	133.21	340.57			
12/14/00 2	47.39	301.38	133.21	340.57			
12/15/00 2	47.39	301.38	133.21	340.57			
12/16/00 2	47.39	301.38	133.21	340.57			
12/17/00 2	47.39	301.38	133.21	340.57			
12/18/00 2	47.39	301.38	133.21	340.57	ļ		
12/19/00 2	47.39	301.38	133.21	340.57			
12/20/00 2	47.39	301.38	133.21	340.57	1		
12/21/00 2	47.39	301.38	133.21	340.57	l		
				1	1		
W	Rate						

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WDW-3

1	WDW	-1	· WDV	V-2	
Date	Rate	Pres	Rate	Pres	Date
09/07/00	247.39	301.38	133.21	340.57	
09/08/00	247.39	301.38	133.21	340.57 i	
09/09/00	247.39	301.38	133.21	340.57	
09/10/00	247.39	301.38	133.21	340.57	
09/11/00	247.39	301.38	133.21	340.57	
09/12/00	247 39	301 38	133 21	340 57	
09/13/00	247 39	301 38	133 21	340 57	
09/14/00	247 39	301.38	133 21	340 57	
09/15/00	247.30	301 38	133.21	340 57	
00/16/00	247.30	301.30	133 21	340.57	
00/17/00	247.33	301.30	133.21	340.57	
00/19/00	247.33	301.30	122 21	240.57	
09/10/00	247.39	301.30	133.21	340.57 340.57	
09/19/00	247.09	201.00	133.21	340.37 240.57	
09/20/00	247.39	201.30	100.21	340.57	
09/21/00	247.39	301.38	133.21	340.57	
09/22/00	247.39	01.30	133.21	340.57	
09/23/00	247.39	301.38	133.21	340.57	
09/24/00	247.39	301.38	133.21	340.57	
09/25/00	247.39	301.38	133.21	340.57	
09/26/00	247.39	301.38	133.21	340.57	
09/27/00	247.39	301.38	133.21	340.57	
09/28/00	247.39	301.38	133.21	340.57	
09/29/00	247.39	301.38	133.21	340.57	
09/30/00	247.39	301.38	133.21	340.57	
10/01/00	247.39	301.38	133.21	340.57	
10/02/00	247.39	301.38	133.21	340.57	
10/03/00	247.39	301.38	133.21	340.57	
10/04/00	247.39	301.38	133.21	340.57	
10/05/00	247.39	301.38	133.21	340.57	
10/06/00	247.39	301.38	133.21	340.57	
10/07/00	247.39	301.38	133.21	340.57	
10/08/00	247.39	301.38	133.21	340.57	
10/09/00	247.39	301.38	133.21	340.57	
10/10/00	247.39	301.38	133.21	i 340.57 i	
10/11/00	247.39	301.38	133.21	340.57	
10/12/00	247.39	301.38	133.21	340.57	
10/13/00	247.39	301.38	133.21	340.57	
10/14/00	247.39	301.38	133.21	340.57	
10/15/00	247.39	301.38	133.21	340.57	
10/16/00	247.39	301.38	133.21	340.57	
10/17/00	247.39	301.38	133.21	340.57	
10/18/00	247.39	301.38	133.21	340.57	
10/19/00	247.39	301.38	133.21	340.57	
10/20/00	247.39	301.38	133.21	340.57	
10/21/00	247 39	301 38	133.21	340.57	
10/22/00	247 39	301.38	133 21	340 57	
10/23/00	247 30	301 38	133.21	340 57	
10/24/00	247 20	301.30	122 21	340.57	
10/25/00	247.09	301.00	122 21	340.57	
10/20/00	241.00	201.00	122.21	040.07 240 57	
10/27/00	241.00	201.00	100.21	1 340.37 1 2 / 1 57	
10/27/00	1247.39	1201.38	133.21	340.37 340.57	
10/28/00	247.39	301.38	133.21	340.57	
10/29/00	247.39	301.38	133.21	340.57	

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WDW-1		-1	WDW-2		WDW-		DW-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
07/16/00	247.39	301.38	133.21	340.57		•	
07/17/00	247.39	301.38	133.21	340.57		÷	
07/18/00	247.39	301.38	133.21	340.57			
07/19/00	247.39	301.38	133.21	340.57			
07/20/00	247.39	301.38	133.21	340.57 i			
07/21/00	247.39	301.38	133.21	340.57			
07/22/00	247.39	301.38	133.21	340.57			
07/23/00	247.39	301.38	133.21	340.57			
07/24/00	247.39	301.38	133.21	340.57			
07/25/00	247.39	301.38	133.21	340.57			
07/26/00	247.39	301.38	133.21	340.57	•		
07/27/00	247.39	301.38	133.21	340.57			
07/28/00	247.39	301.38	133.21	340.57			
07/29/00	247.39	301.38	133.21	340.57			
07/30/00	247.39	301.38	133.21	340.57			
07/31/00	247.39	301.38	133.21	340.57			
08/01/00	247.39	301.38	133.21	340.57			
08/02/00	247.39	301.38	133.21	340.57			
08/03/00	247.39	301.38	133.21	340.57			
08/04/00	247.39	301.38	133.21	340.57			
08/05/00	247.39	301.38	133.21	340.57			
08/06/00	247.39	301.38	133.21	340.57			
08/07/00	247.39	301.38	133.21	340.57			
08/08/00	247.39	301.38	133.21	340.57			
08/09/00	247.39	301.38	133.21	340.57			
08/10/00	247.39	301.38	133.21	340.57			
08/11/00	247.39	301.38	133.21	340.57			
08/12/00	247.39	301.38	133.21	340.57			
08/13/00	247.39	301.38	133.21	i 340.57 i			
08/14/00	247.39	301.38	133.21	340.57			
08/15/00	247.39	301.38	133.21	340.57			
08/16/00	247.39	301.38	133.21	340.57			
08/17/00	247.39	301.38	133.21	340.57	•		
08/18/00	247.39	301.38	133.21	340.57			
08/19/00	247.39	301.38	133.21	340.57			
08/20/00	247.39	301.38	133.21	340.57			
08/21/00	247.39	301.38	133.21	340.57			
08/22/00	247.39	301.38	133.21	340.57			
08/23/00	247.39	301.38	133.21	340.57			
08/24/00	247.39	301.38	133.21	340.57			
08/25/00	247.39	301.38	133.21	340.57			
08/26/00	247.39	301.38	133.21	340.57			
08/27/00	247.39	301.38	133.21	340.57			
08/28/00	247.39	301.38	133.21	340.57			
08/29/00	247.3 9	301.38	133.21	340.57			
08/30/00	247.39	301.38	133.21	340.57			
08/31/00	247.39	301.38	133.21	340.57			
09/01/00	247.39	301.38	133.21	340.57			
09/02/00	247.39	301.38	133.21	340.57			
09/03/00	247.39	301.38	133.21	340.57			
09/04/00	247.39	301.38	133.21	340.57			
09/05/00	247.39	301.38	133.21	340.57			
09/06/00	247.39	301.38	133.21	340.57			

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WDW-3

1	WDW	-1	WDV	V-2		W
Date	Rate	Pres	Rate	Pres	Date	Rate
05/24/00	247.39	301.38	133.21	340.57		
05/25/00	247.39	301.38	133.21	340.57		
05/26/00	247.39	301.38	133.21	340.57		
05/27/00	247.39	301.38	133.21	340.57		
05/28/00	247.39	301.38	133.21	340.57		
05/29/00	247.39	301.38	133.21	340.57		
05/30/00	247.39	301.38	133.21	340.57		
05/31/00	247.39	301.38	133.21	340.57		
06/01/00	247.39	301.38	133.21	340.57		
06/02/00	247.39	301.38	133.21	340.57		
06/03/00	247 39	301 38	133 21	340 57		
06/04/00	247 39	301.38	133 21	340 57		
06/05/00	247 39	301.38	133 21	340 57 1		
06/06/00	247.00	301.38	133 21	340 57		
06/07/00	247.30	301.38	133 21	340 57		
06/08/00	247.30	301.38	133.21	340.57		
06/00/00	247.00	301.00	133.21	340 57		
06/10/00	247.30	301.30	133.21	340.57		
06/11/00	1 247 30	301.30	133.21	3/0 57		
06/12/00	1 247.33	301.30	133.21	340.57		
06/13/00	277.33	301.30	133.21	340.57		
06/14/00	247.33	301.30	133.21	340.57 340.57		
06/15/00	247.39	201.30	122 21	340.37 240.57		
00/10/00	247.39	01.00	133.21	040.07		
06/17/00	247.39	201.30	122 21	340.37 240.57		
00/17/00	247.39	201.30	133.21	340.57		
00/10/00	247.39	01.30	133.21	340.57		
00/19/00	247.39	301.30	133.21	340.57		
00/20/00	247.39	301.30	133.21	340.57		
00/21/00	247.39	01.30	133.21	340.57		
00/22/00	247.39	301.38	133.21	340.57 340.57		
00/23/00	247.39	301.30	133.21	340.57 340.57		
00/24/00	247.39	301.38	133.21	340.57		
00/20/00	247.39	301.30	133.21	340.57		
00/20/00	247.39	301.38	133.21	340.57		
06/27/00	247.39	301.38	133.21	340.57		
00/28/00	247.39	301.38	133.21	340.57		
00/29/00	247.39	301.38	133.21	340.57		·
00/30/00	247.39	301.30	133.21	340.57		
07/01/00	247.39	301.30	133.21	340.57		
07/02/00	247.39	201.30	122 21	340.57 240.57		
07/03/00	247.39	201.30	133.21	340.57		
07/04/00	247.39	201.30	122.21	340.37		
07/05/00	247.39	301.30	122.21	340.37 240.57		
07/00/00	247.35	201.30	122 21	340.57 340.57		
07/07/00	247.35	201.30	100.21	340.57		
07/00/00	241.00	201.30	122.21	340.37 240 57		
07/109/00	247.09	201.30	122.21	340.57 340.57		
07/14/00	247.39	1301.30	133.21	340.57 340.57		
07/11/00	247.39	1301.38	133.21	340.57		
07/12/00	247.39	301.38	133.21	340.57		
07/13/00	247.39	1301.38	133.21	340.57		
07/14/00	247.39	301.38	133.21	340.57		
07/15/00	247.39	301.38	133.21	340.57		

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1	WDW	-1	WDV	V-2		WDW-3		
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
04/01/00	247.39	301.38	133.21	340.57				
04/02/00	247.39	301.38	133.21	340.57				
04/03/00	247.39	301.38	133.21	340.57				
04/04/00	247.39	301.38	133.21	340.57				
04/05/00	247.39	301.38	133.21	340.57	Ì			
04/06/00	247.39	301.38	133.21	340.57				
04/07/00	247.39	301.38	133.21	340.57	ĺ			
04/08/00	247.39	301.38	133.21	340.57				
04/09/00	247.39	301.38	133.21	340.57				
04/10/00	247.39	301.38	133.21	340.57	ĺ			
04/11/00	247.39	301.38	133.21	340.57				
04/12/00	247.39	301.38	133.21	340.57				
04/13/00	247.39	301.38	133.21	340.57	İ			
04/14/00	247.39	301.38	133.21	340.57	ļ			
04/15/00	247.39	301.38	133.21	340.57	Ì			
04/16/00	247.39	301.38	133.21	340.57	ĺ			
04/17/00	247.39	301.38	133.21	340.57	l			
04/18/00	247.39	301.38	133.21	340.57	1			
04/19/00	247.39	301.38	133.21	340.57				
04/20/00	247.39	301.38	133.21	340.57	İ			
04/21/00	247.39	301.38	133.21	340.57	1			
04/22/00	247.39	301.38	133.21	340.57	1			
04/23/00	247.39	301.38	133.21	340.57	l			
04/24/00	247.39	301.38	133.21	340.57				
04/25/00	247.39	301.38	133.21	340.57	ĺ			
04/26/00	247.39	301.38	133.21	340.57				
04/27/00	247.39	301.38	133.21	340.57	i			
04/28/00	247.39	301.38	133.21	340.57	1			
04/29/00	247.39	301.38	133.21	340.57	İ			
04/30/00	247.39	301.38	133.21	340.57				
05/01/00	247.39	301.38	133.21	340.57	İ			
05/02/00	247.39	301.38	133.21	340.57				
05/03/00	247.39	j 301.38	133.21	340.57	i .			
05/04/00	247.39	301.38	133.21	340.57				
05/05/00	247.39	301.38	133.21	340.57				
05/06/00	247.39	301.38	133.21	340.57	1			
05/07/00	247.39	301.38	133.21	340.57				
05/08/00	247.39	301.38	133.21	340.57				
05/09/00	247.39	301.38	133.21	340.57				
05/10/00	247.39	301.38	133.21	340.57				
05/11/00	247.39	301.38	133.21	340.57				
05/12/00	247.39	301.38	133.21	340.57				
05/13/00	247.39	301.38	133.21	340.57				
05/14/00	247.39	301.38	133.21	340.57	1			
05/15/00	247.39	301.38	133.21	340.57	1			
05/16/00	247.39	301.38	133.21	340.57				
05/17/00	247.39	301.38	133.21	340.57				
05/18/00	247.39	301.38	133.21	340.57	1			
05/19/00	247.39	301.38	133.21	340.57				
05/20/00	247.39	301.38	133.21	340.57	1			
05/21/00	247.39	301.38	133.21	340.57	1			
05/22/00	247.39	301.38	133.21	340.57	l I			
05/23/00	247.39	301.38	133.21	340.57	1			

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1	WDW	-1	WDV	V-2		WDW-3		
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	Í
02/13/01	250.72	177.73	139.56	170.14				·
02/14/01	246.00	179.86	152.98	193.68				
02/15/01	222.58	153.33	176.46	189.72				
02/16/01	207.06	142.05	163.06	175.16				
02/17/01	232.05	172.86	095.93	114.48				
02/18/01	271.89	294.57	000.30	000.00				
02/19/01	249.28	249.01	000.42	000.00				
02/20/01	283.89	297.82	000.38	000.02				
02/21/01	263.62	258.16	000.33	000.05				
02/22/01	270.52	239.51	000.36	000.04				
02/23/01	247.20	211.70	000.29	000.07				
02/24/01	276.57	288.67	000.35	000.06				
02/25/01	260.10	271.37	000.23	000.08				
02/26/01	283.43	292.77	000.27	000.05				
02/27/01	289.80	282.94	000.21	000.08				
02/28/01	292.19	290.97	000.24	000.06				
03/01/01	260.34	198.19	113.76	152.48				
03/02/01	223.39	153.02	139.22	161.24				
03/03/01	261.12	219.34	071.16	082.20				
03/04/01	284.43	264.53	000.46	000.00				
03/05/01	290.66	291.97	000.41	000.00				
03/06/01	270.16	267.50	000.50	000.00				
03/07/01	272.28	276.84	000.44	000.00				
03/08/01	281.18	287.93	007.09	008.98				
03/09/01	218.86	140.38	171.96	190.35			1 Šr	
03/10/01	201.34	130.85	165.72	178.13				
03/11/01	279.93	282.07	031.72	035.16				
03/12/01	235.91	195.27	000.48	000.00				
03/13/01	225.04	170.99	000.60	000.01				
03/14/01	281.18	292.66	000.52	000.00				
03/15/01	248.54	236.45	000.58	000.00				
03/16/01	268.93	270.18	000.58	000.00				
03/17/01	252.53	211.38	000.55	000.01				
03/18/01	236.25	200.19	000.64	000.00				
03/19/01	247.16	222.54	000.62	000.00				
03/20/01	223.04	176.78	000.54	000.00				
03/21/01	229.29	172.86	000.54	000.00				
03/22/01	214.62	148.81	000.40	000.00				
03/23/01	248.56	226.23	000.09	000.00	ł			
03/24/01	261.44	253.57	000.14	000.00				
03/25/01	232.89	224.83	000.23	000.00				
03/26/01	214.79	154.48	000.18	000.00				
03/27/01	192.47	104.77	000.19	000.00				
03/28/01	214.73	184.36	000.19	000.00				
03/29/01	220.44	173.66	000.21	000.00				
03/30/01	230.92	210.87	000.17	000.00	l			
03/31/01	226.26	177.12	000.11	000.00	1			
04/01/01	188.74	139.94	000.15	000.00				
04/02/01	231.66	210.76	000.12	000.00				
04/03/01	227.31	207.72	000.15	00.00	1			
04/04/01	234.71	264.45	000.16	000.00				
04/05/01	258.22	298.35	000.11	00.00				
04/06/01	257.11	264.45	000.16	00.000	l			

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1	WDW	-1	WDV	V-2		V	VDW-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
04/07/01	251.26	254.50	000.19	, 000.00		•	
04/08/01	265.43	301.80	000.17	i 000.00 i			
04/09/01	258.45	266.39	040.59	052.90			
04/10/01	145.18	063.74	138.99	091.92			
04/11/01	200 51	192 68	090 48	103 12			
04/12/01	272 27	302 27	000.54				
04/13/01	196.07	157 76	131 83	127 81			
04/14/01	245.80	246 22	062 38	073 22 1			
04/15/01	240.00	101 68	002.00				
04/16/01	207.52	206 11		000.00			
04/17/01	214.01	200.11		000.00			
04/18/01	240.94	219.21	000.70				
04/10/01	240.23	202.07	000.40				
04/20/01	204.70	224 87					
04/20/01	210.01	224.07	000.00				
04/21/01	255.07	202.75	000.02				
04/22/01	200.07	204.21					
04/23/01	233.33	204.01					
04/24/01	219.01	219.01					
04/25/01	200.09	307.97	000.10				
04/20/01	201.07	310.71	000.14				
04/27/01	201.20	295.70	000.19		4		
04/20/01	240.07						
04/29/01	201.01	299.00					
04/30/01	240.12	207.90	039.50	045.49			
05/01/01	237.32	100 02	1007.01	111.90 152 55			
05/02/01	200.29	100.03	139.04	100.00			
05/03/01	105.22	172.00	130.20	103.00			
05/04/01	190.11	047 15	147.00	074 01			
05/05/01	230.40	247.10					
05/00/01	201.70	162.20					
05/07/01	177.12	102.20	004.94				
05/06/01	244.91	290.10	140 49	044.00			
05/09/01	222.00	230.34	000 60	000.00			
05/10/01	209.00	213.10		000.00			
05/12/01	171 31	136.86	156.85	170 04			
05/12/01	103.00	103 36	160.00	012 32			
05/14/01	1 163 36	117 80	154 83	160 80			
05/15/01	1 200 72	210.83	079 56	100.00			
05/16/01	246 26	210.00	000.85	000 17			
05/17/01	100.34	121 34	124 32	217 28			
05/18/01	149 54	189.21	1 000 08	159 32			
05/10/01	188 30	180.06	030.30	002 52			
05/20/01	100.50	181 00	18/ 21	092.02			
05/21/01	1 105 03	201.00	170 15	245.14			
05/21/01	176 62	168 13	168 10	240.00			
05/22/01	162 20	162 22	142 05	170 00			
05/23/01	100.00	102.22	1 142.00	110.20			
05/24/01	1102 16	291.00	1 1 70 76	113.70			
05/26/01	170 20	177 54	110.10	200.07			
05/20/01	1100 15	1004 44	1442.02	210.27 221 05			
05/20/04	172 76	172 54	142.03	221.00 222 22			
05/20/01	11/3./0	1113.01	100.94	223.32			
05/29/01	142.96	114.97	142.59	154.26			

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1 1	WDW-1		WDV	V-2		WD	W-3	1
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	i
05/30/01	164.45	155.54	154.34	190.94				
05/31/01	129.92	136.51	123.13	147.57				
06/01/01	133.24	122.92	130.35	151.61				
06/02/01	164.83	167.05	158.65	201.13				
06/03/01	159.56	151.29	154.06	181.32				
06/04/01	142.08	122.29	139.33	149.34				
06/05/01	132 99	131 47	133 49	154 71				
06/06/01	176 68	204 43	163 10	232 96				
06/07/01	176.46	211 39	160.96	236.68				
06/08/01	189 41	232 77	166.04	254 31				
06/09/01	167 15	209.30	103 72	153 67				
06/10/01	177 24	192 29	161 86	231 62				
06/11/01	177 50	102.20	163.40	232 61				
06/12/01	163 38	150.00	152.84	106 56				
06/13/01	1 223 02	308 65	035.01	037 30				
06/14/01	177 68	188 54	152 31	007.00				
06/15/01	162 71	144 23	152.51	183 30				
06/16/01	162.71	157.02	151 01	103.30				
06/17/01	102.07	137.03	1460 02	059.00				•
06/19/01	177.07	107 05	100.0Z	200.21				
06/10/01	169.06	107.00	140.04	105.00				
00/19/01	100.90	107.02	102.20	195.00				
00/20/01	140.40	130.39	137.04					
06/21/01	1 19.40 454 92	082.00	113.14					
00/22/01	154.83		139.12	107.38			$\frac{1}{2}$	
06/23/01	129.85	104.16		124.37				
06/24/01	159.47	163.20	143.47	186.57				
06/25/01	162.47	191.31	141.67	209.81				
06/26/01	148.19	141.51	133.10	159.96				
06/27/01	151.74	160.78	145.16	192.61				
06/28/01	162.29	183.26	156.10	223.46				
06/29/01	174.30	232.68	033.99	046.82				
06/30/01	233.64	338.07						
07/01/01	236.84	332.45	044.15	069.43				
07/02/01	182.12	210.17	163.92	244.73				
07/03/01	178.09	212.84	149.10	228.00				
07/04/01	192.39	228.46	170.32	266.81				
07/05/01	208.80	295.45	041.53	043.31				
07/06/01	221.15	292.34	0/3.86	130.29				
07/07/01	212.38	285.64	044.57	065.49				
07/08/01	218.45	305.08	045.36	075.23				
07/09/01	240.83	348.64	000.91				•	
07/10/01	226.36	335.37						
07/11/01	162.10	190.82	127.20	204.21				
07/12/01	1/3./3	200.81	133.30	217.06				
07/13/01	226.99	329.08	000.86					
07/14/01	199.17	247.50	135.75	207.88	l			
07/15/01	194.30	237.39	171.51	275.45				
07/16/01	194.83	236.24	172.53	275.09				
07/17/01	174.03	211.59	160.68	247.80				
07/18/01	179.46	214.83	165.15	254.63				
07/19/01	201.73	259.13	172.07	279.61	1			
07/20/01	181.00	225.52	171.68	272.37				
07/21/01	164.43	178.61	157.09	221.80	l			

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	WDW	-1	WDV	V-2		I MD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
07/22/01	195.09	255.17	074.30	103.08			
07/23/01	201.71	265.19	000.74	i 000.00 i			
07/24/01	193 29	233.04	000 93				•
07/25/01	210 17	3/0 68	000.00				
07/20/01	270.17		000.00	1 1 2 4 1 5 1			
07/20/01	205.55	200.00	003.01	124.10			
07/27/01	200.58	232.79	097.78	138.47			
07/28/01	214.40	295.98	075.19	131.41			
07/29/01	183.44	210.03	135.08	206.41			
07/30/01	179.86	213.92	100.75	146.85			
07/31/01	215.35	309.62	000.15	000.00			
08/01/01	220.28	308.54	075.02	136.09			
08/02/01	217.29	312.60	029.83	032.24			
08/03/01	250.09	375 93	000 39				
08/04/01	200.00	373 30					
00/04/01	014 15	077 40		154 50			
00/05/01	214.10	211.10	090.29	104.00			
08/06/01	152.06	147.30	135.72	185.78			
08/07/01	218.67	305.36	015.65	014.50			
08/08/01	229.17	330.86	000.18	000.00			
08/09/01	214.39	278.82	115.49	211.74			
08/10/01	211.01	274.90	120.51	176.65			
08/11/01	186.61	247.18	165.42	297.05			
08/12/01	169 17	204 03	152.96	255 70			
08/13/01	210 21	312 10	058.88	114 14			
08/14/01	218.87	310.20	011 16				
09/15/01	1 210.07	019.20	162.92	1 202 12			
00/15/01	1210.22	290.37	102.02	000.11			
08/10/01	227.90	353.00	101.10	379.39			
08/17/01	249.32	419.40	204.15	423.82			
08/18/01	228.68	348.42	181.19	362.94			
08/19/01	197.29	244.29	166.70	287.04			
08/20/01	168.45	177.54	103.72	130.38			
08/21/01	214.79	276.81	000.19	000.00			
08/22/01	208.04	259.24	056.82	090.51			
08/23/01	180.82	214.28	155.62	249.07			
08/24/01	195.70	256.89	168.29	293.63			
08/25/01	188 80	247 38	162 43	284 32			
08/26/01	176 47	234 97	149 45	269.86			
08/27/01	206 16	286.25	11/5 21	200.00			
08/28/01	1110 22	1 150 52	11/0 12	201.10			
09/20/01		1077 56	001 51	192.33			
00/29/01	400.90	440 54	031.01	067.95			
08/30/01		149.54	031.00				
08/31/01	123.75	051.06	092.12	181.61			
09/01/01	171.86	117.21	172.83	294.73			
09/02/01	262.47	182.88	153.36	237.62			
09/03/01	220.24	158.02	128.00	184.89			
09/04/01	239.48	154.88	043.03	062.46			
09/05/01	268.04	208.25	000.19	000.01			
09/06/01	256.06	212 04	000 14	000 01	-		
09/07/01	1 200.00	237 35		000.01			
00/00/04	1010 50	14670					
00/00/01	1210.09	140.70					
09/09/01	252.38	178.59		019.50			
09/10/01	2/2.81	205.50	000.17	000.00			
09/11/01	286.01	228.38	000.20	000.00			
09/12/01	276.33	218.14	000.17	000.00			

L	WDW	-1	WDW	V-2		i we	DW-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pře
09/13/01	295.88	246.95	000.20	000.00			
09/14/01	256.43	203.26	000.17	000.00			
09/15/01	279.35	228.75	000.16	000.00			
09/16/01	257.19	200.56	000.14	000.00		•	
09/17/01	270.73	229.18	000.12	000.00			
09/18/01	263.80	207.66	000.12	000.01			
09/19/01	263.89	206.07	000.18	000.02			
09/20/01	283.32	240.89	000.18	000.03			
09/21/01	271.43	224.52	000.17	000.02			
09/22/01	261.69	186.69	087.67	139.65			
09/23/01	286.85	242.24	000.20	000.00			
09/24/01	243.15	182.54	000.13	000.00			
09/25/01	272.09	227.65	000.29	000.00			
09/26/01	250.31	191.31	072.23	103.47			
09/27/01	158.59	107.80	098.53	134.89			
09/28/01	270.46	211.72	061.39	093.90			
09/29/01	282.02	255.77	000.28	000.00			,
09/30/01	285.37	265.64	000.30	000.00			
10/01/01	297.68	276.25	000.18	000.00			
10/02/01	264.63	199.94	078.61	121.91			
10/03/01	240.71	165.20	136.95	207.54			
10/04/01	206.22	144.60	127.18	178.84			
10/05/01	262.25	220.10	047.55	065.70			
10/06/01	282.99	245.60	000.17	000.02			;;
10/07/01	255.76	217.22	040.44	063.17			- 1
10/08/01	249.72	186.33	074.72	117.67			
10/09/01	263.39	239.15	000.23	000.00			
10/10/01	245.11	187.01	077.96	115.02			
10/11/01	193.77	148.21	138.74	211.11			
10/12/01	240.90	190.33	147.08	238.09			
10/13/01	270.95	245.84	071.57	122.68			
10/14/01	268.43	237.68	082.75	145.84			
10/15/01	249.18	201.30	084.00	143.40			
10/16/01	289.41	292.69	000.14				
10/17/01	274.07	268.16					
10/18/01	209.20	242.97					
10/19/01	201.09	202 75					
10/20/01	290.44	293.73					
10/21/01	207.00	200.71	000.10	000.00			
10/22/01	277 08	072 10	000.15				
10/23/01	277.50	260 93	000.13				
10/25/01	282 89	285 21	000.22				
10/26/01	290 73	307 42	000 15				
10/27/01	285.46	293 39	000.16	000.00			
10/28/01	231.61	178.43	100.66	164.56			
10/29/01	295.08	300.43	000.17	000.00			
10/30/01	259.65	239.24	000.15	000.00			
10/31/01	241.40	233.84	041.47	072.61			
11/01/01	243.69	200.71	141.48	243.98			
11/02/01	241.29	202.57	151.29	251.05			
11/03/01	231.46	183.62	146.16	234.28			
11/04/01	212.15	175.52	109.53	170.90			
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WDW-3

Rate Pres

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	WDW	-1	WDV	V-2		
Date	Rate	Pres	Rate	Pres	Date	Ì
11/05/01	283.58	305.59	000.12	000.00		
11/06/01	245.35	240.51	000.15	000.00		
11/07/01	265.57	270.84	000.21	000.00		
11/08/01	254.88	269.18	000.19	000.00		
11/09/01	268.20	303.54	000.17	000.00		
11/10/01	270.91	306.33	000.21	000.00		
11/11/01	253.44	269.88	000.09	000.00		
11/12/01	277.64	308.74	000.20	000.00		
11/13/01	269 76	304 80	000.14			
11/14/01	270 91	306.08				
11/15/01	218 47	212 15	145 68	258 73		
11/16/01	210.77	108 /3	130.00	245 07		
11/17/01	185 13	163.45	118 67	102 50		
11/12/01	100.10	220.84	046 16	092.09		
11/10/01	229.29	229.04	040.10			
11/19/01	200.12	302.03	000.20			
11/20/01	204.99	211.02				
11/21/01	241.74	201.02	000.17	000.00		
11/22/01		150 26	020.02	190.02		
11/23/01	170.91		117.52	169.05		
11/24/01	104.88	142.42	109.27	108.30		
11/25/01	223.35	222.19	122.14	216.95		
11/26/01	188.48	184.72	122.94	216.10		
11/27/01	230.15	244.12	094.09	174.95		
11/28/01	210.95	218.71	143.04	272.64		
11/29/01	071.29	066.04	038.18	071.54		
11/30/01	026.75	049.12	000.00	019.40		
12/01/01	049.27	090.38	000.00	035.57		
12/02/01	071.80	131.64	000.00	051.74		
12/03/01	094.32	172.91	000.00	067.91		
12/04/01	116.85	214.17	000.00	084.08		
12/05/01	139.37	255.43	000.00	100.25		
12/06/01	161.90	296.70	000.00	116.42	İ	
12/07/01	184.42	337.96	000.00	132.59		
12/08/01	206.95	379.23	00.00	148.76		
12/09/01	229.47	420.49	00.00	164.93		
12/10/01	252.00	461.75	000.00	181.10		
12/11/01	254.08	496.16	011.32	217.05		
12/12/01	189.09	499.86	118.00	387.70	ĺ	
12/13/01	205.27	499.86	137.00	440.25		
12/14/01	213.31	499.86	143.72	457.50		
12/15/01	214.67	499.86	128.72	424.48		
12/16/01	223.28	499.86	137.23	441.90		
12/17/01	212.74	499.86	139.03	440.08		
12/18/01	213.03	499.86	153.50	474.93		
12/19/01	210.56	499.86	133.39	437.32		
12/20/01	203.53	499.86	132.11	430.24		
12/21/01	241.52	499.86	155.14	463.95		
12/22/01	244.45	499.86	168.38	489.21		
12/23/01	229.74	499.86	166.31	479.50		
12/24/01	218.10	499.86	158.52	469.50		
12/25/01	223.52	499.86	162.10	473.16		
12/26/01	203.23	499.86	217.02	470.23		
12/27/01	188.56	499.86	144.21	451.04		

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		-1		V-Z		VD	W-3	ļ
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
12/28/01	221.47	499.86	159.13	471.84				
12/29/01	226.86	499.86	160.73	474.25				
12/30/01	225.64	499.86	159.74	476.04				
12/31/01	228.19	499.86	162.33	484.57				
01/01/02	333.38	499.86	145.08	484.92				
01/02/02	207 39	499.86	143 74	454 84				
01/02/02	226 30	100.00	155 76	481 56				
01/03/02	220.00	100 96	1/2 62	1 469 49				
01/04/02	221.09	499.00	143.02	400.40				
01/05/02	211.99	499.00	147.40	402.33				
01/06/02	220.97	499.00	159.03	404.14				
01/07/02	226.49	499.86	158.69	480.87				
01/08/02	223.51	499.86	154.33	475.56				
01/09/02	222.67	499.86	152.35	476.65				
01/10/02	221.09	499.86	151.58	472.51				
01/11/02	210.97	499.86	144.82	463.16				
01/12/02	229.85	499.86	157.02	484.28				
01/13/02	227.71	499.86	156.80	481.54	:			
01/14/02	211.20	499.86	149.40	463.49				
01/15/02	220.14	499.86	151 26	471.75				
01/16/02	220.07	499.86	152 10	478 42				
01/17/02	212 07	400.00	133 49	447 68				
01/19/02	212.07	100 86	14762	474 40				
01/10/02	210.40	499.00	147.02	474.40				
01/19/02	212.13	499.00	40.01	400.00				
01/20/02	223.70	499.80	104.47	484.98			5.5	
01/21/02	200.01	499.86	139.02	450.31				
01/22/02	206.71	499.86	145.73	469.24				
01/23/02	169.97	499.86	121.37	424.07				
01/24/02	215.93	499.86	151.08	479.88				
01/25/02	199.39	499.86	138.40	465.24				
01/26/02	195.86	499.86	134.08	447.67				
01/27/02	209.42	499.86	146.70	466.74				
01/28/02	204.02	499.86	140.33	461.57				
02/01/02	257.80	310.10	041.53	092.91				
02/02/02	210.13	245 38	111 43	244 19				
02/03/02	249 93	285 78	145.88	324 11				
02/04/02	262 40	200.70	154 12	368 77				
02/05/02	258 60	310 26	1/18 1/	357 58				
02/05/02	250.05	326.06	152 28	366 96				
02/00/02	233.07	250.30	102.00	222 20				
02/07/02	207.47	404.00	002.07	000 50				
02/08/02	304.00	424.89	093.27	229.00				
02/09/02	310.54	426.79	1/6./1	427.88				
02/10/02	296.15	391.45	168.07	400.22			÷	
02/11/02	260.62	349.09	148.41	341.78				
02/12/02	239.12	339.64	123.86	280.32				
02/13/02	200.23	179.34	099.38	247.80				
02/14/02	245.91	146.19	045.73	000.46				
02/15/02	196.24	003.16	092.96	003.81				
02/16/02	344.50	006.80	094.11	008.19				
02/17/02	387 41	010 45	095 25	012 57				
02/18/02	370 93	014 00	1096 40	016 95	t I		•	
02/10/02	330.00	017 72		021 22				
02/10/02	001 04	011.13	000 00	021.32				
02/20/02	291.34	021.3/	090.09	020.70				
02/21/02	230.58	025.01	1099.84	030.08				

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| WDW-3 | | Rate Pres |

		WDW	-1	WDV	V-2	
	Date	Rate	Pres	Rate	Pres	Date
į	02/22/02	238.61	028.65	100.98	034.46	
ł	02/23/02	206.46	032.29	102.13	038.84	
ł	02/24/02	224.62	035.93	103.28	043.22	
1	02/25/02	216.36	039.58	104.42	047.59	
1	02/26/02	199.50	043.22	105.57	051.97	
1	02/27/02	246.02	046.86	106.71	056.35	
	02/28/02	352.61	050.50	107.86	060.73	
	03/01/02	357.34	054.14	109.01	065.11	
	03/02/02	351.61	057.78	110.15	069.49	
	03/03/02	370.63	061.42	111.30	073.86	
	03/04/02	329.05	065.06	112.45	078.24	
	03/05/02	297.14	068.71	113.59	082.62	
	03/06/02	254.39	072.35	114.74	087.00	
	03/07/02	256.84	075.99	115.88	091.38	
	03/08/02	258.40	079.63	117.03	095.76	
	03/09/02	309.84	083.27	118.18	100.14	
	03/10/02	308.87	086.91	119.32	104.51	
	03/11/02	250.75	090.55	120.47	108.89	
	03/12/02	259.87	094.19	121.62	113.27	
	03/13/02	318.62	097.84	122.76	117.65	
	03/14/02	266.33	101.48	123.91	122.03	
	03/15/02	260.40	105.12	125.05	126.41	
	03/16/02	223 02	108.76	126.20	130.78	
	03/17/02	264.38	112.40	127.35	135.16	
	03/18/02	210 99	116 04	128 49	139 54	
	03/19/02	184 90	119 68	129 64	143.92	
	03/20/02	221 73	123 32	130 78	148 30	
	03/21/02	268.11	126.97	131.93	152.68	
	03/22/02	223.07	130.61	133.08	157.05	
	03/23/02	184.58	134.25	134.22	161.43	
	03/24/02	227.72	137.89	135.37	165.81	
	03/25/02	262.80	141.53	136.52	170.19	
	03/26/02	184.75	145.17	137.66	174.57	
	03/27/02	188.34	148.81	138.81	178.95	
	03/28/02	205.80	152.45	139.95	183.33	
	03/29/02	245.05	156.10	141.10	187.70	
	03/30/02	235.80	159.74	142.25	192.08	
	03/31/02	242.48	163.38	143.39	196.46	
	04/01/02	273.07	167.02	144.54	200.84	
	04/02/02	203.40	170.66	145.69	205.22	
	04/03/02	211.11	174.30	146.83	209.60	
	04/04/02	231.56	177.94	147.98	213.97	
	04/05/02	177.92	181.01	148.94	217.66	
	06/04/02	120.40	314.95	122.46	146.22	
	06/05/02	181.96	499.86	109.48	107.25	
	06/06/02	220.53	499.86	062.43	061.51	
	06/07/02	275.03	499.86	000.57	000.04	
	06/08/02	243.12	499.86	081.86	106.61	
	06/09/02	242 65	499 86	146 63	236 60	
	06/10/02	209.91	499 86	136 68	182 41	l l
	06/11/02	241 80	499 86	149 20	225 49	
	06/12/02	223 58	499 86	141 12	194 49	
	06/13/02	229.00	486.81	140.34	201 01	l
	00/ 10/0Z	1 223.34		1170.04	LC1.21	1

1	WDW	-1	WDW-2		1
Date	Rate	Pres	Rate	Pres	Date
06/14/02	244.62	499.86	146.83	218.09	
06/15/02	220.90	499.86	119.95	174.84	
06/16/02	248.92	499.86	158.43	257.14	
06/17/02	249.44	499.86	151.25	251.53	
06/18/02	219.68	499.86	137.70	193.19	
06/19/02	206.75	499.86	121.65	140.38	
06/20/02	226.99	357.63	133.16	173.36	
06/21/02	283.76	266.44	060.00	091.55	
06/22/02	263.02	205.94	148.76	245.09	
06/23/02	229.46	132.50	094.70	137.24	
06/24/02	350.43	059.06	067.82	106.79	
06/25/02	404.59	003.40	003.90	006.14	
06/26/02	391.67	000.00	000.00	000.00	
06/27/02	355 36	000 00	000 00	000 00	
06/28/02	397.00	000.00	000.00		
06/29/02	400 70	000.00	000.00		
06/30/02	321 32				
07/01/02	287 03				
07/02/02	276 47	018 40	000.00	000.00	
07/03/02	269.87		000.20		
07/04/02	226.30	240 73	072 58	110 78	
07/05/02	230 23	499 86	161 08	272 13	
07/06/02	226 77	499.86	153 31	253 27	
07/07/02	193 64	400.00	131 26	200.27	
07/08/02	173 61	400.00	115 42	165 13	
07/00/02	100.01	400.00	133 01	106.15	
07/10/02	177 00	499.00	117 31	173 70	
07/11/02	201 03	100.00	131 10	105 17	
07/12/02	102 00	100 86	127 16	205 50	
07/13/02	218 05	400 86	140.60	200.03	
07/14/02	203 75	400.00	132 31	20.71	
07/15/02	167 22	400 86	102.01	137 87	
07/16/02	186 50	1 400 86	110 8/	166 62	
07/17/02	108.30	1 499.00	113.04	100.02	
07/18/02	222 52	100 86	11/2 18	226 33	
07/19/02	204 57	499.00	132.10	203 61	
07/20/02	207.04	499.86	130 54	210 92	
07/21/02	209.08	499.86	134 52	215 74	
07/22/02	196 62	499 86	125.67	187 36	
07/23/02	189.65	499.86	121 68	197 53	
07/24/02	199.80	499 86	128.47	197 30	
07/25/02	227 32	499.86	134.38	231 29	
07/26/02	198 91	499 86	132 40	203 66	
07/27/02	181 64	499 86	116 23	162.83	
07/28/02	186 28	499.86	119 69	166 22	
07/29/02	169 99	499.86	105 79	142 25	
07/30/02	163 51	499.86	108.15	132 76	
07/31/02	177 07	490.00	112 74	151 65	
08/01/02	231 55	400.00	147 10	250 45	
08/02/02	231 55	400.00	120 15	200.40	
08/02/02	231.55	400 96	145 77	200.00	
08/04/02	231.55	400 96	122 12	201.40 182.22	
08/05/02	231.55	1 400 96	110 14	1141 27	
30/00/0Z	201.00	1-100.00		1 171.21	I

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WDW-3

Rate Pres

WDW-3

Pres |

WDW-1		WDV	V-2 I		I W	
Date I	Rate	Pres	Rate	Pres	Date	Rate
08/06/02	231.55	499 86	104 00	136 35		1
08/07/02	222 00	393.84	075 68	111 99		
08/08/02	21/ 13	272 45	057 62	103 66 1		
00/00/02	165.07	156 74	126 10	103.00		
00/09/02	103.07	00.74	120.19	02.11		
08/10/02	104.41	202.99	142.70	239.70		
08/11/02			140.09	246.75		
08/12/02	213.28	209.00	109.01	303.19		
08/13/02		288.13				
08/14/02			078.09			
08/15/02		210.30	141.09	247.02		
08/10/02	194.09	227.97		208.91		
08/17/02	202.65	235.58	154.70	267.57		
08/18/02	1/5.61	197.64	136.22	226.82		
08/19/02	203.11	258.47	154.65	290.97		
08/20/02	231.85	306.33	135.59	268.84		
08/21/02	168.71	193.92	132.24	229.52		
08/22/02	186.38	232.21	148.27	269.91		
08/23/02	198.06	253.95	155.24	293.57		
08/24/02	174.17	205.54	139.89	241.94		
08/25/02	182.04	203.19	145.00	242.45		
08/26/02	166.76	178.51	131.71	216.85		
08/27/02	178.11	193.61	141.34	233.82		
08/28/02	161.66	166.30	131.84	204.35		
08/29/02	166.81	175.84	132.94	215.70		
08/30/02	149.10	159.99	122.43	197.21		
09/01/02	159.27	166.72	125.52	190.35		
09/02/02	138.55	147.59	110.93	171.56		
09/03/02	152.14	148.81	121.59	178.10		
09/04/02	158.92	157.41	125.00	187.52		
09/05/02	133.83	121.69	106.50	149.02		
09/06/02	149.71	180.81	119.84	212.96		
09/07/02	139.92	155.30	113.20	186.54		
09/08/02	116.63	097.22	094.00	127.85		
09/09/02	161.35	181.81	123.70	203.43		
09/10/02	176.80	217.38	129.22	227.13		
09/11/02	197.50	251.43	153.74	287.15		
09/12/02	191.03	235.37	148.57	271.41		
09/13/02	172.97	217.64	135.13	250.25		
09/14/02	187.53	236.52	145.46	271.21		
09/15/02	177.88	216.01	140.98	250.89		
09/16/02	175.84	213.93	139.77	249.41		
09/17/02	171.75	205.54	134.86	240.32		
09/18/02	168.51	197.35	134.56	232.87		
09/19/02	164.04	203.95	132.27	237.34		
09/20/02	172.75	206.06	136.48	244.66		
09/21/02	193.26	245.27	153.37	287.34		
09/22/02	165.82	200.82	131.66	236.82	!	
09/23/02	163.04	188.82	117.47	196.88		
09/24/02	151.30	177.60	120.95	210.70		
09/25/02	176.13	215.27	138.16	248.12	1	
09/26/02	198.59	261.16	139.19	264.97		
09/27/02	164.22	206.99	127.32	237.20		
09/28/02	176.13	227.13	134.68	259.23		

1	WDW	-1	WDV	V-2 I		1	WD\	N-3	I
Date I	Rate	Pres	Rate	Pres	Date	i Ra	ite	Pres	i
09/29/02	180.01	220.22	137.74	255.56		1.10		• • • • •	'
09/30/02	184 70	232 26	141.63	268.79					
10/01/02	182 59	235 65	140 59	272 79					
10/02/02	176 35	232.83	135.03	268 51					
10/03/02	170.00	232.00	137 11	271 39					
10/03/02	103 13	251 0/	147 60	271.00					
10/05/02	163.65	100 72	126.01	237 88					
10/05/02	164 12	107.01	120.01	237.00 229.11					
10/00/02	155 0/	176 19	1127.05	1250.11					
10/08/02	107.62	307 30	132 37	280.75					
10/00/02	137.02	296 00	177 00	1 1 1 0 0 1 1					·
10/09/02	204.00	255 12	051 74	005 38					
10/11/02	190.01	200.12	031.74	090.00 021 18					
10/11/02	200.03	201.01	1010.42	021.10					
10/12/02	222.04	014.70	100.20	210.00					
10/13/02	212.47	292.22	109.00	320.04 350.04					
10/14/02	[177.90 405.44	229.47	133.92	209.94					
10/15/02			130.00	2/0.11					
10/16/02	109.82			240.31					
10/17/02	175.19	234.27	133.59	263.92					
10/18/02	170.99	222.12	127.47	249.85					
10/19/02		246.84	131.17	252.00					
10/20/02	149.86	179.66	114.41	208.94					
10/21/02	139.44	164.21	106.50	191.95					
10/22/02	139.70	137.58	107.25	169.00				-2.4	
10/23/02	113.21	115.33	80.880	140.96					
10/24/02	140.40	142.63	102.42	219.38					
10/25/02	222.14	206.05	021.89	032.00					·
10/26/02	240.35	199.16	169.77	233.24					
10/27/02	213.67	1/9.26	153.10	206.74					
10/27/02	234.62	189.73	164.08	221.24					
10/28/02	229.61	213.23	105.50	137.93					
10/29/02	196.02	137.00	145.95	177.66					
10/30/02	158.86	099.43	124.21	133.72					
10/31/02	163.10	099.26	125.90	136.05					
11/01/02	179.21	120.51	132.25	147.21					
11/02/02	189.18	134.08	087.24	089.43					
11/03/02	201.63	134.12	000.00	000.03					
11/04/02	217.34	107.04			, .				
11/05/02		218.55							
11/06/02	224.19	207.47		000.08					
11/07/02	237.87	230.61		000.07					
11/08/02	256.96	252.25		000.05					
11/09/02	265.46	259.42	000.00	000.04					
11/10/02	219.11	205.87	000.00	000.06					
11/11/02	264.03	278.43	000.00	000.06					
11/12/02	266.14	2/7.44	00.00	000.10					
11/13/02	250.29	247.83	00.00	000.10					-
11/14/02	193.72	155.86	114.97	148.76					
11/15/02	207.76	162.63	150.26	198.27					
11/16/02	183.11	131.19	139.30	169.14					
11/17/02	153.36	077.86	115.92	114.23					
11/18/02	146.88	078.55	114.35	112.64					
11/19/02	156.27	126.02	073.42	092.08					

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	WDW	-1	WDV	V-2		WC)W-3	1
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	i
11/20/02	195.62	149.07	147.11	189.45				'
11/21/02	169.03	100.53	129.68	141.22				
11/22/02	143 39	080.35	114 79	115 52				
11/23/02	141 21	076 74	113 94	112 27				
11/24/02	164 10	085 76	125 57	129 18				
11/25/02	173 40	122 15	133 10	164 12				
11/26/02	164 25	122.10	127 05	160 78				
11/27/02	160 27	135.30	127.00	163.70				
11/21/02	175 52	151.59	144 27	103.20 197.90				
11/20/02	101 17	144 24	144.27 1 <i>4</i> 2.40	107.00				
11/20/02	101 70	144.04	142.40 127 70	175 52				
12/01/02	167.02	140.00	134.70	170.00				
12/01/02	103.02	125.20	124.09	157.71				
12/02/02	103.78	125.29	124.07					
12/03/02		125.31	126.39	157.69				
12/04/02	129.10	8 167.5	5					
12/05/02	135.6	9 202.5	01					
12/06/02	145.84	4 204.7	9					
12/07/02	190.47	179.23	137.49	205.66				
12/08/02	206.39	193.91	144.37	211.20				
12/09/02	195.76	183.60	137.51	199.90				
12/10/02	200.85	195.71	149.73	233.26				
12/11/02	184.02	157.37	139.88	198.52	_			
12/12/02	183.30	140.47	133.38	171.60				
12/13/02	148.65	097.02	117.02	128.59				
12/14/02	197.92	179.14	150.35	215.41				
12/15/02	195.45	182.58	146.01	220.74				•
12/16/02	177.49	130.06	134.41	169.66				
12/17/02	148.81	100.70	116.98	134.18				
12/18/02	174.74	130.29	135.32	168.73				
12/19/02	169.39	134.15	129.04	170.98				
12/20/02	175.36	120.94	133.95	161.62	ĺ			
12/21/02	200.98	177.47	151.22	219.50				
12/22/02	193.99	166.34	132.57	183.77	ĺ			
12/23/02	176.86	149.24	132.56	182.37				
12/24/02	155.74	158.30	135.47	192.87	ĺ			
12/25/02	077.79	177.36	145.54	214.18	ĺ			
12/26/02	115.55	147.03	123.72	168.50				
12/27/02	159.98	196.62	131.09	199.48				
12/28/02	199.86	184.00	149.35	224.04	ĺ			
12/29/02	193.27	175.49	144.30	214.32	1			
12/30/02	204.02	178.21	148.38	220.06	Ì			
12/31/02	176.97	139.65	130.94	177.39	İ			
01/01/03	196.08	167.65	144.89	207.67	İ			
01/02/03	165.87	128.86	122.09	164.20	İ			
01/03/03	175.45	152.79	071.82	092.65	Ì			
01/04/03	209.31	189.74	152.98	227.18	İ			
01/05/03	200.95	169.93	145.75	207 20				
01/06/03	184 01	164 81	135 66	197 52				
01/07/03	168 71	142.06	121 06	172 43				
01/08/03	211 29	200 15	1116 77	162.87				
01/09/03	224 38	230.89	087.80	136 29	1 			
01/10/03	176 94	154 01	131.67	187.80	I I			
01/11/02	181 30	150 82	133.41	196.00	1			
J I I I U J	1101.05	1100.00	1 100.41	1 1 UU.Z.*				

1 I	WDW	-1	WDW	V-2			N-3	Т
Date I	Rate	Pres	Rate	Pres I	Date	Rate	Pres	ï
01/12/03	195.84	179.40	138.04	200.47				'
01/13/03	185.59	154.20	132.31	179.97				
01/14/03	232 68	131 45	118 54	155 90				
01/15/03	200.04	178 39	143 58	209 42				
01/16/03	171 11	153 13	122 61	181 02				
01/17/03	197 96	183 26	140 93	214 91				
01/18/03	181 78	161 60	100 30	158.86				
01/10/03	100.70	421 75	120.00	203 18				
01/20/03	172 85	400 86	130 70	213 50				
01/20/03	184 45	400 86	136 15	205 41				
01/22/03	161 74	400 86	120.13	181 85				
01/22/03	188 02	287 35	1/5 18	208 18				
01/23/03	100.02	451 81	163 01	200.10				
01/25/03	142 35	100 86	150.81	213.25				
01/26/03	177 39	100 86	175 22	277 1/				
01/20/03	222 02	499.00	168.03	252 60				
01/27/03	223.03	499.00	161 5/	232.00				
01/20/03	210.75	439.00		250 11				
01/29/03	217.54	499.00	162.69	239.44				
01/30/03	204.50	490.13	102.00	250.74				
01/31/03	210.40	499.00	104.40	230.40				
02/01/03	101 16	499.00	174.30	274.50				
02/02/03	194.40	499.00	157.72	229.04				
02/03/03	200.20	499.00	159.99	231.43	 			
02/04/03	203.20	499.00	155.94	220.10	1		G.	
02/05/03	197.20	499.00	100.09	213.93				
02/00/03	100 02	499.00	140.01	220.20	ŀ			
02/07/03	190.00	499.00	100.20	230.73				
02/06/03	124.10	499.00	101.01	240.09				
02/09/03	142.02 000 10	499.00	475 57	203.43				
02/10/03	233.10	499.00	170.07	247.02				·
02/11/03		499.00	109.30	347.92				
02/12/03	280.02	499.80	199.49	387.53				
02/13/03	217.93	499.00		231.94				
02/14/03	200.41	499.00	197.07	01.19				
02/15/03	221.29	499.00	107.93	294.09				
02/10/03	219.71	499.00	101.00	202.00				
02/19/03	200.07	499.00	161 62	246 74				
02/10/03	212.43	186 10	157 32	240.74				
02/20/03	202.01	204 63	137.32	220.30	1			
02/20/03	209.41	204.00	163.00	200.72	 			
02/21/03	221.99	220.00	160.00	209.00	1			
02/22/03	200.90	199.00	109.90	213.13	1			
02/23/03	202.07	208 75	152.45	210.00	1			
02/24/03	110.88	190 56	196.49	237.20	l			
02/20/03	1 19.00	00.00	103.02	1415 06	1			
02/27/03	147 00	200.79	1 160 16	1410.00	 			
02/21/03	147.99	204.04	161.02	433.00	1			
02/04/02	214.91	242.01	060.93	404.40	 			
03/01/03	1032.01	100.97	1009.70		1			
03/02/03	220.41	239.90	170.29	1499.00	1			
03/03/03	241.04	2/1.01	112.10	499.00				
03/04/03	310.08	414.59	133.21	499.86	ļ			
03/05/03	210.46	Z10.64	101.03	1499.80	1			

1	WDW	-1	WDV	V-2		I WE	W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
03/06/03	241.35	298.09	178.78	499.86				
03/07/03	272.99	373.78	199.83	499.86				
03/08/03	198.11	212.81	150.46	499.86				
03/09/03	181.32	150.55	144.27	499.86				
03/10/03	178.38	152.58	142.42	499.86 i				
03/11/03	191.78	174.68	150.11	499.86 i				
03/12/03	214.66	225.46	166.65	499.86 i				
03/13/03	201.93	209.70	157.69	499.86				
03/14/03	206.91	209.86	160.55	387.46				
03/15/03	204.10	204.03	159.85	250.42				
03/16/03	194.28	189.51	152.17	230.89				
03/17/03	186.49	176.73	147.74	220.05				
03/18/03	188.89	187.95	148.75	229.81				
03/19/03	191.82	190.89	143.37	209.62				
03/20/03	195.13	195.38	142.92	206.84				
03/21/03	203 15	209.81	149 47	225.41				
03/22/03	219 72	242 83	155.77	258.02				
03/23/03	211 24	232 42	159.96	263 89 1				
03/24/03	211.29	220 39	160.29	254 04				
03/25/03	208 17	221 45	094 71	098 84				
03/26/03	133.23	116.05	084 72	089.54				
03/27/03	132.69	129 67	112 91	133 78			•	
03/28/03	240.23	295.07	1112.30	160.391				
03/29/03	263.07	354 59	193.59	392 77				
03/30/03	256.89	359 18	184.84	390 75				
03/31/03	1 100 88	200.10	154.81	236 56 1				
03/01/03	106.36	1 187 51	151 04	200.00 224 95				
04/02/03	1 107 10	181 08	153 10	224.50 210 52				
04/02/03	170.97	151 36	1/3 78	101 27 1				
04/03/03	1100.02	102.28	156 54	1235 00 1				
04/05/03	1 165 70	192.20	135.12	1 163 70 1				
04/06/03	1 163 75	122.51	132 13	150.73				
04/07/03	188 99	173 21	149 16	216 16				
04/08/03	198.89	199.22	155 75	245.00				
04/09/03	1 207 70	219 74	156.36	242 93				
04/10/03	1 189 67	181 16	142 25	199 23				
04/11/03	177 65	173 38	135 27	190.74				
04/12/03	215 44	232.92	160.97	255.97				
04/13/03	168 86	145.56	131.70	167.01				
04/14/03	161.39	128.31	127.53	151.03				
04/15/03	177 58	158 83	138 07	182 84				
04/16/03	176 70	162.58	129.96	167.98				
04/17/03	1157 62	122.00	131 14	165 11				
04/18/03	211 40	228 12	164.20	285 32				
NA/10/03	184 50	180.76	147 70	200.02 227 A2				
04/20/03	188 20	100.70	155 92	220 15				
04/21/02	175 70	167 60	1118 02	200.10				
07/21/03	1160.02	1126 22	1129 55	1 2 1 3.90 1 1 20 05 1				
04/22/03	1172.00	1 150.00	110.00	1 100.00				
04/23/03	1160.04	131.90		190.90 105 74				
04/24/03	1 200 20	149.17	144.04	1 190./1				
04/25/03	1200.30	1210.12	109.90	248.02				
04/20/03	1173.19	101.90	143.29	1 190.00				
04/27/03	171.32	140.98	140.80	1/0.03				

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1	WDW	-1	WDV	V-2	Ì		W-3	1
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	i
04/28/03	151.75	113.19	128.85	140.46				1
04/29/03	202.64	227.33	083.04	058.52				
04/30/03	142.95	094.35	125.56	125.81				
05/01/03	137.25	086.57	122.11	118.32				
05/02/03	141.93	089.22	124.18	123.21				
05/03/03	128.31	067 73	116 14	099 52				
05/04/03	142 49	089 61	124 42	124 29				
05/05/03	143 27	098 41	125 26	131 17				
05/06/03	129.96	104 54	115 20	129 40				
05/07/03	187 13	194 60	153 67	230.38				
05/08/03	210 62	234 60	167 43	271 46				
05/09/03	190.07	201.00	134 72	186 76				
05/10/03	163 78	149 70	128.57	158 53				
05/11/03	194 62	197 30	147 67	218 57				
05/12/03	165.03	137 53	142 12	179 35				
05/13/03	144 43		128 07	135 07				
05/14/03	157 67	130.08	110.60	102.88				
05/15/03	107.07	100.00	150.88	238 00 1				
05/16/03	160.57	156.60	137.00	160.00				
05/17/03	176 15	170.09	157.02	211 24				
05/19/03	200.13	1218 02	150.20	211.24				
05/10/03	200.17	210.02	156 22	217.30				
05/19/03	103 / 9	227.00	150.23	237.12				
05/20/03	190.40	196 02	146 52	241.00				
05/21/03	1 202 56	100.02	140.02	100 21			. ×4	
05/22/03	1 166 22	1 460 64	112.45	00.31				
05/23/03	171 04	176 11	145.05	203.47				
05/24/03	002 51	220 40	140.04	213.49				
05/25/05	202.01	220.43	102.24	250.00				
05/20/03	1 1 0 0 21	220.71	1 152 65	201.54				
05/27/05	162.06	142 70	121 04	166 07				
05/20/03	172 42	174 05	1111.94	00.07				
05/29/03	170 75	107 20	144.04 170 71	200.74				
05/30/03	102 70	101.09	140.71	219.92				
00/01/00	192.79	177.00	1 1 24.31	200.01				
00/01/03	109.09	1111.00	140.42	201.00				
00/02/03	1 1 9 1. 14	107 20	100.15	220.90				
06/03/03	176 18	197.20	141.00	201.00				
00/04/03	181 05	102.45	143.72	208.83				
06/06/03	182 53	190.20	151 68	200.00				
00/00/03	102.55	225 17	161 13	267 10				
06/08/03	185.05	223.17	150 72	207.10	- -			
00/00/03	103.00	200.24	146 65	232.51				
00/09/03	100 16	219.95	154 71	255.77		• .		
06/11/03	180.58	222.03	156 10	201.00				
06/12/03	163.07	162.07	1 1 2 8 10	105 14				
00/12/03	171 64	150.07	1 1 1 1 72	106 02				
06/13/03	100 60	0123.99	141.73	190.02				
06/15/02	104 40	213.40	101.10	100.44				
00/10/03	154.40	1214.10	130.02	100.00				
06/17/03	100.04	1 1 10 05	132.11	109.09				
06/10/03	102.23	149.00	131.19	1 100.19				
06/10/03	140.00	149.97	140.15	203.00			· .	
00/19/03	101.20	100.29	1 149.00	1 228.90				

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		-1		V-Z Draa	Data	VV	DVV-3
		Pres			Date		Pres
06/20/03	189.92	218.37	141.85	213.41			
06/21/03	1/7.60	1/6.14	146.87	212.21			
06/22/03	126.49	092.75	116.69	120.70			
06/23/03	144.91	119.41	125.38	146.66			
06/24/03	168.50	169.98	130.17	169.89			
06/25/03	167.25	165.45	140.91	199.45			
06/26/03	196.09	230.58	158.94	267.19			
06/27/03	167.51	177.09	137.85	198.44			
06/28/03	178.49	189.99	140.74	207.99			
06/29/03	199.58	249.08	086.02	127.54			
06/30/03	232.97	317.41	000.00	000.05			
07/01/03	190.91	224.42	104.03	132.79			
07/02/03	162.97	150.18	131.13	166.32			
07/03/03	154.90	141.20	132.88	173.41			
07/04/03	192.42	226.18	153.01	248.99			
07/05/03	170.74	189.35	141.35	210.91			
07/06/03	182.88	207.64	146.51	225.56			
07/07/03	158.36	159.03	133.97	182.29			
07/08/03	173.14	177.24	145.10	212.56			
07/09/03	151.87	134.82	132.35	169.57			
07/10/03	149.92	137.28	134.92	182.28			
07/11/03	151.06	131.05	128.79	154.17			
07/12/03	168.15	173.38	134.30	181.54			
07/13/03	179.57	187.96	140.78	193.00			
07/14/03	173.29	179.47	144.60	210.71			
07/15/03	171.43	188.29	127.66	171.10			
07/16/03	189.32	209.43	125.27	156.67			
07/17/03	217.08	273.62	120.78	146.54			
07/18/03	207.68	252.89	145.92	223.59			
07/19/03	191.64	223.79	126.09	182.02			
07/20/03	194.34	229.51	159.72	265.62			
07/21/03	157.91	154.03	135.23	182.68	ĺ		
07/22/03	168.34	178.41	137.25	192.44			
07/23/03	173.84	185.63	140.53	198.22			
07/24/03	167.10	170.34	141.97	201.48			
07/25/03	132.44	155.54	150.24	242.48			
07/26/03	178.25	197.46	140.23	202.87			
07/27/03	181.10	208.17	133.20	185.82			
07/28/03	210.92	268.84	131.32	198.04			
07/29/03	201.58	246.25	159.71	276.66			
07/30/03	162.86	174.27	134.45	187.38			
07/31/03	170.47	189.53	143.98	223.44			
08/01/03	202.36	249.41	154.26	257.29	Ì		
08/02/03	183.50	210.38	151.53	241.27			
08/03/03	187.67	215.93	143.02	219.10			
08/04/03	120.83	085.06	112.16	113.44			
08/05/03	153.82	145.60	132.21	178.44	İ		
08/06/03	177.57	195.95	142.55	218.49	i		
08/07/03	101.66	063.25	148.33	239.66	İ		
08/08/03	221.32	181.83	120.89	145.05	i		
08/09/03	191.15	126.58	122.93	095.90	İ		
08/10/03	159.98	074.17	129.28	105.33	i		
08/11/03	145.69	055.60	120.01	077.84			
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	WDW	-1	WDV	V-2	1	1	WD	N-3	I
Date	Rate	Pres	Rate	Pres	Date	i Ra	ate	Pres	í
08/12/03	145.61	051.93	115.93	, 071.63		•			•
08/13/03	150.11	066.13	120.76	081.93					
08/14/03	178.47	116.08	139.10	134.09					
08/15/03	181.41	125.63	138.15	141.51					
08/16/03	195.94	146.86	144.54	158.72					
08/17/03	176.38	147.58	107.22	096.89					
08/18/03	204.47	166.93	157.25	195.98					
08/19/03	232.53	204.23	145 61	186 41					
08/20/03	208 00	174 54	162 53	210 51					
08/21/03	238 18	215 12	167 53	230 11					
08/22/03	210 78	181 13	167.88	231 93					
08/23/03	192 78	162.09	155 36	196 17					
08/24/03	210 50	184 75	164.07	220 39					
08/25/03	185.60	149 16	149 10	183 31					
08/26/03	204 49	166 78	080 46	095 12					
08/27/03	114 16	076 03	122 83	221 75					
08/28/03	1156.80	158 62	100 06	210.85					
08/20/03	244 50	251 30	083 67	130 68					
08/30/03	277.00	2201.50	172 34	130.00					
08/31/03	236.67	229.00	174 35	201.30					
00/01/03	230.07	227.01	172.40	273.77					
09/07/03	204.00	224.02	164 52	210.02					
09/02/03	1 220.31	210.02	174.52	249.30					
09/03/03	200.11	240.00	160 47	211.11					
09/04/03	220.79	219.09	100.47	200.99				i	
09/05/03	207.00	003.93	04.70	029.00					
09/00/03	203.90	210 10	202.94	256 90					
09/07/03	200.40	019.19	175 46	202 75					
09/00/03	1 1 1 0 00	202.33	042.24	056 55					
09/09/03	1 10.09	203.01	043.34	000.00					
09/10/03	222.30	200.40	102.21	220.19					
09/11/03	214.70	217.00	100.40	200.00					
09/12/03	207.30	140 62	142 22	243.09					
09/13/03	110.19	140.02	142.23	170.02 120.20					
09/14/03	100.02	126 61	131.57	164 07					
09/15/03	110.39	130.01	140.72	104.07					
09/10/03	179.59	129.73	127 96	131.40 169.02					
09/17/03	170.01	201.00	156 42	100.02 221 26					
09/10/03	213.50	100 20	156 55	221.20					
09/19/03	183.86	150.25	1/0.00	103 07					
09/21/03	181 19	147 14	149.04	182.57					
09/22/03	171 24		140.42	102.07					
09/22/03	151 50	113 60	122 12	137 82					
09/23/03	179 27		126.12	162 02					
09/24/03	190.27	144.00	14	102.90					
09/25/03	011 70	140.90	160 27	00.00					
03/20/03	196 04	200.30	100.27	109 64					
03121/03	171 42	102.13	102.41	190.01 195 A3					
09/20/03	175.04	142.00	147.00						
09/29/03	173.04	130.93	147.19	104.03				• .	• .
10/04/02	1171.04	139.04	141.95						
10/01/03	190.02	100.31	101.04	192.21					
10/02/03	100./8		151.39	204.03					
10/03/03	218.48	228.64	109.22	258.25					

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1 1	WDW	-1	WDV	V-2			W-3	
i Date i	Rate	Pres I	Rate	Pres	Date	Rate	Pres	i
10/04/03	216 49	236 54	168 89	266.37		1		1
10/05/03	221 86	240 07	170 31	260.05				
10/06/02	221.00	240.07	170.01	209.90				
10/06/03	232.33	249.71	173.04	200.09				
10/07/03	223.36	239.73	161.65	251.98				
10/08/03	248.67	293.22	184.98	332.44				
10/09/03	290.68	391.82	205.56	417.62				
10/10/03	283.09	380.46	204.31	403.55				
10/11/03	311.02	414.15	209.72	431.38				
10/12/03	263.88	351.21	200.33	402.51				
10/13/03	197 68	199.31	158 42	245 52				
10/14/03	157 34	100.01	132 30	154 84				
10/15/03	171 11	129.00	1 1 1 1 0 0 0 1	175 61				
10/15/03	420.04		140.92	170.01				
10/10/03	130.04	097.49	122.00	135.56				
10/17/03	151.59	101.88	132.71	145.20				
10/18/03	137.87	074.60	124.11	119.52				
10/19/03	162.15	114.19	137.88	164.28				
10/20/03	160.43	130.41	141.02	179.03			•	
10/21/03	180.30	163.83	150.91	216.68				
10/22/03	156.13	143.43	141.37	190.98				
10/23/03	183 32	158.06	149 41	197 16				
10/24/03	218 47	222 62	164 59	249 35				
10/25/03	210.47	200 19	150 72	243.33				
10/25/03	175 22	1 4 5 4 4 5	133.72	102 02				
10/20/03	175.32			103.03				
10/27/03	105.27	130.01	138.44	107.15				
10/28/03	181.56	148.95	145.52	183.97				
10/29/03	174.42	133.79	141.34	169.63				
10/30/03	177.95	152.72	145.41	187.06				
10/31/03	161.14	123.43	136.52	157.22				
11/01/03	169.08	134.01	135.44	155.85				
11/02/03	169.61	148.58	141.35	180.60				
11/03/03	213.93	226.57	167 72	265 46				
11/04/03	176 43	169.39	148 14	204 86				
11/05/03	197 21	1 1 9 0 54	158 44	230.89				
11/06/03	100.52	1 187 10	156 30	200.00				
11/07/03	194 54	172 15	1 1 1 0 92	100 79				
11/07/03	104.04	1100.05	149.02	199.70				
11/06/03	100.22	109.00	120.17	120.49				
11/09/03	148.29	100.03		129.98				
11/10/03	153.47	130.62	130.78	152.30				
11/11/03	183.26	1/1./2	144.41	193.65				
11/12/03	170.28	157.33	147.29	202.70				
11/13/03	158.35	141.36	141.78	184.04				
11/14/03	211.21	219.87	170.90	277.84				
11/15/03	191.63	189.80	154.12	224.78				
11/16/03	186.41	186.66	150.33	213.77				
11/17/03	159.35	142.71	135.98	170.34				
11/18/03	177 23	167 57	144 92	198 44				
11/10/02	100 /1	208 22	158.02	240 62				
11/20/02	1 224 56	200.20	17/ 22	200.02				
11/20/03	224.00	200.09	1070.04	233.30				
11/21/03	222.93	291.52						
11/22/03	179.02	248.98	029.87					
11/23/03	085.62	119.08	014.29	000.00				
11/24/03	121.08	146.07	088.14	160.10				
11/25/03	162.48	195.62	108.74	201.78				
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WDW-1		WDV	V-2 I		I W		
	Date I	Rate	Pres	Rate	Pres	Date	Rate
	11/26/03	226.92	292 95	177.98	330.00		1
	11/27/03	309 87	472 08	225 23	499 86		
	11/28/03	243 27	350.69	180 75	359 35		
	11/29/03	152 28	291 98	121 97	328.96		
	11/30/03	205 66	225 99	159 37	263 21		
	12/01/03	116 16	058 40	100.07	106 19		
	12/02/03	002.81	030.40	103.30	030.13		
	12/03/03	118 60	050.00	110 85	102 50		
	12/03/03	187 12	102 31	130 11	206 87 1		
	12/04/03	198.23	192.31	136 56	108 /8		
	12/05/03	197.5/	186.00	133.00	100.40		
	12/00/03	202 21	226.95	100.91	074 77		
	12/01/03	109 65	230.00	144 12	211.11		
	12/00/03	190.00	219.00	144.12	200.09		
	12/09/03	197.73	222.01	140.32	201.10		
	12/10/03	197.33	212.94	130.10	220.29		
	12/11/03	102.00	100.23	130.37			
	12/12/03	145.18			228.02		
	12/13/03	149.81	139.22				
	12/14/03	090.15	142.68	093.27			
	12/15/03	169.21	1/2.70	119.68	200.52		
	12/16/03	162.15	168.94	113.43	197.90		
	12/17/03	128.87	236.11	093.56	289.99		
	12/18/03	140.61	285.69	095.81	330.91		
	12/19/03	219.10	287.06	137.52	305.85		
	12/20/03	184.62	285.29	123.55	327.40		
	12/21/03	171.90	291.67	113.14	335.63		
	12/22/03	197.35	264.73	133.40	304.19		
	12/23/03	216.67	289.28	145.85	332.10		
	12/24/03	233.15	404.93	137.30	419.49		
	12/25/03	280.29	458.49	175.27	459.51		
	12/26/03	279.16	453.49	152.68	453.83		
	12/27/03	274.43	441.15	166.94	441.76		
	12/28/03	259.98	446.23	161.17	439.49		
	12/29/03	133.80	439.43	083.53	451.86		
	12/30/03	202.44	404.63	110.09	499.86		
	12/31/03	196.45	441.96	110.84	499.86		
	01/01/04	248.08	434.47	137.69	499.86		
	01/02/04	280.59	394.42	150.86	499.86		
	01/03/04	290.73	417.59	160.30	499.86		
	01/04/04	285.63	406.41	155.95	499.86		
	01/05/04	289.11	409.00	156.15	499.86		
	01/06/04	183.30	395.70	113.00	499.86		
	01/07/04	164.53	414.19	113.23	499.86		
	01/08/04	298.33	450.62	165.82	499.86		
	01/09/04	273.02	399.27	141.07	499.86		
	01/10/04	301.66	457.29	162.27	499.86		
	01/11/04	302.05	460.29	162.46	499.86		
	01/12/04	307.13	474.61	167.81	499.86		
	01/13/04	275.75	407.15	142.20	499.86		
	01/14/04	296.12	443.48	152.59	499.86		
	01/15/04	299.39	453.69	162.71	499.86		
	01/16/04	280.01	410.61	148.42	499.86		
	01/17/04	288.11	430.32	155.01	499.86		

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WDW-3 |

Pres |

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WDW-3

V-3 | Pres |

1	WDW	-1	WDV	V-2		W
Date	Rate	Pres	Rate	Pres	Date	Rate
01/18/04	262.94	378.74	136.54	499.86		•
01/19/04	291.41	451.88	157.73	499.86 i		
01/20/04	262 75	383.61	133 82	499 86		
01/21/04	246 20	347 42	121 45	499 86 1		
01/22/04	208 43	465 00	160 60	400.00 400.86		
01/22/04	230.40	209 70	124.06	400 96 400 96		
01/23/04		390.79	1 1 34.90	499.00 400.00		
01/24/04		421.33	142.30	499.80		
01/25/04	212.04	257.95	098.23	499.86		
01/26/04	203.82	240.69	093.69	499.86		
01/27/04	255.68	373.48	129.53	499.86		
01/28/04	279.85	425.21	141.44	468.33		
01/29/04	321.72	482.99	166.52	275.57		
01/30/04	267.35	407.84	138.95	053.26		
01/31/04	274.69	423.19	144.21	000.00		
02/01/04	280.07	425.53	144.92	000.00		
02/02/04	264.78	395.87	135.45	000.00		
02/03/04	261.82	392.92	133.00	i 000.00 i		
02/04/04	254.66	368.98	119.59	i 000.00 i		
02/05/04	240 85	329 99	127 30			
02/06/04	257 55	372 91	134 15			
02/07/04	262 69	346 20	137 28	042 06 1		
02/08/04	288 54	248 13	150 06	270 64 1		
02/00/04	200.04	240.13	130.00	210.04		
02/09/04	230.01	247.91	1 1 2 4 6 2	006 44 1		
02/10/04	1 406 70	247.09	001 20	200.41		
02/11/04	007 57	247.00	1 4 4 0 07	120.00 165 97		
02/12/04	ZZI.JI	247.92	110.21			
02/13/04	148.01	247.00		209.01		
02/14/04	279.39	247.79	134.00	451.81		
02/15/04	162.95	247.80	249.24	348.26		
02/16/04	297.28	248.01	166.62	278.97		
02/1//04	290.86	248.03	162.39	271.08		
02/18/04	298.75	247.98	166.90	279.73		
02/19/04	287.30	248.20	158.13	263.99		
02/20/04	291.24	191.13	162.40	268.20		
02/21/04	251.68	159.89	131.81	260.61		
02/22/04	271.14	427.06	146.90	428.31		
02/23/04	235.56	361.73	119.77	364.54		
02/24/04	251.98	396.81	133.56	399.69		
02/25/04	266.58	420.40	144.83	421.77		
02/26/04	252.03	395.00	134.24	397.56		
02/27/04	246.55	377.26	124.51	379.48		
02/28/04	236.52	351.11	103.88	326.16		
02/29/04	240.50	386.37	125.52	389.55		
03/01/04	239.96	373.39	124.97	375 03		
03/02/04	255.89	420 61	135.84	429 74		
03/03/04	263 43	463 08	103 04	370 83		
03/04/04	253 55	433 05	135 65	463 66 1		
03/05/04	255.00	121 07	121 12	1 403.00		
03/06/04	212.04	01.07 ס.וטדן 1/10 סי	1 1 27 00	400.00 111 05		
03/00/04	243.20	412.37	127.09	441.90 424 EQ		
03/07/04	1202.43	403.90	124.30	434.32 254 44		
03/08/04	203.40	330.11	090.25	354.41		
03/09/04	232.83	386.71	119.88	417.07		
03/10/04	237.16	397.85	123.58	429.74		

1	WDW-1		WDW-2		I I W		/DW-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	i
03/11/04	262.23	452.46	139.99	477.43				1
03/12/04	212.98	351.02	102.05	370.42				
03/13/04	232.02	388.96	116.67	412.18				
03/14/04	233.99	396.08	118.38	419.49				
03/15/04	256.60	441 50	135.80	468 94				
03/16/04	222 90	356 35	1 100.00	355 55				
03/17/04	250 56	427 49	132 32	454 43				
03/18/04	239.78	404 54	123 24	429 72				
03/19/04	225 69	262.85	112 13	280.94		. •		
03/20/04	237 64	188 87	118.06	195 04				
03/21/04	207.04	100.07	125 43	206.05				
03/22/04	238 84	101.20	120.70	200.00				
03/22/04	200.04	170 79	1122.70	101 08				
03/23/04	1 244 27	106 32	177 97	1210 22				
03/25/04	1 1 2 3 1 2 1	011 60.52						
03/25/04	120.12	044.09		000.00				
03/20/04	01.41	010.90	170 46	010.02				
03/27/04	293.01	200.02	170.40	290.33				
03/20/04	212.20	243.77	100.00	200.00				
03/29/04	200.20	229.92	130.07	233.31				
03/30/04	201.00	1 2 1 7 . 0 1	130.13	202.20				
03/31/04	1 1 0 1 27	110.90		191.05				
04/01/04	104.37	112.10		123.93				
04/02/04	190.97	120.37		130.02				
04/03/04	192.17	121.03	090.89	127.15			**	
04/04/04	203.55	139.06	112.27				•	
04/05/04	289.54	272.31	160.56	2/1.62				
04/06/04	257.59	228.29	141.16	243.06				
04/07/04	285.93	265.50	160.86	275.69				
04/08/04		253.71	154.84	263.06				
04/09/04	250.25	225.92	137.30	234.24				
04/10/04	212.41	103.04	106.47	1//./4				
04/11/04		174.22	114.99	190.68				
04/12/04	208.97	160.81	104.80	1/6.26				
04/13/04	187.66	124.22	089.23	138.22				
04/14/04	160.34	091.65	074.13	104.13				
04/15/04	195.82	127.79	101.55	143.93				
04/16/04		153.20	120.73					
04/17/04	200.22	143.00	108.80	154.81				
04/18/04	213.09	100.09	118.87	171.38				
04/19/04	208.52	154.20	115.63	109.80				
04/20/04		100.73						
04/21/04		158.78		174.72				
04/22/04	201.74	149.26	111.35					
04/23/04	223.35	186.73	126.80	204.12				
04/24/04	210.15	200.51	104.74	2/1.54				
04/25/04	242.71	214.02	131./6	225.60				
04/20/04	231.53	194./1	122.77	205.12				
04/27/04	208.51	152.31	108.00	164.69				
04/28/04	1/1.73	102.13	078.69	111.81				
04/29/04	208.97	147.57	112.64	161.89				
04/30/04	203.12	142.17	108.47	155.96				
05/01/04	200.57	141.31	099.89	145.74				
05/02/04	211.04	154.95	117.14	171.60				

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	WDW	-1	WDV	V-2		WD	W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	1
05/03/04	212.77	159.30	118.84	175.86				
05/04/04	208.72	154.91	116.04	170.42				
05/05/04	213.38	161.22	121.22	177.49				
05/06/04	212.17	158.21	120.82	177.00				
05/07/04	220.05	170.41	123.25	178.92				
05/08/04	237.40	210.17	123.59	211.06				
05/09/04	257.12	233.18	144.97	249.84				
05/10/04	246.23	219.72	133.92	233.37				
05/11/04	224.55	188.71	114.92	197.42 i				
05/12/04	197.93	139.50	099.15	150.78				
05/13/04	187.47	122.51	094.27	135.85				
05/14/04	188.99	125.94	092.07	133.46				
05/15/04	186.92	124.76	094.13	137.61				
05/16/04	197.22	139.84	103.49	153.77				
05/17/04	197.18	141.67	104.22	155.34				
05/18/04	207.93	154.01	113.30	168.86				
05/19/04	197.23	137.97	105.19	152.45				
05/20/04	183.25	119.37	090.61	132.27				
05/21/04	202.01	143.75	108.98	160.06				
05/22/04	205.43	139.18	112.30	166.23				
05/23/04	191.48	129.45	099.47	145.71				
05/24/04	200.77	141.16	109.72	161.03				
05/25/04	206.34	150.60	109.55	161.50				,
05/26/04	191 43	110 24	112 31	168 88				
05/27/04	238.41	141.83	064.68	091.22				
05/28/04	215.75	116.93	118.67	133.98				
05/29/04	218 95	121 70	119.62	135 39				
05/30/04	198.96	103.75	106.86	116.68				
05/31/04	202.64	109.75	110.87	122.92				
06/01/04	180.40	088.55	092.80	099.96				
06/02/04	186.15	091.42	100.78	104.18				
06/03/04	186.14	096.45	098.10	107.67				
06/04/04	206.66	120.64	117.61	133.55				
06/05/04	190.20	100.27	104.71	112.71				
06/06/04	183.82	093.06	099.41	104.94				
06/07/04	191.50	103.69	108.22	118.02				
06/08/04	198.43	114.33	111.56	128.37				
06/09/04	198.43	114.33	012.42	014.49				
06/10/04	214.31	129.52	127.10	i 147.93 i				
06/11/04	216.39	133.44	128.71	149.69				
06/12/04	207.62	126.96	116.50	134.99				
06/13/04	214.55	135.30	127.61	153.71				
06/14/04	202.17	120.08	120.69	139.13				
06/15/04	207.81	129.94	120.17	i 140.06 i				
06/16/04	207.81	129.94	120.96	158.43				
06/17/04	187.75	108.40	111.05	133.82				
06/18/04	244.66	186.48	144.46	198.08				
06/19/04	280.77	235.72	174.34	251.22				
06/20/04	257.39	211.03	151.09	219.48				
06/21/04	241.82	190.03	139.91	203.36				
06/22/04	178.63	098.82	104.96	121.48				
06/23/04	201.13	129.32	118.57	139.81				
06/24/04	184.13	107.21	101.01	114.89				
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1	WDW-1		WDW	V-2		, WD		ł
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	i
06/25/04	205.57	131.99	121.09	141.92				•
06/26/04	196.67	120.41	109.31	127.45			•	
06/27/04	214.18	140.45	130.97	159.51				
06/28/04	194.08	117.86	114.95	139.33				
06/29/04	200.89	124.40	117.08	138.64				
06/30/04	160.80	077.85	078.75	086.75				
07/01/04	205.39	127.96	119.30	139.81				
07/02/04	207.07	127.98	121.40	138.99				
07/03/04	210.75	134.37	124.11	140.94				
07/04/04	211.70	138.55	131.39	152.79			• .	
07/05/04	211.13	136.99	131.96	152.46			•	
07/06/04	207.55	135.09	129.94	150.66				
07/07/04	190.68	113.60	113.63	129.05				
07/08/04	197.40	125.68	115.15	136.98				
07/09/04	193.04	117.67	118.75	134.99				
07/10/04	183 85	109.93	107.02	120.62				
07/11/04	193 71	123 46	114 30	132 90				
07/12/04	202 47	135.96	125 80	146 78				
07/13/04	172 11	101 65	094 61	110 23				
07/14/04	203.24	135.91	128.09	146.29				
07/15/04	204 90	139.93	141 17	167.83				
07/16/04	176 79	104 89	106 43	124 53				
07/17/04	199 66	135 89	134 11	161 34				
07/18/04	197.62	134.02	127.59	148.42				
07/19/04	188.92	124 02	113.97	132.61			·, 1	
07/20/04	196 72	135 24	128.92	147 26				
07/21/04	175 40	107 40	105.19	118.37				
07/22/04	197 12	137 07	119 17	139 99				
07/23/04	204 57	145 68	126 66	150.87				
07/24/04	204.62	145 67	135.30	162.12				
07/25/04	208.53	152.88	141.72	171.20				
07/26/04	208.40	157.53	129.71	173.00				
07/27/04	258.32	225.64	152.45	219.85				
07/28/04	257.27	225.27	149.11	215.57				
07/29/04	259.47	230.25	154.54	227.56				
07/30/04	263.11	237.79	169.19	252.82				
07/31/04	237.40	206.86	132.85	199.70				
08/01/04	203.71	150.71	132.26	170.79				
08/02/04	195.24	145.54	122.27	158.93				
08/03/04	184.61	133.47	113.99	146.42				
08/04/04	196.55	148.87	119.64	154.55				
08/05/04	202.68	159.49	131.31	171.92				
08/06/04	195.10	148.67	118.54	154.59				
08/07/04	213.46	174.06	134.95	185.07				
08/08/04	259.62	238.31	165.55	246.84				
08/09/04	251.58	220.85	169.24	245.47				
08/10/04	213.15	163.73	128.90	171.36				
08/11/04	212.51	164.13	126.11	171.05				
08/12/04	229.15	194.96	129.36	195.02				
08/13/04	244.22	215.36	153.19	235.81				
08/14/04	245.90	220.95	149.92	230.85				
08/15/04	259.05	242.29	162.21	254.63				
08/16/04	233.24	207.60	147.93	229.49			1	
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1	WDW-1		WDW	V-2		I WC	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
08/17/04	244.10	219.69	141.28	219.35		•	
08/18/04	223.28	189.87	128.31	197.92			
08/19/04	242.36	214.40	149.83	229.19			
08/20/04	124.22	051.45	031.55	047.42			
08/21/04	235.04	204.74	134.30	202.53			
08/22/04	268 95	250 10	176 30	265.76			
08/23/04	189 05	140.23	095.64	139.24			
08/24/04	242.25	214.07	134.55	198.70			
08/25/04	209.45	162.37	115.22	158.63			
08/26/04	182.52	120.36	112.65	137.70			
08/27/04	203.93	150.18	128.09	159.82			
08/28/04	189.87	131.73	117.38	146.10			
08/29/04	200.98	147.66	127.54	160.13			
08/30/04	198.05	145 77	128 43	163.80			
08/31/04	206 77	158 28	140.00	177 64			
09/01/04	178 42	122.34	109 16	137 95			
09/02/04	190.96	137 70	124 78	156 23			
09/03/04	179 69	122 60	112 49	139 22			
09/04/04	189 66	135 50	121 68	151 73			
09/05/04	201 07	150.97	132 75	167 19			
09/06/04	191 51	136.96	125 77	153 49			•
09/07/04	193.01	140 59	122 80	149 84			
09/08/04	198.41	147.99	127.79	159.09			
09/09/04	197 26	144 28	127 13	155 28			
09/10/04	178 57	121 16	105 13	128 80			
09/11/04	200.93	153.97	134 28	169.53			
09/12/04	185.62	133 35	120 18	149 96			
09/13/04	175.10	119.57	106.05	130.90			
09/14/04	184 99	131.92	120.29	148.64			
09/15/04	183.25	128.11	118.13	147.01			
09/16/04	188.70	136.94	124.57	155.67			
09/17/04	196.89	147.14	127.25	158.40			
09/18/04	195.35	144.73	122.15	153.18			
09/19/04	196.45	146.80	130.11	165.22			
09/20/04	195.44	145.21	126.64	159.53			
09/21/04	195.34	, 145.83	126.74	161.32			
09/22/04	196.80	145.48	128.65	161.34			
09/23/04	189.75	136.52	116.10	145.12			
09/24/04	194.43	144.54	128.76	162.25	ĺ		
09/25/04	190.36	141.26	122.90	153.26			
09/26/04	183.63	134.28	j 114.17	142.01			
09/27/04	187.17	141.98	103.02	129.74			
09/28/04	190.28	147.87	125.09	162.49			
09/29/04	191.18	147.10	121.90	156.08			
09/30/04	175.10	126.16	107.99	138.63			
10/01/04	239.12	219.10	140.00	199.06			
10/02/04	249.66	229.25	163.07	241.30			
10/03/04	251.77	230.07	151.69	227.77			
10/04/04	195.47	142.33	120.99	158.57			
10/05/04	187.70	128.20	107.36	132.94	ĺ		
10/06/04	214.78	165.16	140.80	183.09			
10/07/04	257.95	242.37	153.09	234.87			
10/08/04	253.49	241.02	151.77	238.24			

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1	WDW-1		WDV		1	WD	W-3	T	
Date	Rate	Pres	Rate	Pres	Date	i	Rate	Pres	i
10/09/04	256.17	247.12	152.03	244.35		•			
10/10/04	234.14	218.18	141.79	229.22					
10/11/04	195.55	148.36	122.48	168.50					
10/12/04	193.74	149.63	120.69	167.85					
10/13/04	190.39	145.33	110.84	152.26					
10/14/04	193 13	150 86	114.96	160.97					
10/15/04	186 24	141 68	102.75	144.99					
10/16/04	100.24	148 88	115 86	162 88					
10/17/04	183 51	138 57	107 49	152 46					
10/18/04	169 92	120 14	096 19	133 37					
10/19/04	190.69	149 80	119 50	166 13					
10/20/04	171 31	123 44	099.96	138 26					
10/21/04	182 07	137 26	109 79	153 48					
10/22/04	190.37	148 91	110.10	166 22					
10/23/04	1 103 50	154.86	121 36	171 71					
10/24/04	1 180 65	151 54	110 01	156 53					
10/25/04	109.05	165.08	118 07	160.00					
10/25/04	102 26	165.00	110.97	109.23 169.51					
10/20/04	193.30	157.35	116.09	100.01					
10/27/04	190.23	152.15	110.09	100.40					
10/20/04	109.10	150.00	121.00	100.30					
10/29/04	193.41	100.03	121.00	173.00					
10/30/04	1 190.10	103.00	1 124.40	167.32					
10/31/04	100.04	104.00	114.01	107.31					
11/01/04	190.03	162.00	<u>22.2</u>	176.00				• .*	
11/02/04	194.34	103.82	119.54	110.21					
11/03/04	190.30	159.45		171.03					
11/04/04	190.50		115.59	056 52					
11/05/04	240.55		152.09	200.03					
11/06/04	204.03	203.00	137.15	239.73					
11/07/04		301.79	100.14	280.12					
11/08/04	200.01	213.09	105.04						
11/09/04	228.47	225.58	137.21	241.07					
11/10/04	187.49		1111.72	103.38	l				
11/11/04	193.41	159.25	118.29	174.77					
11/12/04	198.05	170.91	122.43	180.03					
11/13/04	1197.13	109.48	120.13	184.79					
11/14/04	213.33	203.00	120.94	210.03					
11/15/04	242.47	204.03	147.27	2/1.19					
11/10/04	201.03	203.03	162.07	01.90					
11/17/04	203.41	200.04	103.29	000.04					
11/18/04	202.10	2/1.04	104.30	289.23					
11/19/04	240.89	204.79	140.01	201.10					
11/20/04	057.70								
11/21/04	201.13	279.40		297.40	ļ				
11/22/04	257.57	280.21	155.34	297.75					
11/23/04	236.52	250.52	137.77		1				
11/24/04	236.40	248.59	137.02	205.21	ł				
11/25/04	215.00	209.96	122.04	225.44	l				
11/26/04	185.82	1 150.61	103.51	165.49	ļ				
11/27/04	1/7.02	140.14	093.38	150.50	ļ				
11/28/04	187.51	158.70	101.61	165.97	ļ				
11/29/04	183.13	151.86	097.77	160.27	ļ				
11/30/04	188.07	160.69	102.84	171.86					

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		WDW-1		WDW-2			WDW-3		
ĺ	Date I	Rate	Pres	Rate	Pres	Date	Rate	Pres	Ì
	12/01/04	164.96	170.10	104.39	251.78				
	12/02/04	154.07	280.89	150.81	341.34				
	12/03/04	174.98	228.23	125.26	244.83				
	12/04/04	182.86	273.64	136.33	290.11				
	12/05/04	252 44	265 58	143 53	281 59				
	12/06/04	252 28	268.03	145 14	283 62				
	12/07/04	218 46	211 17	115 02	223 26				
	12/08/04	255 20	269 72	147 71	284 29				
	12/09/04	246 25	254 93	140 52	268 17				
	12/10/04	243 72	249 39	137 28	261.93				
	12/11/04	240.12	245.62	134.21	258.34				
	12/12/04	215.86	200.03	115 90	212.07				
	12/13/04	189.11	147.30	099.45	159.49				
	12/14/04	187 05	148 79	098 39	160 62	I 			
	12/15/04	154.88	148 78	096 28	160.25				
	12/16/04	166.33	211 48	123 19	223 63				
	12/17/04	250 17	269 50	144 26	283 94				
	12/18/04	202.94	273.41	149.91	287.46				
	12/19/04	188.93	271.25	150.45	284 90				
	12/20/04	220.87	287.18	160.30	301.52				
	12/21/04	218.78	218.79	110.11	208.67				
	12/22/04	256.25	279.27	155.07	295.83				
	12/23/04	092.05	228.87	126.67	272.13				
	12/24/04	000.02	277.06	138.73	499.86				
	12/25/04	071.82	410.06	414.47	426.07				
	12/26/04	109.92	319.66	312.02	365.48				
	12/27/04	195.98	296.84	157.13	267.62	İ			
	12/28/04	293.06	267.38	142.71	279.29	İ			
	12/29/04	304.27	291.13	155.50	304.60	İ			
	12/30/04	308.22	300.62	160.33	314.89	İ			
	12/31/04	305.67	294.79	157.54	308.25	İ			
ļ	01/01/05	297.28	277.11	147.58	289.00	İ			
1	01/02/05	298.75	279.72	149.27	291.24				
(01/03/05	284.89	250.45	132.44	259.69	ĺ			
(01/04/05	275.04	229.14	121.97	238.73				
1	01/05/05	281.83	243.74	131.24	254.19				
(01/06/05	283.29	251.11	132.01	261.23				
(01/07/05	286.79	258.65	136.01	269.61				
1	01/08/05	266.32	212.15	111.81	221.44				
I	01/09/05	254.79	184.79	101.88	193.63				
	01/10/05	259.89	195.97	105.00	203.82	· ·			
	01/11/05	256.94	186.21	102.41	198.72				
	01/12/05	272.43	223.52	125.69	241.49				
	01/13/05	258.65	195.94	105.11	198.73				
	01/14/05	205.68	206.83	112.37	221.67				
	01/15/05	229.96	202.12	109.00	215.03				
	01/16/05	241.79	222.55	124.16	238.93	l			
	01/17/05	132.32	156.66	099.50	209.71	l .			
	01/18/05	145.70	164.86	104.95	182.01				
	01/19/05	158.94	159.56	102.38	188.96				
	01/20/05	227.30	263.95	147.36	285.55	ļ			
	01/21/05	233.56	228.25	123.81	243.98				
	01/22/05	236.62	231.47	124.79	247.49	ļ			

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1	WDW-1		WDV	WDW-			W-3	I	
Date	Rate	Pres	Rate	Pres	Date	i	Rate	Pres	i
01/23/05	230.09	217.94	122.90	235.51	1				·
01/24/05	192.09	148.06	093.24	162.86	ĺ				
01/25/05	202.75	166.96	103.58	182.21	, 				
01/26/05	202.76	168.29	104.33	185.19					
01/27/05	233.64	233.64	123.72	250.87					
01/28/05	252.49	265.95	140.08	284.97					
01/29/05	249.23	258.81	135.97	276.27					
01/30/05	246.66	255.76	132.30	272.67					
01/31/05	240.99	247.80	127 54	264.31					
02/01/05	191.76	160.00	081 93	170.47					
02/02/05	249.79	265 90	133.88	279 24					
02/03/05	251.86	268 11	132.95	275 74					
02/04/05	182.53	230.09	114 25	257 01					
02/05/05	253.03	238.36	118 31	245 71					
02/06/05	241.33	214 61	106.35	221 34	 				
02/07/05	233 58	194.85	100.00	202 90	ł				
02/08/05	248 80	228 45	104.00	202.00					
02/09/05	255 77	240.40	123 48	255 66					
02/10/05	261 49	251 63	123.40	264 24					
02/11/05	1 248 17	201.00	1115 00	207.27					
02/10/05	240.17	240 23	110.33	257.50					
02/12/05	233.00	240.23	123.23	200.24					
02/13/05	240.20	105 24		221.11					
02/14/05	232.01	190.04	007 44	100 45					
02/15/05	1230.10	101.11	097.44	190.40				ь. I.	
02/10/05	1 264 06	100.07	1 1 2 2 2 7	197.30					
02/19/05	204.50	201.94	110 66	270.00					
02/10/05	200.00	209.00	102 20	200.91					
02/19/05	237.52	192 10	002.30	101 62					
02/20/05	220.00	003.40	105 29	191.00					
02/21/05	237.43	202.09	1100.20	211.90					
02/22/05	245.44	220.01	112.00	231.00					
02/23/03	240.00	222.00	114.09	204.04 225 22					
02/24/03	247.32	222.00	124 00	233.32					
02/25/05	200.00	200.04	134.00	214.20					
02/20/05	200.04	230.92	122.29	201.00					
02/27/05	251.10	200.01	130.94	200.71					
02/20/05	251.20	239.13	124.70	200.02					
03/01/05	237.10	200.17	111016	207.93					
03/02/05	106 02	207.22	067 20	126 64	•				
03/04/05	254 12	247 14	122 01	052 42					
03/04/03	204.12	247.14	106 97	202.40					
03/05/05	237.32	106 22	007.17	105 62					
03/06/05	220.21	100.32	097.17	190.00					
03/07/05	243.24		112.70	232.02					
03/00/03	1 231.79	130.20		209.14					
03/09/05	192.91	122.10		29.43					
03/10/05	237.69	210.5/		220.06					
03/11/05	2/1.83	2/1.41	138.32	281.46					
03/12/05	236.95	207.92	105.45	214.14					
03/13/05	253.47	239.13	122.60	247.23					
03/14/05	234.25	200.27	104.33	207.90			1		
03/15/05	213.13	160.00	083.60	166.38					
03/16/05	257.86	250.23	129.74	261.18					

	WDW	-1	WDV	V-2		WD\	N-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
03/17/05	241.78	219.41	112.16	244.33				
03/18/05	227.70	190.82	098.03	199.60				
03/19/05	239.76	212.61	110.24	223.12				
03/20/05	246.34	224.09	116.95	235.70				
03/21/05	232.54	197.53	103.13	209.04				
03/22/05	233.59	201.68	088.59	180.25				
03/23/05	224.58	183.54	095.02	192.15				
03/24/05	250.75	238.95	109.38	224.58				
03/25/05	239.99	218.64	112.11	230.29				
03/26/05	244.43	229.56	113.21	230.22				
03/27/05	245.81	240.40	123.00	249.05				
03/28/05	252.89	251.79	119.02	242.64				
03/29/05	232.33	210.10	099.92	202.43				
03/30/05	247.91	244.71	127.47	256.81				
04/01/05	245.58	242.23	127.05	261.61				
04/02/05	262.05	283.02	142.19	294.01	İ			
04/03/05	256.33	267.11	134.67	276.76				
04/04/05	256 77	270.85	132.74	271 23	! 			
04/05/05	220 63	189 94	091 65	185 29				
04/06/05	243 68	247 35	109 43	224 03				
04/07/05	254 21	279 50	136 24	283 64				
04/08/05	229 15	227 00	104 11	216 61				
04/09/05	261 07	297 66	093.86	202 74				
04/10/05	245 45	276 45	141 66	298 66				
04/11/05	219 35	212 40	103 20	218 88				
04/12/05	206 71	178 74	088.07	184 77	1			
04/13/05	227.06	232.06	112 93	235 44	l			
04/14/05	227 84	233.98	118 24	244 98				
04/15/05	231 10	240 49	107 41	225 16				
04/16/05	220 51	215.08	103 26	217 99				
04/17/05	213 56	197.98	096.08	200 41	۱ 			
04/18/05	231 91	240 45	119.84	247 54				
04/19/05	238.42	250.12	124.44	255.95				
04/20/05	238.78	244.79	123.64	253.33				
04/21/05	253.01	273.23	140.43	287.08				
04/22/05	248.86	260.70	135.75	271.02	ĺ			
04/23/05	253.44	269.31	128.03	260.13	, 			
04/24/05	249.36	257.22	134.81	273.83	İ			
04/25/05	262.57	287.06	147.53	299.23				
04/26/05	267.19	293.73	152.54	309.07				
04/27/05	262.42	284.16	144.13	291.59	İ			
04/28/05	271.95	304.67	155.37	312.48	İ			
04/29/05	278.14	313.53	162.25	324.83	i İ			
04/30/05	269.53	291.30	148.88	299.67				
05/01/05	276.92	310.32	163.35	332.69	1			
05/02/05	269.85	291.58	153.66	310.47	İ			
05/03/05	268.63	290.68	152.24	309 70	İ			
05/04/05	256.75	265 51	138 79	282 70	1			
05/05/05	249.84	244.65	128 65	260 70	1 			
05/06/05	267.13	279.34	147.57	296 44	1			
05/07/05	232 62	204 54	108.36	217 64				
05/08/05	265 47	270 42	144 89	288 22	! 			
05/09/05	246 60	232 16	123.18	246 13	l			
	1 - 10.00		1 120.10		ſ			

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	WDW	-1	WDV	V-2	WDW		
Date	Rate	Pres	Rate	Pres	Date	Rate	Pre
05/10/05	253.19	243.28	129.57	258.33			
05/11/05	273.79	285.08	153.83	303.36			
05/12/05	261.91	261.64	138.64	277.15			
05/13/05	260.49	259.01	136.50	273.92			
05/14/05	254.37	245.86	129.81	260.68			
05/15/05	246.28	230.65	125.49	245.08			
05/16/05	272.27	285 72	149.22	302.91			
05/17/05	274.17	287.29	147.43	296.96			
05/18/05	275.16	288 62	147.39	297.39			
05/19/05	253.01	241.38	125.25	250.40			
05/20/05	276 71	289 40	143 95	289 09			
05/21/05	266 26	265 22	140.12	281 19			
05/22/05	261 92	256 19	136 42	272 80			
05/23/05	259 76	251.06	133 12	268 69			
05/24/05	264 50	257.73	136 20	275 24			
05/25/05	204.00	275 11	142.84	280 50			
05/26/05	277.30	285 30	144.26	203.03			
05/27/05	277 60	285.86	145.03	296 76			
05/28/05	277.00	200.00	136 30	230.70			
05/20/05	278.07	209.20	1111 60	200.03			
05/20/05	270.07	269.33	136.88	281 40			
05/30/05	271.02	209.07	124 15	201.40			
06/01/05	203.33	240.11	124.10	250.55	, 1		
00/01/05	207.34	201.99	122.00	202.04			
00/02/05	1213.13	207.43	1100.19	204.44			
00/03/03	1202.21	241.09	110.00	233.29			
00/04/05	203.30	244.00		201.02			
00/05/05	209.20	140.09	013.00	101.92			
00/00/03	203.13	202.03	147.31	304.90			
00/07/05	270.90	213.94	1 100.90	209.90			
00/00/05	219.00	210.00	137.00	200. IZ 272.02			
00/09/05	210.30	204.00	129.09	272.92			
06/11/05	200.40	251.00	120.93	270.03			
00/11/00	209.02	201.90	145 00	201.13			
00/12/05	203.31	204.00	140.09	000.13			
00/13/05	219.10	211.23	140.24	290.77			
06/14/05	200.37	209.07	143.47	290.52			
00/15/05	202.09	201.92	140.00	292.01			
00/10/05	203.25	202.01	130.30	200.94			
00/17/05	214.20	205.07	110.10	209.39			
00/10/05	1200.10	1291.10	147.00	291 04			
00/19/05	219.94	211.04	130.90	201.94			
00/20/05	200.09	200.00	144.13	297.00			
06/22/05	202.00	214.30	121 72	207.00			
00/22/05	211.00	203.70	101.70	211.19			
00/23/03	291.92	209.00	141.13	009.21			
00/24/03	1 307.00	019.00	109.03	333.44 333.36			
00/20/00	003.95	312.31		322.30			
00/20/05		004.49	152.21	323.72			
00/21/05	1 302.81	309.29	103.60	329.02			
00/28/05	273.82	255.14	125.60	272.25			
06/29/05	297.40	296.90	146.27	314.40			
06/30/05	294.69	292.51	145.71	312.59			
07/01/05	283.89	271.33	136.28	291.57			

1	WDW	-1	WDV	V-2		1	· WD	W-3	
Date	Rate	Pres	Rate	Pres	Date	Ì	Rate	Pres	Ť
07/02/05	274.89	254.62	128.22	269.38					-
07/03/05	269.09	248.49	124.06	257.99					
07/04/05	277.77	260.45	134.81	272.58					
07/05/05	241.63	195.55	101.44	209.06					
07/06/05	281.76	264.66	136.56	281.00					
07/07/05	252.60	213.82	105.11	217.42					
07/08/05	279.90	258.71	133.30	276.10					
07/09/05	255.93	219.04	111.53	233.80					
07/10/05	270.18	242.57	122.60	260.39					
07/11/05	233.88	200.20	112.55	241.83					
07/12/05	282.93	266.41	134.11	289.14					
07/13/05	283.06	267.48	132.77	285.01					
07/14/05	260.15	227.34	109.92	236.37					
07/15/05	280.03	262.79	127.91	276.15					
07/16/05	254.35	217.46	106.15	230.44					
07/17/05	263.35	235.12	120.27	263.57					
07/18/05	263.28	233.68	109.53	242.05					
07/19/05	280.79	264.17	125.92	270.54					
07/20/05	262.08	214.23	116.19	241.07					
07/21/05	267.47	236.55	125.01	258.66					
07/22/05	267.70	236.38	124.28	258.45					
07/23/05	272.35	244.46	128.31	265.69					
07/24/05	240.94	190.33	131.87	272.41					
07/25/05	275.94	250.75	127.87	263.41					
07/26/05	257.61	218.60	109.56	226.70					
07/27/05	278.54	261.38	127.09	260.24					
07/28/05	278.65	253.93	132.09	272.24					
07/29/05	272.98	244.04	126.74	260.28					
07/30/05	280.23	256.24	129.98	266.60					
07/31/05	264.06	225.38	115.83	238.07					
08/01/05	282.05	257.16	131.47	272.27					
08/02/05	280.58	253.35	130.36	269.70					
08/03/05	234.15	172.11	102.26	212.40					
08/04/05	263.01	218.13	131.27	270.19					
08/05/05	269.04	225.38	117.72	238.62					
08/06/05	250.36	209.17	113.06	236.26	Ì				
08/07/05	298.44	275.94	123.37	259.36					
08/08/05	249.22	193.93	j 102.09	211.70	ĺ				
08/09/05	246.92	189.98	096.87	200.08	ĺ				
08/10/05	199.07	108.34	059.65	118.80	ĺ				
08/11/05	278.47	234.41	124.99	253.60					
08/12/05	274.56	226.93	121.77	245.06					
08/13/05	289.73	252.58	131.80	265.00					
08/14/05	266.51	214.51	114.21	226.71					
08/15/05	274.95	225.47	123.35	241.51	ĺ				
08/16/05	271.92	220.64	123.04	238.70					
08/17/05	254.00	192.48	101.94	197.45					
08/18/05	277.03	227.28	129.73	242.20	Í				
08/19/05	230.29	162.88	103.18	192.72	ĺ				
08/20/05	233.37	167.64	101.36	180.37	İ				
08/21/05	245.57	172.84	106.01	193.20	İ				
08/22/05	261.06	198.10	119.34	218.27	İ				
08/23/05	260.02	197.67	118.40	215.59	İ				
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WDW-3

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1	wdw	-1	WDV	V-2 I		
Date I	Rate	Pres	Rate	Pres	Date	Rate
08/24/05	249.86	183.21	108.88	194.34		1
08/25/05	246 11	175 77	108.00	187 43	•	
08/26/05	275 45	221 87	132 10	239 52		
08/27/05	257 45	101 12	102.10	108 63		
08/28/05	253 30	185.25	112 55	0.00		
08/20/05	233.39	224 44	12/ 20	205.44		
00/29/03	270.09	224.44	104.09	243.31		
08/31/05	210.09	210.73	129.02	237.23		
00/01/05	200.33	200.00	129.70	240.00 224 66		
09/01/05	213.33	240 10	140 50	234.00 256 A5		
09/02/05	203.20	240.10	140.00	200.40		
09/03/05	204.10	241.07	130.32	249.10		
09/04/05	210.11	220.00	130.12	200.10		
09/05/05	270.43	228.91	137.33			
09/06/05	232.94	159.81	095.37	176.21		
09/07/05	282.40	236.83	138.32	252.53		
09/08/05	235.99	163.07	096.04	176.09		
09/09/05	237.22	163.26	097.74	174.94		
09/10/05	259.82	198.85	117.44	213.60		
09/11/05	238.79	167.44	101.00	183.67		
09/12/05	243.80	173.90	105.44	187.78		
09/13/05	231.27	152.19	096.19	164.01		
09/14/05	244.65	174.31	105.48	187.68		
09/15/05	232.14	157.17	092.22	170.21		
09/16/05	238.78	168.32	102.70	179.02		
09/17/05	219.42	137.34	082.06	138.77		
09/18/05	235.61	163.41	103.64	179.35		
09/19/05	217.95	133.29	083.48	146.18		
09/20/05	235.29	159.72	099.94	174.60		
09/21/05	253.42	163.20	102.30	177.84		
09/22/05	229.08	145.32	091.38	158.03		
09/23/05	243.78	171.52	109.98	186.59		
09/24/05	240.43	167.79	098.71	170.77		
09/25/05	235.01	153.06	097.14	168.78		
09/26/05	237.81	143.76	088.18	159.01		
09/27/05	238.53	155.64	098.87	172.05		
09/28/05	232.92	156.37	099.84	172.57		
09/29/05	240.20	166.50	105.11	184.30		
09/30/05	232.60	146.47	094.96	165.30		
10/01/05	259.26	197.97	125.67	215.57		
10/02/05	249.39	183.44	111.53	193.49		
10/03/05	238.98	170.20	101.47	181.22		
10/04/05	237.33	165.06	101.47	178.59		
10/05/05	238.09	169.14	104.53	183.71		
10/06/05	230.93	157.86	096.60	172.02		
10/07/05	229.42	159.82	097.80	175.28		
10/08/05	253 74	192.05	115.99	204 45		
10/09/05	236 75	165 74	104 21	176 71		
10/10/05	255 70	195.81	119 30	204 61		
10/11/05	235 00	160.01	103 38	181 28		
10/12/05	222 24	144 81	1 103.00	150 08		
10/12/05	219 01	127 /0	1090.12	1/6 55		
10/14/05	210.91	101.49	1 1 2 2 4 7	1 21/ 02		
10/14/03	204.00	CO.U.D	122.11	214.92 104 04		
10/10/05	1243.23	10.111	1107.54	1 104.01	1	

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·	WDW-1		WDV	WDV			N-3	I	
Date	Rate	Pres	Rate	Pres	Date	i	Rate	Pres	i
10/16/05	226.18	154.50	098.01	170.79		'			
10/17/05 j	229.55	160.76	103.73	180.05	İ				
10/18/05	233.95	168.35	104.51	184.33					
10/19/05	229.55	160.28	096.54	172.16					
10/20/05 j	244.02	186.09	115.50	201.03					
10/21/05	247.12	186.18	113.89	200.98					
10/22/05	246.49	181.22	109.10	196.09					
10/23/05	248.11	192.17	119.59	208.53					
10/24/05	240.14	182.07	111.42	198.26					
10/25/05	229.34	162.92	098.67	177.26					
10/26/05	253.59	195.40	119.11	212.82					
10/27/05	250.78	193.83	119.03	211.23					
10/28/05	254 16	202 10	123 03	219 04					
10/29/05	253.06	199.70	126.63	223.78					
10/30/05	259 55	210.89	127 63	223 59					
10/30/05	253.94	199.93	122 63	214 72					
11/01/05	244 29	188 27	120.95	213 29					
11/02/05	234 60	172 99	109 44	191 51					
11/03/05	230 36	167.93	102.39	179.46	1				
11/04/05	250.67	201 58	122.00	216 61					
11/05/05	241 55	188 65	114 25	202.09					
11/06/05	253 94	207 56	112 29	196 95	1				
11/07/05	231 19	173 20	104 42	188 12	1				
11/08/05	230 21	189 60	110 28	100.12	1				
11/00/05	200.21	100.00	116 50	207.90	1				
11/10/05	246.83	198.06	123 35	217 38	1				
11/11/05	240.00	190.33	118 64	211.00	1				
11/12/05	240.04	189 64	111 58	197 41	1				
11/13/05	237 52	188 41	118 18	213 33	1				
11/14/05	239 72	192.58	114 19	210.00	1				
11/15/05	237 96	185.90	107 48	196 90	1				
11/16/05	234 58	186.04	1111 78	203 71	1				
11/17/05	232 79	179 27	110.63	200.7 1	1				
11/18/05	234 74	180.81	111 38	205.04	1				
11/19/05	248 54	210.55	124 48	228 03	ľ				
11/20/05	237 69	190.65	107 16	197 43	l				
11/21/05	234 81	183 16	104 07	192 16	1				
11/22/05	237 10	189.67	107.34	198 63	 				
11/23/05	234.09	191.87	114.59	211.01					
11/24/05	266.41	244.19	128.97	245.19					
11/25/05	263.52	234.51	120.28	232.55					
11/26/05	275.06	257.78	136.00	265.29	1				
11/27/05	266.49	238.69	128.42	250.21					
11/28/05	213.64	195.95	131 84	255 99					
11/29/05	262.11	238.63	126.29	244 39	l				
11/30/05	219.20	258.02	136.18	236.46	' 				
12/01/05	227.74	231.10	115.98	222 26	, 				
12/02/05	210.36	207.51	085 94	172 49	1 				
12/03/05	266 03	281 41	104 48	217 86					
12/04/05	236 37	249 87	130 28	255 35	1				
12/05/05	222 71	248 68	121 93	238 95	1				
12/06/05	234 36	259 14	125 71	235 51	r 				
12/07/05	156.35	302.96	131.18	359 35					
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1	WDW-1		WDW-2		Wi		WD	DW-3	
Date	Rate	Pres	Rate	Pres	Date	j F	Rate	Pres	i
12/08/05	183.09	370.13	165.65	476.81		•			
12/09/05	302.51	367.05	312.98	499.86					
12/10/05	304.82	345.28	091.07	499.86					
12/11/05	271.53	292.10	137.59	499.86					
12/12/05	268.42	283.79	134.08	499.86					
12/13/05	259.64	258.44	121.27	499.86					
12/14/05	267.90	275.24	129.35	499.86					
12/15/05	269.46	282.98	143.72	499.86					
12/16/05	243.90	269.71	088.11	499.86					
12/17/05	244.25	264.03	041.90	499.86					
12/18/05	255.59	287.29	123.18	499.86					
12/19/05	222.16	253.05	098.32	499.86					
12/20/05	181.08	145.24	056.51	499.86					
12/21/05	242.25	287.78	120.61	499.86					
12/22/05	212.77	248.39	094.82	499.86					
12/23/05	233.33	253.40	119.02	499.86					
12/24/05	223.25	221.18	098.73	499.86					
12/25/05	232.03	234.00	113.40	499.86					
12/26/05	227.66	221.17	111.83	499.86					
12/27/05	224.12	208.90	106.36	499.86					
12/28/05	235.83	226.72	111.01	499.86					
12/29/05	228.30	212.05	103.48	499.86					
12/30/05	231.05	213.14	106.25	499.86					
12/31/05	230.21	209.31	105.69	499.86					
01/01/06	237.34	220.12	113.08	499.86					
01/02/06	204.91	170.58	100.72	499.86					
01/03/06	229.63	199.97	104.02	499.86					
01/04/06	241.01	215.53	114.44	499.86					
01/05/06	235.89	205.65	108.62	499.86					
01/06/06	221.09	181.27	095.18	499.86					
01/07/06	227.39	185.94	093.72	499.86					
01/08/06	238.51	200.14	109.59	499.86					
01/09/06	236.80	194.88	107.18	499.86					
01/10/06	231.37	187.84	110.61	499.86					
01/11/06	247.14	234.90	105.06	499.86					
01/12/06	243.24	200.89	106.82	499.86					
01/13/06	259.79	235.04	123.44	499.86					
01/14/06	254.61	226.95	118.09	499.86					
01/15/06	254.22	217.00	121.98	499.86					
01/16/06	263.65	232.50	131.94	499.86					
01/17/06	272.46	248.79	141.59	499.86					
01/18/06	280.75	253.84	144.70	499.86					
01/19/06	280.66	229.88	141.31	499.86					
01/20/06	273.72	212.96	133.58	499.86					
01/21/06	268.96	206.87	129.24	499.86					
01/22/06	285.31	239.09	144.49	499.86					
01/23/06	286.48	240.12	143.89	499.86					
01/24/06	288.53	245.08	143.10	499.86					
01/25/06	281.69	229.21	136.75	499.86					
01/26/06	273.06	213.87	128.45	499.86					
01/27/06	270.41	208.28	135.96	499.86					
01/28/06	270.98	214.25	126.73	499.86			. ·		
01/29/06	278.64	231.64	126.94	499.86	1				

WDW-3

	WDW	-1	WDW-2				WDV	V-3	
Date	Rate	Pres	Rate	Pres	Date	1	Rate	Pres	
01/30/06	276.49	235.44	140.96	499.86					
01/31/06 i	260.72	214.46	118.37	499.86					
02/01/06 İ	255.36	214.67	121.56	499.86					
02/02/06	251.59	210.32	128.80	499.86					
02/03/06	264.37	237.98	129.42	499.86					
02/04/06	265.17	248.65	i 140.01 i	391.84					
02/05/06	262.90	243.46	137.10	260.61					•
02/06/06	258.93	233.16	131.21	248.93					
02/07/06	263.07	245.63	133.07	263.00					
02/08/06	230.62	192.44	099.17	193.81					
02/09/06	266.53	253.36	130.22	264.54					
02/10/06	256.75	236.51	124.01	241.46					
02/11/06	205.16	141.94	072.15	142.52					
02/12/06	227.15	185.07	099.76	184.01	ĺ				
02/13/06	200.02	228.85	093.31	099.45					
02/14/06	240.13	210.11	112.61	218.96					
02/15/06	224 41	178.78	097.58	189.15					
02/16/06	237.00	196.52	106.08	201.58					
02/17/06	223 66	174.20	095.51	180.57]				
02/18/06	210.89	158.64	087.56	138.75]				
02/19/06	218.14	171.36	091.31	144.41					
02/20/06	231.93	196.14	110.13	305.10					
02/21/06	240 72	203.65	112.26	210.82]				
02/22/06	206.32	140.17	080 20	151 60					
02/23/06	229 52	179 72	101 70	190.52	1				
02/24/06	244.93	205 81	117 57	219 77	1				
02/25/06	232 41	181 75	105 75	196.85	1				
02/26/06	218 13	157 82	087 13	161 45] 				
02/27/06	212 21	148 45	084 85	156 29	, I				
02/28/06	278.94	173 55	096 84	178 49] 				
03/01/06	214 00	146 29	080.57	147 64) 				
03/02/06	216 53	150.74	089 19	162.93]				
03/03/06	213 92	149.05	092.03	170.75	, 				
03/04/06	219 52	160.79	095.94	178.78	, 				
03/05/06	232 71	182.98	106.63	197.36	1				
03/06/06	242.14	196.40	113.48	208.21	l I				
03/07/06	221 31	157.57	090.02	164.89	, 				
03/08/06	216.46	153.24	090.45	158.37	Ì				
03/09/06	224.88	163.28	100.45	181.61					
03/10/06	247.90	203.49	116.11	210.76					
03/11/06	211.67	140.20	079.37	144.26					
03/12/06	217.31	147.45	089.80	161.54	l				
03/13/06	225.31	160.94	096.36	173.32	ł				
03/14/06	237 56	180.81	114.27	203 32	1 				
03/15/06	199 55	119.98	071 50	128 94	ł				
03/16/06	264 64	221.22	133 54	239.00	1				
03/17/06	263 41	218 42	131 77	235 17	1				
03/18/06	260.50	214 18	129 13	230 46	1 				
03/19/06	236 70	176 23	106 27	190 93	1 				
03/20/06	250.70	197 08	110 66	214 02	1				
03/21/06	200.24	154.12	1 NG3 80	160 58	1 I				
03/22/06	242 61	187.13	108.00	217 51	1				
03/22/00	242.01	150.00	100.20	166 22	, · ·				
00123/00	223.31	103.10	032.20	100.23	i				

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Date I	Rate	Pres	Rate	Pres	Date	Rate	Pre
03/24/06	245.29	187.66	110.09	234.85 I			
03/25/06	247.25	190.67	115.26	207.53			
03/26/06	242.95	182.45	106.20	189.80			
03/27/06	251.77	194.80	118.89	212.55			
03/28/06	235.25	168 62	104 10	186 61			
03/29/06	256 61	201 97	118 28	210 93			
03/30/06	243.80	182 59	107.34	192 32			
03/31/06	254.33	196.98	116 61	206 91			
04/01/06	244 92	183 71	108.06	191 34			
04/02/06	255 31	108.84	117 97	210 53			
04/03/06	259 64	205 18	126 30	210.00		,	
04/04/06	233 20	164 21	030 34	071 26			
04/05/06	162 60	057.49	118 76	235 20 1			
04/06/06	225 50	150 64	102 32	200.20			
04/07/06	220.00	2/3 71	056 80				
04/08/06	266 62	245.71	131 53	235 30			
04/00/06	200.02	183.81	112 /8	100 87			
04/10/06	240.24	220 /0	135 71	242 08			
04/11/06	205.45	220.40	134 55	272.50			
04/12/06	251 02	103 26	112 04	200.15			
04/12/00	201.02	195.20	105 65	180 12			
04/14/06	243.43	167.05	103.05	109.12			•
04/15/06	230.99	107.11 191 <i>.11</i>	1111 88	100.09			
04/15/00	240.00	014 77	1100 20	00.00			
04/10/00	203.70	211.11	129.00	220.00 283 58			• •
04/11/00	271.47	227.44	129.24	243.54 270 92			
04/10/00	270.00	230.97	100.04	249.00 222 24			
04/19/00	203.09	214.02	124.13	223.24 225 76			
04/20/00	200.02	220.00	129.02	233.70			
04/21/00	200.05	100 21	120.40	106 72			
04/22/00	240.21 '241 95	100.31	100.21	100.72			
04/23/00	241.00	208 76	104.04	017 55			
04/25/06	253.75	200.70	120.71	277.33			
04/26/06	201.00	202 58	118 83	217.86			•
04/27/06	202.04	188 83	110.05	203 42 1			
04/28/06	247.00	184 85	107 38	200.72 100 22			
04/20/00	240.40	105.00	115 81	213 08			•
05/01/06	246 60	188.89	111 64	201 86			
05/02/06	244 64	184 77	110 29	199.08			
05/03/06	267.34	220.32	129.34	236 17	1		
05/04/06	266.65	222.06	130 28	239 30			
05/05/06	248.71	194 28	114 86	211 87			
05/06/06	259.16	214.06	127.67	235.49			
05/07/06	253.39	207.28	119.41	221.19			
05/08/06	268.37	231.62	134.17	247.64			
05/09/06	261.37	217.59	125.88	231.34			
05/10/06	266.19	226.63	130.21	238.08			
05/11/06	263.75	224.43	129.48	238.04			
05/12/06	263.46	226.16	128.79	237.50			
05/13/06	259.42	217 63	124 38	227.45			
05/14/06	264.72	226.83	133.38	243 95			
05/15/06	260.38	221 56	133 21	246 23			
05/16/06	299.70	295.00	156.29	305.35			
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1	WDW-1		WDW-2					W-3	1
I Date I	Rate	Pres	Rate	Dres I	I Date	ł	Rate	Pres	ł
	1.010	1224.06	116 70	100 100		ļ	ivale	FIGS	I
05/17/00	200.04	204.00	1 1 0.7 3	221.02					
05/16/06	297.39	290.30	147.ZZ 490.00	291.75					
05/19/06	285.14	278.70	130.38	270.72					
05/20/06	280.64	281.47	141.21	282.88					
05/21/06	284.45	298.32	132.86	269.47	•				
05/22/06	249.65	227.50	116.99	235.56					
05/23/06	284.50	311.66	149.12	305.93					
05/24/06	265.92	271.44	116.04	238.47					
05/25/06	252.86	272.69	133.64	275.70					
05/26/06	263.61	261.57	135.95	274.31	•				
05/27/06	267.81	268.13	126.98	255.76					
05/28/06	278.45	286.03	139.90	281.41					
05/29/06	263.40	255.80	131.60	264.57					
05/30/06	268.88	266.24	139.56	279.84					
05/31/06	270 19	260 34	135 79	270 98					
06/01/06	263 67	251 66	132 42	266 65					
06/02/06	284 00	285.84	151 20	304 51					
06/02/06	262.06	243 45	123 00	253 88					
06/04/06	264 72	245.40	126.00	255.00					
06/05/06	204.72	240.00	120.04	201.01					
00/05/00	200.70	202.00	129.00	203.75					
00/00/00		240.94							
00/07/06		240.31	128.11	201.24					
06/08/06	287.97	281.17	145.68	297.39					
06/09/06	255.80	221.09	114.96	235.16					
06/10/06	275.71	252.90	132.38	269.18					
06/11/06	250.45	209.97	109.53	223.81					
06/12/06	252.93	208.51	109.80	224.64					
06/13/06	220.05	152.81	086.91	169.42					
06/14/06	231.57	173.94	095.19	184.41					
06/15/06	227.41	167.59	088.30	173.33					
06/16/06	281.81	261.43	130.09	269.95					
06/17/06	281.40	260.90	130.40	269.79					
06/18/06	258.14	221.72	111.11	231.98					
06/19/06	275.43	250.15	125.95	260.23					
06/20/06	270.92	240.47	120.31	249.86					
06/21/06	273.59	247.41	123.17	257.40					
06/22/06	248.16	202.23	099.01	209.19					
06/23/06	282.29	268.82	136.14	286.05					
06/24/06	263.98	241.60	118.48	252.51					
06/25/06	276.96	265.30	128.56	274.03					
06/26/06	271.33	261.40	125.10	268.39					
06/27/06	303.63	326.30	160.18	345.40	1				
06/28/06	306.92	332.60	159.52	341.44					
06/29/06	311.30	338.63	164.31	350.49	İ				
06/30/06	295.94	314.19	148.20	320.32	ĺ				
07/01/06	253.08	234.94	136.46	293.87	ĺ				
07/02/06	280.52	280.22	134.34	290.80					
07/03/06	304.15	325.00	138.93	300.15					
07/04/06	248.67	223.03	102 90	226.06					
07/05/06	277 08	275.54	133 41	286 92					
07/06/06	256 23	232 87	108 11	233 95					
07/07/06	219 13	162 37	077 77	175.02					
07/08/06	264 72	243.25	116 40	248 28					
			0.70						

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WDW-1		WDW	WDW-			N-3	1		
j Date j	Rate	Pres	Rate	Pres	Date	i	Rate	Pres	i
07/09/06	256.11	228.87	112.65	239.04		'			•
07/10/06	279.66	268.92	128.97	272.94					
07/11/06	250.24	215.09	108.44	232.49					
07/12/06	267 88	248 20	126.09	267 14					
07/13/06	253 19	221 27	105 67	225 85					
07/14/06	259 54	234 44	117 25	257 71					
07/15/06	257.01	229 61	113 62	243 71					
07/16/06	270 40	251 37	121 37	260 77					
07/17/06	264 25	241 06	118 68	258 00 1					
07/18/06	204.20	271.30	108.00	236.24					
07/10/06	233.40	215 07	100.00	235 23					
07/19/00	293.12	170.00	005 65	200.20					
07/20/00	247.04	156 29	115.02	200.44					
07/21/06	217.94	100.20	115.03	249.07					
07/22/06	274.99	207.03	120.20	200.90					
07/23/06	252.38	217.35	104.02	227.43					
07/24/06	2/9.9/	207.82	127.80	277.23					
07/25/06	201.50	234.78	111.84	244.08					
07/26/06	263.43	239.48	113.45	248.19			,		
07/27/06	244.35	202.63	097.64	214.09					
07/28/06	280.64	272.33	131.36	287.27					
07/29/06	258.19	230.68	107.79	236.62					
07/30/06	224.29	173.04	110.36	243.09					
07/31/06	274.93	258.81	127.14	279.87					
08/01/06	251.50	218.45	119.86	263.48				· · .	
08/02/06	271.34	248.96	109.74	241.57				• •	
08/03/06	299.50	295.64	117.96	258.56					
08/04/06	193.82	101.60	106.25	231.97					
08/05/06	226.52	142.71	097.46	213.54					
08/06/06	265.74	216.23	116.79	253.72				,	
08/07/06	235.75	172.93	093.90	205.26	ł				
08/08/06	244.53	189.89	095.24	207.64					
08/09/06	231.53	172.23	086.45	189.39					
08/10/06	243.52	192.37	096.67	210.29					
08/11/06	265.84	231.08	115.82	249.74					
08/12/06	255.18	216.29	095.63	209.25					
08/13/06	263.54	234.46	113.90	250.19					
08/14/06	216.47	156.17	089.07	199.70					
08/15/06	263.08	240.17	110.74	246.24	ĺ				
08/16/06	249.14	212.76	099.84	222.42					
08/17/06	234.02	183.13	111.33	246.88					
08/18/06	272.00	242.66	127.99	281.40					
08/19/06	279.22	263.56	117.10	256.12					
08/20/06	292.69	282.06	088.20	198.87					
08/21/06	293.08	284.93	101.90	224.17	ĺ				
08/22/06	281.68	268.79	115.77	254.14					
08/23/06	311.93	328.09	123.92	272.38	Ì				
08/24/06	251.54	223.89	106.06	234.17	, I				
08/25/06	196 88	280 70	000 00	005 45					
08/26/06	133.04	040 35	000.05	004 83	r 				
08/27/06	294 62	289 86	140 65	307 38	1				
08/28/06	208 10	200.00	122 27	1 277 /0	1				
08/20/06	270 85	1 248 70	106 20	1 222 65	l 				
00129100	270.00	290.79	121 04	233.03	1				
00/00/00	L Z I J.4U	1 401.14	1 1 3 1 . 0 4						

	WDW-1		WDW-2			WD\	DW-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	Ì
08/31/06	240.92	191.26	099.00	215.60		΄ τ		
09/01/06	216.94	151.42	064.19	145.13				
09/02/06	249.61	207.46	106.49	233.99				
09/03/06	235 17	188 09	095 18	210.84				
00/04/06	264 57	241 72	118 40	103 02				
00/05/06	204.07	274 70	145 31	217 45				
09/05/00	207.72	214.10	120.51	101 22				
09/00/00	219.13	204.20	110.04	101.00				
09/07/00	200.70	243.77						
09/08/06	255.18	224.98	108.90	362.30				
09/09/06	229.68	1/1.5/	088.39	410.17				
09/10/06	209.98	142.86	070.79	313.82				
09/11/06	232.03	180.56	088.46	230.67				
09/12/06	230.95	181.03	084.28	258.25				
09/13/06	257.06	228.54	110.65	446.89				
09/14/06	163.68	061.32	030.83	489.92				
09/15/06	177.27	084.65	042.54	495.31				
09/16/06	287.19	293.05	148.53	490.24				
09/17/06	299.65	308.41	153.00	496.41	¹			
09/18/06	277.67	274.39	116.03	458.31				
09/19/06	286.07	287.09	109.42	479.11				
09/20/06	261.41	240.85	078.61	499.86				
09/21/06	250.99	221.86	083.75	496.54				
09/22/06	243.76	205.82	099.29	496.05				
09/23/06	251.43	222.16	098.07	471.75				
09/24/06	242.51	208.06	079.42	371.03				
09/25/06	237.10	197.60	091.02	408.91				
09/26/06	240 76	204 99	099 64	439 61				
09/27/06	142 17	058 92	000 00	383 97				
09/28/06	129.68	001 94	000.00	427 75				
09/29/06	204 27	141 27	066 78	427 61				
09/30/06	300 50	319.08	163 28	495 38				
10/01/06	264 95	251 29	127.05	460.32				
10/02/06	260.06	243 80	123 13	446 81				
10/03/06	272 31	267 63	120.10	434 67				
10/04/06	267.33	255 31	114 27	397.36	1			
10/05/06	248 90	223 87	092 00	357 89	ļ			
10/06/06	240.00	220.07	104 17	421 38				
10/07/06	229 62	185.05	086 74	439 16	1			
10/08/06	223 27	179.30	080.85	480.98	1			
10/09/06	216 58	172 26	083.04	494 70				
10/10/06	211.06	167 54	075 19	492 56				
10/11/06	217.00	180.65	071 84	402.00	ļ			
10/12/06	217.00	172 33	071.04	1 100 86	1			
10/12/00	1111 22	1112.00		1 4 9 9 . 0 0	1			
10/13/00	1 1 25 20	104.77			1			
10/15/06	1 123.23	000.33		100 00				
10/10/00	1 144.19	034.43	124 42	433.00				
10/10/00	1312.33	1330.90	1 154.13	433.00				
10/17/00	0102.00	1 330.32	1006.00	499.00				
10/10/00	240.3/	252.00	1 120 00	1499.00				
10/19/00	1 309.11	1 332.01	130.00	499.00	1			
10/20/06	200.49	1313.75	130.70	499.80				
10/21/06	290.21	335.37	135.64	499.86				
10/22/06	291.61	326.80	132.68	499.86	ļ			

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I		WDW-1		WDW-2			WD		-}
	Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	İ
	10/23/06	271.49	292.69	126.22	499.86				•
	10/24/06	256.74	263.30	108.88	499.86				
	10/25/06	282.51	316.14	110.04	499.86				
	10/26/06	263.17	276.31	106.62	499.86				
	10/27/06	256.35	264.22	102.07	499.86				
	10/28/06	229.30	217.90	089.75	499.86				
	10/29/06	211.33	192.33	080.65	499.86				
	10/29/06	207.49	189.28	066.69	499.86				
	10/30/06	202.59	176.00	063.01	499.86				
	11/01/06	177.82	119.78	016.06	499.28				
	11/02/06	161.62	076 97	032.66	446 85				
	11/03/06	298.11	361.88	154.31	497.94				
	11/04/06	273.04	309 73	130 69	474 35				
	11/05/06	282.65	336 20	146 90	499 86				
	11/06/06	279.09	329 10	135.05	499.86				
	11/07/06	268.90	311 81	130.00	499.86				
	11/08/06	262.36	206 63	124 44	400.00				
	11/00/06	266 85	304 58	123.18	400 86				
	11/10/06	263 44	007.00	106 75	100.86				
	11/11/06	200.77	291.11	100.75	100 86				
	11/12/06	240.00	207.10	1100.40	499.00				
	11/12/00	245.15	211.22	109.31	1 499.00				
	11/14/06	273.37	201.03	1111 64	499.00				
	11/14/00	1277.11	069 24		499.00				
	11/16/06	1 1 2 2 . 7 3	000.31		499.00			1 + 3,	
	11/10/00	1 226 07	033.39		499.00				
	11/1//00	200.91	250.03	143.70	499.00				
	11/10/00	205.20	309.00	141.22	499.00				
	11/19/00	200.01	200.03	102.99	499.00				
	11/20/00	200.15	1 329.39	132.20	499.00				
	11/21/00	273.00	001.24	405 56	499.00				
	11/22/00	271.01	040.30	120.00	499.00				
	11/23/00	211.90	007.76	119.23	499.00				
	11/24/00	200.29	01.10	120.19	499.00				
	11/20/00	201.22	006 70	122.24	499.00				
	11/20/00	241.00	290.70		499.00				
	11/21/00	231.19	209.17	103.52	499.00				
	11/20/00	236 63	214.11	103.70	499.00				
	11/29/00	230.05	207.39	103.55	499.00 182 Q1				
	12/01/06	341 61	27 1.22	100.00	205 12				
	12/01/00	155 07	365 22	1005.40	200.12	K ,			
	12/02/00	100.97	212 04	1109.02	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
	12/03/00	128 03	1 250 02	111/21	441.47 403 53				
	12/04/00	1/7 83	1 272 01	120.08	423.33	1			
	12/05/00	1/105	1 204 24	102 71	405.54	1			
	12/07/00	270.22	277 61	120.71	1 400.74	 			
	12/00/100	210.00	1202 06	133.13	1 499.00	1			
	12/00/00	102.00	1 202.90	1 127 66	499.00 200 70	1			
	12/103/00	133.23	1 402.19	1 107.00 1 120 74	1 100 00				
	12/11/00	203.40	1 292 14	130.71	1 433.00				•
	12/11/00	204.13	003.11	133.31	1 499.00				
	12/12/00	200.00	1 265 20	122.00	1 499.00				
	12/13/00	201.22	303.29	129.00	499.00				
	12/14/06	228.28	304.77	120.85	1499.86	ł			

Pres |

		WDW-1		WDV	V-2			W-3
	Date	Rate	Pres	Rate	Pres	Date	Rate	Pre
	12/15/06	257.90	357.16	130.00	499.86		• • •	
	12/16/06	251.99	333.35	115.54	499.86 i			
	12/17/06	241.69	311.56	110.02	499.86			
	12/18/06	254.77	341.08	117.58	499.86			
	12/19/06	235 53	305 19	108.33	499 86			
	12/20/06	231 40	297.08	106.00	499 86			
	12/21/06	157 35	310 00	112 35	240 73			
	12/22/06	236 51	302 72	112.00	100 84			
	12/23/06	253.01	330 03	123.60	318 65			
	12/23/00	101 0/	347 12	123.04	1 8/ 01			
	12/25/06	203 64	370 17	122.73	300 86			
	12/20/00	203.04	250.20	125 72	300.00 212 70			
	12/20/00	201.11	275 05	123.72	213.10			
	12/21/00	204.70	226 11	122.96	204.33 265 16			
	12/20/00	200.14	270 02	123.00	200.10			
	12/29/00	203.03	370.03	137.73	209.30			
	12/30/00	200.01	301.17	129.20				
	12/31/00		303.77	134.37	209.40			
	01/01/07	188.73	362.06	128.23	151.73			
	01/02/07	182.94	359.51	123.77	118.76			
	01/03/07	253.59	356.37	124.61	227.00			
	01/04/07	245.54	339.68	119.66				
	01/05/07	243.25	355.94	117.53	336.75			
1	01/06/07	245.77	358.30	120.48	404.30			
1	01/07/07	246.15	364.40	117.24	369.12			
	01/08/07	243.64	362.76	122.72	218.35			
	01/09/07	230.33	363.63	119.53	219.77			
	01/10/07	233.00	338.65	108.71	272.00			
1	01/11/07	242.48	358.15	119.78	360.48			
1	01/12/07	253.90	386.59	124.21	425.33			
I	01/13/07	235.82	339.19	114.82	352.86			
1	01/14/07	243.02	364.12	116.33	455.03			
1	01/15/07	132.56	364.99	111.72	418.53			
1	01/16/07	104.44	345.25	112.74	109.28			
1	01/17/07	067.68	380.62	116.72	074.54			
1	01/18/07	070.51	373.17	128.77	052.04			
	01/19/07	149.15	369.62	116.87	173.96			
	01/20/07	192.86	387.55	128.29	333.06			
	01/21/07	242.76	377.43	125.71	129.85			
	01/22/07	243.31	379.52	128.07	164.99			
	01/23/07	039.95	381.21	120.31	0/4./4			
	01/24/07	135.07	389.95	125.25	027.67			
	01/25/07	149.08	417.28	112.91	153.33			
	01/26/07	179.38	403.77	125.34	145.37			
	01/27/07	262.54	414.49	110.74	212.17			
	01/28/07	254.18	410.62	123.83	166.78			
	01/29/07	236.64	400.20	115.49	142.30			
	01/30/07	175.81	388.86	104.50	191.22			
	01/31/07	243.45	385.18	113.10	158.56			
	02/01/07	178.50	378.08	112.13	319.97			
	02/02/07	200.27	257.90	080.94	295.48			
	02/03/07	199.98	340.85	089.80	255.48			
	02/04/07	223.82	388.10	128.08	184.86			
	02/05/07	249.69	379.76	123.65	207.38			

WDW-1			WDW	V-2		W
Date	Rate	Pres	Rate	Pres	Date	Rate
02/06/07	253.22	370.01	121.87	288.46		
02/07/07	216.47	223.86	074.56	385.48		
02/08/07	350.92	361.59	078.82	499.86		
02/09/07	296.82	295.59	157.80	499.86 i		
02/10/07	298.90	317.37	150.24	499.86		
02/11/07	296 91	325.04	114.41	499.86		
02/12/07	269.01	273.13	127.86	499.86		
02/13/07	294 63	315.77	125.56	499.86		
02/14/07	247 16	232.32	113.82	499.86		
02/15/07	016 92	263.00	114 42	182.48		
02/16/07	122.05	264.30	115 68	259 07		
02/17/07	180 64	255 28	133 36	333 12		
02/18/07	206 55	304 63	144 03	382 82 1		
02/10/07	230.00	302 98	157 41	213 60 1		
02/13/07	299.00	279 76	140 51	345 14		
02/20/07	293.02	255 05	132 76	400 86		
02/21/07	203.73	200.00	121 /2	499.00 105 80		
02/22/07	1 293 17	249.10	121.42	490.00 468.30		
02/23/07	203.41	260 17	120.79	400.39 102 56		
02/24/07	293.07	203.17	124.00	000.00		
02/25/07	200.34	200.08	134.52	000.00		
02/20/07	209.90	239.12	134.30	000.00		
02/21/07	2/1.03	242.04	137.09			
02/28/07	200.70		120.29			
03/01/07	200.04	231.04	123.00	012.25		
03/02/07	283.08		154.78			
03/03/07	264.20	243.55	130.93	040.00		
03/04/07	253.27	211.12	141.14	109.51		
03/05/07	233.89	229.31	109.73	049.34		
03/06/07	245.43	221.18	155.34	111.97		
03/07/07	200.24	249.79	145.25	001.90		
03/08/07	277.19	265.38	147.24	011.41		
03/09/07	275.00		149.65	048.76		
03/10/07	294.62	294.82	158.44	002.03		
03/11/07	276.38	2/1.5/	149.34	010.34		
03/12/07	273.40	265.81	148.91	011.62		
03/13/07	278.39	275.61	153.17	031.54		
03/14/07	275.07	271.09	144.21	034.23		
03/15/07	262.91	249.70	151.26	164.04		
03/16/07	289.25	294.09	133.99	075.11		
03/17/07	283.98	290.75	147.17	187.59		
03/18/07	285.18	293.80	154.59	132.71		
03/19/07	277.62	287.41	147.56	019.49		
03/20/07	283.09	301.29	143.56	000.00		
03/21/07	278.74	293.27	149.09	000.00		
03/22/07	275.25	290.51	141.72	000.00	· ·	
03/23/07	271.56	299.95	149.99			
03/24/07	285.10	335.14	160.06	000.06		
03/25/07	288.97	339.82	133.70	000.04		
03/26/07	277.22	318.46	138.55	000.21		
03/27/07	290.36	335.37	160.72	003.49		
03/28/07	283.86	328.67	159.75	006.18		
03/29/07	282.56	321.90	166.55	000.01		
03/30/07	273.04	300.02	147.06	000.00		

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WDW-3

V-3 .| Pres |

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1	WDW-1		WDV	V-2			W-3
Date	Rate	Pres	Rate	Pres I	Date	Rate	Pre
04/01/07	271.84	288.46	120.97	010.05		• • • • • • • •	
04/02/07	260.49	266.37	095.03	027.78			
04/03/07	203.87	175.17	058.64	006.05			
04/04/07	201.30	171.55	049.34	070.51			
04/05/07	199 33	174 07	042 34	467 18			
04/06/07	288 21	313 50	154 39	499 86 1			
04/07/07	290.65	313.88	160.35	499 86 1			
04/08/07	188 75	297.39	148 83	499 86			
04/09/07	161.56	303.92	152 87	422 79			
04/10/07	279 55	296 15	152.50	499 86			
04/11/07	283 88	299.04	146.31	499 86 1			
04/12/07	290.53	310 22	146.09	499 86 1			
04/13/07	278 67	286.56	150 45	499 86 1			
04/14/07	273 98	279 11	147 96	400.00			
04/15/07	282 67	292 78	144.56	400.00			
04/16/07	265 10	262.10	138.89	499.85			
04/17/07	274 42	275 34	130.00	345 20			
04/18/07	282 17	210.04	125 67	266 86			
04/10/07	202.17	291.09	153 67	200.00			
04/20/07	261.83	257.04	128 27	27/ 28			
04/21/07	201.00	259.44	120.27	214.20			
04/22/07	230.10	250.19	121.44	202.00			
04/22/07	249.00	230.03	122.40	234.03			
04/23/07	272.24	201.13	10/ 61	273.07			
04/24/07	259.04	257.04	104.01	234.31			
04/26/07	250.24	201.01	120.20	273.43			
04/20/07	200.70	407 07	123.00	201.93			
04/29/07	223.20	197.97	007 30	210.30			
04/20/07	214.15	207 20	110 50	201.00			
04/29/07	220.40	201.29	1 1 25 01	201 10			
05/01/07	292.55	302 78	150.31	321 17			
05/02/07	285 30	521 60	1/0.30	538.00			
05/02/07	205.59	604 57	164 10	705 10			
05/04/07	230.10	400 77	156 00	679 50			
05/05/07	203.70	681 63	169 23	721 01			
05/06/07	283.07	637 76	153 14	670 21			
05/07/07	288 14	653.07	155.80	679 91			
05/08/07	268 95	596.83	138 13	621 78			
05/09/07	285.52	645.71	162.18	714.35			
05/10/07	280.38	633.49	144.66	650.60			
05/11/07	299.86	687.11	153.91	684.31			
05/12/07	296.78	687.20	153.22	675.48			
05/13/07	273 11	620.97	143.07	644 35			
05/14/07	273.80	616 87	140.07	635 70			
05/15/07	275 63	629.87	143.77	655 46			
05/16/07	279 87	646 66	128 56	602 34			
05/17/07	280.97	660.95	147 80	679 25			
05/18/07	285 29	675.51	154.07	696 67			
05/19/07	272 53	637 11	142 10	654 47			
05/20/07	278 69	650 65	141 29	652 63			
05/21/07	273.97	638.89	141.23	655.33			
05/22/07	271 35	629.95	135.38	642 18			
05/23/07	277.08	655.28	147.29	689.38			
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1	WDW	-1	WDV	V-2 I		
Date I	Rate	Pres	Rate Pres		Date	Rate
05/24/07	272.06	637.50	143.17	673.13		1
05/25/07	271.56	641 67	144.13	682 31		
05/26/07	272 01	646 96	146 03	693 50		
05/27/07	273.69	653 88	139.67	663 51		
05/28/07	271 87	643.32	143 42	678 61 1		
05/29/07	274.38	648 94	143 79	681 44 1		
05/30/07	275.03	645 60	153 85	720 18 1		
05/31/07	278 57	656 12	148 66	696 91 1		
06/01/07	273 74	640 95	140.00	676 15		
06/02/07	210.14	664 08	142.00	603 02 1		
06/02/07	201.21	70/ 21	162.60	7/6 23		
06/03/07	286.06	681 75	155 0/	724 62		
06/05/07	200.00	640.80	1/2 20	1 24.02 673 70		
06/06/07	111 5/	158 11	000 00	1/19 96 1	,	
00/00/07	1 1 1	100.11	000.00	140.00 275 66		
00/01/01	127.00	210.02	169 12	273.00 724.02		
00/00/07	295.22	721.00	176 96	744 45 1		
00/09/07	291.04	1726.10	190.00	761 72 761 72		
06/11/07	293.03	744 24	175 60	701.72 745 40		
06/12/07	270.50	69/69	179.52	740.10 750.62		
06/12/07	219.01	004.00	170.00	7 30.03 600 96		
00/13/07	290.00	676 76	100.01	090.00		•
00/14/07	211.00		457.04	040.14		
06/16/07	242.90	000.09	107.01	003.30		
06/17/07	249.40	000.34	109.01	570 00		
00/1//07	243.27	07.30				
06/18/07	264.41	027.10	140.28	048.44		
00/19/07	259.04	012.00	130.70	020.93		
06/20/07	200.11	004.39	124.03	097.74		
06/22/07	06.162	1017.01 642.22	144.01	049.99		
00/22/07	204.10 1 244 20	500 46	130.40	009.00		
06/23/07	244.20		131.30	010.39		
06/24/07	204.09	1717.04	137.1Z	043.33 676 07		
06/20/07	204.23	620.25	147.00	010.01		
06/27/07	207.91	039.30	107.10			
00/21/01	271.00	000.03	100.22	090.33		
00/20/07	275.40	713.13	100.90	004.02		
00/29/07	270.90	74.00	129.04	017.01		
00/30/07	274.00	712.00	107.27			
07/02/07	274.02	657 44	162 12	090.40 600.21		
07/02/07	200.91	665 40	162.12	099.21 604 03		
07/08/07	200.00	647 11	151 52	054.03 656.00		
07/05/07	200.00	676 92	101.02	706 76 1		
07/06/07	204.30	662 22	154 90	669 59 1		
07/07/07	201.44	612 01	1 1 59 12	000.00 665.07		
07/09/07	241.11	694 96	1 160 96	000.07 719.20		
07/00/07	1 203.00	642 40	103.00	1 10.20 666 0E		
07/109/07	201.00	043.49	150.52	000.00		
07/110/07	200.92	667 20	102.11	1007.19		
07/11/0/	204.01	1007.30	100.00	1 23.43		
07/42/07	201.01	001.93	109.12	030.30		
07/44/07	203.30	003.34	1100.71	011.04		
07/14/07	202.40	010.00	142.09	040.09	,	
U//15/0/	1 204.20	1000.52	1123.29	004.00		

1	WDW-1		WDW-2				W-3	
i Date I	Rate	Pres	Rate	Pres	Date	Rate	Pres	i
07/16/07	256.60	627.28	143.43	646.80	1	•		'
07/17/07	272.03	683.32	159.93	703.67				
07/18/07	255.13	584.39	138.96	588.94				
07/19/07	281.04	355.87	162.68	354.99				
07/20/07	267 71	330.30	153 42	344 86				
07/21/07	264 52	322.69	144 02	332 16				
07/22/07	272 71	342 75	150.87	356 30				
07/23/07	267 34	332 67	138 01	335 97				
07/24/07	275 47	345 25	127 62	313 40				
07/25/07	264 35	322 70	146 73	355 42				
07/26/07	204.00	336 71	140.70	351 05				
07/27/07	268 73	332 17	144.20	348 66				
07/28/07	265 54	320 40	1/11/25	3/3 21				
07/20/07	205.04	326 12	137 11	338 53				
07/20/07	203.41	307 17	128 /8	322 50				
07/30/07	234.41	01.17	120.40	264 60				
07/31/07	230.51	201.97		204.00				
00/01/07	200.10	200 07		003.00				
08/02/07	207.01	044 70	000.24	207.07				
08/03/07		241.79	090.34	200.31			•••	
08/04/07	200.90	020.00	134.00	339.29				
08/05/07	200.30	321.13	118.18					
08/06/07	254.03	305.70	132.29	338.98				
08/07/07	270.03	335.90	131.20	337.74				
08/08/07	279.64		127.24	328.03				
08/09/07			131.92	339.90				
08/10/07	255.69	306.02	124.76	320.62				
08/11/07	274.70	348.20	146.14	372.60				
08/12/07	258.49	316.84	121.62	315.35				
08/13/07	268.18	333.67	138.15	352.93				
08/14/07	256.89	312.41	106.60	296.01				
08/15/07	251.84	302.93	119.52	315.17				
08/16/07	234.73	265.87	123.71	323.34				
08/17/07	245.82	289.91	113.51	297.06				
08/18/07	239.04	279.63	109.46	288.07				
08/19/07	237.18	273.87	109.09	287.19	ļ			
08/20/07	239.96	277.31	109.38	288.56				
08/21/07	246.32	291.87	092.25	266.58	l			
08/22/07	248.47	294.56	079.69					
08/23/07	242.40	287.68	108.02	303.73				
08/24/07	252.46	306.06	115.61	319.22				
08/25/07	245.63	296.29	1111.92	310.69				
08/26/07	254.45	314.57	117.74	324.31	ļ			
08/27/07	253.16	313.37	119.31	326.50				
08/28/07	244.06	295.90	115.35	319.28				
08/29/07	251.44	302.76	125.76	337.82				
08/30/07	227.93	260.21	100.23	290.05				
08/31/07	247.34	299.81	113.13	313.58	1			
09/01/07	256.72	316.43	123.77	328.49	1			
09/02/07	261.70	326.95	131.63	341.54	l			
09/03/07	255.09	315.43	129.02	330.66				
09/04/07	249.80	305.29	124.19	318.51	l .			
09/05/07	269.03	344.89	141.63	357.53				
09/06/07	258.65	321.42	135.13	341.90				

1	WDW	-1	WDV	V-2		WD\	N-3	ł
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	Í
09/07/07	257.23	322.25	135.31	340.53				
09/08/07	269.88	345.78	149.93	370.65				
09/09/07	254.62	318.21	135.17	338.77				
09/10/07	256.30	322.50	142.04	355.92				
09/11/07	252.19	317.34	131.32	332.31				
09/12/07	282.13	388.43	048.17	238.66				
09/13/07	285.45	387.19	066.64	246.29				
09/14/07	277.05	358.03	111.08	282.68				
09/15/07	109.01	072.98	019.04	071.66				
09/16/07	082.60	062.24	020.77	075.79				
09/17/07	270.69	351.97	128.67	330.66				
09/18/07	266.04	342.59	153.98	381.41				
09/19/07	274.02	362.66	156.31	384.44				
09/20/07	268.82	351.37	139.16	345.36				
09/21/07	274.13	363.54	140.80	358.02				
09/22/07	270.43	423.41	149.80	372.66				
09/23/07	272.83	493.34	154.10	382.75				
09/24/07	267.75	431.17	146.37	364.34				
09/25/07	258.18	396.94	138.98	347.13				
09/26/07	258.69	324.06	135.74	338.10				
09/27/07	267.64	338.45	143.89	355.03				
09/28/07	265.37	304.90	134.97	334.09				
09/29/07	271.64	289.12	132.92	327.67				
09/30/07	259.88	256.93	131.69	325.66				
10/01/07	282.86	289.12	143.95	353.59			Ż	
10/02/07	297.88	242.65	128.73	320.27				
10/03/07	282.73	163.13	086.79	226.28	ĺ			
10/04/07	301.34	266.36	135.38	333.73				
10/05/07	304.36	289.81	131.07	326.91				
10/06/07	303.10	285.49	132.06	325.15				
10/07/07	292.99	270.37	136.04	336.44				
10/08/07	301.91	306.99	127.43	320.84				
10/09/07	291.79	296.94	130.25	329.32				
10/10/07	300.97	296.87	135.29	341.58				
10/11/07	295.16	296.03	132.93	334.20				
10/12/07	291.39	283.36	124.61	320.11		,		
10/13/07	196.75	068.47	032.53	108.89				
10/14/07	161.68	001.36	000.00	029.99				
10/15/07	288.57	288.46	142.83	367.34				
10/16/07	284.52	297.65	155.85	399.30				
10/17/07	285.12	300.67	149.32	381.91				
10/18/07	287.26	302.41	159.52	405.81				
10/19/07	280.31	287.32	153.03	390.41				
10/20/07	286.71	296.65	155.89	394.36				
10/21/07	291.36	305.32	147.09	370.46				
10/22/07	287.09	314.15	155.28	397.80	l			
10/23/07	272.99	292.14	143.08	374.37	·			
10/24/07	285.12	316.17	152.25	392.01				
10/25/07	281.14	308.45	149.04	374.62				
10/26/07	277.98	304.41	149.90	385.89				
10/27/07	281.16	277.49	148.11	380.04	l			
10/28/07	274.41	291.04	142.64	369.81				
10/29/07	276.90	305.38	142.49	370.85				

WDW-3

ł	WDW	-1	WDV	V-2	1	WDW-3	
Date I	Rate	Pres	Rate	Pres	Date	Rate Pres	i
10/30/07	280.28	309.67	142.62	372.67			'
10/31/07	276 22	295 91	144 00	370.03	· ·		
11/01/07	278 66	300 59	141.37	371 35	1		
11/02/07	270.00	285.68	142.03	371 08			
11/02/07	271.30	200.00	1426.00	257 49			
11/03/07	273.30	219.01	130.20	267 40			
11/04/07	210.10	004.00	109.21	307.49			
11/04/07				305.00			
11/05/07	100.UZ		039.48	107.10			
11/06/07	170.43	086.91	036.09	120.77			
11/07/07	270.43	297.79	151.20	380.31			
11/08/07	277.47	303.84	156.27	388.14			
11/09/07	279.92	318.35	146.15	366.99			
11/10/07	270.21	294.73	166.43	401.43			
11/11/07	269.82	286.05	136.20	324.12			
11/12/07	274.94	305.81	159.81	368.08	l		
11/13/07	270.24	303.05	163.62	377.41			
11/14/07	263.36	287.21	157.11	364.91			
11/15/07	258.50	285.24	154.71	358.25			
11/16/07	256.52	272.78	151.09	348.81			
11/17/07	261.37	274.65	150.68	346.33			
11/18/07	259.03	278.22	148.63	342.22			
11/19/07	259 32	288.96	151 35	350 95			
11/20/07	252 44	270106	135.68	315 78			
11/21/07	242 62	264 45	130.45	306 60			
11/22/07	212 31	316 66	1 1 1 1 77	3/0 31		,	
11/22/07	062 71	1 222 04	1 1 4 9 . 7 7	222 50			
11/23/07	1 1 5 5 6 5	224 61	140.97	220.25			
11/24/07	004 17	024.01	1 1 7 4 0 2	329.23			
11/25/07		001.07	171.02	390.08			
11/20/07		385.81		399.84			
11/2//07	207.07	382.99	173.83	395.80			
11/28/07	237.20	331.14	156.19	360.27			
11/29/07	257.87	375.30	175.27	397.49			
12/01/07	257.77	443.82	178.03	400.90			
12/02/07	263.54	467.88	175.25	394.46			
12/03/07	260.79	397.92	179.59	402.28			
12/04/07	257.82	409.43	177.42	399.94			
12/05/07	256.40	418.26	181.08	406.99			
12/06/07	256.65	416.11	180.38	406.50			
12/07/07	253.44	386.25	169.02	382.17			
12/08/07	261.73	389.84	152.89	366.54			
12/09/07	259.47	386.72	172.92	390.83			
12/10/07	252.84	396.01	182.93	414.51			
12/11/07	246.73	377.39	172.84	392.81			
12/12/07	244.65	376.83	172.23	388.18			
12/13/07	252.30	400.42	183.59	411.56			
12/14/07	255.98	397.10	179.53	402.34			
12/15/07	255.32	395.23	181.71	408.53			
12/16/07	252.33	389.25	180.68	408.95			
12/17/07	194 58	374 81	168 88	408 84			
12/18/07	236.34	391 93	178 87	421 71			
12/10/07	250.34	360 96	168 11	400 31			
12/20/07	251 19	385 52	176 44	110.31			
12/21/07	10/7 10	370 34	167 60	404 40			
12121101	1241.1Z	J JI U.Z4		404.49			

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	WDW	-1	WDW	V-2		WD\	N-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	Ì
12/22/07	253.54	387.13	177.72	423.43				•
12/23/07	245.90	381.10	169.49	410.58				
12/24/07	172.03	390.45	176.56	434.17				
12/25/07	190.04	368.15	162.36	396.50				
12/26/07	247.12	395.37	175.84	424.29				
12/27/07	246.28	399.43	178.61	432.49				
12/28/07	198 47	401 05	181 96	440.90				
12/29/07	145.84	396.00	187 49	442 83				
12/30/07	166 79	399 24	175 22	435 32				
12/31/07	184 65	398 10	172 83	430 78				
01/01/08			000.00					
01/02/08								
01/03/08					Υ			
01/00/00								
01/05/08								
01/05/00								
01/00/00								
01/07/00								
01/00/00								
01/09/00								
01/10/00								
01/11/00								
01/12/00						i.		
01/13/08								
01/14/08								
01/15/08				000.00			375	
01/16/08	000.00							
01/17/08	000.00		000.00	000.00				
01/18/08	000.00		000.00	000.00				
01/19/08	000.00	000.00	000.00				•	
01/20/08	000.00	000.00	000.00	000.00				
01/21/08	000.00	000.00	000.00	000.00				
01/22/08	000.00	000.00	000.00	000.00				
01/23/08	000.00	000.00	000.00	000.00				
01/24/08	000.00	000.00	000.00	000.00				
01/25/08	000.00	000.00	000.00	000.00				
01/26/08	000.00	000.00	000.00	000.00				
01/27/08	000.00	000.00	000.00	000.00				
01/28/08	000.00	000.00	000.00	000.00				
01/29/08	00.00	00.00	000.00	000.00				
01/30/08	000.00	000.00	000.00	000.00				
01/31/08	000.00	000.00	000.00	000.00				
02/01/08	00.00	000.00	000.00	000.00				
02/02/08	00.00	000.00	000.00	000.00				
02/03/08	000.00	000.00	000.00	000.00				**
02/04/08	00.00	00.00	000.00	000.00				
02/05/08	000.00	000.00	000.00	000.00				
02/06/08	00.00	000.00	000.00	000.00				
02/07/08	00.00	000.00	00.00	00.00				
02/08/08	00.00	000.00	000.00	000.00	I			
02/09/08	00.00	00.00	00.00	00.00	· ·			
02/10/08	00.00	000.00	00.00	000.00] .			
02/11/08	00.00	000.00	000.00	000.00	Ì			
02/12/08	000.00	000.00	00.00	00.00	1	•	•	

	WDW	-1	WDV	V-2		WD	W-3	I
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
02/13/08	000.00	000.00	000.00	000.00			,	
02/14/08	000.00	000.00	000.00	000.00				
02/15/08	000.00	000.00	000.00	000.00				
02/16/08	000.00	000.00	000.00	000.00				
02/17/08	000.00	000.00	000.00	000.00				
02/18/08	000.00	000.00	000.00	000.00				
02/19/08	000.00	000.00	000.00	000.00				
02/20/08	000.00	000.00	000.00	000.00				
02/21/08	000.00	000.00	000.00	000.00	l			
02/22/08	000.00	000.00	000.00	000.00				
02/23/08	000.00	000.00	000.00	000.00				
02/24/08	000.00	000.00	000.00	000.00				
02/25/08	000.00	000.00	000.00	000.00				
02/26/08	000.00	000.00	000.00	000.00				
02/27/08	000.00	000 00	000.00	000.00				
02/28/08	000.00	000.00	000.00	000.00				
02/29/08		000.00	000.00	000.00				
03/01/08	387.36	900.00	403.00	900.00	03/01/08	234 84	474 53	L
03/02/08	387 36	900.00	403.00	900.00	03/02/08	222.24	456.35	i.
03/03/08	387.36	900.00	403.00	900.00	03/03/08	217 86	451 64	i
03/04/08	387 36	900.00	403.00	900.00	03/04/08	247 86	539 51	ł.
03/05/08	387 36	900.00	403.00	900.00	03/05/08	000 00	963 15	i
03/06/08	387.36	900.00	403.00	900.00	03/06/08	000.00	923.70	i
03/07/08	387 36	900.00	403.00	900.00	03/07/08	000.00	617 52	ł
03/08/08	387.36	900.00	403.00	900.00	03/08/08		-00 25	
03/09/08	387 36	900.00	403.00	900.00	03/09/08		-00 25	
03/10/08	387.36	900.00	403.00	900.00	03/10/08	207 23	437 11	I
03/11/08	387 36	900.00	403.00	900.00	03/11/08	243 49	518 87	i
03/12/08	387.36	900.00	403.00	900.00	03/12/08	243 46	517.82	ł
03/13/08	387.36	900.00	403.00	900.00	03/13/08	253.93	550.06	i
03/14/08	387.36	900.00	403.00	900.00	03/14/08	242.72	524.60	i
03/15/08	387.36	900.00	403.00	900.00	03/15/08	249 02	540 51	i
03/16/08	387.36	900.00	403.00	900.00	03/16/08	239.09	520.02	i
03/17/08	387.36	900.00	403.00	900.00	03/17/08	214.73	487.14	i
03/18/08	387.36	900.00	403.00	900.00	03/18/08	234.25	524.16	i
03/19/08	387.36	900.00	403.00	900.00	03/19/08	233.53	519.07	i
03/20/08	387.36	900.00	403.00	900.00	03/20/08	238.37	528.92	i.
03/21/08	387.36	900.00	403.00	900.00	03/21/08	220.59	502.07	i.
03/22/08	387.36	900.00	403.00	900.00	03/22/08	223.71	521.65	i.
03/23/08	387.36	900.00	403.00	900.00	03/23/08	206.37	494.71	i.
03/24/08	387.36	900.00	403.00	900.00	03/24/08	210.57	505.25	i.
03/25/08	387.36	900.00	403.00	900.00	03/25/08	214.73	513.23	i.
03/26/08	387.36	900.00	403.00	900.00	03/26/08	218.62	522.07	İ.
03/27/08	387.36	900.00	403.00	900.00	03/27/08	219.06	521.16	i
03/28/08	387.36	900.00	403.00	900.00	03/28/08	224.73	556.69	i
03/29/08	387.36	900.00	403.00	900.00	03/29/08	230.70	567.91	i
03/30/08	387.36	900.00	403.00	900.00	03/30/08	228.17	576.81	i
03/31/08	387.36	900.00	403.00	900.00	03/31/08	265.80	655.15	i
04/01/08	387.36	900.00	403.00	900.00	04/01/08	274.81	664.59	i
04/02/08	387.36	900.00	403.00	900.00	04/02/08	233.28	583.11	i
04/03/08	387.36	900.00	403.00	900.00	04/03/08	232.77	588.41	i
04/04/08	387.36	900.00	403.00	900.00	04/04/08	236.15	584.76	i
04/05/08	387.36	900.00	403.00	900.00	04/05/08	227.10	561.65	i
	-	-	-	•	-	-		۰.

Date Rate Pres Date Rate Pres 04/06/08 387.36 900.00 403.00 900.00 04/06/08 219.39 557.37 04/07/08 387.36 900.00 403.00 900.00 04/07/08 222.21 569.98 04/08/08 387.36 900.00 403.00 900.00 04/07/08 222.71 587.98 04/10/08 387.36 900.00 403.00 900.00 04/10/08 122.74 587.18 04/11/08 387.36 900.00 403.00 900.00 04/12/08 188.52 527.80 04/14/08 387.36 900.00 403.00 900.00 04/15/08 188.25 521.77 04/16/08 387.36 900.00 403.00 900.00 04/17/08 188.25 521.77 04/16/08 387.36 900.00 403.00 900.00 04/17/08 142.21 477.47 04/18/08 387.36 900.00 403.00 900.00 04/21/08 196.	1	WDW	-1	WDW-2		WDW-3		
04/06/08 387.36 900.00 403.00 900.00 04/07/08 222.21 569.98 04/07/08 387.36 900.00 403.00 900.00 04/07/08 222.21 569.98 04/09/08 387.36 900.00 403.00 900.00 04/07/08 222.21 569.98 04/10/08 387.36 900.00 403.00 900.00 04/10/08 212.74 587.18 04/11/08 387.36 900.00 403.00 900.00 04/11/08 188.94 525.84 04/11/08 387.36 900.00 403.00 900.00 04/11/08 188.28 521.77 04/15/08 387.36 900.00 403.00 900.00 04/15/08 188.28 521.77 04/16/08 387.36 900.00 403.00 900.00 04/15/08 186.27 57.47 04/16/08 387.36 900.00 403.00 900.00 04/15/08 105.15 42.21 04/17/08 387.36 900.00 04/23/08	Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
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04/08/08 387.36 900.00 403.00 900.00 04/09/08 206.88 551.09 04/10/08 387.36 900.00 403.00 900.00 04/10/08 212.74 587.18 04/11/08 387.36 900.00 403.00 900.00 04/11/08 188.94 525.84 04/12/08 387.36 900.00 403.00 900.00 04/11/08 188.58 527.80 04/14/08 387.36 900.00 403.00 900.00 04/14/08 188.52 514.22 04/15/08 387.36 900.00 403.00 900.00 04/16/08 186.74 501.83 04/17/08 387.36 900.00 403.00 900.00 04/17/08 182.21 477.47 04/18/08 387.36 900.00 403.00 900.00 04/18/08 134.07 452.47 04/21/08 387.36 900.00 04/20/08 105.15 437.94 04/21/08 387.36 900.00 04/21/08 105.15 437.94	04/07/08	387.36	900.00	403.00	900.00	04/07/08	222.21	569.98
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05/05/08 387.36 900.00 403.00 900.00 05/05/08 168.48 588.22 05/06/08 387.36 900.00 403.00 900.00 05/06/08 164.38 569.63 05/07/08 387.36 900.00 403.00 900.00 05/07/08 155.77 543.75 05/08/08 387.36 900.00 403.00 900.00 05/07/08 155.77 543.75 05/09/08 387.36 900.00 403.00 900.00 05/09/08 183.81 571.93 05/10/08 387.36 900.00 403.00 900.00 05/09/08 183.81 571.93 05/10/08 387.36 900.00 403.00 900.00 05/10/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/11/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/11/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/11/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/11/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/11/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/11/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/11/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/11/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/11/08 128.20 537.82 05/19/08 387.36 900.00 403.00 900.00 05/11/08 128.20 436.78 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436	05/04/08	387.36		403.00		05/04/08	166 71	501.10
05/06/08 387.36 900.00 403.00 900.00 05/06/08 164.38 569.63 05/07/08 387.36 900.00 403.00 900.00 05/07/08 155.77 543.75 05/08/08 387.36 900.00 403.00 900.00 05/07/08 155.77 543.75 05/09/08 387.36 900.00 403.00 900.00 05/09/08 183.81 571.93 05/10/08 387.36 900.00 403.00 900.00 05/10/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/14/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.37 464.83 05/20/08 387.36 900.00 403.00 900.00 05/19/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78	05/05/08	387 36		403.00		05/05/08	168.48	588 22
05/07/08 387.36 900.00 403.00 900.00 05/07/08 155.77 543.75 05/08/08 387.36 900.00 403.00 900.00 05/08/08 175.83 583.84 05/09/08 387.36 900.00 403.00 900.00 05/09/08 183.81 571.93 05/10/08 387.36 900.00 403.00 900.00 05/10/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.37 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/06/08	387 36	900.00	403.00		05/06/08	164.38	569 63
05/08/08 387.36 900.00 403.00 900.00 05/08/08 175.83 583.84 05/09/08 387.36 900.00 403.00 900.00 05/09/08 183.81 571.93 05/10/08 387.36 900.00 403.00 900.00 05/10/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.37 464.83 05/20/08 387.36 900.00 403.00 900.00 05/19/08 128.20 436.78 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78	05/07/08	387 36		403.00		05/07/08	155 77	543 75
05/09/08 387.36 900.00 403.00 900.00 05/09/08 183.81 571.93 05/10/08 387.36 900.00 403.00 900.00 05/10/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/15/08 387.36 900.00 403.00 900.00 05/14/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.37 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 128.20 436.78	05/08/08	387 36		403.00		05/08/08	175.83	583 84
05/10/08 387.36 900.00 403.00 900.00 05/10/08 174.36 535.60 05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/14/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/09/08	387 36	900.00	403.00		05/09/08	183.81	571 93
05/11/08 387.36 900.00 403.00 900.00 05/11/08 177.54 562.95 05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/10/08	387.36	900.00	403.00	900.00	05/10/08	174.36	535 60
05/12/08 387.36 900.00 403.00 900.00 05/12/08 155.53 508.32 05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/14/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/11/08	387 36	900.00	403.00	900.00	05/11/08	177 54	562.95
05/13/08 387.36 900.00 403.00 900.00 05/13/08 170.48 541.86 05/14/08 387.36 900.00 403.00 900.00 05/14/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/12/08	387.36	900.00	403.00	900.00	05/12/08	155.53	508 32
05/14/08 387.36 900.00 403.00 900.00 05/14/08 173.33 545.59 05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/13/08	387.36	900.00	403.00	900.00	05/13/08	170.48	541.86
05/15/08 387.36 900.00 403.00 900.00 05/15/08 162.32 518.41 05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/18/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/14/08	387.36	900.00	403.00	900.00	05/14/08	173.33	545.59
05/16/08 387.36 900.00 403.00 900.00 05/16/08 167.82 532.09 05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/15/08	387.36	900.00	403.00	900.00	05/15/08	162.32	518.41
05/17/08 387.36 900.00 403.00 900.00 05/17/08 138.34 477.91 05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/16/08	387.36	900.00	403.00	900.00	05/16/08	167.82	532.09
05/18/08 387.36 900.00 403.00 900.00 05/18/08 162.39 537.82 05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/17/08	387.36	900.00	403.00	900.00	05/17/08	138.34	477.91
05/19/08 387.36 900.00 403.00 900.00 05/19/08 138.87 464.83 05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/18/08	387.36	900.00	403.00	900.00	05/18/08	162.39	537.82
05/20/08 387.36 900.00 403.00 900.00 05/20/08 128.20 436.78 05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/19/08	387.36	900.00	403.00	900.00	05/19/08	138.87	464.83
05/21/08 387.36 900.00 403.00 900.00 05/21/08 156.46 513.30	05/20/08	387.36	900.00	403.00	900.00	05/20/08	128.20	436.78
	05/21/08	387.36	900.00	403 00	900.00	05/21/08	156 46	513 30
05/22/08 387.36 900.00 403.00 900.00 05/22/08 126.11 415.97	05/22/08	387.36	900.00	403.00	900.00	05/22/08	126.11	415.97
05/23/08 387.36 900.00 403.00 900.00 05/23/08 155.47 485.80	05/23/08	387.36	900.00	403.00	900.00	05/23/08	155.47	485 80 1
05/24/08 387.36 900.00 403.00 900.00 05/24/08 190.60 567.16	05/24/08	387 36	900 00	403 00	900 00	05/24/08	190.60	567 16
05/25/08 387.36 900.00 403.00 900.00 05/25/08 170.22 501.02	05/25/08	387.36	900 00	403 00	900 00	05/25/08	170 22	501 02
05/26/08 387.36 900.00 403.00 900.00 05/26/08 174.52 001.02	05/26/08	387.36	900.00	403.00	900 00	05/26/08	174 53	514 30
05/27/08 387.36 900.00 403.00 900.00 05/27/08 153.93 458.44	05/27/08	387.36	900.00	403.00	900.00	05/27/08	153.93	458 44 1
05/28/08 387.36 900.00 403.00 900.00 05/28/08 172.96 516.52	05/28/08	387.36	900.00	403.00	900.00	05/28/08	172.96	516.52

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	WDW	-1	WDV	V-2		WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
05/29/08	387.36	900.00	403.00	900.00	05/29/08	157.67	470.49
05/30/08	387.36	900.00	403.00	900.00	05/30/08	162.98	487.18
05/31/08	387 36	900.00	403 00	900.00	05/31/08	157 63	482 24
06/01/08	387 36		403.00		06/01/08	163 22	503 48
00/01/00	397 36		403.00		06/02/08	163.87	522 37
00/02/00	207.30		402.00		00/02/00	175 12	562.07
00/03/00	307.30	900.00	403.00		00/03/08	170.12	502.02
00/04/08	307.30	900.00	403.00	900.00	06/04/08	1/0.10	000.21
	307.30	900.00	403.00		00/05/00		010.20
00/00/08	387.30	900.00	403.00	900.00		190.07	030.14
06/07/08	387.36	900.00	403.00	900.00	06/07/08	191.39	640.12
06/08/08	387.30	900.00	403.00	900.00	06/08/08	191.40	041.08
06/09/08	387.36	900.00	403.00	900.00	06/09/08	191.40	642.08
06/10/08	387.36	900.00	403.00	900.00	06/10/08	192.87	630.58
06/11/08	387.36	900.00	403.00	900.00	06/11/08	191.21	618.20
06/12/08	387.36	900.00	403.00	900.00	06/12/08	193.23	626.26
06/13/08	387.36	900.00	403.00	900.00	06/13/08	191.60	603.51
06/14/08	387.36	900.00	403.00	900.00	06/14/08	190.97	587.48
06/15/08	387.36	900.00	403.00	900.00	06/15/08	178.52	549.31
06/16/08	387.36	900.00	403.00	900.00	06/16/08	175.07	542.84
06/17/08	387.36	900.00	403.00	900.00	06/17/08	181.45	564.11
06/18/08	387.36	900.00	403.00	900.00	06/18/08	190.80	585.52
06/19/08	387.36	900.00	403.00	900.00	06/19/08	191.64	581.62
06/20/08	387.36	900.00	403.00	900.00	06/20/08	191.21	592.87
06/21/08	387.36	900.00	403.00	900.00	06/21/08	193.10	598.58 i
06/22/08	387.36	900.00	403.00	900.00	06/22/08	172.24	528.93 i
06/23/08	387.36	900.00	403.00	900.00	06/23/08	177.64	547.04
06/24/08	387.36	900.00	403.00	900.00	06/24/08	154.49	483.87
06/25/08	387 36	900.00	403.00	900.00	06/25/08	149 30	476 99
06/26/08	387 36	900.00	403.00	900.00	06/26/08	165 10	523 40
06/27/08	387 36		403.00		06/27/08	184 48	582 00 1
06/28/08	387 36		403.00		06/28/08	100.40	602.00
06/20/08	387 36		403.00		06/20/08	188 21	604 16
06/30/08	387 36		403.00		06/30/08	103.40	600 70 1
07/01/08	387 36		403.00		07/01/08	195.45	616 04
07/07/08	397 36		1 403.00		07/07/08	107 33	617 04
07/02/08	297 26		403.00		07/02/08	106 35	622.85
07/03/08	297 26		1 403.00		07/03/08	107 19	620 78 1
07/04/08	207.30		403.00		07/04/08	102.06	610 51
07/05/08	007.00		403.00		07/05/08	105 05	610 42
07/00/08	007.00		403.00		07/00/00	195.05	602 44
07/07/08	307.30		403.00		07/07/08	109.20	557.041
07/08/08	387.30	900.00	403.00			174.20	
07/09/08	387.30	900.00	403.00	900.00	07/09/08	177.19	
07/10/08	387.36	900.00	403.00	900.00	07/10/08	197.83	620.43
07/11/08	387.36	900.00	403.00	900.00	07/11/08	196.31	617.70
07/12/08	387.36	900.00	403.00	900.00	07/12/08	199.22	621.26
07/13/08	387.36	900.00	403.00	900.00	07/13/08	196.93	619.60
07/14/08	387.36	900.00	403.00	900.00	07/14/08	195.69	617.34
07/15/08	387.36	900.00	403.00	900.00	07/15/08	192.96	609.10
07/16/08	387.36	900.00	403.00	900.00	07/16/08	186.27	580.92
07/17/08	387.36	900.00	403.00	900.00	07/17/08	168.04	522.77
07/18/08	387.36	900.00	403.00	900.00	07/18/08	173.96	542.80
07/19/08	387.36	900.00	403.00	900.00	07/19/08	174.62	546.85
07/20/08	387.36	900.00	403.00	900.00	07/20/08	161.58	506.02
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1	WDW	-1	WDV	V-2	WDW-3			
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
07/21/08	387.36	900.00	403.00	900.00	07/21/08	154.71	489.81	ŀ
07/22/08	387.36	900.00	403.00	900.00	07/22/08	153.42	490.66	i
07/23/08	387.36	900.00	403.00	900.00	07/23/08	170.78	545.81	Ĺ
07/24/08	387.36	900.00	403.00	900.00	07/24/08	156.90	508.50	İ
07/25/08	387.36	900.00	403.00	900.00	07/25/08	163.32	536.57	ĺ
07/26/08	387.36	900.00	403.00	900.00	07/26/08	173.36	568.01	i
07/27/08	387.36	900.00	403.00	900.00	07/27/08	186.16	605.63	i
07/28/08	387.36	900.00	403.00	900.00	07/28/08	190.93	605.84	i
07/29/08	387.36	900.00	403.00	900.00	07/29/08	192.22	601.83	i
07/30/08	387.36	900.00	403.00	900.00	07/30/08	194.33	611.02	i
07/31/08	387.36	900.00	403.00	900.00	07/31/08	192.91	603.78	i
08/01/08	387.36	900.00	403.00	900.00	08/01/08	190.27	601 44	
08/02/08	387.36	900 00	403 00	900.00	08/02/08	197.77	626 68	í
08/03/08	387.36	900.00	403.00	900.00	08/03/08	195.86	623.31	
08/04/08	387.36	900.00	403 00	900.00	08/04/08	194 97	610 46	
08/05/08	387.36	900.00	403 00	900.00	08/05/08	192 91	600.97	İ
08/06/08	387.36	900.00	403.00	900.00	08/06/08	188.47	596 50	
08/07/08	387 36	900.00	403.00	900.00	08/07/08	193 73	609.30	
08/08/08	387.36	900.00	403.00	900.00	08/08/08	191 54	596.26	ł
08/09/08	387 36	900.00	403.00	900.00	08/09/08	196 95	613.82	ļ
08/10/08	387 36	900.00	403.00	900.00	08/10/08	189.52	604 11	I.
08/11/08	387.36	900.00	403.00	900.00	08/11/08	190.06	609.04	l
08/12/08	387 36	900.00	403.00	900.00	08/12/08	199.08	636 22	
08/13/08	387 36		403.00	900.00	08/13/08	197 82	630 79	1
08/14/08	387 36		403.00		08/14/08	208 02	664 70	ŀ
08/15/08	387 36		403.00	900.00	08/15/08	213 38	674 51	ŀ
08/16/08	387.36	900.00	403.00	900.00	08/16/08	212 87	675 54	ŀ
08/17/08	387 36	900.00	403.00	900.00	08/17/08	208 88	668 74	
08/18/08	387 36	900.00	403.00	900.00	08/18/08	211 92	676 86	i
08/19/08	387 36	900.00	403.00	900.00	08/19/08	209 19	665.37	
08/20/08	387 36	900.00	403.00	900.00	08/20/08	218 50	686.97	
08/21/08	387.36		403.00	900.00	08/21/08	221 04	682.85	
08/22/08	387 36	900.00	403.00	900.00	08/22/08	222 72	683 78)
08/23/08	387 36	900.00	403.00	900.00	08/23/08	218 88	676 51	1
08/24/08	387 36		403.00	900.00	08/24/08	216.00	675.93	
08/25/08	387.36	900.00	403.00	900.00	08/25/08	213.83	672 70	
08/26/08	387.36	900.00	403.00	900.00	08/26/08	205 19	642 78	
08/27/08	387.36	900.00	403.00	900.00	08/27/08	211.45	663.04	ļ
08/28/08	387.36	900.00	403.00	900.00	08/28/08	218.52	678.19	i
08/29/08	387.36	900.00	403.00	900.00	08/29/08	200.02	654.82	İ
08/30/08	387.36	900.00	403.00	900.00	08/30/08	213.31	688.09	ĺ
08/31/08	387.36	900.00	403.00	900.00	08/31/08	212.16	687.97	İ
09/01/08	387.36	900.00	403.00	900.00	09/01/08	210.66	691.01	i
09/02/08	387.36	900.00	403.00	900.00	09/02/08	212.67	691.39	i
09/03/08	387.36	900.00	403.00	900.00	09/03/08	215.06	685.65	i
09/04/08	387.36	900.00	403.00	900.00	09/04/08	216.43	691.88	i
09/05/08	387.36	900.00	403.00	900.00	09/05/08	215.41	682.56	ί
09/06/08	387.36	900.00	403.00	900.00	09/06/08	218.15	690 45	í
09/07/08	387.36	900 00	403 00	900 00	09/07/08	216 96	696 14	í
09/08/08	387.36	900 00	403 00	900.00	09/08/08	209.87	673 23	ľ
09/09/08	387 36	900 00	403 00	900 00.	09/09/08	211 47	689 42	ŀ
09/10/08	387.36	900.00	403.00	00.00	09/10/08	207.61	676.03	l
09/11/08	387.36	900.00	403.00	900.00	09/11/08	211.20	690.40	ί

1 1	WDW	-1	WDV	V-2		WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
09/12/08	387.36	900.00	403.00	900.00	09/12/08	207.06	680.22
09/13/08	387.36	900.00	403.00	900.00	09/13/08	210.71	695.46 i
09/14/08	387.36	900.00	403.00	900.00	09/14/08	211.69	691.14
09/15/08	387 36	900 00	403 00	900 00	09/15/08	206.04	691 48
09/16/08	387 36		403.00		09/16/08	202.49	672 49
00/17/08	397 36		1 403 00 1		00/17/08	202.40	671 93
09/17/00	242 66	070.00	226.00	007 50	09/17/00	204.92	
09/10/08	312.00	019.23	004 52	704.00	09/10/00	211.04	
09/19/08	190.10	012.34	204.53	704.83	09/19/08		097.90
09/20/08	187.55	667.53	203.89	706.75	09/20/08	212.33	705.54
09/21/08	184.48	661.74	203.63	714.81	09/21/08	211.27	705.94
09/22/08	189.52	662.67	203.16	/12.20	09/22/08	209.25	696.60
09/23/08	181.54	687.65	207.80	715.94	09/23/08	202.34	676.26
09/24/08	188.92	669.28	197.69	683.67	09/24/08	201.48	669.35
09/25/08	139.37	607.60	169.06	686.91	09/25/08	205.76	671.60
09/26/08	122.14	641.18	130.39	680.98	09/26/08	208.74	670.62
09/27/08	126.92	648.82	129.25	676.97	09/27/08	204.69	664.17
09/28/08	124.33	632.00	131.54	687.02	09/28/08	202.16	656.12
09/29/08	112.11	591.71	132.25	698.03	09/29/08	209.45	678.67
09/30/08	076.00	440.28	097.16	508.50	09/30/08	142.78	491.96
10/01/08	114.50	574.55	121.88	643.17	10/01/08	189.29	626.08
10/02/08	135.70	682.57	132.35	684.54	10/02/08	201.80	670:10
10/03/08	136.54	688.22	133.15	691.44	10/03/08	198.64	671.26
10/04/08	136 52	689.75	134.40	693.48	10/04/08	199.69	674.67
10/05/08	133 65	691 41	132 96	696 49	10/05/08	197 71	677 19
10/06/08	131 22	682.90	130 71	688.07	10/06/08	204 32	689 43 1
10/07/08	130.85	685 51	130 58	600.67	10/07/08	204.02	688 17 I
10/08/08	131 67	688 61	130.30	602 33	10/08/08	200.42	687 25 1
10/00/08	131.07	600.01	130.70	601 30	10/00/08	205.70	687 71 1
10/10/08	122 16	601 20	130.39	601 45	10/09/08	205.09	690.21
10/10/08	132.10	091.20	130.49	602 42	10/10/08	205.40	601.00
10/11/08	130.77		129.30	092.43		200.30	
10/12/08	128.99	087.79	129.24	097.12	10/12/08	212.90	085.25
10/13/08	127.99	687.72	124.82	6/4.2/	10/13/08	210.56	685.60
10/14/08	122.89	682.33	130.61	709.15	10/14/08	209.27	680.39
10/15/08	123.80	685.24	129.71	708.29	10/15/08	206.27	681.43
10/16/08	123.31	686.65	129.36	706.09	10/16/08	205.57	683.31
10/17/08	123.43	683.15	127.90	698.20	10/17/08	208.59	700.28
10/18/08	122.23	683.62	124.75	683.73	10/18/08	207.80	/04.04
10/19/08	121.82	688.18	122.74	677.49	10/19/08	208.12	704.77
10/20/08	119.53	672.40	120.20	664.16	10/20/08	211.93	701.03
10/21/08	116.87	670.39	127.21	693.86	10/21/08	209.77	691.70
10/22/08	107.86	637.64	124.95	678.78	10/22/08	203.70	672.32
10/23/08	108.48	641.70	122.26	662.51	10/23/08	203.98	674.21
10/24/08	113.12	635.99	124.39	661.08	10/24/08	200.89	659.36
10/25/08	104.74	601.41	119.15	638.67	10/25/08	189.93	623.35
10/26/08	107.84	618.58	118.50	631.86	10/26/08	186.03	613.01
10/27/08	096.43	575.64	111.37	602.22	10/27/08	181.70	603.59
10/28/08	103.04	598.65	119.25	641.01	10/28/08	195.78	644.12
10/29/08	115.00	648.51	125.58	669.60	10/29/08	201.88	676.45
10/30/08	120.30	689.40	122.57	666.42	10/30/08	215.37	714.36
10/31/08	124.79	704.45	087.50	525.94	10/31/08	227 43	750.00
11/01/08	1116 88	654 14	129 09	713 61	11/01/08	213.04	702 81
11/02/08	110.00	685 11	126.60	608 69	11/02/08	211 / 2	600 10
11/02/08	118 04	672 21	120.04	605.00	11/02/00	212 17	706 20
11/00/00	1 10.04	012.01	1 120.00	030.23	11/05/00	213.17	100.29
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I Date Rate Fres Rate Fres Date Rate	Pres
11/04/08 116.51 670.11 109.15 625.92 11/04/08 219.1	7 726.89
11/05/08 118.23 671.42 109.95 622.42 11/05/08 215.1	2 710.08
11/06/08 119.58 695.16 104.71 602.05 11/06/08 209.0	1 693.19
11/07/08 112.98 651.41 123.67 676.70 11/07/08 214.2	5 691.83
11/08/08 116.38 663.62 125.99 686.37 11/08/08 197.7	1 650.81
11/09/08 113.75 651.88 125.70 685.43 11/09/08 204.1	9 666.95
11/10/08 111.13 624.32 123.93 664.32 11/10/08 204.9	2 665.28
11/11/08 114.78 658.39 123.80 674.36 11/11/08 206.1	5 676.80
11/12/08 112.95 651.81 122.70 677.74 11/12/08 207.2	1 682.92
11/13/08 111.37 638.49 125.09 687.53 11/13/08 204.2	6 670.48
11/14/08 111.64 649.03 123.63 682.11 11/14/08 204.7	9 674.85
11/15/08 115.19 679.31 125.74 703.60 11/15/08 208.6	7 698.11
11/16/08 114.86 665.52 125.68 700.19 11/16/08 206.7	5 699.36
11/17/08 117.13 670.28 126.56 706.37 11/17/08 206.1	4 692.37
11/18/08 114.93 661.09 125.95 700.17 11/18/08 210.1	2 703.75
11/19/08 117.53 666.77 127.12 703.38 11/19/08 205.8	1 694.20
11/20/08 111.66 652.81 126.19 704.88 11/20/08 208.9	2 701.21
11/21/08 113.35 655.59 127.78 705.43 11/21/08 193.2	0 679.57
11/22/08 116.71 674.23 127.83 704.91 11/22/08 198.1	5 696.45
11/23/08 118.26 667.11 127.77 710.52 11/23/08 193.9	1 693.82
11/24/08 119.60 686.22 123.82 710.54 11/24/08 192.2	3 693.57
11/25/08 118.59 680.02 125.96 727.08 11/25/08 196.5	6 700.43
11/26/08 120.97 684.68 125.25 720.94 11/26/08 198.4	7 699.69
11/27/08 119.23 682.28 124.57 720.90 11/27/08 197.8	1 698.90
11/28/08 117.34 670.92 123.80 717.91 11/28/08 194.7	2 701.99
11/29/08 120.60 694.06 124.99 725.66 11/29/08 189.6	2 695.24
11/30/08 119.91 674.87 125.91 721.94 11/30/08 188.0	5 692.63
12/01/08 120.10 688.58 123.88 722.41 12/01/08 195.8	9 712.40
12/02/08 120.45 672.50 126.29 723.56 12/02/08 196.5	7 715.55
12/03/08 117.73 685.89 126.02 738.18 12/03/08 194.3	1 728.56
12/04/08 114.21 684.45 123.82 736.48 12/04/08 193.2	1 728.48
12/05/08 115.02 688.28 122.78 764.27 12/05/08 192.8	0 728.45
12/06/08 118.22 694.63 123.60 736.88 12/06/08 188.9	9 721.64
12/07/08 119.87 690.65 121.71 727.06 12/07/08 172.5	3 680.80
12/08/08 120.00 675.64 116.98 695.04 12/08/08 180.3	8 701.67
12/09/08 111.95 655.19 110.03 665.00 12/09/08 171.8	9 677.43
12/10/08 110.82 652.47 109.03 791.13 12/10/08 177.8	1 700.38
12/11/08 119.33 685.41 113.34 682.43 12/11/08 183.0	8 708.19
12/12/06 118.20 075.04 117.40 709.06 12/12/06 180.8	3 701.13 2 709.27
12/13/00 119.01 000.91 113.03 701.47 12/13/00 103.4	5 700.27
12/14/00 120.40 002.90 112.03 070.01 12/14/00 100.9	0 7 10.00
12/16/08 218 36 707 61 110 /3 803 78 12/16/08 100 3	6 720 56
12/10/06 210.30 707.01 110.43 603.76 12/10/06 190.3	0 729.00 2 732.46
12/18/08 123 57 696 69 118 13 723 36 12/18/08 194.9	1 722 51
	5 742 68
12/20/08 121 77 697 10 113 55 702 89 12/20/08 106 3	7 732 23
12/21/08 118 44 708 79 112 23 717 28 12/21/08 190.5	0 730 14
12/22/08 253 98 754 98 111 44 824 84 12/22/08 107 2	1 752 04
12/23/08 118 22 691 29 116 01 723 78 12/23/08 201 1	3 746 72 1
12/24/08 121 57 711 22 117 00 732 20 12/24/08 198 1	0 740 74
12/25/08 124 08 713 03 117 33 723 30 12/25/08 195 3	3 729 00 1
12/26/08 126.23 716.47 117.39 720.00 12/26/08 177.9	5 683.05

1 1	WDW	-1	WDW	/-2		WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
12/27/08	121.27	715.32	119.41	749.70	12/27/08	187.03	720.52
12/28/08	117.74	691.13	120.33	750.12	12/28/08	189.26	719.43
12/29/08 i	119.82	698.99 İ	121.57	747.66	12/29/08	194.08	731.09
12/30/08	121.21	685.61	120.97	729.48	12/30/08	194.08	713.71
12/31/08	123.23	691.30	119.85	721.60	12/31/08	198.66	710.36
01/01/09	124.34	679.71	191.45	686.92	01/01/09	191.45	686.92
01/02/09	120.60	658.22	194.89	701.11	01/02/09	194.89	701.11
01/03/09	126.04	674.33	192.34	686.89	01/03/09	192.34	686.89
01/04/09	124 89	666.88	184.17	673.65	01/04/09	184.17	673.65
01/05/09	124 11	690.66	196.44	712.76	01/05/09	196.44	712.76
01/06/09	127.49	695.87	206.70	731.51	01/06/09	206.70	731.51
01/07/09	128 10	694.80	203.38	729.35	01/07/09	203.38	729.35
01/08/09	129.02	699.49	204.30	730.31	01/08/09	204.30	730.31
01/09/09	125.80	682.99	198.12	726.64	01/09/09	198.12	726.64
01/10/09	125.23	695.40	198.65	730.63	01/10/09	198.65	730.63
01/11/09	122.76	691.30	200.84	737.44	01/11/09	200.84	737.44
01/12/09	122 12	692.82	199.05	723.59	01/12/09	199.05	723.59
01/13/09	123.49	706.75	195.89	730.18	01/13/09	195.89	730.18
01/14/09	121.96	694.39	196.74	731.74	01/14/09	196.74	731.74
01/15/09	120.61	697 49	196 67	732.34	01/15/09	196.67	732.34
01/16/09	121.40	702.64	197.41	725.19	01/16/09	197.41	725.19
01/17/09	118.87	688.63	200.42	733.18	01/17/09	200.42	733.18
01/18/09	121.74	696.50	195.07	715.74	01/18/09	195.07	715.74
01/19/09	121 76	701.24	193.63	713.20	01/19/09	193.63	713.20
01/20/09	121.98	688.98	202.38	718.06	01/20/09	202.38	718.06
01/21/09	124.09	679.03	204.88	719.52	01/21/09	204.88	719.52
01/22/09	122.82	679.73	207.40	723.71	01/22/09	207.40	723.71
01/23/09	126.51	705.60	207.09	733.84	01/23/09	207.09	733.84
01/24/09	126.51	706.43	203.48	728.56	01/24/09	203.48	728.56
01/25/09	125.67	703.88	199.96	725.86	01/25/09	199.96	725.86
01/26/09	121.93	697.35	207.27	749.60	01/26/09	207.27	749.60
01/27/09	121.81	705.74	200.07	738.32	01/27/09	200.07	738.32
01/28/09	108.74	704.46	195.93	724.61	01/28/09	195.93	724.61
01/29/09	120.68	698.98	198.03	720.52	01/29/09	198.03	720.52
01/30/09	120.50	693.19	199.45	718.33	01/30/09	199.45	718.33
01/31/09	119.41	688.45	204.35	716.84	01/31/09	204.35	716.84
02/01/09	116.18	672.15	203.44	697.82	02/01/09	203.44	697.82
02/02/09	088.65	543.03	167.98	579.19	02/02/09	167.98	579.19
02/03/09	069.04	458.07	128.67	476.96	02/03/09	128.67	476.96
02/04/09	059.54	407.63	100.91	421.16	02/04/09	100.91	421.16
02/05/09	063.61	438.22	114.19	464.48	02/05/09	114.19	464.48
02/06/09	062.92	438.99	108.70	445.76	02/06/09	108.70	445.76
02/07/09	064.30	449.58	115.87	468.04	02/07/09	115.87	468.04
02/08/09	063.44	460.16	113.54	475.30	02/08/09	113.54	475.30
02/09/09	059.75	457.46	115.59	487.09	02/09/09	115.59	487.09
02/10/09	053.23	455.17	106.12	469.57	02/10/09	106.12	469.57
02/11/09	110.23	676.70	207.18	716.52	02/11/09	207.18	716.52
02/12/09	102.38	641.47	196.93	667.80	02/12/09	196.93	667.80
02/13/09	099.94	609.97	178.02	624.53	02/13/09	178.02	624.53
02/14/09	074.74	478.62	137.49	522.98	02/14/09	137.49	522.98
02/15/09	061.38	412.85	105.19	446.69	02/15/09	105.19	446.69
02/16/09	057.80	414.39	106.69	442.36	02/16/09	106.69	442.36
02/17/09	064.89	441.09	111.92	460.96	02/17/09	111.92	460.96
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1	WDW	-1	WDV	V-2	1 1	WD	W-3
i Date I	Rate	Pres I	Rate	Pres	Date I	Rate	Pres
02/18/09	071.11	483.56	126.26	504.53	02/18/09	126.26	504.53
02/19/09	104.07	657.08	186.72	676.43	02/19/09	186.72	676.43
02/20/09	091.78	581.93	160.03	595.51	02/20/09	160.03	595.51
02/21/09	102.12	645.01	190.83	679.64	02/21/09	190.83	679.64
02/22/09	100 60	629 53	181 28	641 86	02/22/09	181 28	641 86
02/23/09	109 78	652.03	200 41	701 49	02/23/09	200 41	701 49
02/24/09	112 04	652.59	197 16	688.00	02/24/09	197 16	688.00
02/25/09	115.09	671.50	197.50	693 38	02/25/09	197 50	693.38
02/26/09	110.07	630.78	185.08	656 14	02/26/09	185.08	656 14
02/27/09	104.44	603.90	174.06	630.96	02/27/09	174.06	630.96
02/28/09	098 51	585 44	161 47	612 92	02/28/09	161 47	612.92
03/01/09	114.12	671 42	188 91	694 23	03/01/09	188 91	694 23
03/02/09	111 67	645 99	186.04	685.34	03/02/09	186.04	685.34
03/03/09	109.36	627 33	175.03	667 13	03/03/09	175.03	667 13
03/04/09	100.00	628 26	172 08	654 33	03/04/09	172 08	654 33
03/05/09	1111 02	638 20	178 58	667 41	03/05/09	178 58	667 41
03/06/09	115 04	645.00	170.00	668.40	03/06/09	170.00	668.40
03/07/09	103 37	584 20	154 72	602 17	03/07/09	154 72	602 17
03/08/00	103.37	615 60	166 08	631 01	03/08/09	166.08	631 01
03/00/03	1100.20	659.00	170.00	673 22	03/00/03	170.00	673 22
03/10/09	107.37	640 14	176.58	659 77	03/10/09	176 58	659 77
03/11/09	117 59	695.81	183.82	704 56	03/11/09	183.82	704 56
03/12/09	116 50	676 95	183.37	701.82	03/12/09	183.37	704.00
03/13/09	119 58	698 68	102.07	712 69	03/13/09	103.07	712 69
03/14/09	122 52	687 50	102.10	712.00	03/14/09	102.10	712.08
03/15/09	132 36	694 42	106.10	722 03	03/15/09	106.10	772.00
03/16/09	125 29	699 97	198.87	722.00	03/16/09	108.13	722.00
03/17/09	118 25	703 58	201 49	729.61	03/17/09	201 20	720.21
03/18/09	118 67	704.09	202.80	727 37	03/18/09	201.40	727 37
03/19/09	117 45	706.50	207 72	736.49	03/19/09	207 72	736 49
03/20/09	117 88	711 50	202.30	718 08	03/20/09	202 30	718 08
03/21/09	117 48	710 20	207 60	727 21	03/21/09	207 60	727 21
03/22/09	117.87	722.27	198.11	704.54	03/22/09	198 11	704 54
03/23/09	116.03	701.52	209.23	744.50	03/23/09	209 23	744 50
03/24/09	119.06	724.72	195.80	704.72	03/24/09	195.80	704 72
03/25/09	117.07	704.90	206.74	735.42	03/25/09	206.74	735.42
03/26/09	119.12	704.59	205.27	730.91	03/26/09	205.27	730.91
03/27/09	114.22	726.96	208.31	738.60	03/27/09	208.31	738.60
03/28/09	139.06	704.83	207.01	746.32	03/28/09	207.01	746.32
03/29/09	127.97	717.82	203.10	726.08	03/29/09	203.10	726.08
03/30/09	116.10	704.74	204.93	740.87	03/30/09	204.93	740.87
03/31/09	125.60	713.16	199.13	732.67	03/31/09	199.13	732.67
04/01/09	116.07	708.52	201.16	746.01	04/01/09	201.16	746.01
04/02/09	120.68	726.16	198.97	757.56	04/02/09	198.97	757.56
04/03/09	117.23	730.80	195.66	753.25	04/03/09	195.66	753.25
04/04/09	114.56	712.63	191.36	743.08	04/04/09	191.36	743.08
04/05/09	127.78	737.05	191.58	758.60	04/05/09	191.58	758.60
04/06/09	133.58	723.50	187.79	746.17	04/06/09	187.79	746.17
04/07/09	143.80	732.16	189.72	758.33	04/07/09	189.72	758.33
04/08/09	112.54	712.56	188.14	750.53	04/08/09	188.14	750.53
04/09/09	114.29	728.54	191.95	754.90	04/09/09	191.95	754.90
04/10/09	110.30	717.40	193.98	767.12	04/10/09	193.98	767.12
04/11/09	112.93	735.34	196.35	769.26	04/11/09	196.35	769.26

Date Rate Pres Date Rate Pres Date Rate Pres Date 04/12/09 112.62 732.84 190.30 756.04 04/12/09 190.30 756.04 04/13/09 113.88 732.75 191.36 759.89 04/13/09 196.81 759.89 04/16/09 111.85 715.06 184.00 718.13 04/16/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/22/09 195.44 747.93 04/22/09 174.55 04/22/09 195.94 753.58 04/22/09 195.94 753.58 04/22/09 195.94 753.58 04/22/09 196.62 173.45 04/25/09 196.62 770.99 04/25/09 196.62 770.91 04/25/09 196.62 770.79 <t< th=""><th> </th><th>WDW</th><th>-1 </th><th>WDV</th><th>V-2</th><th> </th><th>WD</th><th>W-3 </th><th></th></t<>		WDW	-1	WDV	V-2		WD	W-3	
04/12/09 112.62 732.84 190.30 756.04 04/13/09 190.30 756.04 04/14/09 113.88 732.75 191.36 759.89 04/14/09 191.36 759.56 04/15/09 111.85 752.66 195.73 750.45 04/16/09 184.00 718.13 04/16/09 111.82 715.09 184.00 718.13 104/16/09 184.00 718.22 04/17/09 113.25 713.19 196.80 746.65 04/17/09 188.44 747.93 04/20/09 113.22 716.52 202.94 754.53 04/21/09 195.94 723.58 04/20/09 109.52 680.12 177.98 655.25 04/23/09 180.60 713.45 04/23/09 180.60 713.45 04/26/09 186.67 704.32 04/26/09 109.26 692.28 190.62 727.09 04/26/09 180.67 704.32 04/26/09 109.51 785.68 763.28 04/29/09 180.57 732.28	Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
04/13/09 113.18 732.75 191.36 759.89 04/13/09 191.36 759.89 04/14/09 113.88 734.13 196.81 759.56 04/14/09 196.81 759.56 04/16/09 111.85 715.60 184.00 718.13 04/16/09 184.00 718.13 04/17/09 112.92 709.99 182.42 702.30 04/17/09 182.42 702.30 04/18/09 113.25 713.19 196.80 746.65 04/18/09 198.84 747.93 04/20/09 113.25 713.19 196.80 746.65 04/18/09 198.84 747.93 04/20/09 113.25 716.52 202.94 754.53 04/21/09 195.94 723.58 04/21/09 10.57 700.88 195.94 723.58 04/21/09 195.94 723.58 04/22/09 10.55 688.09 189.60 713.45 04/23/09 186.07 704.32 04/26/09 109.26 669.12 177.98 655.25 04/22/09 177.98 655.25 04/23/09 109.26 622.28 90.62 727.09 04/25/09 106.21 727.09 04/26/09 109.26 622.28 90.62 727.09 04/25/09 106.21 727.09 04/26/09 109.26 774.191.59 735.08 04/28/09 181.65 704.70 04/27/09 107.61 714.76 181.65 704.70 04/26/09 181.65 704.70 04/27/09 107.81 711.92 189.47 724.99 04/27/09 189.47 732.28 04/30/09 111.43 723.84 196.53 763.07 05/01/09 196.53 763.07 05/02/09 109.41 718.65 198.61 753.28 05/02/09 186.61 753.28 05/03/09 109.41 718.65 198.61 753.28 05/04/09 195.34 748.34 05/04/09 109.81 724.84 195.84 748.41 05/03/09 195.84 748.41 05/04/09 109.81 734.84 196.53 766.62 05/07/09 198.61 753.28 05/03/09 111.07 739.70 201.25 766.62 05/07/09 198.61 753.28 05/03/09 111.07 739.70 201.25 766.62 05/07/09 198.61 753.28 05/03/09 111.07 739.70 201.25 766.52 05/07/09 198.61 765.49 05/13/09 104.23 755.80 197.22 782.59 05/04/09 195.81 776.76 05/04/09 108.23 755.80 197.22 782.59 05/04/09 195.81 763.61 05/13/09 107.19 750.22 193.85 768.62 05/13/09 196.41 783.56 05/12/09 106.44 734.73 198.26 773.30 05/14/09 202.52 766.63 05/13/09 107.45 711.42 2	04/12/09	112.62	732.84	190.30	756.04	04/12/09	190.30	756.04	I
04/14/09 113.98 734.13 196.81 759.56 04/14/09 196.81 759.56 04/15/09 116.05 729.66 195.73 750.45 04/15/09 184.01 718.13 04/16/09 113.25 713.19 196.80 746.65 04/18/09 184.02 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 702.30 04/17/09 113.25 713.51 198.84 747.93 04/19/09 198.84 747.93 04/20/09 113.25 715.51 198.84 747.93 04/19/09 198.84 747.93 04/20/09 113.22 716.52 202.94 754.53 04/21/09 195.94 723.58 04/21/09 105.57 700.88 195.94 723.58 04/21/09 195.94 723.58 04/21/09 105.57 700.88 195.94 723.58 04/21/09 186.67 704.32 04/24/09 109.52 669.12 177.98 655.25 04/22/09 189.60 713.45 04/23/09 180.67 704.32 04/24/09 180.67 704.32 04/24/09 180.67 704.32 04/24/09 180.67 704.32 04/24/09 180.67 704.32 04/24/09 180.67 704.70 04/25/09 109.20 692.28 190.62 727.09 04/25/09 199.61 714.76 181.65 704.70 04/25/09 189.47 724.99 04/26/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/26/09 107.51 711.92 189.47 724.99 04/27/09 189.47 722.80 04/20/09 107.51 711.92 189.47 735.08 04/28/09 195.17 732.28 04/29/09 193.1 711.95 187.61 735.28 04/29/09 198.61 753.28 05/02/09 109.31 711.85 198.61 753.28 04/29/09 198.61 753.28 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/03/09 108.91 720.48 195.44 748.41 05/03/09 195.44 748.41 05/03/09 198.47 732.80 05/03/09 109.21 74.56 05/17/09 198.64 763.26 05/03/09 109.22 735.64 05/03/09 109.23 755.80 107.22 785.64 05/03/09 199.78 770.77 05/07/09 198.64 753.28 05/13/09 107.43 73.56 05/13/09 195.41 745.91 05/13/09 106.44 733.55 05/70/0	04/13/09	113.18	732.75	191.36	759.89	04/13/09	191.36	759.89	i
04/15/09 116.05 729.66 195.73 750.45 04/15/09 195.73 750.45 04/16/09 111.85 715.60 184.00 718.13 04/16/09 182.42 702.30 04/17/09 113.25 713.19 196.80 746.65 04/18/09 198.84 747.93 04/19/09 113.25 713.19 196.80 746.65 04/18/09 198.84 747.93 04/20/09 113.25 713.19 196.80 746.65 04/18/09 198.84 747.93 04/20/09 113.22 716.52 202.94 754.53 04/20/09 195.94 723.58 04/21/09 110.57 700.88 195.94 723.58 04/21/09 195.94 723.58 04/21/09 195.94 723.58 04/21/09 195.94 723.58 04/21/09 186.07 704.32 04/24/09 109.56 688.09 189.60 713.45 04/23/09 186.07 704.32 04/24/09 109.98 690.62 186.07 704.32 04/25/09 109.20 692.28 190.62 727.09 04/25/09 190.62 727.09 04/25/09 190.61 714.76 181.65 704.70 04/25/09 180.47 724.99 04/27/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/27/09 107.51 711.92 189.47 732.28 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 193.31 711.95 180.67 732.28 04/28/09 194.32 748.36 05/01/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.64 715.31 194.32 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 192.29 735.64 05/04/09 109.8 734.13 195.29 735.64 05/04/09 195.29 735.64 05/04/09 198.91 725.74 09.77 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.04 783.35 05/10/09 106.94 739.76 205.77 05/07/09 198.04 783.35 05/10/09 107.43 748.41 05/33/09 197.24 78.56 05/13/09 107.43 749.45 765.77 05/07/09 198.30 767.86 05/13/09 107.43 732.20 05/23/09 198.41 754.30 05/13/09 107.45 767.86 05/13/09 198.41 754.30	04/14/09	113.98	734.13	196.81	759.56	04/14/09	196.81	759.56	i
04/16/09 111.85 715.60 184.00 718.13 04/16/09 184.00 718.13 04/17/09 112.92 709.99 182.42 702.30 04/17/09 182.42 702.30 04/17/09 182.42 772.51 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 198.84 747.93 04/18/09 199.52 652.25 04/22/09 199.52 669.12 177.98 655.25 04/22/09 199.52 669.12 177.98 655.25 04/22/09 199.52 669.28 190.62 727.09 04/25/09 190.62 727.09 04/25/09 190.62 727.09 04/25/09 190.62 727.09 04/25/09 190.61 714.76 181.65 704.70 04/26/09 181.65 704.70 04/26/09 191.61 714.76 181.65 704.70 04/26/09 181.65 704.70 04/26/09 193.16 711.95 189.67 732.28 04/29/09 198.67 732.28 04/29/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/27/09 109.31 711.95 189.67 732.28 04/29/09 198.61 732.28 04/29/09 198.61 732.28 05/02/09 199.31 713.51 194.32 748.36 04/30/09 194.32 748.36 05/03/09 111.13 723.84 195.53 735.76 05/02/09 198.61 753.28 05/03/09 113.91 730.70 201.25 755.62 05/03/09 201.25 765.62 05/03/09 201.25 765.62 05/03/09 201.25 705.64 05/03/09 103.91 730.70 201.25 765.62 05/03/09 199.78 770.77 05/06/09 199.78 770.77 05/06/09 199.78 770.77 05/06/09 103.92 735.46 05/11/09 195.47 743.35 05/10/09 196.44 783.35 05/10/09 196.44 783.35 05/10/09 199.47 745.39 05/13/09 111.07 730.60 201.44 783.35 05/10/09 199.47 765.42 05/03/09 199.42 778.56 05/13/09 111.07 730.60 201.44 783.35 05/10/09 199.47 765.42 05/13/09 199.47 765.42 05/13/09 199.47 773.20	04/15/09	116.05	729.66	195.73	750.45	04/15/09	195.73	750.45	i
04/17/09 112.92 709.99 182.42 702.30 04/17/09 182.42 702.30 04/18/09 113.25 713.19 196.80 746.65 04/18/09 196.80 746.65 04/19/09 113.75 725.51 198.84 747.93 04/19/09 198.84 747.93 04/20/09 110.57 700.88 195.94 723.58 04/21/09 120.94 754.53 04/21/09 110.57 700.88 195.94 723.58 04/21/09 195.94 723.58 04/22/09 109.52 669.12 177.98 655.25 04/22/09 177.98 655.25 04/23/09 110.55 688.09 189.60 713.45 04/23/09 189.60 713.45 04/24/09 109.98 690.62 186.07 704.32 04/24/09 186.07 704.32 04/25/09 109.20 692.28 190.62 727.09 04/25/09 190.62 727.09 04/26/09 109.16 714.76 181.65 704.70 04/26/09 181.65 704.70 04/27/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.51 711.92 189.47 732.28 04/29/09 189.47 724.99 04/28/09 107.51 711.92 189.67 732.28 04/29/09 198.947 732.28 04/29/09 109.31 71.95 189.67 732.28 04/29/09 194.52 748.36 05/01/09 111.13 723.84 196.53 763.07 05/01/09 194.52 748.36 05/03/09 119.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.81 720.48 195.84 748.41 05/03/09 195.84 748.41 05/04/09 109.08 734.13 195.29 735.64 05/04/09 195.84 748.41 05/04/09 109.08 734.13 195.29 735.64 05/04/09 195.84 748.41 05/04/09 111.03 735.74 199.78 770.77 05/06/09 199.78 770.77 05/07/09 112.28 755.80 197.22 782.59 05/09/09 198.76 772.78 05/03/09 111.09 735.54 199.78 770.77 05/06/09 199.78 770.77 05/07/09 112.08 749.27 198.90 766.82 05/07/09 198.94 766.32 05/03/09 110.39 735.54 197.22 780.59 05/09/09 197.22 782.59 05/04/09 107.92 732.40 195.61 765.49 05/14/09 192.52 766.62 05/04/09 110.92 741.56 200.17 785.66 05/14/09 192.54 767.86 05/11/09 107.19 750.72 193.35 767.86 05/11/09 193.35 767.86 05/11/09 107.19 750.72 193.35 767.86 05/14/09 195.41 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.81 745.91 05/14/09 110.10 730.60 120.44 783.35 05/14/09 195.61 765.49 05/14/09 107.45 771.84 197.49 766.21 05/14/09 195.81 745.91 05/14/09 107.45 771.84 197.49 766.21 05/14/09 194.57 765.72 05/28/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/28/09 103.44 74.73 198.26 778.33 05/24/09 198.40 765.32 05/21/0	04/16/09	111.85	715.60	184.00	718.13	04/16/09	184.00	718.13	i
04/18/09 113.25 713.19 196.80 746.65 04/18/09 196.80 746.65 04/18/09 113.25 725.51 198.84 747.93 04/20/09 202.94 754.53 04/20/09 105.7 700.88 195.94 723.58 04/21/09 195.94 723.58 04/21/09 195.94 723.58 04/21/09 195.94 723.58 04/21/09 195.95 688.09 189.60 713.45 04/23/09 189.60 713.45 04/23/09 186.07 704.32 04/26/09 109.20 692.28 190.62 727.09 04/25/09 190.62 727.09 04/25/09 190.61 714.76 181.65 704.70 04/26/09 181.65 704.70 04/26/09 109.16 714.76 181.65 704.70 04/26/09 189.47 724.99 04/27/09 107.51 711.92 189.47 724.99 04/27/09 195.54 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 198.61 753.28 04/29/09 189.67 732.28 04/29/09 189.67 732.28 04/29/09 189.67 732.28 04/29/09 189.67 732.28 04/29/09 189.67 732.28 04/29/09 196.51 753.28 05/02/09 109.31 711.95 189.67 732.28 04/29/09 189.67 732.28 04/29/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/02/09 109.21 75.56 205/05/09 101.57 765.62 05/05/09 101.57 765.62 05/05/09 101.57 765.62 05/05/09 109.27 735.64 05/04/09 199.28 770.77 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.80 766.42 05/07/09 198.61 753.28 05/10/09 106.23 755.80 197.22 785.69 05/08/09 200.17 785.66 05/08/09 100.29 741.56 200.17 785.66 05/08/09 200.17 785.66 05/08/09 101.92 741.56 200.17 785.66 05/08/09 200.17 785.66 05/08/09 200.17 785.66 05/18/09 107.29 741.43 195.18 745.91 05/13/09 195.41 745.91 05/13/09 107.42 748.36 196.61 752.56 05/18/09 193.61 765.42 05/18/09 107.45 711.42 204.55 765.77 05/18/09 1	04/17/09	112.92	709.99	182.42	702.30	04/17/09	182.42	702.30	ί
04/19/09 113.75 725.51 198.84 747.93 04/19/09 198.84 747.93 04/20/09 113.27 716.52 202.94 754.53 04/21/09 19.52 669.12 177.98 655.25 04/22/09 177.98 655.25 04/22/09 175.98 655.25 04/22/09 175.98 655.25 04/22/09 175.98 655.25 04/22/09 175.98 655.25 04/22/09 186.07 704.32 04/24/09 186.07 704.32 04/24/09 186.07 704.32 04/24/09 186.07 704.32 04/24/09 186.07 704.32 04/25/09 109.20 692.28 190.62 727.09 04/25/09 190.62 727.09 04/26/09 107.51 711.72 189.47 724.99 04/27/09 187.56 704.70 04/26/09 181.65 704.70 04/26/09 181.65 704.70 04/26/09 107.80 705.74 191.59 735.08 04/29/09 189.67 732.28 04/29/09 109.31 711.95 189.67 732.28 04/29/09 198.61 753.28 05/01/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/03/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 199.78 748.41 05/03/09 195.84 748.41 05/03/09 195.84 748.41 05/03/09 195.84 748.41 05/03/09 195.84 748.41 05/03/09 195.84 748.41 05/03/09 195.84 748.41 05/03/09 190.77 05/06/09 110.39 735.44 195.78 05/01/09 195.72 735.64 05/04/09 195.72 735.64 05/04/09 195.72 735.64 05/04/09 195.72 735.64 05/03/09 10.29 735.64 05/03/09 10.29 735.64 05/03/09 10.29 735.64 05/03/09 10.20 76.62 05/03/09 110.92 741.56 200.17 785.66 05/03/09 200.17 785.66 05/03/09 10.20 749.27 198.90 766.42 05/03/09 107.22 725.79 05/13/09 107.42 755.70 05/13/09 107.42 755.70 05/13/09 107.42 755.70 05/13/09 107.43 755.70 05/13/09 107.43 755.70 05/13/09 107.44 752.56 05/13/09 107.45 711.42 204.55 765.77 05/13/09 195.18 745.91 05/13/09 107.45 711.42 204.55 765.77 05/13/09 195.18 755.70 05/23/09	04/18/09	113.25	713.19	196.80	746.65	04/18/09	196.80	746.65	i
04/20/09 113.22 716.52 202.94 754.53 04/20/09 202.94 754.53 04/21/09 110.57 700.88 195.94 723.58 04/21/09 195.94 723.58 04/22/09 109.52 669.12 177.98 655.25 04/22/09 177.98 655.25 04/23/09 110.55 688.09 188.00 713.45 04/23/09 189.60 713.45 04/24/09 109.98 690.62 186.07 704.32 04/26/09 186.07 704.32 04/25/09 109.16 714.76 181.65 704.70 04/26/09 181.65 704.70 04/27/09 107.51 711.92 189.47 724.99 04/27/09 189.67 732.28 04/28/09 107.80 705.74 191.59 735.08 04/28/09 191.59 735.08 04/29/09 107.31 711.92 189.47 732.28 04/29/09 189.67 732.28 04/30/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.13 723.84 196.53 763.07 05/01/09 196.53 763.07 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.81 720.48 195.84 748.41 05/03/09 195.84 748.41 05/04/09 109.08 734.13 195.29 735.64 05/04/09 195.29 735.64 05/05/09 111.07 739.70 201.25 765.62 05/05/09 195.87 748.41 05/04/09 110.92 741.58 190.77 70 56/02/09 198.61 753.28 05/05/09 110.92 741.56 200.17 785.66 05/08/09 195.29 735.64 05/06/09 110.92 741.56 200.17 785.66 05/08/09 197.22 782.59 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.70 777 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.61 763.26 05/08/09 110.92 732.40 195.61 765.49 05/11/09 196.44 783.35 05/11/09 107.92 732.40 195.61 765.49 05/11/09 195.61 765.40 05/12/09 107.92 732.40 195.61 765.49 05/11/09 195.61 765.49 05/13/09 111.07 736.00 201.44 752.56 05/15/09 201.51 765.62 05/16/09 107.62 721.93.35 767.86 05/11/09 193.51 767.86 05/11/09 107.52 741.58 197.41 755.66 05/13/09 195.18 745.91 05/11/09 107.52 741.58 197.49 753.60 05/13/09 195.61 765.49 05/13/09 107.55 728.61 193.61 765.49 05/13/09 195.81 775.90 05/13/09 107.55 748.61 193.61 765.49 05/13/09 197.89 759.60 05/18/09 107.55 748.61 193.61 765.32 05/21/09 193.61 775.20 05/22/09 106.44 734.73 198.26 779.33 05/21/09 193.61 775.20 05/22/09 106.44 734.73 198.26 779.33 05/21/09 193.61 775.20 05/22/09 106.44 734.73 198.26 779.33 05/21/09 193.61 775.20 05/22/09 107.48 -00.51 100.42 778.35 05/28/09 183.02 775.50 05/28/09 109.30 6	04/19/09	113.75	725.51	198.84	747.93	04/19/09	198.84	747.93	i
04/21/09 110.57 700.88 195.94 723.58 04/21/09 195.94 723.58 04/22/09 109.52 669.12 177.98 655.25 04/23/09 189.60 713.45 04/23/09 189.60 713.45 04/23/09 189.60 713.45 04/23/09 189.60 704.32 04/24/09 186.07 704.32 04/24/09 186.67 704.32 04/25/09 190.62 727.09 04/25/09 190.62 727.09 04/25/09 191.57 75.08 04/28/09 191.57 75.08 04/28/09 191.57 735.08 04/28/09 191.57 735.08 04/28/09 194.32 748.36 04/30/09 194.32 748.36 05/01/09 196.53 763.07 05/01/09 196.53 763.07 05/01/09 196.53 763.07 05/01/09 196.53 763.07 05/03/09 108.91 723.84 196.53 763.07 05/03/09 195.29 735.64 05/03/09 195.29 735.64 05/03/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/06/09 195.29	04/20/09	113.22	716.52	202.94	754.53	04/20/09	202.94	754.53	i
04/22/09 109.52 669.12 177.98 655.25 04/22/09 177.98 655.25 04/23/09 110.55 668.09 189.60 713.45 04/23/09 189.60 713.45 04/24/09 109.20 692.28 190.62 727.09 04/25/09 180.67 704.32 04/26/09 109.16 714.76 181.65 704.70 04/26/09 181.65 704.70 04/26/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.50 705.74 191.59 735.08 04/28/09 189.67 732.28 04/29/09 109.31 711.95 189.67 732.28 04/29/09 189.67 732.28 04/30/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.64 715.31 194.32 748.36 04/30/09 194.53 763.07 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.94 1720.48 195.84 748.41 05/03/09 195.84 748.41 05/04/09 109.08 734.13 195.29 735.64 05/04/09 195.29 735.64 05/04/09 109.08 734.13 195.29 735.64 05/04/09 195.29 735.64 05/06/09 110.92 743.62 100.12 765.62 05/05/09 201.25 765.62 05/06/09 110.92 741.56 200.17 785.66 05/05/09 201.72 765.62 05/06/09 110.92 741.56 200.17 785.66 05/05/09 201.7 785.66 05/08/09 109.23 745.54 199.78 770.77 05/06/09 199.78 770.77 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.00 766.42 05/08/09 109.23 745.54 199.78 770.77 05/06/09 109.74 776.76 05/09/09 108.23 755.80 197.22 782.59 05/09/09 197.22 782.59 05/10/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.61 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.61 765.49 05/13/09 111.77 738.64 195.49 05/13/09 195.61 765.49 05/13/09 107.45 711.42 204.55 765.77 05/16/09 199.49 754.30 05/17/09 107.45 714.88 197.94 762.21 05/13/09 197.84 745.91 05/14/09 107.45 741.88 197.94 762.21 05/13/09 197.84 745.91 05/21/09 103.55 728.61 180.04 775.27 05/21/09 183.02 765.32 05/21/09 103.55 728.61 180.04 775.27 05/21/09 183.02 765.32 05/21/09 103.30 145.61 186.04 775.27 05/21/09 183.02 765.32 05/21/09 103.30 145.61 186.04 775.27 05/21/09 183.02 765.32 05/21/09 103.44 00.05 180.04 785.16 05/22/09 183.02 775.50 05/28/09 104.4	04/21/09	110.57	700.88	195.94	723.58	04/21/09	195.94	723.58	i
04/23/09 110.55 688.09 189.60 713.45 04/23/09 189.60 713.45 04/23/09 109.98 690.62 186.07 704.32 04/24/09 186.07 704.32 04/25/09 109.20 692.28 190.62 727.09 04/25/09 190.62 727.09 04/25/09 190.62 777.09 04/25/09 190.62 777.09 04/25/09 109.16 714.76 181.65 704.70 04/26/09 181.65 704.70 04/26/09 109.31 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.50 705.74 191.59 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 191.59 735.08 04/28/09 194.32 748.36 04/30/09 194.32 748.36 04/30/09 194.32 748.36 04/30/09 194.32 748.36 05/01/09 196.53 763.07 05/01/09 196.53 763.07 05/01/09 196.53 763.07 05/01/09 196.51 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.01 720.48 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/04/09 195.29 735.64 05/05/09 111.07 739.70 1201.25 765.62 05/05/09 121.25 766.62 05/06/09 110.39 735.54 199.78 770.77 05/06/09 199.78 770.77 05/06/09 190.82 741.56 200.17 785.66 05/08/09 200.17 785.66 05/08/09 120.17 785.66 05/08/09 120.17 785.66 05/08/09 120.17 785.66 05/08/09 120.17 785.66 05/08/09 190.82 7365.80 197.22 782.59 05/01/09 196.44 783.35 05/11/09 106.94 739.68 196.44 783.35 05/11/09 193.35 767.86 05/18/09 197.22 782.59 05/10/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 195.18 745.91 05/13/09 197.25 760.53 05/21/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 782.52 05/23/09 193.61 773.20 05/22/09 104.20 699.00 186.37 773.20 05/22/09 188.30 775.50 05/23/09 189.30 775.50 05/23/09 189.30 775.50 05/23/09 189.30 775.50	04/22/09	109.52	669.12	177.98	655.25	04/22/09	177.98	655.25	ί
04/24/09 109.98 690.62 186.07 704.32 04/24/09 186.07 704.32 04/25/09 109.20 692.28 190.62 727.09 04/25/09 190.62 727.09 04/26/09 109.16 714.76 181.65 704.70 04/26/09 181.65 704.70 04/27/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.80 705.74 191.59 735.08 04/29/09 189.67 732.28 04/29/09 109.31 711.95 189.67 732.28 04/29/09 189.67 732.28 04/20/09 111.13 723.84 196.52 748.36 04/30/09 194.32 748.36 05/01/09 111.13 723.84 195.84 748.41 05/03/09 195.84 748.31 05/03/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.39 735.54 199.78 770.77 05/06/09 199.78 770.77 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.90 766.42 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.90 766.42 05/08/09 100.23 735.54 199.78 770.77 05/06/09 197.22 782.59 05/11/09 106.94 739.68 196.44 783.35 05/10/09 193.35 767.86 05/11/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.18 745.91 05/14/09 107.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/16/09 107.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/16/09 107.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/17/09 107.55 728.61 193.61 762.21 05/13/09 188.26 779.33 05/22/09 104.24 734.73 198.26 779.33 05/22/09 188.26 779.33 05/22/09 104.54 734.73 198.26 775.30 05/22/09 188.30 775.20 05/23/09 109.30 298.28 189.04 755.71 05/13/09 193.61 785.72 05/23/09 109.30 398.31 12.08 755.18 05/26/09 139.04 755.18 05/26/09 109.30 398.33 192.08 755.18 05/2	04/23/09	110.55	688.09	189.60	713.45	04/23/09	189.60	713 45	i
04/25/09 109.20 662.28 190.62 727.09 04/25/09 190.62 727.09 04/26/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.80 705.74 191.59 735.08 04/28/09 199.67 732.28 04/29/09 109.31 711.95 188.67 732.28 04/29/09 189.67 732.28 04/30/09 111.64 715.31 194.32 748.36 04/29/09 198.61 753.28 05/01/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.41 736.54 195.29 735.64 05/03/09 195.29 735.64 05/04/09 109.08 734.13 195.29 735.64 05/04/09 199.78 770.77 05/05/09 111.07 739.70 201.25 765.62 05/05/09 197.22 782.59 05/04/09 199.78 770.77 05/07/09 118.23 755.80 197.22 782.59 05/07/09 198.26 <t< td=""><td>04/24/09</td><td>109 98</td><td>690 62</td><td>186.07</td><td>704 32</td><td>04/24/09</td><td>186.07</td><td>704 32</td><td>i</td></t<>	04/24/09	109 98	690 62	186.07	704 32	04/24/09	186.07	704 32	i
04/26/09 109.16 714.76 181.65 704.70 04/26/09 181.65 704.70 04/27/09 107.51 711.92 189.47 724.99 04/27/09 189.47 724.99 04/28/09 107.80 705.74 191.59 735.08 04/29/09 189.47 732.28 04/29/09 109.31 711.95 189.67 732.28 04/29/09 189.67 732.28 04/30/09 111.41 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.61 715.32 195.64 763.07 05/02/09 198.61 753.28 05/03/09 108.91 720.48 195.29 735.64 05/03/09 195.29 735.64 05/06/09 110.39 735.54 199.78 770.77 05/06/09 199.78 770.77 05/06/09 110.29 741.56 200.17 785.66 05/08/09 200.17 785.66 05/08/09 20.177 785.66 05/08/09 20.177 785.66 05/08/09 100.17 785.66 05/08/09 107.22	04/25/09	109.00	692 28	190.62	727 09	04/25/09	190.62	727 09	ï
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04/29/09 109.31 711.95 189.67 732.28 04/29/09 189.67 732.28 04/30/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.13 723.84 196.53 763.07 05/01/09 196.53 763.07 05/02/09 109.41 718.65 188.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/02/09 198.61 753.28 05/03/09 108.91 720.48 195.84 748.41 05/03/09 195.29 735.64 05/04/09 109.08 734.13 195.29 735.64 05/05/09 201.25 765.62 05/05/09 201.25 765.62 05/06/09 110.39 735.54 199.78 770.77 05/06/09 199.78 770.77 05/06/09 110.39 735.54 199.78 770.77 05/06/09 200.17 785.66 05/08/09 200.17 785.66 05/08/09 200.17 785.66 05/08/09 200.17 785.66 05/09/09 108.23 755.80 197.22 782.59 05/09/09 197.22 782.59 05/10/09 196.44 783.35 05/11/09 106.44 739.68 196.44 783.35 05/11/09 196.44 783.35 05/11/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/12/09 107.92 732.40 195.61 765.49 05/13/09 195.18 745.91 05/13/09 111.07 730.64 202.52 760.63 05/14/09 202.52 760.63 05/14/09 202.52 760.63 05/14/09 107.45 711.42 204.55 765.77 05/17/09 204.55 765.77 05/17/09 107.45 711.42 204.55 765.77 05/17/09 204.55 765.77 05/17/09 107.45 741.48 197.89 759.96 05/18/09 197.89 759.96 05/18/09 107.25 741.88 197.94 766.21 05/9/09 197.89 759.96 05/12/09 103.55 728.61 193.61 782.23 05/21/09 183.02 763.32 05/21/09 183.02 765.32 05/23/09 108.30 775.50 05/22/09 104.20 699.00 186.37 773.20 05/22/09 186.34 775.27 05/22/09 104.20 699.00 186.37 775.20 05/22/09 188.30 775.50 05/22/09 109.30 434.61 186.04 775.27 05/24/09 186.04 775.27 05/24/09 109.30 434.61 186.04 775.27 05/24/09 188.30 775.50 05/22/09 109.30 434.61 186.04 775.27 05/24/09	04/28/09	107.80	705 74	191 59	735.08	04/28/09	100.47	735.08	1
04/30/09 111.64 715.31 194.32 748.36 04/30/09 194.32 748.36 05/01/09 111.13 723.84 196.53 763.07 05/01/09 196.53 763.07 05/02/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/03/09 109.41 718.65 198.61 753.28 05/02/09 198.61 753.28 05/04/09 109.08 734.13 195.29 735.64 05/04/09 195.29 735.64 05/06/09 111.07 737.07 105/06/09 199.78 770.77 05/06/09 198.90 766.42 05/07/09 198.90 766.42 05/07/09 198.90 766.42 05/09/09 198.23 755.80 197.22 782.59 05/09/09 197.22 782.59 05/10/09 107.92 732.40 195.61 765.49 05/11/09 195.18 767.86 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.22 760.63 05/14/09 107.45 711.42 194.55	04/29/09	109.31	711 95	189.67	732 28	04/29/09	189.67	732 28	1
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05/05/09 111.07 739.70 201.25 765.62 05/06/09 201.25 765.62 05/06/09 110.39 735.54 199.78 770.77 05/06/09 199.78 770.77 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.90 766.42 05/08/09 110.92 741.56 200.17 785.66 05/08/09 200.17 785.66 05/09/09 108.23 755.80 197.22 782.59 05/09/09 197.22 782.59 05/11/09 106.94 739.68 196.44 783.35 05/11/09 196.44 783.35 05/12/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 194.4 752.56 05/16/09 100.768 727.54 199.49 754.30 05/16/09 194.4 752.56 05/18/09 107.85 740.14 197.89 759.96 05/18/09 197.94 766.21 05/19/09 10	15/04/09	100.01	734 13	105.04	735 64	05/04/09	105.04	735 64	1
05/06/09 110.39 735.54 199.78 770.77 05/06/09 199.78 770.77 05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.90 766.42 05/08/09 110.92 741.56 200.17 785.66 05/08/09 200.17 785.66 05/09/09 108.23 755.80 197.22 782.59 05/09/09 197.22 782.59 05/11/09 106.94 739.68 196.44 783.35 05/11/09 193.35 767.86 05/12/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 199.48 745.91 05/14/09 101.0 730.64 202.52 760.63 05/14/09 202.52 760.63 05/17/09 101.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/17/09 107.45 714.42 204.55 765.77 05/18/09 197.89 759.96 05/20/09 10	05/05/09	111 07	739 70	201 25	765 62	05/05/09	201 25	765 62	
05/07/09 112.08 749.27 198.90 766.42 05/07/09 198.90 766.42 05/08/09 110.92 741.56 200.17 785.66 05/08/09 200.17 785.66 05/09/09 108.23 755.80 197.22 782.59 05/09/09 198.90 766.42 05/10/09 106.94 739.68 196.44 783.35 05/11/09 198.90 767.86 05/11/09 107.19 750.72 193.35 767.86 05/11/09 193.35 767.86 05/12/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.18 745.91 05/14/09 110.10 730.64 202.52 760.63 05/14/09 202.52 766.63 05/15/09 111.09 736.00 201.44 752.56 05/15/09 201.44 752.56 05/16/09 107.68 727.54 199.49 754.30 05/18/09 197.89 759.96 05/18/09 1	05/06/09	110 30	735 54	100 78	770 77	05/06/09	100 78	770 77	
05/08/09 112.30 143.21 150.30 160.42 05/08/09 130.30 160.42 05/08/09 110.92 741.56 200.17 785.66 05/08/09 197.22 782.59 05/10/09 106.94 739.68 197.22 782.59 05/10/09 196.44 783.35 05/11/09 107.92 732.40 195.61 767.86 05/11/09 193.35 767.86 05/12/09 107.92 732.40 195.61 765.49 05/12/09 195.61 765.49 05/14/09 110.10 730.64 202.52 760.63 05/14/09 202.52 760.63 05/15/09 111.09 736.00 201.44 752.56 05/15/09 201.44 752.56 05/16/09 107.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/17/09 107.45 711.42 204.55 765.77 05/17/09 204.55 765.77 05/18/09 107.25 741.88 197.94 766.21 05/18/09 197.94 766.21 05/20/09 1	05/07/09	112 08	740 27	108.00	766 42	05/07/00	108.70	766 42	
05/09/09 108.23 755.80 197.22 782.59 05/09/09 197.22 782.59 05/10/09 106.94 739.68 196.44 783.35 05/11/09 196.44 783.35 05/11/09 107.19 750.72 193.35 767.86 05/11/09 193.35 767.86 05/11/09 107.19 750.72 193.35 767.86 05/11/09 193.35 767.86 05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.18 745.91 05/14/09 110.10 730.64 202.52 760.63 05/14/09 202.52 760.63 05/15/09 111.09 736.00 201.44 752.56 05/15/09 201.44 752.56 05/16/09 107.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/17/09 107.45 711.42 204.55 765.77 05/17/09 204.55 765.77 05/18/09 107.25 741.88 197.94 766.21 05/18/09 197.94 766.21 05/20/09 1	05/08/09	112.00	741 56	200 17	785 66	05/08/09	1 200 17	785 66	
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05/13/09 111.77 738.84 195.18 745.91 05/13/09 195.18 745.91 05/14/09 110.10 730.64 202.52 760.63 05/14/09 202.52 760.63 05/15/09 111.09 736.00 201.44 752.56 05/15/09 201.44 752.56 05/16/09 107.68 727.54 199.49 754.30 05/16/09 199.49 754.30 05/17/09 204.55 765.77 05/17/09 107.45 711.42 204.55 765.77 05/17/09 204.55 765.77 05/18/09 107.89 740.14 197.89 759.96 05/18/09 197.89 759.96 05/19/09 107.25 741.88 197.94 766.21 05/20/09 198.26 779.33 05/21/09 103.55 728.61 193.61 782.23 05/21/09 193.61 782.23 05/21/09 103.55 728.61 193.61 782.23 05/21/09 186.37 773.20 05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/23/09 109.30 612.01 183.02 765.32 05/23/09 188.04 775.27 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/24/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 189.36 788.75 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 104.74 000.52 190.42 778.35 05/29/09 190.42 778.35 05/29/09 104.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13 06/03/09 168.99 660.13 06/03/09 105.32 000.3 168.99 660.13 06/03/09 105.89 660.13 06/03/09 107.48 000.3 168.99 660.13 06/03/09 107.48 000.4 202.92 806.78 06/03/09 104.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/03/09 107.48 000.18	05/12/09	107 92	732 40	195.61	765 49	05/12/09	195.61	765 49	i
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05/18/09 107.89 740.14 197.89 759.96 05/18/09 197.89 759.96 05/19/09 107.25 741.88 197.94 766.21 05/19/09 197.94 766.21 05/20/09 106.14 734.73 198.26 779.33 05/20/09 198.26 779.33 05/21/09 103.55 728.61 193.61 782.23 05/21/09 193.61 782.23 05/21/09 104.20 699.00 186.37 773.20 05/22/09 186.37 773.20 05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/24/09 109.30 612.01 183.02 765.32 05/23/09 188.04 775.27 05/24/09 186.04 775.27 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/26/09 109.30 298.28 189.04 785.16 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/27/09 188.49 012.14 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 190.42 778.35 05/28/09 107.48 -00.05 190.42 778.35 05/28/09 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/17/09	107.45	711.42	204.55	765.77	05/17/09	204 55	765.77	i
05/19/09 107.25 741.88 197.94 766.21 05/19/09 197.94 766.21 05/20/09 106.14 734.73 198.26 779.33 05/20/09 198.26 779.33 05/21/09 103.55 728.61 193.61 782.23 05/21/09 193.61 782.23 05/22/09 104.20 699.00 186.37 773.20 05/22/09 186.37 773.20 05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/23/09 109.30 612.01 183.02 765.32 05/23/09 186.04 775.27 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/25/09 109.30 298.28 189.04 785.16 05/26/09 189.04 785.16 05/26/09 109.30 298.28 189.04 785.16 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/28/09 104.74 000.52 189.36 788.75 05/28/09 190.42 778.35 05/29/09 104.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/18/09	107.89	740.14	197.89	759.96	05/18/09	197.89	759.96	İ
05/20/09 106.14 734.73 198.26 779.33 05/20/09 198.26 779.33 05/21/09 103.55 728.61 193.61 782.23 05/21/09 193.61 782.23 05/22/09 104.20 699.00 186.37 773.20 05/22/09 186.37 773.20 05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/24/09 109.30 612.01 183.02 765.32 05/24/09 186.04 775.27 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/25/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 109.30 298.28 189.04 785.16 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/02/09 202.92 806.78 06/02/09 202.92 806.78 06/03/09 168.99 660.13 06/03/09 168.99 660.13	05/19/09	107.25	741.88	197.94	766.21	05/19/09	197.94	766.21	İ
05/21/09 103.55 728.61 193.61 782.23 05/21/09 193.61 782.23 05/22/09 104.20 699.00 186.37 773.20 05/22/09 186.37 773.20 05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/25/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.50 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/20/09	106.14	734.73	198.26	779.33	05/20/09	198.26	779.33	ί
05/22/09 104.20 699.00 186.37 773.20 05/22/09 186.37 773.20 05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/25/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/26/09 109.30 139.83 192.08 795.50 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/21/09	103.55	728.61	193.61	782.23	05/21/09	193.61	782.23	i
05/23/09 109.30 612.01 183.02 765.32 05/23/09 183.02 765.32 05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/25/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/26/09 192.08 795.18 05/26/09 192.08 795.18 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/28/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/29/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/22/09	104.20	699.00	186.37	773.20	05/22/09	186.37	773.20	i
05/24/09 109.30 454.61 186.04 775.27 05/24/09 186.04 775.27 05/25/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/27/09 108.49 012.14 188.30 775.50 05/27/09 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/28/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 199.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/23/09	109.30	612.01	183.02	765.32	05/23/09	183.02	765.32	i
05/25/09 109.30 298.28 189.04 785.16 05/25/09 189.04 785.16 05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/27/09 108.49 012.14 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/28/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 199.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/24/09	109.30	454.61	186.04	775.27	05/24/09	186.04	775.27	i
05/26/09 109.30 139.83 192.08 795.18 05/26/09 192.08 795.18 05/27/09 108.49 012.14 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/29/09 190.42 778.35 05/30/09 195.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 109.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/25/09	109.30	298.28	189.04	785.16	05/25/09	189.04	785.16	i
05/27/09 108.49 012.14 188.30 775.50 05/27/09 188.30 775.50 05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/26/09	109.30	139.83	192.08	795.18	05/26/09	192.08	795.18	i
05/28/09 104.74 000.52 189.36 788.75 05/28/09 189.36 788.75 05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 199.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/27/09	108.49	012.14	188.30	775.50	05/27/09	188.30	775.50	i
05/29/09 107.48 -00.05 190.42 778.35 05/29/09 190.42 778.35 05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 199.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/28/09	104.74	000 52	189.36	788.75	05/28/09	189.36	788.75	
05/30/09 105.32 000.03 191.99 779.71 05/30/09 191.99 779.71 05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 199.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/29/09	107.48	-00.05	190.42	778.35	05/29/09	190.42	778 35 1	1
05/31/09 106.05 000.08 191.67 768.42 05/31/09 191.67 768.42 06/01/09 109.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/30/09	105 32	000 03	191 99	779 71	05/30/09	191 99	779 71	1
06/01/09 109.86 000.18 194.27 776.42 06/01/09 194.27 776.42 06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	05/31/09	106.05	000 08	191 67	768 42	05/31/09	191 67	768 42	
06/02/09 094.27 000.04 202.92 806.78 06/02/09 202.92 806.78 06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	06/01/09	109.86	000 18	194 27	776 42	06/01/09	194 27	776 42	1
06/03/09 197.98 -00.03 168.99 660.13 06/03/09 168.99 660.13	06/02/09	094 27	000 04	202 92	806 78	06/02/09	202 92	806 78	1
	06/03/09	197.98	-00.03	168.99	660.13	06/03/09	168.99	660.13	•

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WDW-1			N-2	WDW-3		W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
06/04/09	199.68	-00.25	106.98	625.00	06/04/09	106.98	625.00
06/05/09	169.64	000.02	195.09	471.83	06/05/09	195.09	471.83
06/06/09	186.84	-00.25	150.64	380.32	06/06/09	150.64	380.32
06/07/09	140.40	-00.25	183.88	421.65	06/07/09	183.88	421.65
06/08/09	134.02	-00.25	178.30	409.33	06/08/09	178.30	409.33
06/09/09	133.01	-00.25	176.08	403.13	06/09/09	176.08	403.13
06/10/09	150.37	-00.25	192.14	449.98	06/10/09	192.14	449.98
06/11/09	161.69	-00.25	202.33	472.90	06/11/09	202.33	472.90
06/12/09	158.36	-00.25	202.83	477.61	06/12/09	202.83	477.61
06/13/09	163.71	-00.25	196.33	465.09	06/13/09	196.33	465.09
06/14/09	160.94	-00.25	201.21	490.31	06/14/09	201.21	490.31
06/15/09	159.11	-00.25	200.13	490.52	06/15/09	200.13	490.52
06/16/09	160.21	-00.11	196.38	485.58	06/16/09	196.38	485.58
06/17/09	162.21	-00.25	201.25	502.57	06/17/09	201.25	502.57
06/18/09	167.14	-00.25	193.78	476.84	06/18/09	193.78	476.84
06/19/09	162.67	-00.25	206.02	510.51	06/19/09	206.02	510.51
06/20/09	163.01	001.87	210.91	522.18	06/20/09	210.91	522.18
06/21/09	167.24	-00.24	206.42	509.87	06/21/09	206.42	509.87
06/22/09	165.74	021.07	203.88	503.36	06/22/09	203.88	503.36
06/23/09	162.70	019.39	207.20	523.95	06/23/09	207.20	523.95
06/24/09	160.27	058.25	207.11	513.05	06/24/09	207.11	513.05
06/25/09	163.33	116.21	202.61	503.57	06/25/09	202.61	503.57
06/26/09	164.54	146.58	203.27	505.69	06/26/09	203.27	505.69
06/27/09	159.55	-00.19	204.98	513.03	06/27/09	204.98	513.03
06/28/09	148.60	000.48	195.10	493.77	06/28/09	195.10	493.77
06/29/09	156.07	-00.25	197.45	507.51	06/29/09	197.45	507.51
06/30/09	162.08	007.81	201.08	518.97	06/30/09	201.08	518.97
07/01/09	161.35	-00.24	195.55	514.82	07/01/09	195.55	514.82
07/02/09	160.91	-00.23	192.92	511.42	07/02/09	192.92	511.42
07/03/09	157.51	-00.25	197.92	526.16	07/03/09	197.92	526.16
07/04/09	154.33	-00.25	197.03	531.31	07/04/09	197.03	531.31
07/05/09	153.75	032.79	199.43	527.90	07/05/09	199.43	527.90
07/06/09	157.22	-00.25	199.95	528.57	07/06/09	199.95	528.57
07/07/09	160.74	-00.25	196.86	523.91	07/07/09	196.86	523.91
07/08/09	168.24	-00.25	190.03	490.75	07/08/09	190.03	490.75
07/09/09	165.00		197.78	518.91 409.77		102.60	
07/10/09	100.40	-00.23 260 77	192.00	490.77	07/10/09	192.00	490.77
07/12/00	160.72	005 40	199.00	1520.95	07/11/09	1 105 00	520.95
07/12/09	150.54	000.40	170.88	1467 55	107/12/09	170.99	
07/13/09	157.88	000.30 _00 25	103 18	1 407.33	107/13/09 107/13/00	103 18 I	506 58 1
07/15/09	157.00	-00.23 -00 25	199.10	494 00	07/15/09	199.10	494 00
07/16/09	146.00	-00.20	206 15	481 43	07/16/09	206 15	481 43
07/17/09	155 25	078 63	1 175 84	1 429 36	07/17/09	175 84	429 36
07/18/09	147.04	002 26	205 49	474 75	07/18/09	205 49	474 75
07/19/09	144.99	-00.25	206.43	468.37	07/19/09	206.43	468.37
07/20/09	141.21	-00.25	204.34	460.00	07/20/09	204.34	460.00
07/21/09	141.40	-00.25	206.32	465.94	07/21/09	206.32	465.94
07/22/09	130.28	-00.25	198.73	456.22	07/22/09	198.73	456.22
07/23/09	145.88	-00.25	208.96	482.74	07/23/09	208.96	482.74
07/24/09	147.93	-00.25	204.78	480.78	07/24/09	204.78	480,78
07/25/09	151.12	-00.25	207.32	485.28	07/25/09	207.32	485.28
07/26/09	152.10	003.01	210.24	488.91	07/26/09	210.24	488.91

	WDW	-1	WDV	V-2		WD	W-3
i Date i	Rate	Pres	Rate	Pres	Date i	Rate	Pres
07/27/09	157.37	001.55	219.01	1519.99	07/27/09	219.01	519.99
07/28/09	156 83	000 00	209.93	501 22	07/28/09	209.93	501 22
07/29/09	155.09	-00 24	215 13	513 58	07/29/09 1	215 13	513 58
07/30/09	155 74	-00 25	213.06	521 28	07/30/09	213.06	521 28
07/31/00	153 42	_00.20	200 00 1	514 31	07/31/00	200.00	514 31
08/01/09	149.63	_00.25	202.00	100 81	08/01/00	200.00	100 81
08/02/09	1/7 07	00.20	1 202.00	1/06 73	1 08/02/00	1202.00	106 73 1
00/02/09	1/8 2/		200.33	517 121	08/02/09	200.59	517 12
08/04/09	120.00	00.10	102 11	471 00 1	08/04/09	103 //	471 00 1
00/04/09	109.99	-00.23 172.60	195.44 j 106 /0	1 486 38	108/05/00	195.44	471.00
00/00/09	120.77	172.03	101 75	1 4 9 4 30	00/00/09	104 75	1 1 2 1 30 1
08/07/09	121.04	432.01	1 1 20 /6	1 404.30		1 1 20 16	404.30 471 62
00/07/09	131.95	420.90	109.40	471.03		109.40	47 .03 472 90
08/08/09	104.01	433.02	101 12	470.09	00/00/09	104 12	47 3.09 470 94
00/09/09	130.33	442.32	194.13	419.21	00/09/09	194.13	4/ 9.2 400 55
08/10/09	139.70	440.17	201.34	490.00	00/10/09	201.34	490.00 500.62
08/11/09	407.07	400.00	200.10	1 309.03		100.10	009.03
08/12/09	137.34	444.07	190.02	403.31	08/12/09	190.02	403.31 402 74
08/13/09	141.01	409.29	199.07	1493.71	00/13/09	199.07	493.7 500 45
08/14/09	143.43	401.01	204.40	000.15	00/14/09	1 204.40	000.10
00/10/09	144.07	472.40	199.00	499.77	00/15/09	199.00	499.77 402 97
00/10/09	140.01	475.01	197.93	1 506 00	00/10/09	001 40	490.07 506 00
00/17/09	141.75	407.90	201.40	500.22		201.40	500.22 515 66
00/10/09	149.10	490.41	205.09	502.21	00/10/09	205.09	010.00 500.21
00/19/09	144.92	470.21	200.71	501.16			002.31
00/20/09	142.07	400.29	200.04	500.10	00/20/09	200.04	501.10
00/21/09	126 24	161 66	1 1 2 0 3 . 3 9	1 178 20	00/21/09	1 1 203.35	300.74 479 30
00/22/09	100.04	1 401.00	170 90	1 470.30	00/22/09	1 1 7 9 9 9	470.30 452 51
00/20/09	081.40	067 35	1 240 80	637.05	08/23/09	1 240 20	400.01
00/24/09		1/0 15	300 54	828 71	08/25/09	1 300 54	828 71 828 71
08/26/09	000.11	147 54	310 70	832 28	08/26/09	310 70	832 28 1
08/27/09	000.20	146.91	306 21	825.09	08/27/09	306 21	825.09
08/28/09	000.10	145.31		166 04	08/28/09		1 166 04 1
08/29/09	000.20	141 98		162.04	08/29/09		162 04 1
08/30/09	000.00	654 47	264 94	640.01	08/30/09	264.94	640 01 1
08/31/09	049 94	624.36	248 34	594 54	08/31/09	248.34	594 54 1
09/01/09	124 32	492 24	222 53	514.75	09/01/09	222 53	514.75
09/02/09	140.52	485.32	216.34	504.56	09/02/09	216.34	504.56
09/03/09	141.71	486.51	210.88	496.80	09/03/09	210.88	496.80
09/04/09	135.26	472.14	206.59	493.52	09/04/09	206.59	493.52
09/05/09	146.73	495.80	182.64	440.27	09/05/09	182.64	440.27
09/06/09	146.47	496.44	180.08	426.60	09/06/09	180.08	426.60
09/07/09	141.08	486.22	196.41	473.41	09/07/09	196.41	473.41
09/08/09	145.23	491.27	197.98	470.72	09/08/09	197.98	470.72
09/09/09	136.58	480.40	212.67	502.90	09/09/09	212.67	502.90
09/10/09	138.19	481.73	208.81	493.67	09/10/09	208.81	493.67
09/11/09	131.51	465.18	217.39	516.77	09/11/09	217.39	516.77
09/12/09	132.07	474.89	218.27	518.73	09/12/09	218.27	518.73
09/13/09	133.66	484.93	207.39	497.49	09/13/09	207.39	497.49
09/14/09	127.14	474.87	217.98	530.26	09/14/09	217.98	530.26
09/15/09	125.07	477.54	211.00	508.37	09/15/09	211.00	508.37
09/16/09	123.20	469.30	206.44	501.10	09/16/09	206.44	501.10
09/17/09	118.71	463.17	211.98	514.57	09/17/09	211.98	514.57
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1	WDW	-1	WDW	V-2	1	WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
09/18/09	122.17	463.78	202.93	491.99	09/18/09	202.93	491.99
09/19/09	123.15	477.20	202.03	494.87	09/19/09	202.03	494.87
09/20/09	125.71	486.81	210.97	515.68	09/20/09	210.97	515.68
09/21/09	124.17	476.32	214.96	531.50	09/21/09	214.96	531.50
09/22/09	127.96	490.62	217.57	529.05	09/22/09	217.57	529.05
09/23/09	129.00	494.01	198.83	503.01	09/23/09	198.83	503.01
09/24/09	127.74	490.11	209.48	516.58	09/24/09	209.48	516.58
09/25/09	128.26	490.90	213.62	520.92	09/25/09	213.62	520.92
09/26/09	128.14	490.31	213.14	519.64	09/26/09	213.14	519.64
09/27/09	125.94	480.54	207.61	504.79	09/27/09	207.61	504.79
09/28/09	041.82	265.07	066.51	286.36	09/28/09	066.51	286.36
09/29/09	000.14	155.63	000.00	177.14	09/29/09	000.00	177.14
09/30/09	000.28	153.59	000.00	176.51	09/30/09	000.00	176.51
10/01/09	000.05	152.31	000.00	256.05	10/01/09	000.00	256.05
10/02/09	000.10	151.88	000.00	095.57	10/02/09	000.00	095.57
10/03/09	000.10	149.24	000.00	007.58	10/03/09	000.00	007 58
10/04/09	124 10	460.04	215 49	492 48	10/04/09	215 49	492 48
10/05/09	133 54	498 44	226.31	524 91	10/05/09	226.31	524 91
10/06/09	129.80	487 01	225 52	520.40	10/06/09	225 52	520 40
10/07/09	130.70	1 490 49	221.02	511.06	10/07/09	220.02	511 06
10/08/09	132 16	491 60	223.17	511.52	10/08/09	223 17	511 52
10/09/09	132 51	492 70	213 27	495.36	10/09/09	213 27	495 36
10/10/09	129.46	488 23	219 28	504 12	10/10/09	219 28	504 12
10/11/09	130 44	488 67	212.20	104.12	10/11/09	212 68	494 39
10/12/09	130.44	487 04	272.00	503.81	10/12/09	272.00	503 81
10/13/09	129.33	479.80	219 42	506.46	10/13/09	219 42	506.46
10/14/09	128.00	484 61	220 17	507.81	10/14/09	220 17	507.81
10/15/09	128 35	482 90	218 55	506.07	10/15/09	218 55	506.07
10/16/09	127.25	492.00	218.50	515.87	10/16/09	218 50	515 87
10/17/09	133.55	519.06	202 37	498 95	10/17/09	202.37	498 95 1
10/18/09	126.08	494 09	216 25	527.31	10/18/09	216 25	527 31
10/19/09	120.00	490 37	216 35	532 62	10/19/09	216 35	532 62 1
10/20/09	118 72	1 400 28	213.00	538 52	10/20/00	213.70	538 52
10/21/00	110.72	1 404 63	210.73	520 44	10/21/09	210.73	520.02
10/22/09	122 30	1 506 21	210.07	534 27	10/22/09	210.07	534 27
10/23/09	100 58	775 37	060.00	285 44	10/23/09	060.00	285 44
10/24/09	242 52	899.03		181 47	10/24/09		181 47
10/25/09	243.79	900.12	000.00	180.94	10/25/09	000.00	180.94
10/26/09	160 56	648 95	000.00	120 12	10/26/09	000.00	120.12
10/27/09	126 56	547 45	000.01	173 92	10/27/09	000.00	218.87
10/28/09	000.03	157.04	000.00	176.49	10/28/09	000.00	211.79
10/29/09	000.13	155.62	000.01	175.72	10/29/09	000.00	206.63
10/30/09	035.89	238.39	032.39	276.91	10/30/09	050.37	224.83
10/31/09	132.31	475.97	109.24	510.30	10/31/09	190.41	461.66
11/01/09	140 72	500 77	117 18	538 53	11/01/09	205 37	551 41
11/01/09	132.85	477 59	117 72	539 48	11/01/09	211 42	529 82
11/02/09	130 43	485 28	114 43	536 76	11/02/09	197 88	464 39
11/03/09	132 20	494 36	114 42	539 10	11/03/09	204 54	401 72
11/04/09	132 12	496.05	101 41	491 94	11/04/09	207 25	334 13
11/05/09	121 55	472 17	104 29	505.05	111/05/09	220 09	320 44
11/06/09	133.08	504 51	1 092 98	475 72	111/06/09	213 35	294 11
11/07/09	133.40	499 46	101 59	498 55	111/07/09	218 71	323 65
11/08/09	128.23	490.67	103.22	501.46	11/08/09	201.34	330.62

Date Rate Pres Date Rate Pres 11/09/09 123.98 477.21 106.46 509.92 11/09/09 210.76 369.65 11/11/109 118.70 468.95 101.69 499.17 11/11/109 194.65 308.37 11/12/09 128.28 500.85 106.01 515.35 11/11/109 194.65 308.37 11/13/09 122.05 486.52 109.83 528.45 11/13/09 122.32 493.09 079.54 436.06 11/15/09 182.82 224.28 11/16/09 122.22 491.00 081.03 457.52 11/17/09 182.04 248.17 11/16/09 122.72 491.20 081.03 457.52 11/17/09 182.04 248.17 11/17/09 122.72 491.20 081.03 457.52 11/17/09 182.04 248.17 11/12/09 122.43 503.24 109.76 488.06 11/22/09 13.30 260.24 11/20/09 13	1	WDW-1		WDW-2		WD		W-3	
11/09/09 123.98 477.21 106.46 509.92 11/09/09 210.76 369.66 11/10/09 133.30 507.45 098.55 485.84 11/11/09 120.219 359.85 11/12/09 128.28 500.85 106.01 515.35 11/12/09 195.71 268.09 11/13/09 124.05 486.52 109.83 528.45 11/16/09 180.67 274.62 11/14/09 122.12 493.09 079.54 436.06 11/15/09 189.82 242.81 11/16/09 112.72 122.72 491.00 808.04 446.37 11/16/09 122.04 248.17 11/17/09 112.27 291.02 081.03 443.35 11/16/09 223.93 260.45 11/19/09 110.58 477.71 111.04 550.32 11/20/09 224.81.73 274.82 11/20/09 124.21 503.42 097.56 448.95 11/23/09 233.91 200.21 11/20/09 134.12 539.543.94 093.76 488.69 11/24/09 213.90 202.02	Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
11/10/09 133.30 507.45 098.55 485.84 11/10/09 202.19 359.85 11/11/09 118.70 468.95 101.69 499.17 11/11/09 195.71 268.09 11/13/09 128.28 500.85 106.01 515.35 11/13/09 195.71 268.09 11/14/09 128.28 500.85 106.05 499.21 11/14/09 186.07 274.62 11/16/09 112.32 493.09 079.54 436.06 11/15/09 189.88 294.28 11/16/09 116.76 475.83 082.04 446.37 11/16/09 123.04 248.17 11/18/09 114.15 461.05 073.73 443.35 11/18/09 223.93 260.45 11/20/09 110.81 4475.77 111.04 550.32 11/20/09 213.96 296.24 11/22/09 124.21 503.42 097.55 488.69 11/23/09 213.96 296.24 11/23/09 134.12 539.50 077.82 446.95 11/23/09 213.96 296.24 11/23/09	11/09/09	123.98	477.21	106.46	509.92	11/09/09	210.76	369.66	
11/11/09 118.70 468.95 101.69 499.17 11/11/09 194.65 308.37 11/12/09 128.28 500.85 106.01 515.35 11/12/09 195.77 268.09 11/14/09 124.05 486.52 109.83 528.45 11/16/09 172.10 273.82 11/16/09 112.32 493.09 079.54 436.06 11/15/09 188.88 294.28 11/16/09 112.72 491.20 081.03 457.52 11/16/09 122.515 11/17/09 122.72 491.20 081.03 457.52 11/17/09 128.04 248.17 11/17/09 112.72 081.03 457.52 11/17/09 128.04 248.28 11/21/09 114.51 461.05 073.73 443.35 11/17/09 128.04 248.28 11/22/09 124.21 503.56 077.82 446.95 11/22/09 223.81 340.82 11/22/09 124.21 503.55 142.84 11/22/09 203.81 202.21 11/28/09 125.98 513.20 161.11	11/10/09	133.30	507.45	098.55	485.84	11/10/09	202.19	359.85	İ
11/12/09 128.28 500.85 106.01 515.35 11/12/09 195.71 268.09 11/13/09 124.05 1486.52 109.83 528.45 11/13/09 209.18 273.82 11/14/09 125.14 493.09 079.54 436.06 11/15/09 188.88 294.28 11/16/09 116.76 475.83 082.04 446.37 11/16/09 172.10 252.15 11/17/09 122.72 491.20 081.03 457.52 11/17/09 122.33 260.45 11/18/09 114.51 461.05 073.73 443.35 11/12/09 223.93 260.45 11/2/09 112.81 475.77 111.04 550.32 11/22/09 213.96 296.24 11/2/09 129.34 151.82 099.09 504.19 11/22/09 213.90 206.41 11/2/09 129.34 134.22 097.55 498.89 11/22/09 213.90 202.02 11/2/09 129.34 134.25 099.09 134.12 139.20 213.40 30.02 211.22 11/2/2/09	11/11/09	118.70	468.95	101.69	499.17	11/11/09	194.65	308.37	Ĺ
11/13/09 124.05 486.52 109.83 528.45 11/13/09 209.18 273.82 11/14/09 125.14 495.98 100.55 499.21 11/14/09 180.68 273.82 11/15/09 122.32 493.09 079.54 436.06 11/15/09 189.88 294.28 11/16/09 116.76 475.83 082.04 446.37 11/16/09 172.10 252.15 11/17/09 122.72 491.20 081.03 457.52 11/17/09 182.04 248.17 11/17/09 110.81 4475.77 111.04 550.32 11/20/09 242.51 527.48 11/20/09 1124.21 533.56 097.55 498.89 11/21/09 202.05 269.10 11/24/09 135.95 543.94 093.78 488.69 11/24/09 213.40 320.02 11/26/09 135.95 543.94 093.78 488.69 11/26/09 203.87 265.36 11/26/09 127.97 520.75 126.46 495.43 11/26/09 203.91 270.70 127.27 571.48 <t< td=""><td>11/12/09</td><td>128.28</td><td>500.85</td><td>106.01</td><td>515.35</td><td>11/12/09</td><td>195.71</td><td>268.09</td><td>Ĺ</td></t<>	11/12/09	128.28	500.85	106.01	515.35	11/12/09	195.71	268.09	Ĺ
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	11/13/09	124 05	486 52	109.83	528.45	11/13/09	209 18	273 82	i
11/15/09 122.32 493.09 079.54 436.06 11/15/09 189.88 294.28 11/16/09 116.76 475.83 082.04 446.37 11/16/09 172.10 252.15 11/17/09 122.72 491.20 081.03 457.52 11/17/09 182.04 248.17 11/18/09 114.15 461.05 073.73 443.35 11/18/09 223.93 260.45 11/19/09 110.8 444.99 119.12 583.64 11/19/09 221.39 260.45 11/21/09 129.34 518.25 099.90 504.19 11/21/09 223.81 260.45 11/22/09 124.21 503.56 077.52 446.95 11/23/09 223.81 340.82 11/23/09 135.1 533.52 157.21 551.48 11/26/09 203.39 265.36 11/26/09 135.95 534.39 109.37 248.62 11/28/09 208.39 265.36 11/26/09 135.51 533.52 157.21 551.48 11/26/09 208.39 265.36 11/26/09 135	11/14/09	125 14	495 98	100.55	499 21	11/14/09	186.07	274 62	
11/16/09 116.76 475.83 082.04 446.37 11/16/09 172.10 252.15 11/17/09 122.72 491.20 081.03 457.52 11/17/09 182.04 248.17 11/18/09 114.15 461.05 073.73 443.35 11/12/09 223.93 260.45 11/12/09 110.08 444.99 119.12 583.64 11/19/09 243.52 274.48 11/20/09 112.421 503.42 097.55 488.89 11/22/09 220.55 269.00 11/23/09 134.12 539.56 077.82 446.85 11/12/09 220.55 266.24 11/23/09 134.12 539.55 543.94 093.78 488.69 11/24/09 213.40 320.02 11/25/09 127.97 520.75 126.46 495.43 11/26/09 201.39 270.70 11/26/09 123.51 533.52 157.21 551.48 11/26/09 201.39 287.14 120/109 124.07 526.33 161.11 568.86 11/27/09 213.40 320.51 11/	11/15/09	122 32	493.09	079 54	436.06	11/15/09	189 88	294 28	
11/17/09 122.72 491.20 081.03 457.52 11/17/09 182.04 248.17 11/18/09 114.15 461.05 073.73 443.35 11/18/09 223.93 260.45 11/19/09 110.08 444.99 119.12 583.64 11/19/09 212.69 281.28 11/20/09 115.81 475.77 111.04 550.32 11/2/09 213.66 284.28 11/21/09 124.21 503.42 097.55 498.89 11/23/09 213.66 286.24 11/24/09 134.12 539.56 077.82 446.95 11/23/09 213.96 200.83 200.53 11/24/09 133.51 533.52 157.21 551.48 11/27/09 208.39 265.36 11/28/09 130.43 536.63 157.18 552.24 11/28/09 208.39 265.36 11/28/09 130.43 536.63 157.18 552.24 11/28/09 203.91 287.14 12/01/09 130.43 536.63 157.15 512/01/09 210.17 247.43 12/01/09 1	11/16/09	116 76	475.83	082 04	446.37	11/16/09	172 10	252 15	
11/18/09 114.15 461.05 073.73 443.35 11/18/09 223.81 260.45 11/19/09 110.88 444.99 119.12 583.64 11/12/09 224.53 274.48 11/20/09 124.21 503.42 099.05 04.91 11/21/09 220.05 269.10 11/22/09 124.21 503.42 097.55 498.89 11/22/09 213.40 320.02 11/22/09 135.95 543.94 093.78 488.69 11/24/09 213.40 320.02 11/26/09 133.51 53.52 157.21 551.48 11/26/09 208.39 265.36 11/26/09 133.51 53.66 157.18 552.24 11/28/09 209.87 290.63 11/28/09 136.45 513.20 161.11 568.66 11/17/09 203.31 287.44 12/01/09 131.69 541.18 158.94 560.02 11/30/09 203.31 287.44 12/02/09 266.90 538.78 265.20 11/20/09 210.16 249.64 12/03/09 065.27 607.	11/17/09	122 72	491 20	081 03	457 52	11/17/09	182.04	248 17	
11/19/09 110.08 444.99 119.12 583.64 11/19/09 243.53 274.48 11/20/09 115.81 475.77 111.04 550.32 11/20/09 212.69 281.28 11/21/09 129.34 518.25 099.90 504.19 11/21/09 212.69 281.28 11/22/09 134.12 533.42 097.55 498.89 11/22/09 213.40 320.22 11/25/09 134.12 533.52 157.21 551.48.89 11/26/09 203.92 270.70 11/26/09 125.98 513.20 161.11 568.86 11/27/09 201.39 265.36 11/28/09 126.58 513.20 161.11 568.86 11/29/09 209.87 290.63 11/28/09 126.58 513.20 161.11 568.22 11/29/09 203.87 296.63 11/20/09 130.43 566.63 157.18 552.24 11/29/09 203.87 296.63 11/30/09 130.43 566.20 611.00 12/02/09 206.69 248.57 12/01/09 146.84 <t< td=""><td>11/18/09</td><td>114 15</td><td>461.05</td><td>073 73</td><td>443 35</td><td>11/18/09</td><td>223.93</td><td>260 45</td><td></td></t<>	11/18/09	114 15	461.05	073 73	443 35	11/18/09	223.93	260 45	
11/20/09 115.81 475.77 111.04 550.32 11/20/09 212.69 281.28 11/21/09 129.34 518.25 099.90 504.19 11/21/09 202.05 269.10 11/22/09 124.21 503.42 097.55 498.89 11/22/09 213.96 266.24 11/24/09 135.95 543.94 093.78 488.69 11/24/09 213.40 320.02 11/26/09 135.95 53.52 157.21 551.48 11/26/09 208.39 265.36 11/27/09 125.98 513.20 161.11 568.52 11/27/09 209.87 266.33 11/28/09 130.43 536.63 157.18 552.24 11/28/09 209.87 286.33 11/20/09 130.43 536.63 157.18 552.24 11/29/09 203.91 287.14 12/01/09 124.07 526.43 155.90 571.55 12/01/09 210.66 248.92 12/03/09 065.27 607.52 350.57 872.94 12/03/09 214.25 278.54 12/06/09 14	11/19/09	110.08	444 99	119 12	583 64	11/19/09	243 53	274 48	
11/21/09 129.34 518.25 099.00 504.19 11/21/09 202.05 269.10 11/22/09 124.21 503.42 097.55 498.89 11/22/09 213.96 296.24 11/23/09 134.12 539.56 077.82 446.95 11/23/09 223.81 340.82 11/24/09 135.95 543.94 093.78 488.69 11/24/09 213.40 320.02 11/26/09 135.95 53.52 152.64 495.43 11/25/09 201.39 270.70 11/26/09 128.52 523.83 161.21 568.66 11/27/09 208.39 265.36 11/28/09 130.43 56.63 157.18 552.24 11/28/09 203.91 287.14 1/20/09 130.43 536.63 155.90 571.55 12/01/09 203.91 287.14 1/20/09 124.07 526.43 155.90 571.55 12/01/09 201.16 249.64 12/04/09 266.90 538.78 265.20 611.00 12/04/09 205.02 242.57 12/04/09 369.8	11/20/09	115 81	475 77	111 04	550.32	11/20/09	212 69	281 28	
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12/12/09 147.75 566.88 157.26 603.67 12/12/09 211.68 384.76 12/13/09 146.49 564.21 157.51 584.22 12/13/09 212.20 432.36 12/14/09 144.68 557.23 159.45 597.58 12/14/09 211.91 421.51 12/15/09 145.76 563.96 157.15 579.24 12/16/09 209.25 499.23 12/16/09 145.86 562.04 159.19 593.45 12/16/09 209.25 499.23 12/17/09 158.06 610.25 155.24 574.11 12/17/09 183.30 441.01 12/18/09 149.88 561.38 157.53 578.78 12/18/09 212.25 418.23 12/19/09 146.97 552.75 156.28 580.15 12/20/09 208.31 399.25 12/20/09 145.30 587.14 150.90 557.35 12/21/09 208.31 399.25 12/21/09 148.08 568.30 153.11 580.03 12/21/09 204.16 391.55 12/22/09 1	12/11/09	148 70	569.62	156 11	562 22	12/11/09	212 64	287 20	1
12/13/09 146.49 564.21 157.51 584.22 12/13/09 212.20 432.36 12/14/09 144.68 557.23 159.45 597.58 12/14/09 211.91 421.51 12/15/09 145.76 563.96 157.15 579.24 12/15/09 211.93 497.36 12/16/09 145.86 562.04 159.19 593.45 12/16/09 209.25 499.23 12/17/09 158.06 610.25 155.24 574.11 12/17/09 183.30 441.01 12/18/09 149.88 561.38 157.53 578.78 12/18/09 212.25 418.23 12/19/09 146.97 552.75 156.28 580.15 12/19/09 208.31 399.25 12/20/09 153.29 583.78 152.95 569.56 12/20/09 204.16 391.55 12/21/09 154.60 587.14 150.90 557.35 12/21/09 210.98 356.83 12/22/09 149.93 571.41 153.71 577.47 12/22/09 211.48 377.74 12/23/09 148.08 568.30 153.11 580.03 12/23/09 211.99 370.92 12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 144.08 552.49 153.62 586.07 12/26/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 204.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/27/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/27/09 204.83 237.32 12/29/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/30/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241	12/12/09	140.75	566.88	157 26	603.67	12/12/09	212.04	384 76	1
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12/15/09 145.76 563.96 157.15 579.24 12/15/09 211.93 497.36 12/16/09 145.86 562.04 159.19 593.45 12/16/09 209.25 499.23 12/17/09 158.06 610.25 155.24 574.11 12/17/09 183.30 441.01 12/18/09 149.88 561.38 157.53 578.78 12/18/09 212.25 418.23 12/19/09 146.97 552.75 156.28 580.15 12/19/09 208.31 399.25 12/20/09 153.29 583.78 152.95 569.56 12/20/09 204.16 391.55 12/21/09 154.60 587.14 150.90 557.35 12/21/09 210.98 356.83 12/22/09 149.93 571.41 153.71 577.47 12/22/09 211.48 377.74 12/23/09 148.08 568.30 153.11 580.03 12/23/09 211.99 370.92 12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/14/09	144 68	557 23	159 45	597 58	12/14/09	211 91	421 51	1
12/16/09 145.86 562.04 159.19 593.45 12/16/09 209.25 499.23 12/17/09 158.06 610.25 155.24 574.11 12/17/09 183.30 441.01 12/18/09 149.88 561.38 157.53 578.78 12/18/09 212.25 418.23 12/19/09 146.97 552.75 156.28 580.15 12/19/09 208.31 399.25 12/20/09 153.29 583.78 152.95 569.56 12/20/09 204.16 391.55 12/21/09 154.60 587.14 150.90 557.35 12/21/09 210.98 356.83 12/22/09 149.93 571.41 153.71 577.47 12/22/09 211.48 377.74 12/23/09 148.08 568.30 153.11 580.03 12/23/09 211.99 370.92 12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 204.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/30/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/15/09	145 76	563.96	157 15	579 24	12/15/09	211.93	497 36	Ì
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	12/16/09	145.86	562.04	159.19	593.45	12/16/09	209.25	499.23	i
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	12/17/09	158.06	610.25	155.24	574.11	12/17/09	183.30	441.01	i
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	12/18/09	149.88	561.38	157.53	578.78	12/18/09	212.25	418.23	İ
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	12/19/09	146.97	552.75	156.28	580.15	12/19/09	208.31	399.25	i
12/21/09 154.60 587.14 150.90 557.35 12/21/09 210.98 356.83 12/22/09 149.93 571.41 153.71 577.47 12/22/09 211.48 377.74 12/23/09 148.08 568.30 153.11 580.03 12/23/09 211.99 370.92 12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/20/09	153.29	583.78	152.95	569.56	12/20/09	204.16	391.55	i
12/22/09 149.93 571.41 153.71 577.47 12/22/09 211.48 377.74 12/23/09 148.08 568.30 153.11 580.03 12/23/09 211.99 370.92 12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 204.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/21/09	154.60	587.14	150.90	557.35	12/21/09	210.98	356.83	ł
12/23/09 148.08 568.30 153.11 580.03 12/23/09 211.99 370.92 12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/22/09	149.93	571.41	153.71	577.47	12/22/09	211.48	377.74	í
12/24/09 144.08 552.49 153.62 586.07 12/24/09 199.68 240.73 12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/23/09	148.08	568.30	153.11	580.03	12/23/09	211 99	370.92	l
12/25/09 134.00 581.26 153.40 593.17 12/25/09 211.82 208.40 12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/24/09	144.08	552 49	153 62	586.07	12/24/09	199 68	240 73	ł
12/26/09 147.21 593.42 150.78 585.81 12/26/09 204.79 221.48 12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/25/09	134.00	581.26	153.40	593.17	12/25/09	211 82	208.40	i
12/27/09 143.19 579.13 152.63 612.78 12/27/09 201.83 233.98 12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/26/09	147 21	593 42	150 78	585 81	12/26/09	204 79	221 48	l
12/28/09 142.56 583.43 151.32 608.99 12/28/09 204.83 237.32 12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/27/09	143 19	579 13	152 63	612 78	12/27/09	201 83	233 98	l
12/29/09 143.06 582.78 152.58 613.34 12/29/09 205.02 219.06 12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/28/09	142 56	583 43	151 32	608 99	12/28/09	204 83	237 32	
12/30/09 143.17 583.14 151.34 606.88 12/30/09 204.91 246.86 12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/29/09	143.06	582 78	152 58	613 34	12/29/09	205.02	219 06	1
12/31/09 142.47 580.88 149.99 603.60 12/31/09 208.07 241.68	12/30/09	143 17	583 14	151.34	606 88	12/30/00	204 91	246.86	1
	12/31/09	142.47	580.88	149.99	603.60	12/31/09	208.07	241.68	l

1	WDW	-1	WDW-2		WDW-3		
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
01/01/10	145.23	595.56	151.13	617.84	01/01/10	204.22	224.98
01/02/10	143.94	591.30	150.44	618.17	01/02/10	201.96	265.95
01/03/10	142.52	585.24	150.42	621.79	01/03/10	201.80	281.25
01/04/10	141.06	581.49	147.79	601.50	01/04/10	196.61	261.44
01/05/10	146.31	600.39	147.32	599.68	01/05/10	204.48	241.45
01/06/10	144.42	584.62	145.76	583.26	01/06/10	196.25	243.86
01/07/10	145.11	593.55	148.29	608.56	01/07/10	200.92	225.18
01/08/10	191.70	578.58	151.28	624.96	01/08/10	198.18	229.63
01/09/10	332.01	686.62	149.91	614.48	01/09/10	200.13	233.67
01/10/10	131.37	571.53	147.31	591.79	01/10/10	189.54	256.11
01/11/10	142.26	600.69	148.91	607.52	01/11/10	198.25	272.05
01/12/10	143.08	597.63	150.30	618.56	01/12/10	197.82	258.13
01/13/10	140.62	587.53	149.22	610.03	01/13/10	195.82	251.01
01/14/10	139.62	578.76	148.61	595.23	01/14/10	194.23	271.26
01/15/10	140.46	585.03	151.69	613.95	01/15/10	200.14	322.25
01/16/10	145.22	612.49	149.82	601.32	01/16/10	194.13	330.55
01/17/10	137.79	572.97	153.32	624.95	01/17/10	201.82	366.89
01/18/10	142.06	592.75	151.61	607.51	01/18/10	201.45	300.03
01/19/10	144.54	602.49	153.23	619.75	01/19/10	197.99	252.11
01/20/10	141.11	587.52	149.45	589.21	01/20/10	182.76	257.03
01/21/10	144.08	605.24	151.36	607.72	01/21/10	200.05	246.39
01/22/10	141.63	593.69	151.37	607.66	01/22/10	190.78	264.16
01/23/10	140.17	595.92	151.34	610.68	01/23/10	196.95	277.83
01/24/10	142.03	607.97	149.94	605.87	01/24/10	201.72	236.02
01/25/10	138.66	590.19	152.20	623.23	01/25/10	202.56	251.05
01/26/10	141.21	605.01	148.44	598.50	01/26/10	204.66	241.34
01/27/10	141.61	606.66	148.37	598.90	01/27/10	205.49	247.04
01/28/10	142.29	615.31	147.76	600.42	01/28/10	206.70	247.09
01/29/10	130.13	604.85	144.38	578.66	01/29/10	199.62	235.40
01/30/10	138.82	603.79	141.98	557.03	01/30/10	204.83	261.45
01/31/10	138.25	603.51	147.89	603.28	01/31/10	202.82	271.11
02/01/10	140.32	608.04	146.61	584.94	02/01/10	201.59	327.25
02/02/10	139.22	596.68	145.44	576.56	02/02/10	194.64	348.65
02/03/10	142.04	617.64	139.22	530.74	02/03/10	208.58	294.26
02/04/10	143.45	621.43	145.55	574.80	02/04/10	201.04	261.87
02/05/10	143.64	620.16	147.38	581.47	02/05/10	201.58	340.35
02/06/10	143.04	613.14	148.02	587.93	02/06/10	203.01	346.22
02/07/10	138.83	596.79	147.01	577.57	02/07/10	197.23	331.95
02/08/10	123.60	517.38	134.14	480.52	02/08/10	158.68	284.62
02/09/10	134.45	583.48	146.93	580.74	02/09/10	206.95	306.01
02/10/10	142.70	619.43	141.41	536.38	02/10/10	199.87	251.19
02/11/10	142.39	618.81	147.45	576.05	02/11/10	191.95	252.79
02/12/10	138.63	598.49	146.80	572.57	02/12/10	200.44	256.96
02/13/10	139.94	603.31	146.05	563.67	02/13/10	201.50	294.51
02/14/10	134.31	578.93	148.83	585.45	02/14/10	200.22	315.94
02/15/10	121.54	512.66	140.09	521.59	02/15/10	172.83	299.54
02/16/10	116.82	480.07	132.38	458.15	02/16/10	137.02	325.44
02/17/10	121.35	516.24	143.18	542.65	02/17/10	168.07	289.07
02/18/10	138.10	604.53	147.72	586.86	02/18/10	207.79	331.14
02/19/10	138.31	608.52	148.07	590.85	02/19/10	198.65	360.87
02/20/10	110.24	442.49	131.99	457.68	02/20/10	116.64	368.86
02/21/10	130.34	563.06	145.68	568.54	02/21/10	192.70	336.40
02/22/10	134.06	602.29	147.90	599.90	02/22/10	210.24	362.14

1 1	WDW-1		WDW-2			WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
02/23/10	126.82	611.45	148.52	615.20	02/23/10	208.67	293.02
02/24/10	126.84	580.05	148.44	626.11	02/24/10	211.53	277.91
02/25/10	128.51	581.51	146.18	597.74	02/25/10	193.72	292.83
02/26/10	133.78	601.54	148.49	615.49	02/26/10	211.45	350.77
02/27/10	133.24	607.00	146.08	604.60	02/27/10	212.46	390.38
02/28/10	133.12	601.29	147.96	614.33	02/28/10	205.13	404.56
03/01/10	130.28	595.74	147.97	614.79	03/01/10	206.80	399.81
03/02/10	130.07	587.90	146.52	600.47	03/02/10	208.59	396.63
03/03/10	134.60	609.75	148.21	608.43	03/03/10	208.78	397.34
03/04/10	132.72	598.64	148.64	616.51	03/04/10	209.50	391.81
03/05/10	135.34	612.00	147.14	616.95	03/05/10	207.94	391.90
03/06/10	135.74	622.25	152.66	649.71	03/06/10	185.14	394.32
03/07/10	133.90	615.45	146.02	605.52	03/07/10	210.06	419.68
03/08/10	134.53	620.94	147.83	624.05	03/08/10	199.78	408.12
03/09/10	130.22	602.80	146.02	617.08	03/09/10	208.66	356.56
03/10/10	129.50	602.25	145.48	615.47	03/10/10	210.99	362.91
03/11/10	128.11	596.75	144.72	622.96	03/11/10	211.76	352.61
03/12/10	129.80	605.87	144.41	619.09	03/12/10	212.70	317.90
03/13/10	130.35	609.00	143.85	616.92	03/13/10	212.88	317.42
03/15/10	130.76	609.96	144.00	616.30	03/15/10	213.70	308.78
03/16/10	127.71	600.02	145.34	635.80	03/16/10	215.16	298.54
03/17/10	131.40	622.17	144.25	627.24	03/17/10	214.25	238.88
03/18/10	129.76	585.46	144.32	625.11	03/18/10	201.05	246.67
03/19/10	133.61	627.53	144.26	630.50	03/19/10	213.96	290.61
03/20/10	130.50	581.51	144.34	636.34	03/20/10	217.28	342.56
03/21/10	132.63	631.06	144.81	648.61	03/21/10	210.63	351.49
03/22/10	132.74	627.23	144.22	647.89	03/22/10	205.46	338.04
03/23/10	128.40	589.74	143.93	647.35	03/23/10	210.69	355.08
03/24/10	131.49	608.84	141.93	634.79	03/24/10	203.28	390.56
03/25/10	131.25	597.16	142.06	634.12	03/25/10	210.73	420.85
03/26/10	127.80	603.25	161.74	640.93	03/26/10	197.55	406.84
03/27/10	128.83	587.60	165.44	650.16	03/27/10	215.02	389.79
03/28/10	128.37	602.79	160.31	648.54	03/28/10	213.60	436.85
03/29/10	123.15	569.04	155.18	646.92	03/29/10	213.48	466.57
03/30/10	133.15	628.71	150.05	645.30	03/30/10	209.39	496.49
03/31/10	131.19	600.18	144.92	643.68	03/31/10	211.32	517.02
04/01/10	133.76	611.73	140.58	632.78	04/01/10	212.31	530.94
04/02/10	128.18	588.40	142.58	635.66	04/02/10	217.33	542.96
04/03/10	130.02	598.35	143.80	632.23	04/03/10	210.42	491.97
04/04/10	126.15	595.74	142.57	625.24	04/04/10	203.74	433.27
04/05/10	121.57		145.79	042.85	04/05/10	207.54	401.59
04/05/10	123.84	588.94	144.27	031.35	04/06/10	217.81	444.11
04/07/10	124.56	586.35	140.64	606.34	04/07/10	212.13	442.50
04/08/10	110.88	501.78	137.94	582.20	04/08/10	183.17	411.83
04/09/10	120.01	050.54	141.68	010.01	04/09/10	186.24	291.16
04/10/10	131.02		144.92	038.41	04/10/10	211.68	311./6
04/11/10	129.27	014.70	140.73	042.30	04/11/10	212.50	332.55
04/12/10	131.11	030.00	144.99	030.00	04/12/10		351.00
04/13/10	132.13	019.25	144.59	646.00	04/13/10	209.51	391.40
04/15/10	131.40	621.09	144.92	040.93	04/14/10	204.78	435.40
04/15/10	120.94	021.71	140.07	000.00	04/15/10		441.30
04/10/10	112.21	012.00	142.09	647 00	04/10/10	004 70	323.20
04/17/10	1 130.30		1 142.02	047.20	04/17/10	204.70	319.00

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WDW-1		WDW-2		· ·	W-3		
Date I	Rate	Pres i	Rate	Pres	Date	Rate	Pres
04/18/10	128.98	615.94	142.48	639.15	04/18/10	198.65	343.19
04/19/10	131.38	673.03	142.63	638.84	04/19/10	207.01	334.22
04/20/10	128.92	602.21	143.29	642.78	04/20/10	200.56	328.64
04/21/10	132.71	637.06	142.97	640.50	04/21/10	209.31	306.56
04/22/10	133.42	617.87	143.35	650.87	04/22/10	206.76	313.15
04/23/10	129.65	605.90	143.20	656.36	04/23/10	202.30	298.19
04/24/10	124.15	602.18	138.12	609.85	04/24/10	166.89	271.86
04/25/10	115.30	569.77	135.53	563.32	04/25/10	148.27	290.62
04/26/10	122 65	544.26	137.44	591.75	04/26/10	174 27	309.92
04/27/10	129.83	591.98	142.20	644.36	04/27/10	193.08	372.62
04/28/10	129.91	636.55	144.90	674.43	04/28/10	193.59	380.50
04/29/10	118 80	590 42	133 17	554 48	04/29/10	156 65	380 88
04/30/10	133.00	620.97	139 92	618 10	04/30/10	180.28	354 85 1
05/01/10	133 81	622 12	140 10	638 74	05/01/10	186 65	426 04
05/02/10	135.02	645 48	138 48	626 63	05/02/10	187 87	407 87 1
05/03/10	132 79	642 27	139 83	659 93	05/03/10	181 61	343 37
05/04/10	118 63	593 64	131 45	557 87	05/04/10	141 25	315 20
05/05/10	118.38	528 37	132 66	558 62	05/05/10	140.17	327 78
05/06/10	130.96	627.96	138 15	623 39	05/06/10	194 35	444 50 1
05/07/10	133 52	634 69	139 16	641 91	05/07/10	193 52	413 38
05/08/10	135 22	611 72	138 40	649 13	05/08/10	190.02	389 57
05/09/10	132.94	594 90	137 98	657 41	05/09/10	188 19	353 27
05/10/10	134.20	659 15	137 99	645 30	05/10/10	188 56	256 53
05/11/10	131 16	600 72	137 21	622 94	05/11/10	193.80	261 25
05/12/10	130.94	593 69	139 11	809 78	05/12/10	178 57	267 29
05/13/10	120.75	358 16	127 64	712 45	05/13/10	120.66	259 01
05/14/10	123.31	550.10	130.55	687 28	05/14/10	153 36	319 28 1
05/15/10	130.54	566 24	131 74	744 47	05/15/10	168 11	298 66 1
05/16/10	133 72	620.99	127 80	699 88	05/16/10	178 50	280 58
05/17/10	128.86	628 66	131 95	724 25	05/17/10	148 64	274 34
05/18/10	139.00	652 40	133 13	874 26	05/18/10	139 76	347 60
05/19/10	137 69	668 23	134 71	909 85	05/19/10	151.80	303 29
05/20/10	110 45	486 97	123.29	612 22	05/20/10	086 78	281 96
05/21/10	137.81	621 52	138.13	634.36	05/21/10	160 87	398.94
05/22/10	128 98	440 82	125 87	513 90	05/22/10	136 45	330 53
05/23/10	117.73	493.13	129.19	549.48	05/23/10	136.48	286.18
05/24/10	125.07	524.49	133.57	609.88	05/24/10	151.93	319.59
05/25/10	133.82	603.41	138.13	673.53	05/25/10	170.51	332.74
05/26/10	122.85	449.00	133.46	604.65	05/26/10	149.56	301.71
05/27/10	133.36	465.31	139.34	651.10	05/27/10	166.78	338.11
05/28/10	137.19	510.74	135.82	613.53	05/28/10	173.76	340.59 i
05/29/10	137.43	486.52	138.76	632.15	05/29/10	173.97	334.18
05/30/10	137.46	372.07	141.81	660.40	05/30/10	172.38	310.85
05/31/10	137.99	410.92	140.35	642.84	05/31/10	174.68	308.84
06/01/10	136.83	387.83	137.92	630.47	06/01/10	177.47	306.36
06/02/10	132.42	371.00	137.61	616.92	06/02/10	179.12	298.81
06/03/10	132.54	567.66	139.65	627.15	06/03/10	181.52	311.22
06/04/10	126.94	481.74	136.11	589.56	06/04/10	154.57	286.53
06/05/10	126.79	508.83	136.55	589.18	06/05/10	162.56	321.74
06/06/10	127.60	533.19	136.66	593.55	06/06/10	160.23	363.79
06/07/10	135.73	626.34	134.21	583.27	06/07/10	179.65	440.57
06/08/10	133.07	578.90	140.49	643.06	06/08/10	184.66	431.66
06/09/10	135.37	601.02	142.40	661.79	06/09/10	181.81	416.92

1	WDW-1		WDW-2			WD	W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
06/10/10	135.33	596.69	142.66	665.91	06/10/10	182.06	399.61	
06/11/10	133.37	551.43	141.55	662.22	06/11/10	185.25	355.12	
06/12/10	131.83	556.90	140.82	665.25	06/12/10	184.27	317.00	
06/13/10	131.40	525.45	139.62	662.66	06/13/10	185.97	359.27	
06/14/10	129.47	517.32	138.54	666.26	06/14/10	183.20	363.67	
06/15/10	132 07	597 01	139 14	663.93	06/15/10	184 61	306 95	
06/16/10	131 58	602.04	138 97	666.00	06/16/10	183.89	278.06	
06/17/10	131 33	512 66	138 86	666.33	06/17/10	182 57	265 99	
06/18/10	130.94	511 79	138.92	666 79	06/18/10	183.07	251 85	
06/19/10	129 64	594 90	137 27	652.99	06/19/10	175 07	257 01	
06/20/10	131.06	566 55	137 55	655 73	06/20/10	178 63	349 43	
06/21/10	132 60	550.85	135.91	644 87	06/21/10	183 43	359 07	
06/22/10	131 93	612 23	134 98	641 26	06/22/10	184 32	376 13	
06/23/10	128 00	521 61	137 56	662 82	06/23/10	185 26	101 10 I	
06/24/10	120.00	415 23	136.67	654 03	06/24/10	176 03	373 84	
06/25/10	130.22	610 13	137.74	666 10	06/25/10	183 58	301 78	
06/26/10	131 27	158 68	137 35	667 /3	06/26/10	182 74	202 12 1	
06/27/10	130.27	150.00	137.00	667 10	06/27/10	170 35	207 03 1	
06/28/10	126.24	283 04	136.35	657 13	00/27/10	175.00	231.33	
06/20/10	120.24	200.94	130.55	660.01	06/20/10	176 58	325.47	
06/30/10	125.47	346 68	137 35	652 40	00/23/10	178.83	306 50 1	
07/01/10	120.00	300.00	136.70	6/2 00		173.18	303 60 1	
07/02/10	120.01	365 78	137.50	650 70	07/02/10	1 1 80 50	320.51	
07/02/10	120.77	375.06	137.50	655 25	07/02/10	175 /0	361 35 1	
07/03/10	127.00	1 462 25	137.45	657 /2	07/03/10	177.92	112 66 1	
07/04/10	127.00	659 10	137.59	652 77	07/04/10	174.00	415.00	
07/06/10	125.00	1 606 06	136.64	647 69	07/06/10	176.97	453.04 153.66	
07/07/10	120.00	631.81	135.76	637 02		167.20	405.00 106 13	
07/08/10	1 006 27	1 165 70	115.70	102 12	07/08/10	051 01	128 07 1	
07/00/10	135.08	1 400.75	112.07	660 80	07/00/10	152/0	201 00 1	
07/10/10	130.00	567 31	1/11/36	656.26	07/10/10	1 1 80 13	352 54	
07/10/10	1 1 20 45	630.31	141.00	657 30	07/11/10	170.10	302.34 304 12	
07/12/10	1 1 30.45	675.05	140.95	653 25	07/12/10	119.40	339 05 1	
07/13/10	1 130.19	677 00	140.44	653.20	07/13/10	1 1 8 1 70	330.93 200 81	
07/13/10	136.35	761 10	126 72	520 46	07/14/10	188.50	288.84	
07/15/10	130.33	761 78	138.24	661 99		170 04	200.04	
07/16/10	130.23	718 72	138 50	654 57	07/16/10	181 50	315 57	
07/17/10	130 15	715 29	138 88	658 91	07/17/10	182 74	310 30	
07/18/10	129.33	684 87	139 74	669.57	07/18/10	181.98	303 60 1	
07/19/10	129.23	669.19	139.98	672.46	07/19/10	183.08	297 69	
07/20/10	130.12	664.20	139.76	668.20	07/20/10	178 70	285 64	
07/21/10	129.85	645.00	139 23	662 41	07/21/10	180.37	270 20 1	
07/22/10	130 76	605 78	138.86	664 60	07/22/10	178 69	267 33	
07/23/10	128.98	640 22	139 47	666 40	07/23/10	180.95	278 72 1	
07/24/10	129 21	611 87	139 27	672 83	07/24/10	178 94	300 17	
07/25/10	1 1 29 17	457 63	138 18	669 76	07/25/10	176 35	309 95 1	
07/26/10	129.34	502.84	139 60	677 40	07/26/10	175 48	304.01	
07/27/10	120.04	1 620 21	130.00	678 65	07/27/10	178.40	324 26	
07/28/10	131 07	667 27	132 83		07/29/10	182 00	347.20 347.70	
07/20/10	130 40	631 56	135.62	628 5/	07/20/10	182 02.33	366 01	
07/30/10	120.49	636.99	133.02	668 34	07/20/10	177 72	330 44 1	
07/31/10	129.03	1 688 06	140.00	670.04	07/21/10	170 51	320.44	
08/01/10	120.00	720 05	130.20	668 12	07/01/10	180 12	020.90 020 12	
00/01/10	1.120.07	1120.00	1.00.23	000.12	1 00/01/10		200.10	

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1 1	WDW-1		WDW-2		·	WD'	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
08/02/10	131.19	754.44	137.87	659.05	08/02/10	177.96	285.21
08/03/10	129.44	771.93	140.36	679.14	08/03/10	179.81	283.86
08/04/10	130.23	720.74	139.06	670.56	08/04/10	182.37	294.49
08/05/10	127.30	707.12	139.85	674.85	08/05/10	181.07	247.34
08/06/10	125.04	675.79	140.63	690.07	08/06/10	181.45	208.06
08/07/10	129.80	653.99	140.00	680.34	08/07/10	177.98	195.23
08/08/10	128.91	666.16	139.07	672.68	08/08/10	179.53	216.00
08/09/10	125.96	629.80	140.71	688.97	08/09/10	179.81	253.65
08/10/10	126.74	576.53	140.06	684.28	08/10/10	178.08	272.30
08/11/10	129.82	614.23	139.38	679.47	08/11/10	178.82	263.49
08/12/10	129.00	662.84	138.73	675.66	08/12/10	180.03	265.11
08/13/10	129.29	671.82	138.57	672.57	08/13/10	180.18	286.44
08/14/10	129.01	692.96	138.67	674.28	08/14/10	175.43	318.16
08/15/10	129.67	691 17	140 27	692.96	08/15/10	181 59	348.30
08/16/10	129.93	660 66	140 58	693.33	08/16/10	180 45	368 92
08/17/10	132 42	643 63	139 47	687 41	08/17/10	178 40	384 77
08/18/10	131 60	662.32	139.63	690.00	08/18/10	178 42	395.07
08/19/10	132 23	667 43	140 22	697.09	08/19/10	177 29	410 75
08/20/10	132 71	614 66	140.22	703 92	08/20/10	173 93	398 46 1
08/21/10	131 93	670 14	139 94	694.83	08/21/10	179.85	390.93
08/22/10	130 65	596.31	139 16	687.96	08/22/10	180.56	396 80
08/23/10	131 12	541.08	138 35	683.09	08/23/10	180.21	370 21
08/24/10	129 13	533 67	138 82	688 68	08/24/10	180.62	377 45
08/25/10	127.87	365 20	140.37	707 98	08/25/10	180.33	368 56
08/26/10	130.06	424 14	139.89	705 76	08/26/10	177 54	306 30
08/27/10	127 07	389 43	138 87	695 47	08/27/10	179 69	243.96
08/28/10	128.89	410 31	140.09	706.05	08/28/10	178 16	209.93
08/29/10	128.00	470.01	138.52	693 57	08/29/10	178 71	249 73
08/30/10	132.66	536 42	139 11	693 73	08/30/10	177 53	268 46 1
08/31/10	129.06	355.84	140.37	710.37	08/31/10	181 01	277 47
09/01/10	131 19	458 14	139 20	691 55	09/01/10	177 73	259 40 1
09/02/10	132 49	629 57	141 17	700 81	09/02/10	179.83	260.40
09/03/10	133.04	509 57	140.56	692.06	09/03/10	179.96	220 60
09/04/10	130 44	375.02	140.24	699.16	09/04/10	177.46	186.90
09/05/10	130 77	430.01	140 64	703 25	09/05/10	167.48	214.42
09/06/10	128 60	533 61	137 47	669 63	09/06/10	181 48	256 01
09/07/10	129.13	564.98	139.35	688.34	09/07/10	179.49	324.78
09/08/10	129.66	596.34	143.84	732.29	09/08/10	180.43	346.19
09/09/10	130.19	627.70	138.55	680.42	09/09/10	179.36	345.46
09/10/10	130.72	659.07	140.34	700.04	09/10/10	176.71	292.40
09/11/10	130.81	686.32	140.16	698.30	09/11/10	177.26	261.56
09/12/10	130.12	691.50	139.67	697.27	09/12/10	174.29	258.19
09/13/10	128.85	693.41	138.04	681.37	09/13/10	178.49	256.55
09/14/10	130.47	702.68	140.89	707.78	09/14/10	180.04	290.53
09/15/10	132.32	711.33	140.91	705.74	09/15/10	180.59	305.47
09/16/10	132.78	706.91	134.37	638.58	09/16/10	184.04	322.98
09/17/10	123.93	685.33	140.13	704.32	09/17/10	180.71	328.56
09/18/10	124 65	667 08	139 10	698.06	09/18/10	181 51	278 63
09/19/10	133 47	648 33	141 94	718 04	09/19/10	180 59	272 74
09/20/10	142 29	629 58	140 42	701 98	09/20/10	179 66	298 86
09/21/10	1151 11	610 83	140 12	700 77	09/21/10	177 28	324 78
09/22/10	142 60	650 74	135.05	654 14	09/22/10	172 20	328.05
09/23/10	130.62	688.72	130.70	604.22	09/23/10	135.62	317.11
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1	WDW-1		WDW-2				W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
09/24/10	125.42	643.26	139.35	702.14	09/24/10	189.29	292.80 [']	
09/25/10	119.18	591.19	140.33	714.90	09/25/10	181.41	335.29	
09/26/10	112.94	539.11	121.50	504.18	09/26/10	090.75	262.36	
09/27/10	106 70	487 03	124 95	537 65	09/27/10	117 88	191 53	i
09/28/10	100 46	434 96	130 16	599.08	09/28/10	144 82	402 74	
09/29/10	094 21	382.88	139 62	700.82	09/29/10	188 46	428.01	
09/30/10	087 97	330.80	147 35	773 79	09/30/10	114 85	322 44 1	
10/01/10	080 45	283.06	155 20	846 84			022.44	
10/02/10	076 24	270 07	101.20	275 20	10/02/10		003.30	i
10/03/10	122.86	503 72	132 13	580 /6	10/02/10	1/15 31	122 00 1	i
10/04/10	125.00	667 01	130.81	677 60	10/03/10	182 78	3/1 38	i
10/05/10	127.12	682 38	130.01	673.85		102.70	341.50	
10/06/10	126.28	660 60	130.85	677.03	10/06/10	191.23	071 /3	
10/07/10	120.20	669 91	139.00	676 27		100.54	27 1.40 276 26	
10/07/10	125.72	667 56	140 02	700.57	10/07/10	192.34	240.30 270 25	
10/00/10	125.01	660 12	140.93	700.75		190.75	210.00	
10/09/10	125.10		140.94	701.29		190.93	200.00	
10/10/10	120.47	671 90	141.17	702.09		190.30	210.30 107.71	
10/11/10	125.40	674 62	141.19	705.05 600.01		100.29	000 50 1	
10/12/10	120.90	660 22	140.00	602 14	10/12/10	104.91	202.52	
10/13/10	124.31	670 65	139.42	602.02	10/13/10	103.03	201.10	
10/14/10	120.90	602.00	140.11 127.70	093.02 670.20	10/14/10	190.20	201.00	
10/15/10	127.07	600 25	140 50	600.20	10/15/10	101.97	270.00	
10/10/10	120.04	600.20	140.59	600.32	10/10/10	109.44	701.31 704.24	
10/17/10	120.04	600.90	140.59	701 15	10/17/10	109.44	701.31 701.21	
10/10/10	120.04	670.90	140.40	101.15 600.50		109.44	101.31 606 07	
10/19/10	127.21	602 61	139.30	605.00	10/19/10	100.00	000.01	
10/20/10	127.00	670 12	139.55	607 20	10/20/10	100.00	000.00 607 66	
10/21/10	120.00	670 12	139.00	696.04	10/21/10	100.00	097.00	
10/22/10	120.00	675 66	130.00 140.64	709 34	10/22/10	191.09	709.07 702.11	
10/24/10	126.20	679.67	141.20	712 25	10/23/10	186.80	602.11	
10/25/10	126.42	679.67	140.78	706 71	10/25/10	180.66	032.12	
10/26/10	120.42	672 38	140.70	704 62	10/26/10	103.00	706.83	
10/27/10	124.02	672.38	140.37	704.02	10/27/10	190.67	706.53	(
10/28/10	136 98	747 95	116 76	325.51	10/28/10	206.81	764 10	1
10/29/10	142.08	779 16	098.65	127 84	10/29/10	200.01	790 72	
10/30/10	142.08	779 16	114.37	442 85	10/30/10	186.82	684 11	
10/31/10	142.08	779 16	137.98	685.08	10/31/10	186.82	684 11	1
11/01/10	127 47	683 61	136.92	655 68	11/01/10	189.92	698 40 1	
11/02/10	127.78	685.13	137.19	689.79	11/02/10	188.75	689.02	1
11/03/10	126.62	679.63	136.17	672 94	11/03/10	188 02	675 21	
11/04/10	126 71	686 33	136 67	682 73	11/04/10	188.34	697 97	r
11/05/10	128.22	693 80	136.04	686 60	11/05/10	186 68	688 60 1	ł
11/06/10	128.14	689 26	135.07	675.34	11/06/10	191 15	700 47	i
11/07/10	126.80	686.13	137.48	692.62	11/07/10	189.05	688 56 1	
11/08/10	127 21	690.89	137 64	705.88	11/08/10	185 42	683 14	
11/09/10	125.48	674.54	136.87	692.13	11/09/10	186.32	682 83	
11/10/10	125 25	678 07	135.01	518 14	11/10/10	192 49	720 95	
11/11/10	000 00	281 64	000 00	289 22	11/11/10	202.09	751 23	
11/12/10	000 00	279 95	000 00	279 72	11/12/10	000 00	284 15	
11/13/10	121.86	632.69	137.46	563.91	11/13/10	190 76	696 47	
11/14/10	128.04	681.42	137.46	661.87	11/14/10	182 25	681 42	ł
11/15/10	128.04	686.36	137.46	554.05	11/15/10	182.03	666.80	1

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1	WDW	-1	WDW-2		WDV		W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
11/16/10	128.04	676.66	137.46	676.66	11/16/10	186.62	691.29
11/17/10	124.90	676.66	137.46	661.87	11/17/10	186.62	691.29
11/18/10	128.04	671.73	137.46	607.96	11/18/10	186.62	691.04
11/19/10	124.90	671.73	137.46	691.29	11/19/10	190.98	686.36
11/20/10	127.88	671.48	137.46	686.60	11/20/10	186.62	686.36
11/21/10	128.04	666.80	137.46	701.15	11/21/10	186.83	681.67
11/22/10	128.04	656.94	134.32	578.54	11/22/10	182.25	681.42
11/23/10	121.86	652.17	137.46	661.87	11/23/10	177.89	681.42
11/24/10	124.90	671.73	134.32	666.80	11/24/10	182.25	686.36
11/25/10	124.90	671.73	134.32	652.17	11/25/10	177.89	676.66
11/26/10	121.86	681.42	137.46	607.96	11/26/10	177.89	671.48
11/27/10	118.72	671.73	134.32	622.75	11/27/10	182.25	671.73
11/28/10	118.72	671.73	134.32	607.96	11/28/10	177.89	676.66
11/29/10	118.72	666.80	134.32	671.73	11/29/10	182.25	681.421
11/30/10	118.72	676.66	134.32	632.20	11/30/10	173.52	666.80
12/01/10	115.58	656.94	134.32	666.80	12/01/10	178.11	671.73
12/02/10	118.72	676.66	131.18	652.17	12/02/10	177.89	666.80
12/03/10	071.82	298.39	096.84	284.33	12/03/10	000.00	289.26
12/04/10	118.72	666.80	134.32	578.54	12/04/10	190.98	691.53
12/05/10	103.12	666.80	137.46	622.75	12/05/10	186.62	681.42
12/06/10	118.72	666.80	134.32	676.66	12/06/10	190.98	691.29
12/07/10	118.72	666.80	131.18	652.17	12/07/10	186.62	691.29
12/08/10	118.72	671.73	134.32	671.73	12/08/10	190.76	691.29
12/09/10	118.72	676.66	134.32	666.80	12/09/10	190.98	695.97
12/10/10	118.72	675.41	131.18	583.47	12/10/10	182.25	681.19
12/11/10	121.86	676.66	140.60	632.45	12/11/10	182.25	671.73
12/12/10	118.72	681.42	137.46	681.42	12/12/10	177.89	661.87
12/13/10	118.72	671.73	134.32	622.75	12/13/10	186.62	696.22
12/14/10	121.86	686.36	121.86	568.67	12/14/10	186.62	706.08
12/15/10	114.17	658.75	134.32	647.24	12/15/10	182.25	671.73
12/16/10	106.16	607.96	134.32	534.49	12/16/10	169.31	622.75
12/17/10	109.30	632.45	137.46	573.61	12/17/10	173.52	637.38
12/18/10	143.79	824.50	106.16	294.20	12/18/10	000.00	289.26
12/19/10	068.78	294.20	106.16	284.33	12/19/10	000.00	289.26
12/20/10	071.82	279.57	103.27	294.20	12/20/10	000.00	284.33
12/21/10	121.71	676.90	137.46	563.91	12/21/10	195.13	695.97
12/22/10	118.72	676.66	140.60	603.03	12/22/10	186.62	661.87
12/23/10	115.58	656.94	140.60	588.40	12/23/10	190.98	686.36
12/24/10	115.42	661.87	140.60	681.42	12/24/10	186.83	691.29
12/25/10	118.72	691.29	134.32	627.52	12/25/10	190.98	686.36
12/26/10	118.72	686.36	140.60	637.38	12/26/10	190.98	681.42
12/27/10	118.72	681.42	140.60	647.24	12/27/10	186.83	691.29
12/28/10	112.44	666.80	140.60	593.33	12/28/10	190.76	696.22
12/29/10	118.53	676.66	140.60	676.66	12/29/10	195.35	691.29
12/30/10	117.11	681.42	140.60	681.42	12/30/10	190.98	696.22
12/31/10	115.58	673.03	137.46	666.80	12/31/10	190.98	696.22
01/01/11	000.00	725.64	140.60	725.64	01/01/11	182.25	686.36
01/02/11	118.72	671.73	140.60	656.94	01/02/11	182.25	676.66
01/03/11	118.72	691.29	137.46	671.73	01/03/11	186.62	701.15
01/04/11	118.72	691.29	137.46	661.87	01/04/11	190.98	701.15
01/05/11	118.72	686.36	140.60	696.22	01/05/11	190.98	696.22
01/06/11	124.90	686.36	140.60	701.15	01/06/11	190.98	696.22
01/07/11	121.86	686.36	140.60	691.29	01/07/11	195.35	691.29

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	WDW-1		WDW-2		WDW		W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
01/08/11	118.72	691.29	140.60	686.36	01/08/11	182.25	676.66
01/09/11	118.72	681.42	140.60	691.29	01/09/11	195.35	706.08
01/10/11	118.56	676.66	140.60	701.15	01/10/11	195.35	706.08
01/11/11	112.44	681.42	137.46	593.33	01/11/11	195.13	691.29 i
01/12/11	106.16	666.80	140.60	607.96	01/12/11	190.98	696.22
01/13/11	115.58	671.73	137.46	652.17	01/13/11	186.62	696.22
01/14/11	115.58	696.22	137.46	632.45	01/14/11	190.98	706.08
01/15/11	115.58	696.22	137.46	632.45	01/15/11	190.98	706.08
01/16/11	116.27	696.22	134.32	652.17	01/16/11	190.76	706.08
01/17/11	115 58	701 15	140.60	607.96	01/17/11	186.62	681.42
01/18/11	114 96	691 29	143 64	647 24	01/18/11	190 98	701 15
01/19/11	115 58	691 29	137 46	652 17	01/19/11	190.98	701 15
01/20/11	115 58	691 29	137 46	656 94	01/20/11	190.98	701 15
01/21/11	112 44	686 36	137 62	642 31	01/21/11	186.62	701.10
01/22/11	112.44	681 42	137.02	588 40	01/22/11	100.02	606 22 1
01/22/11	112.44	686 60	137.40	603.40	01/22/11	186.62	701 15
01/23/11	112.44	666 80	137.40	701 15	01/23/11	100.02	710 85
01/24/11	112.44	601 20	121.40	612 90	01/24/11	196.50	606 22 1
01/25/11	112.44	427 11	104.40 102.12	257.07	01/25/11		204 06
01/20/11	115 50	710.95	140 60	612 00	01/20/11	172 52	SU4.00
01/27/11	110.00	606.26	140.00	520 56	01/27/11	100.02	706 09
01/20/11	1 1 2 .44 1 1 2 <i>4 4</i>	696.30	137.77	529.00	01/20/11	190.90	
01/29/11	112.44	601.30	140.00	000.70	01/29/11	100.02	
01/30/11	100.20	091.29	140.00	002.17	01/30/11	195.35	
01/31/11	109.30			032.45	01/31/11		
02/01/11	037.00				02/01/11		
02/02/11	521.11			480.41	02/02/11		
02/03/11	309.10		037.08	410.81	02/03/11	010.79	382.70
02/04/11	130.53	725.04	137.40	578.54	02/04/11		080.30
02/05/11	074.90	353.04	103.12	372.59	02/05/11		299.13
02/06/11	071.82	353.04	099.98	318.93	02/06/11		299.13
02/07/11	060.14	254.91	140.60	431.43	02/07/11	195.35	720.71
02/08/11	109.30	050.94	099.98	083.32	02/08/11	201.52	
02/09/11	174.94		131.18	455.92	02/09/11	143.48	974.90
02/10/11	074.33	328.55	102.97	490.28	02/10/11		152.02
02/11/11	140.00	019.70	099.98	400.95	02/11/11	117.23	490.28
02/12/11	112.44		137.40	400.80	02/12/11	099.78	485.34
02/13/11	143.04	598.09	159.35	485.34	02/13/11	129.90	572.04
02/14/11	137.40		109.30	034.49	02/14/11	134.34	579 54
02/15/11	149.92		102.30	514.70	02/15/11		578.54
02/10/11	134.32			000.40	02/10/11		598.09
02/17/11	143.04	000.09	159.50	524.38	02/17/11	104.94	598.09
02/18/11	149.92	603.03	165.52		02/18/11	147.49	568.67
02/19/11	146.78	612.89	159.35	603.03	02/19/11	173.31	603.27
02/20/11	159.72	5/3.02	156.20	426.50	02/20/11	151.85	558.98
02/21/11	153.06	622.75	156.20	470.72	02/21/11	160.58	603.03
02/22/11	074.96	338.24	099.98	357.97	02/22/11	000.00	308.82
02/23/11	146.78	626.26	156.20	500.14	02/23/11	164.94	598.09
02/24/11	097.40	398.45	099.98	490.28	02/24/11	00.00	308.82
02/25/11	168.66	725.64	171.80	554.05	02/25/11	199.56	696.22
02/26/11	074.96	362.90	099.98	476.14	02/26/11	000.00	308.82
02/27/11	165.52	705.84	174.94	588.40	02/27/11	195.35	681.42
02/28/11	162.38	686.36	178.09	632.45	02/28/11	190.98	686.36
03/01/11	168.66	715.78	174.94	563.91	03/01/11	186.62	671.73
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1 1	WDW	-1	WDV	V-2		WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
03/02/11	168.66	720.71	171.80	431.43	03/02/11	195.35	681.42
03/03/11	124.90	573.61	184.26	588.40	03/03/11	212.65	745.20
03/04/11	140.60	647.49	143.64	416.81	03/04/11	130.18	519.70
03/05/11	131 18	607.96	099.98	362.90	03/05/11	000.00	309.07
03/06/11	215 46	956 07	099 98	377 53	03/06/11	173 52	607 96
03/07/11	140 60	617 82	099 98	357 97	03/07/11		309.07
03/08/11	205.99	896.99	149 92	441 30	03/08/11	004 36	402 01
03/09/11	212 43	931 58	149 92	455 92	03/09/11	134 54	519 70
03/10/11	209 59	916.79	146.78	392.32	03/10/11	138 91	539 25
03/11/11	234 20	1000.1	134 32	446.23	03/11/11	104 14	470 97
03/12/11	106.00	490 28	099 98	392 81	03/12/11	000.00	318 68
03/13/11	218 60	995.36	134.32	451.16	03/13/11	130 18	500 14
03/14/11	221 74	1000.1	143.64	490.28	03/14/11	138 91	529 56
03/15/11	221.74	1000.1	146.78	573.61	03/15/11	125.81	500 14
03/16/11	203.00	902.16	159.35	519.70	03/16/11	173.52	622 75
03/17/11	118 72	558.98	156.20	509.83	03/17/11	161 02	568 92
03/18/11	146 78	681.42	162.38	455.92	03/18/11	190 98	642 31
03/19/11	215.46	990.43	140.60	509.83	03/19/11	134 54	514 76
03/20/11	115 58	529.56	106.16	509.83	03/20/11		352 79
03/21/11	209 29	975.63	149.92	539.25	03/21/11	151 85	549 12
03/22/11	209 29	965.69	168.66	534.49	03/22/11	195 35	676 66
03/23/11	212 43	980.56	149.92	549.12	03/23/11	160.58	568 67
03/24/11	212.10	965.69	099.98	509.83	03/24/11		308 82
03/25/11	212 58	995.36	156 20	544 19	03/25/11	186 62	642 31
03/26/11	212 27	990 43	153.06	519 70	03/26/11	169.31	583 47
03/27/11	209 29	970 70	159 35	524 63	03/27/11	177 89	612.89
03/28/11	209 29	970.70	099 98	500 14	03/28/11		279 57
03/29/11	209.29	975.88	162.38	519.70	03/29/11	186.62	627.52
03/30/11	215.46	1000.1	153.06	524.63	03/30/11	170.78	581.74
03/31/11	218.60	1000.1	159.35	524.63	03/31/11	169.31	588.40
04/01/11	228.03	1000.1	162.38	524.63	04/01/11	186.62	622.75
04/02/11	221.74	1000.1	159.35	490.28	04/02/11	177.89	607.96
04/04/11	215.46	1000.1	100.14	529.56	04/04/11	000.00	294.20
04/05/11	220.98	1000.1	156.20	485.34	04/05/11	173.52	603.03
04/06/11	209.29	1000.1	134.32	500.14	04/06/11	134.54	514.76
04/07/11	169.65	411.26	099.98	279.57	04/07/11	000.00	328.55
04/08/11	200.00	912.00	167.92	550.00	04/08/11	043.49	656.94
04/09/11	216.92	1002.2	160.00	581.00	04/09/11	129.00	615.00
04/10/11	218.00	1010.3	180.00	640.00	04/10/11	157.08	729.00
04/11/11	225.00	1050.0	164.00	506.92	04/11/11	143.00	652.00
04/12/11	221.92	1037.2	175.00	446.92	04/12/11	151.08	701.00
04/13/11	220.00	1034.2	170.00	568.00	04/13/11	148.00	681.92
04/14/11	218.00	1020.8	173.00	480.92	04/14/11	149.67	673.00
04/15/11	220.83	1034.3	167.08	599.00	04/15/11	139.92	647.00
04/16/11	135.00	629.00	162.00	489.00	04/16/11	136.92	635.00
04/17/11	200.00	932.92	128.08	553.00	04/17/11	075.92	469.00
04/18/11	222.08	1043.1	166.00	533.92	04/18/11	140.00	653.00
04/19/11	216.92	1023.9	164.08	517.00	04/19/11	140.00	652.00
04/20/11	111.08	540.08	102.00	512.00	04/20/11	000.00	347.00
04/21/11	108.00	532.00	101.00	461.00	04/21/11	218.83	988.75
04/22/11	080.00	377.00	101.00	525.08	04/22/11	000.00	348.00
04/23/11	140.00	663.00	162.92	568.00	04/23/11	136.00	644.00
04/24/11	135.08	649.00	158.00	572.00	04/24/11	129.08	623.00

1	WDW	-1	WDV	V-2	1 1	WD	W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
04/25/11	153.08	727.00	176.00	562.00	04/25/11	148.00	694.00	I I
04/26/11	115.00	564.00	145.00	551.08	04/26/11	102.08	536.00	i
04/27/11	147.92	707.00	171.92	540.00	04/27/11	145 08	676.00	i
04/28/11	153 00	731 00	175.00	509.00	04/28/11	151 00	699.00	i
04/29/11	153 92	731.00	174.08	611 00	04/29/11	152 08	694 00	i
04/30/11	145 08	695 08	173.00	594.00	04/30/11	148 17	603.00	¦ .
05/01/11	150.00	718.00	176.00	566.00	05/01/11	155.00		
05/02/11		507 50		567.08	05/02/11		258 17	
05/02/11		224 00	175.00	501.00	05/02/11		1 200.17	ļ
05/03/11	150.00	724.00	175.00	564.00	05/03/11	151.00		ļ
05/04/11	140.00	716.00	173.00	500.00	05/04/11	151.00	702.00	
05/05/11	070.00	442.25	101 00	500.00	05/05/11		252.00	
05/00/11		443.23						ļ
05/07/11	149.00	701.00	179.00			149.00		!
05/06/11	145.92		174.00	574.00	05/08/11			ļ
05/09/11	147.00	713.00	170.92	500.08	05/09/11	152.08	712.00	ļ
05/10/11	151.08	736.00	176.00	581.00	05/10/11	149.00	704.00	ļ
05/11/11	140.00	686.00	165.00	638.00	05/11/11	140.00	666.00	ļ
05/12/11	153.08	742.00	173.00	570.00	05/12/11	148.83	693.00	ļ
05/13/11	149.00	725.00	176.00	573.00	05/13/11	152.08	715.00	ļ
05/14/11	145.08	659.92	164.00	590.00	05/14/11	141.92	658.92	ļ
05/15/11	147.00	718.00	171.00	558.00	05/15/11	157.00	724.00	ļ
05/16/11	151.17	735.00	176.00	621.00	05/16/11	150.08	697.00	
05/17/11	150.00	719.00	173.00	578.00	05/17/11	147.08	686.00	ļ
05/18/11	146.92	709.00	175.00	590.00	05/18/11	152.83	706.00	ł
05/19/11	146.92	707.00	172.92	606.08	05/19/11	152.17	714.00	ļ
05/20/11	146.08	710.00	171.92	605.00	05/20/11	154.00	715.00	ļ
05/21/11	146.92	710.00	171.00	533.00	05/21/11	152.08	714.00	
05/22/11	146.00	711.00	171.08	593.00	05/22/11	151.08	715.00	
05/23/11	146.92	712.00	172.00	608.00	05/23/11	152.00	713.00	
05/24/11	146.08	713.00	172.00	549.00	05/24/11	151.92	712.00	
05/25/11	147.00	715.00	172.00	583.08	05/25/11	151.08	714.00	
05/26/11	146.92	713.00	171.00	558.00	05/26/11	153.08	711.00	
05/27/11	146.92	711.00	175.46	616.00	05/27/11	149.92	706.00	
05/28/11	148.92	724.00	175.00	535.08	05/28/11	144.92	692.00	
05/29/11	145.00	709.00	172.00	562.00	05/29/11	148.17	701.00	
05/30/11	144.00	708.00	172.00	573.00	05/30/11	149.17	701.00	
05/31/11	142.92	708.00	171.00	549.92	05/31/11	148.00	701.00	
06/01/11	144.00	705.00	171.08	570.00	06/01/11	149.08	697.00	
06/02/11	145.00	705.00	171.08	560.00	06/02/11	147.92	692.00	
06/03/11	145.08	703.92	170.00	505.00	06/03/11	152.00	697.92	
06/04/11	163.92	759.00	179.08	621.00	06/04/11	163.08	755.00	
06/05/11	159.00	782.00	178.00	685.00	06/05/11	163.00	755.00	
06/06/11	157.00	773.00	183.08	681.00	06/06/11	163.00	765.00	
06/07/11	157.08	775.08	182.92	690.92	06/07/11	163.08	766.00	
06/08/11	150.92	742.00	174.00	682.92	06/08/11	152.75	722.00	
06/09/11	164.08	807.00	182.00	666.00	06/09/11	167.83	791.00	
06/10/11	150.08	735.00	175.00	543.00	06/10/11	152.92	719.00	
06/11/11	137.00	682.00	164.92	581.00	06/11/11	138.00	671.00	
06/12/11	148.00	730.00	173.92	526.00	06/12/11	152.92	726.00	
06/13/11	174.08	677.83	168.00	575.92	06/13/11	146.17	678.83	
06/14/11	149.92	736.92	176.00	580.08	06/14/11	152.92	715.00	
06/15/11	151.00	741.00	175.92	539.08	06/15/11	149.00	710.00	
06/16/11	149.00	735.00	174.00	596.00	06/16/11	152.92	722.92	
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43.64

1	WDW	-1	WDV	V-2		WD	W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
06/17/11	151.92	731.00	172.57	608.56	06/17/11	147.08	712.00	l
06/18/11	152.00	736.00	176.08	563.00	06/18/11	147.92	714.00	ĺ
06/19/11	153.00	735.00	174.00	582.00	06/19/11	i 150.00 i	721.00	ĺ
06/20/11	151.00	740.00	175.00	619.00	06/20/11	150.08	726.00	i
06/21/11	149.08	739.00	174.00	587.00	06/21/11	149.92	724.00	İ
06/22/11	150.08	739.08	175.00	604.00	06/22/11	150.92	724.08	Ĺ
06/23/11	149.58	737.71	175.71	613.11	06/23/11	150.02	721.71	ĺ
06/24/11	149.92	737.00	175.00	583.24	06/24/11	149.83	721.92	ĺ
06/25/11	150.00	738.00	175.00	601.00	06/25/11	150.00	721.08	ĺ
06/26/11	150.00	735.92	175.92	589.00	06/26/11	150.92	719.00	ĺ
06/27/11	148.00	732.00	176.00	596.00	06/27/11	148.00 i	717.00	ĺ
06/28/11	082.00	413.08	102.00	589.00	06/28/11	000.00	369.00	Ĺ
06/29/11	150.92	746.00	174.00	594.00	06/29/11	147.08	714.08	i
06/30/11	082.00	418.08	102.00	582.08	06/30/11	000.00	372.00	i.
07/01/11	159.00	787.00	102.00	466.00	07/01/11	155.92	742.00	í
07/02/11	148.00	735.00	174.00	557.00	07/02/11	148.83	713.00	i.
07/03/11	081.00	397.00	102.00	564.00	07/03/11	000.00	371.00	i
07/04/11	149.00	740.00	174.00	556.00	07/04/11	149.00	723.00	ί.
07/05/11	149.92	740.00	173.92	572.00	07/05/11	148.00	724.00	ĺ
07/06/11	081.00	406.08	101.00	568.08	07/06/11	000.00	371.00	i
07/07/11	130.92	658.00	159.00	588.08	07/07/11	120.00	623.00	i
07/08/11	149.00	741.00	174.00	578.00	07/08/11	148.92	730.00	i
07/09/11	148.00	732.00	173.00	592.08	07/09/11	148.00	721.00	i
07/10/11	147.00	731.00	172.00	592.00	07/10/11	147.00	720.00	i
07/11/11	147.00	728.00	171.08	567.00	07/11/11	147.08	718.00	i
07/12/11	145.92	728.00	171.08	598.00	07/12/11	146.08	721.00	ĺ
07/13/11	145.92	729.00	170.00	606.00	07/13/11	148.08	723.00	í
07/14/11	145.00	729.00	166.92	577.00	07/14/11	148.17	726.92	İ
07/15/11	080.00	447.17	101.00	592.00	07/15/11	000.00	380.00	i
07/16/11	146.00	735.92	172.92	598.00	07/16/11	145.08	722.92	İ
07/17/11	181.17	671.42	165.92	588.92	07/17/11	136.75	655.50	i
07/18/11	146.00	741.00	172.00	608.00	07/18/11	141.00	707.00	i
07/19/11	080.00	410.08	102.00	604.08	07/19/11	000.00	378.00	Ĺ
07/20/11	144.92	730.00	172.92	583.00	07/20/11	146.00	724.00	ĺ
07/21/11	146.08	746.00	173.08	601.00	07/21/11	141.00	706.00	İ
07/22/11	148.00	744.00	173.08	618.00	07/22/11	139.17	696.00	İ
07/23/11	145.00	738.00	171.00	612.00	07/23/11	145.00	723.00	
07/24/11	144.92	740.00	171.08	634.08	07/24/11	146.08	721.00	ĺ
07/25/11	145.92	744.00	171.00	637.92	07/25/11	143.00	713.00	
07/26/11	146.08	747.00	171.00	622.00	07/26/11	139.92	706.00	
07/27/11	145.08	739.00	168.17	620.00	07/27/11	144.00	726.00	
07/28/11	145.08	744.00	170.92	617.00	07/28/11	145.92	729.00	
07/29/11	176.25	683.67	165.92	602.92	07/29/11	134.08	670.67	
07/30/11	080.00	416.08	100.08	564.00	07/30/11	000.00	388.00	
07/31/11	146.00	749.00	169.00	582.00	07/31/11	142.92	722.00	
08/01/11	145.00	744.00	170.92	595.00	08/01/11	143.92	728.00	
08/02/11	080.00	442.17	102.00	602.00	08/02/11	000.00	392.00	ļ
08/03/11	143.00	742.00	172.00	575.00	08/03/11	144.00	730.00	
08/04/11	143.00	745.00	170.00	608.00	08/04/11	143.00	727.00	١.
08/05/11	144.00	736.00	171.00	603.00	08/05/11	145.92	731.00	
08/06/11	140.92	732.00	171.92	610.00	08/06/11	146.17	734.00	
08/07/11	170.75	644.00	164.75	624.00	08/07/11	130.33	651.17	
08/08/11	143.00	752.00	169.08	606.00	08/08/11	145.75	737.00	

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1 1	WDW	-1	WDW	/-2		WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
08/09/11	142.92	752.00	169.00	595.00	08/09/11	144.92	736.00
08/10/11	143.00	751.00	169.00	581.00	08/10/11	145.83	735.00
08/11/11	143.00	753.00	169.00	578.00	08/11/11	145.92	736.00
08/12/11	143.00	749.08	167.92	582.00	08/12/11	145.08	732.00
08/13/11	143.00	751.00	168.00	598.00	08/13/11	144.83 i	733.00 i
08/14/11	143.00	750.00	168.08	604.00	08/14/11	142.17	731.00
08/15/11	079.00	518.33	101.00	604.00	08/15/11	000.00	404.00
08/16/11	143 00	754.00	167.92	603.00	08/16/11	141.92	731.00
08/17/11	143.00	759.92	167.00	605.00	08/17/11	143.92	730.00
08/18/11	141 08	748.00	170.92	650.00	08/18/11	143.08	737.00
08/19/11	141 00	749 00	171 00	634 00	08/19/11	143 00	738.00
08/20/11	141.00	751.00	171.00	621.00	08/20/11	145 92	740 00
08/21/11	142.00	748 00	171.00	596.00	08/21/11	144 17	738 00
08/22/11	141 08	748 00	171.00	630.00	08/22/11	144 08	739 00 1
08/23/11	141.00	747 00	170 92	627.00	08/23/11	143 92	737 00 1
08/24/11	079 00	430.08	102.00	606.00	08/24/11		401 00 1
08/25/11	154 08	721 92	168.00	618.00	08/25/11	139.00	713 92
08/26/11	138.00	738 02	172 00	651.00	08/26/11	143.83	736.00
08/27/11	1/2 00	758.00	170.00	659 00	08/27/11	140.00	742 00 1
08/28/11	142.00	762.00	160.00	660.00	08/28/11	142.00	738 00
08/20/11	142.92	760.00	170 08	688.00	08/20/11	142.00	745 00 1
00/29/11	142.00	742.00	170.00	712 08	08/30/11	145.00	748.00
08/31/11	1/2 02	760.00	171.00	712.00	08/31/11	143.32	740.00
00/01/11	142.92	750.00	160.08	681 08		144.00	743.00
09/01/11	142.00	761 02	169.00	666 00	09/07/11	1/13 83	730 00 1
09/02/11	142.00	763.00	160.00	675.00	00/02/11	140.00	732 00 1
09/03/11	142.00	757.08	168.00	654.00	09/03/11	146.02	749 00
00/05/11	130.00	757.00	166.08	627.00	00/05/11	140.02	749.00
09/06/11	130.02	755.00	167.00	632.00	00/06/11	141.00	748 00
09/07/11	130.00	762.00	170 02	651 00	00/07/11	143.83	740.00
00/08/11	133.32	761.00	170.02	688.00	09/08/11	140.00	738 00 1
09/00/11	140.00	761.00	170.00	670.00	09/00/11	1/11 08	733.00
09/09/11	138.00	753 92	160 02	672.08	03/03/11	145.08	750.00
09/11/11	137.00	751.00	164 42	657.00	09/11/11	146.00	751 08 1
09/12/11	136.08	745.08	170.00	00,000	09/12/11	140.02	752 00 1
09/13/11	140.00	762 92	169.08	630.00	09/13/11	144.00	747 00
09/14/11	140.00	764 00	169.00	634.00	09/14/11	142.00	748.00
09/15/11	140.00	762.00	168.00	589.00	09/15/11	145.00	746.00
09/16/11	141.08	758.00	167.00	582.00	09/16/11	144.00	740.92
09/17/11	080.00	430.00	099.00	562.00	09/17/11	000.00	405.00
09/18/11	078.00	503.25	099.00	496.00	09/18/11	158.08	816.00
09/19/11	149.08	806.00	179.00	602.00	09/19/11	152.83	787.08
09/20/11	150.92	809.00	179.08	654 00	09/20/11	151 92	780.00
09/21/11	140.00	763.92	172.92	681.00	09/21/11	136 17	729 92
09/22/11	135.00	740.00	171.00	692.00	09/22/11	142.08	754 00
09/23/11	135.00	746.00	170.00	665.00	09/23/11	142.92	754 00
09/24/11	140.00	767 00	169 92	683.00	09/24/11	143.92	750 00
09/25/11	137.00	751.00	167.00	662.00	09/25/11	137.00	734 92
09/26/11	139.00		169.00	660 08	09/26/11	142 00	749 00 1
09/27/11	130.00	770 00	1160.00	648 00	09/27/11	130 17	749.00
09/28/11	140 92	772 00	170 00	1 689 nn	09/28/11	143 75	751 00 1
09/29/11	1079.00	448 00	099 08	631.00	09/29/11	000 00	415 00
09/30/11	139.92	771.00	169.00	656.08	09/30/11	142.08	746.00

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1	WDW	-1	WDV	V-2		WD	W-3	
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres	
10/01/11	139.00	772.00	169.00	631.08	10/01/11	138.00	746.00	
10/02/11	140.00	770.00	169.08	645.00	10/02/11	141.00	747.00	
10/03/11	140.00	771.00	169.92	631.00	10/03/11	140.92	743.00	
10/04/11	090.00	536.00	122.00	649.00	10/04/11	056.83	512.00	
10/05/11	140.08	774.00	169.00	650.00	10/05/11	139.17	740.00	
10/06/11	078.92	546.25	122.00	649.00	10/06/11	059.00	528.17	
10/07/11	138.00	766.00	167.00	662.00	10/07/11	143.00	755.00	
10/08/11	077.00	545.33	118.00	632.00	10/08/11	036.25	510.00	
10/09/11	119.00	686.00	155.08	627.00	10/09/11	122.00	687.00	
10/10/11	134.00	754.00	168.00	621.00	10/10/11	140.08	760.00	
10/11/11	133.08	755.00	166.00	647.00	10/11/11	i 141.08 i	759.00	
10/12/11	138.08	776.00	169.92	643.00	10/12/11	135.17	751.00	
10/13/11	138.00	777.00	169.00	647.00	10/13/11	136.17	752.00	
10/14/11	138.00	778.00	169.00	658.08	10/14/11	138.00	752.00	
10/15/11	138.08	780.00	169.00	669.08	10/15/11	137.08	750.00	
10/16/11	138.08	782.00	170.00	667.08	10/16/11	134.08	746.00	
10/17/11	139.00	781.00	169.00	685.00	10/17/11	134.92	747.00	
10/18/11	137.92	778.00	167.92	646.08	10/18/11	139.92	764.00	
10/19/11	138.00	780.08	166.08	646.08	10/19/11	134.08	761.00	
10/20/11	079.00	447.00	186.00	661.00	10/20/11	000.00	420.00	
10/21/11	080.36	445.59	175.88	760.44	10/21/11	00.00	418.72	
10/22/11	080.47	443.69	099.85	580.52	10/22/11	001.06	416.11	
10/23/11	138.25	753.73	126.88	575.14	10/23/11	130.77	737.62	
10/24/11	137.01	760.47	166.96	678.85	10/24/11	136.60	746.27	
10/25/11	135.01	751.98	164.82	710.04	10/25/11	131.21	737.02	
10/26/11	140.51	774.15	169.17	732.78	10/26/11	138.23	759.25	
10/27/11	135.45	753.99	165.16	704.11	10/27/11	131.20	739.46	
10/28/11	140.09	772.96	168.42	585.51	10/28/11	138.25	758.90	
10/29/11	136.08	752.47	164.13	635.38	10/29/11	125.23	738.33	
10/30/11	140.65	767.77	166.86	676.53	10/30/11	134.90	754.11	
10/30/11	136.08	751.06	164.11	705.62	10/30/11	126.12	737.49	
10/31/11	145.54	793.96	168.72	725.93	10/31/11	140.81	771.77	
11/01/11	144.15	792.62	165.81	771.90	11/01/11	139.78	770.18	
11/02/11	143.85	790.85	168.40	711.49	11/02/11	142.39	769.78	
11/03/11	138.59	769.46	166.17	682.79	11/03/11	140.45	750.02	
11/04/11	138.30	771.23	165.88	725.32	11/04/11	211.00	750.60	
11/05/11	142.86	796.40	169.41	741.36	11/05/11	176.92	773.23	
11/06/11	136.17	768.11	165.59	740.54	11/06/11	130.85	743.30	
11/0//11	140.50	785.24	168.93	747.08	11/07/11	134.27	755.50	
11/08/11	129.90	736.01	158.25	701.07	11/08/11	122.72	727.90	
11/09/11	125.45	716.21	153.26	084.72	11/09/11	113.05		
11/10/11	141.19	793.09		022.20	11/10/11	062.27	080.08	
11/11/11	148.29	820.30	098.28	470.88			427.00	
11/12/11		404.29 540.00	157 22	017.42	44/42/44		420.07	
11/10/11	144 60	701 06	107.22	705 04	1 1 1 1 3/ 1 1	110.02	760 44	
11/14/11	141.09	04.00	100.71	672.00	1 / 14/ 1 4 4 /4 5 /4 4	139.00	709.44 922.00	
11/10/11	1124.00	652.00	142.00	670.00	11/10/11	140.00	032.00	
11/10/11	1155.00	950.00	143.00	620 00	11/10/11	140.92	035.00	
11/17/11	155.00	000.00	177 00	630.00	/ //	174.20	000.00	
11/10/11		034.00			11/10/11	114.70	020.00	
11/19/11	102.00	655 00	140.00		11/19/11	065 00	030.00	
11/20/11	1 152 00	0000.00	140.20		11/20/11	160.00	032.00	
11/21/11	102.00	049.00		034.00		102.17	000.00	

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1 1	WDW	-1	WDV	V-2		WD	W-3
Date	Rate	Pres	Rate	Pres	Date	Rate	Pres
11/22/11	101.00	618.92	137.00	684.00	11/22/11	084.75	602.08
11/23/11	147.00	851.00	180.00	689.00	11/23/11	145.92	838.92
11/24/11	136.00	777.00	167.00	706.00	11/24/11	189.58	768.00
11/25/11	089.00	560.00	120.08	740.00	11/25/11	038.33	543.00
11/26/11	136.00	785.00	166.92	683.00	11/26/11	131.08	770.00
11/27/11	119.00	710.00	151.00	641.00	11/27/11	104.92	695.00
11/28/11	136.92	786.00	166.00	679.00	11/28/11	130.92	771.00
11/29/11	105.00	611.92	132.00	697.08	11/29/11	066.92	593.08
11/30/11	153.00	851.00	177.00	682.00	11/30/11	147.75	834.00
12/01/11	126.00	726.92	154.00	718.00	12/01/11	115.92	708.00
12/02/11	122.08	786.00	161.00	563.00	12/02/11	130.00	769.00
12/03/11	139.00	858.00	174.00	595.00	12/03/11	145.00	837.00
12/04/11	129.00	757.92	157.00	604.00	12/04/11	118.92	740.92
12/05/11	126.00	790.00	161.00	638.00	12/05/11	129.17	769.00
12/06/11	653.00	780.00	157.00	773.92	12/06/11	129.08	1063.0
12/07/11	082.00	558.00	107.00	588.00	12/07/11	000.00	535.00
12/08/11	146.08	834.00	170.08	617.00	12/08/11	132.92	792.00
12/09/11	095.92	581.00	119.00	646.00	12/09/11	000.58	541.00
12/10/11	146.00	839.92	170.08	655.00	12/10/11	145.00	824.00
12/11/11	138.92	809.00	166.00	653.00	12/11/11	138.08	800.00 i
12/12/11	145.00	839.00	171.00	723.00	12/12/11	146.08	832.00
12/13/11	133.92	783.00	162.92	749.00	12/13/11	133.00	784.00
12/14/11	111.00	689.00	141.00	777.00	12/14/11	097.17	671.08
12/15/11	146.00	862.00	173.92	724.00	12/15/11	149.08	847.00
12/16/11	146.00	858.00	172.92	728.00	12/16/11	146.08	842.00
12/17/11	143.00	845.00	170.00	738.00	12/17/11	141.92	828.00
12/18/11	144.08	856.00	172.08	802.00	12/18/11	152.92	856.00
12/19/11	140.00	834.00	179.00	807.00	12/19/11	151.17	859.00
12/20/11	151.08	897.92	178.08	716.00	12/20/11	121.92	739.00
12/21/11	142.92	851.00	168.08	763.00	12/21/11	147.08	841.00
12/22/11	142.08	724.67	145.00	701.00	12/22/11	110.58	710.67
12/23/11	119.00	732.00	141.00	676.08	12/23/11	112.92	716.00
12/24/11	107.00	668.00	127.00	614.00	12/24/11	089.17	651.00
12/25/11	107.00	667.00	168.00	634.00	12/25/11	139.08	820.00
12/26/11	153.00	792.92	160.00	814.83	12/26/11	126.83	774.92
12/27/11	138.92	826.00	165.00	637.00	12/27/11	000.00	745.08
12/28/11	148.00	873.92	174.00	645.00	12/28/11	151.75	855.00
12/29/11	139.00	828.00	168.00	703.00	12/29/11	112.92	723.08
12/30/11	091.00	619.08	124.08	749.00	12/30/11	061.17	601.08
12/31/11	114.00	718.00	145.92	778.00	12/31/11	105.25	703.08
01/01/12	139.92	857.92	172.92	737.08	01/01/12	073.33	851.00
01/02/12	128.00	804.00	166.00	712.00	01/02/12	146.83	841.00
01/03/12	141.00	870.00	173.00	706.00	01/03/12	141.92	822.00
01/04/12	136.00	845.00	170.00	721.00	01/04/12	144.92	832.00
01/05/12	139.00	861.92	172.92	751.08	01/05/12	147.00	848.92
01/06/12	102.00	723.08	146.00	734.00	01/06/12	090.08	708.00
01/07/12	129.00	811.00	162.00	726.00	01/07/12	123.00	<u>7</u> 98.00
01/08/12	131.00	802.00	161.00	743.00	01/08/12	137.08	788.00
01/09/12	127.08	808.00	162.00	755.00	01/09/12	012.75	793.00
01/10/12	100.00	661.00	131.92	706.00	01/10/12	000.00	636.00
01/11/12	104.00	681.08	137.00	729.08	01/11/12	102.17	665.00
01/12/12	117.00	759.08	152.00	692.00	01/12/12	127.25	743.00
01/13/12	101.00	669.00	134.00	679.08	01/13/12	090.00	651.00
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Historical Injection Rates and Surface Injection Pressures Navajo Refining Company, L.L.C. Artesia, New Mexico

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WDW	-1	WDW	√-2	1, a p.	I WĎ	W-3	L
Rate	Pres	Rate	Pres	Date	Rate	Pres	
128.00	812.00	162.00	707.00	01/14/12	128.83	797.00	
085.83	697.25	138.00	710.00	01/15/12	094.25	679.17	1
117.00	753.08	152.00	740.00	01/16/12	106.75	737.00	I
131.00	804.92	162.00	714.08	01/17/12	135.17	788.92	T
123.08	796.00	159.00	635.00	01/18/12	131.00	780.00	L
127.00	811.00	161.00	691.92	01/19/12	155.25	793.00	Ĺ
129.00	807.00	161.00	670.00	01/20/12	133.83	787.00	Ì
126.00	810.00	162.92	679.00	01/21/12	041.25	786.00	Ì
101.08	671.08	135.00	692.00	01/22/12	115.50	644.92	Ì
096.00	646.00	128.92	614.00	01/23/12	134.50	617.00	Ì
097.00	646.00	129.92	625.00	01/24/12	211.83	618.00	Ì
079.00	489.00	094.00	516.00	01/25/12	052.75	678.00	Ì
079.00	488.00	093.00	459.00	01/26/12	00.00	461.00	Ì
079.00	487.00	094.00	485.00	01/27/12	000.00	459.00	Ì
128.00	802.00	162.00	603.00	01/28/12	134.00	788.00	Ì
130.00	798.00	161.00	586.00	01/29/12	131.00	783.00	1
	WDW Rate 128.00 085.83 117.00 131.00 123.08 127.00 129.00 126.00 101.08 096.00 097.00 079.00 079.00 079.00 128.00 130.00	WDW-1 Rate Pres 128.00 812.00 085.83 697.25 117.00 753.08 131.00 804.92 123.08 796.00 127.00 811.00 129.00 807.00 126.00 810.00 101.08 671.08 096.00 646.00 097.00 489.00 079.00 487.00 128.00 802.00 130.00 798.00	WDW-1 WDW Rate Pres Rate 128.00 812.00 162.00 085.83 697.25 138.00 117.00 753.08 152.00 131.00 804.92 162.00 123.08 796.00 159.00 127.00 811.00 161.00 129.00 807.00 161.00 126.00 810.00 162.92 101.08 671.08 135.00 096.00 646.00 129.92 097.00 489.00 094.00 079.00 487.00 094.00 128.00 802.00 162.00 130.00 798.00 162.00	WDW-1 WDW-2 Rate Pres Rate Pres 128.00 812.00 162.00 707.00 085.83 697.25 138.00 710.00 117.00 753.08 152.00 740.00 131.00 804.92 162.00 714.08 123.08 796.00 159.00 635.00 127.00 811.00 161.00 691.92 129.00 807.00 161.00 670.00 126.00 810.00 162.92 679.00 101.08 671.08 135.00 692.00 096.00 646.00 128.92 614.00 097.00 489.00 094.00 516.00 079.00 488.00 093.00 459.00 079.00 487.00 094.00 485.00 128.00 802.00 162.00 603.00 130.00 798.00 161.00 586.00	WDW-1 WDW-2 Image: Constraint of the state Pres Date 128.00 812.00 162.00 707.00 01/14/12 085.83 697.25 138.00 710.00 01/15/12 117.00 753.08 152.00 740.00 01/16/12 131.00 804.92 162.00 740.00 01/16/12 123.08 796.00 159.00 635.00 01/18/12 127.00 811.00 161.00 691.92 01/19/12 129.00 807.00 161.00 670.00 01/22/12 126.00 810.00 162.92 679.00 01/21/12 120.00 807.00 161.00 692.00 01/22/12 096.00 646.00 128.92 614.00 01/23/12 097.00 646.00 129.92 625.00 01/24/12 079.00 489.00 093.00 459.00 01/26/12 079.00 488.00 093.00 459.00 01/27/12 128.00 802.00 <td>WDW-1 WDW-2 WD Rate Pres Rate Pres Date Rate 128.00 812.00 162.00 707.00 01/14/12 128.83 085.83 697.25 138.00 710.00 01/15/12 094.25 117.00 753.08 152.00 740.00 01/16/12 106.75 131.00 804.92 162.00 714.08 01/17/12 135.17 123.08 796.00 159.00 635.00 01/18/12 131.00 127.00 811.00 161.00 691.92 01/19/12 155.25 129.00 807.00 161.00 670.00 01/20/12 133.83 126.00 810.00 162.92 679.00 01/21/12 041.25 101.08 671.08 135.00 692.00 01/22/12 115.50 096.00 646.00 128.92 614.00 01/23/12 134.50 097.00 489.00 093.00 459.00 01/26/12 00.00</td> <td>WDW-1 WDW-2 WDW-3 Rate Pres Rate Pres Date Rate Pres 128.00 812.00 162.00 707.00 01/14/12 128.83 797.00 085.83 697.25 138.00 710.00 01/15/12 094.25 679.17 117.00 753.08 152.00 740.00 01/16/12 106.75 737.00 131.00 804.92 162.00 714.08 01/17/12 135.17 788.92 123.08 796.00 159.00 635.00 01/18/12 131.00 780.00 127.00 811.00 161.00 691.92 01/19/12 155.25 793.00 126.00 807.00 161.00 670.00 01/21/12 041.25 786.00 101.08 671.08 135.00 692.00 01/21/12 041.25 786.00 096.00 646.00 128.92 614.00 01/23/12 134.50 617.00 097.00 488.00 093.00</td>	WDW-1 WDW-2 WD Rate Pres Rate Pres Date Rate 128.00 812.00 162.00 707.00 01/14/12 128.83 085.83 697.25 138.00 710.00 01/15/12 094.25 117.00 753.08 152.00 740.00 01/16/12 106.75 131.00 804.92 162.00 714.08 01/17/12 135.17 123.08 796.00 159.00 635.00 01/18/12 131.00 127.00 811.00 161.00 691.92 01/19/12 155.25 129.00 807.00 161.00 670.00 01/20/12 133.83 126.00 810.00 162.92 679.00 01/21/12 041.25 101.08 671.08 135.00 692.00 01/22/12 115.50 096.00 646.00 128.92 614.00 01/23/12 134.50 097.00 489.00 093.00 459.00 01/26/12 00.00	WDW-1 WDW-2 WDW-3 Rate Pres Rate Pres Date Rate Pres 128.00 812.00 162.00 707.00 01/14/12 128.83 797.00 085.83 697.25 138.00 710.00 01/15/12 094.25 679.17 117.00 753.08 152.00 740.00 01/16/12 106.75 737.00 131.00 804.92 162.00 714.08 01/17/12 135.17 788.92 123.08 796.00 159.00 635.00 01/18/12 131.00 780.00 127.00 811.00 161.00 691.92 01/19/12 155.25 793.00 126.00 807.00 161.00 670.00 01/21/12 041.25 786.00 101.08 671.08 135.00 692.00 01/21/12 041.25 786.00 096.00 646.00 128.92 614.00 01/23/12 134.50 617.00 097.00 488.00 093.00

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APPENDIX E-2

HISTORICAL INJECTION VOLUME DATA

Date	WDW-1	WDW-2	WDW-3
mm/dd/yy	(gallons)	(gallons)	(gallons)
10/1 to 10/20	3,499,177	3,988,598	4,806,153
10/21/10	184,375	197,947	268,727
10/22/10	179,851	202,470	274,698
10/23/10	184,375	202,470	268,727
10/24/10	184,375	206,838	256,157
10/25/10	179,851	202,470	268,727
10/26/10	179,851	198,173	275,012
10/27/10	184,375	206,838	268,727
10/28/10	206,838	143,973	312,192
10/29/10	202,470	134,925	299,936
10/30/10	184,375	197,947	268,727
10/31/10	199,098	197,947	268,727
10/31/10	179,851	193.423	262,756
11/01/10	184,375	197,947	262,442
11/02/10	180,078	197,947	262,442
11/03/10	184,149	197,947	275,012
11/04/10	184,375	193,649	268,727
11/05/10	184,375	193,423	268,727
11/06/10	179,851	197,947	268.727
11/07/10	184,375	197,947	275.012
11/08/10	180,078	197,947	262,442
11/09/10	179,633	197,947	274,698
11/10/10	103,415	143,973	287,366
11/11/10	107,938	134,925	000,000
11/12/10	107,938	134,925	000,000
11/13/10	175,484	197,947	274,698
11/14/10	184,375	197,947	262,442
11/15/10	184,375	197,947	262,128
11/16/10	184,375	197,947	268,727
11/17/10	179,851	197,947	268,727
11/18/10	184,375	197,947	268,727
11/19/10	179,851	197,947	275,012
11/20/10	184,149	197,947	268,727
11/21/10	184,375	197,947	269,041
11/22/10	184,375	193,423	262,442
11/23/10	175,484	197,947	256,157
11/24/10	179,851	193,423	262,442
11/25/10	179,851	193,423	256,157
11/26/10	175,484	197,947	256,157
11/27/10	170,960	193,423	262,442
11/28/10	170,960	193,423	256,157
11/29/10	170,960	193,423	262,442
11/30/10	170,960	193,423	249,872
12/01/10	166,436	193,423	256,471
12/02/10	170,960	188,899	256,157
12/03/10	103,415	139,449	000,000
12/04/10	170,960	193,423	275,012
12/05/10	148,497	197,947	268,727
12/06/10	170,960	193,423	275,012
12/07/10	170,960	188,899	268,727

Date	WDW-1	WDW-2	WDW-3
mm/dd/yy	(gallons)	(gallons)	(gallons) j
12/08/10	170,960	193,423	274,698
12/09/10	170,960	193,423	275,012
12/10/10	170,960	188,899	262,442
12/11/10	175,484	202,470	262,442
12/12/10	170,960	197,947	256,157
12/13/10	170,960	193,423	268,727
12/14/10	175,484	175.484	268,727
12/15/10	164,405	193,423	262,442
12/16/10	152,864	193.423	243,804
12/17/10	157,388	197,947	249,872
12/18/10	207,064	152,864	000,000 i
12/19/10	99.047	152,864	000,000
12/20/10	103.415	148.715	000,000 i
12/21/10	175.257	197,947	280,983
12/22/10	170,960	202.470	268,727
12/23/10	166,436	202,470	275,012
12/24/10	166,210	202,470	269,041
12/25/10	170,960	193,423	275.012
12/26/10	170,960	202,470	275,012
12/27/10	170,960	202,470	269.041
12/28/10	161,912	202,470	274,698
12/29/10	170,688	202,470	281,297
12/30/10	168,637	202.470	275,012
12/31/10	166,436	197,947	275,012
01/01/11	000,000	202,470	262,442
01/02/11	170,960	202,470	262,442
01/03/11	170,960	197,947	268,727
01/04/11	170,960	197,947	275,012
01/05/11	170,960	202,470	275,012
01/06/11	179,851	202,470	275,012
01/07/11	175,484	202,470	281,297
01/08/11	170,960	202,470	262,442
01/09/11	170,960	202,470	281,297
01/10/11	170,734	202,470	281,297
01/11/11	161,912	197,947	280,983
01/12/11	152,864	202,470	275,012
01/13/11	166,436	197,947	268,727
01/14/11	166,436	i 197,947	275,012
01/15/11	166,436	197,947	275,012
01/16/11	167,423	193,423	274,698
01/17/11	166,436	202,470	268,727
01/18/11	165,539	206,838	275,012
01/19/11	166,436	197,947	275,012
01/20/11	166,436	197,947	275,012
01/21/11	161,912	198,173	268,727
01/22/11	161,912	197,947	275,012
01/23/11	161,912	197,947	268,727
01/24/11	161,912	j 197 , 947	275,012
01/25/11	161,912	193,649	268,727
01/26/11	99,047	148,497	000,000

Date	WDW-1	WDW-2	WDW-3
mm/dd/yy	(gallons)	(gallons)	(gallons)
01/27/11	166,436	202,470	249,872
01/28/11	161,912	198,391	275,012
01/29/11	161,912	202,470	268,727
01/30/11	161,912	202,470	281,297
01/31/11	157,388	197,947	275,012
02/01/11	917,389	917,389	000,000
02/02/11	759,992	000,000	1,274,552
02/03/11	445,197	917,389	24,185
02/04/11	196,597	197,947	255,843
02/05/11	107,938	148,497	000,000
02/06/11	103,415	143,973	000,000
02/07/11	86,598	202,470	281,297
02/08/11	157,388	143,973	290,183
02/09/11	251,920	188,899	206,614
02/10/11	107,041	148,270	000,000
02/11/11	202,470	143,973	168,817
02/12/11	161,912	197,947	143,676
02/13/11	206,838	229,457	187,141
02/14/11	197,947	229,457	193,740
02/15/11	215,886	233,825	218,663
02/16/11	193,423	242,873	231,234
02/17/11	206,838	229,676	237,519
02/18/11	(215,886	238,349	212,378
02/19/11	211,362	229,457	249,569
02/20/11	229,996	224,934	218,663
02/21/11	220,410	224,934	231,234
02/22/11	107,938	143,973	000,000
02/23/11	211,362	224,934	237,519
02/24/11	140,251	143,973	000,000
02/25/11	242,873	247,397	287,366
02/26/11	1.07,938	143,973	000,000
02/27/11	238,349	251,920	281,297
02/28/11	233,825	256,444	275,012
03/01/11	242,873	251,920	268,727
03/02/11	242,873	247,397	281,297
03/03/11	179,851	265,336	306,221
03/04/11	202,470	206,838	187,455
03/05/11	188,899	143,973	
03/06/11	310,262	143,973	249,872 000 000
03/0//11	202,470	143,973	
03/08/11	290,020	1 215,000	0,2/2 102 7/0
03/09/11	1 303,094	21J,000	1 200 025
03/10/11	1 301,013	1 102 122	1 140 061
03/11/11	1 150 CAC	1 110,423	1 100 000 I
03/12/11		1 102 102	
03/13/11	1 314,/00 1 310 310	1 206 020	1 107,400
U3/14/11 D3/15/11	1 313,310	1 200,030	1 200,023 1 101 170
03/15/11	1 010,010	1 220 157	1 101,1/0 1 2/0 072
03/10/11	1 272,323	1 223,437	243,074 221 062
03/1//11	1 1/0,960	1 224,934	231,002

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Date	WDW-1	WDW-2	WDW-3	
mm/dd/yy	(gallons)	(gallons)	(gallons)	
03/18/11	211,362	233,825	275,012	Ì
03/19/11	310,262	202,470	193,740	Ι
03/20/11	166,436	152,864	000,000	1
03/21/11	301,370	215,886	218,663	Ì
03/22/11	301,370	242,873	281,297	Ì
03/23/11	305,894	215,886	231,234	Ì
03/24/11	305,442	143,973	000,000	i
03/25/11	306,113	224,934	268,727	1
03/26/11	305,668	220,410	243,804	i
03/27/11	301.370	229,457	256,157	i
03/28/11	301,370	143,973	000,000	i
03/29/11	301.370	233,825	000,000	i
03/30/11	310,262	220,410	245,928	i
03/31/11	314.786	229,457	243,804	i
04/01/11	328,357	233,825	268,727	i
04/02/11	319,310	229,457	256,157	i
04/04/11	310,262	144,199	000,000	İ
04/05/11	318,208	224,934	249,872	i
04/06/11	301,370	193,423	193,740	i
04/07/11	244,291	143.973	000,000	i
04/08/11	288,000	241,800	62,621	i
04/09/11	312,360	230,400	185,760	i
04/10/11	313,920	259,200	226,200	i
04/11/11	324,000	236,160	205,920	i
04/12/11	319,560	252,000	217,560	i
04/13/11	316,800	244,800	213,120	Í
04/14/11	313,920	249,120	215,520	İ
04/15/11	318,000	240,600	201,480	Í
04/16/11	194,400	233,280	197,160	Ì
04/17/11	288,000	184,440	109,320	Ì
04/18/11	319,800	239,040	201,600	Ì
04/19/11	312,360	236,280	201,600	Ì
04/20/11	159,960	146,880	000,000	Ι
04/21/11	155,520	145,440	315,120	1
04/22/11	115,200	145,440	000,000	I
04/23/11	201,600	234,600	195,840	I
04/24/11	194,520	227,520	185,880	I
04/25/11	220,440	253,440	213,120	I
04/26/11	165,600	208,800	147,000	1
04/27/11	213,000	247,560	208,920	I
04/28/11	220,320	252,000	217,440	I
04/29/11	221,640	250,680	219,000	I
04/30/11	208,920	249,120	213,360	ł
05/01/11	216,000	253,440	223,200	I
05/02/11	110,880	142,560	000,000	1
05/03/11	216,000	252,000	217,440	1
05/04/11	217,320	252,000	217,440	I
05/05/11	214,560	249,120	224,640	I
05/06/11	113,760	145,440	000,000	ł
05/07/11	214,560	257,760	214,560	1

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Date	WDW-1	WDW-2	WDW-3	۱
mm/dd/yy	(gallons)	(gallons)	(gallons)	
05/08/11	210,120	250,560	208,800	L
05/09/11	211,680	254,760	219,000	L
05/10/11	217,560	253,440	214,560	I
05/11/11	201,600	237,600	201,600	ł
05/12/11	220,440	249,120	214,320	Ĺ
05/13/11	214,560	253,440	219,000	Ì.
05/14/11	208,920	236,160	204,360	Ì
05/15/11	211,680	246,240	226,080	Ì.
05/16/11	217,680	253,440	216,120	I
05/17/11	216,000	249,120	211,800	L
05/18/11	211,560	252,000	220,080	I
05/19/11	211,560	249,000	219,120	I
05/20/11	210,360	247,560	221,760	
05/21/11	211,560	246,240	219,000	1
05/22/11	210,240	246,360	217,560	ł
05/23/11	211,560	247,680	218,880	L
05/24/11	210,360	247,680	218,760	Ì
05/25/11	211,680	247,680	217,560	I
05/26/11	211,560	246,240	220,440	E
05/27/11	211,560	252,660	215,880	T
05/28/11	214,440	252,000	208,680	T
05/29/11	208,800	247,680	213,360	T
05/30/11	207,360	247,680	214,800	ļ
05/31/11	205,800	246,240	213,120	I
06/01/11	207,360	246,360	214,680	1
06/02/11	208,800	246,360	213,000	1
06/03/11	1 208,920	244,800	218,880	I
06/04/11	236,040	257,880	234,840	I
06/05/11	228,960	256,320	234,720	I
06/06/11	226,080	263,640	234,720	I
06/07/11	226,200	263,400	234,840	I
06/08/11	217,320	250,560	219,960	I
06/09/11	236,280	262,080	241,680	I
06/10/11	216,120	252,000	220,200	T
06/11/11	197,280	237,480	198,720	I
06/12/11	213,120	250,440	220,200	I
06/13/11	250,680	241,920	210,480	I
06/14/11	215,880	253,440	220,200	1
06/15/11	217,440	253,320	214,560	I
06/16/11	214,560	250,560	220,200	
06/17/11	218,760	248,497	211,800	ļ
06/18/11	218,880	253,560	213,000	1
06/19/11	220,320	250,560	216,000	1
06/20/11	217,440	252,000	216,120	
06/21/11	214,680	250,560	215,880	1
06/22/11	216,120	252,000	217,320	1
06/23/11	215,393	253,024	216,034	
06/24/11	215,878	252,000	215,756	1
06/25/11	216,000	252,000	216,000	1
06/26/11	216,000	253,320	217,320	

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Date	WDW-1	WDW-2	WDW-3	
mm/dd/yy	(gallons)	(gallons)	(gallons)	
06/27/11	213,120	253,440	213,120	
06/28/11	118,080	146,880	000,000	
06/29/11	217,320	250,560	211,800	
06/30/11	118,080	146,880	000,000	
07/01/11	228,960	146,880	224,520	
07/02/11	213,120	250,560	214,320	
07/03/11	116,640	146,880	000,000	
07/04/11	214,560	250,560	214,560	
07/05/11	215,880	250,440	213,120	
07/06/11	116,640	145,440	000,000	
07/07/11	188,520	228,960	172,800	
07/08/11	214,560	250,560	214,440	
07/09/11	213,120	249,120	213,120	
07/10/11	211,680	247,680	211,680	
07/11/11	211,680	246,360	211,800	
07/12/11	210,120	246,360	210,360	
07/13/11	210,120	244,800	213,240	
07/14/11	208,800	240,360	213,360	
07/15/11	115,200	145,440	000.000	
07/16/11	210,240	249.000	208,920	
07/17/11	260,880	238,920	196,920	
07/18/11	210,240	247,680	203.040	
07/19/11	115,200	146.880		
07/20/11	208,680	249,000	210.240	
07/21/11	210,360	249,240	203.040	
07/22/11	213,120	249,240	200,400	
07/23/11	208,800	246,240	208,800 1	
07/24/11	208,680	246,360	210,360	
07/25/11	210,120	246,240	205,920	
07/26/11	210,360	246,240	201,480	
07/27/11	208,920	242,160	207,360	
07/28/11	208,920	246,120	210,120	
07/29/11	253,800	238,920	193,080	
07/30/11	115,200	144,120	000,000	
07/31/11	210,240	243,360	205,800	
08/01/11	208,800	246,120	207,240	
08/02/11	115,200	146,880	000,000	
08/03/11	205,920	247,680	207,360	
08/04/11	205,920	244,800	205,920	
08/05/11	207,360	246,240	210,120	
08/06/11	202,920	247,560	210,480	
08/07/11	245,880	237,240	187,680	
08/08/11	205,920	243,480	209,880	
08/09/11	205,800	243,360	208,680	
08/10/11	205,920	243,360	210,000	
08/11/11	205,920	243,360	210,120	
08/12/11	205,920	241,800	208,920	
08/13/11	205,920	241,920	208,560	
08/14/11	205,920	242,040	204,720	
08/15/11	113,760	145,440	000,000	

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Date	WDW-1	WDW-2	WDW-3
mm/dd/yy	(gallons)	(gallons)	(gallons)
08/16/11	205,920	241,800	204,360
08/17/11	205,920	240,480	207,240
08/18/11	203,160	246,120	206,040
08/19/11	203,040	246,240	205,920
08/20/11	203,040	246,240	210,120
08/21/11	204,480	246,240	207,600
08/22/11	203,160	246,240	207.480
08/23/11	203,040	246,120	207,240
08/24/11	113,760	146,880	000,000
08/25/11	221,880	241,920	200,160
08/26/11	198,720	247,680	207,120
08/27/11	204,480	244,800	207.360
08/28/11	205,800	243,360	204,480
08/29/11	204,480	244,920	206.040
08/30/11	200,160	247,560	210,120
08/31/11	205,800	246,240	207.360
09/01/11	204,480	243,480	207.360
09/02/11	204,600	243,360	207,120
09/03/11	204,600	243,480	204,600
09/04/11	201,600	241,920	211,560
09/05/11	201,480	239,160	203,160
09/06/11	200,160	240,480	207,480
09/07/11	201,480	246,120	207,120
09/08/11	201,600	244,800	207,360
09/09/11	201,600	247,560	203,160
09/10/11	198,720	244,680	208,920
09/11/11	197,280	236,760	211,560
09/12/11	195,960	244,800	207,600
09/13/11	201,600	243,480	207,360
09/14/11	202,920	243,360	204,480
09/15/11	201,600	241,920	208,800
09/16/11	203,160	240,480	207,360
09/17/11	115,200	142,560	000,000
09/18/11	112,320	142,560	227,640
09/19/11	214,680	257,760	220,080
09/20/11	217,320	257,880	218,760
09/21/11	201,600	249,000	196,080
09/22/11	194,400	`246,240	204,600
09/23/11	194,400	244,800	205,800
09/24/11	201,600	244,680	207,240
09/25/11	1 197,280	240,480	197,280
09/26/11	200,160	243,360	204,480
09/27/11	200,160	243,360	200,400
09/28/11	202,920	244,800	207,000
09/29/11	113,760	142,680	000,000
09/30/11	201,480	243,360	204,600
10/01/11	200,160	243,360	198,720
10/02/11	201,600	243,480	203,040
10/03/11	201,600	244,680	202,920
10/04/11	129,600	175,680	81,840

Date	WDW-1	WDW-2	WDW-3
mm/dd/yy	(gallons)	(gallons)	(gallons)
10/05/11	201,720	243,360	200,400
10/06/11	113,640	175,680	84,960
10/07/11	198,720	240,480	205,920
10/08/11	110,880	169,920	52,200
10/09/11	171,360	223,320	175,680
10/10/11	192,960	241,920	201,720
10/11/11	191,640	239,040	203,160
10/12/11	198,840	244,680	194,640
10/13/11	198,720	243,360	196,080
10/14/11	198,720	243,360	198,720
10/15/11	198,840	243,360	197,400
10/16/11	198,840	244,800	193,080
10/17/11	200,160	243,360	194,280
10/18/11	198,600	241,800	201,480
10/19/11	198,720	239,160	193,080
10/20/11	113,760	234,360	000,000
10/21/11	115,725	221,606	000,000
10/22/11	115,884	125,811	1,527
10/23/11	199,076	159,871	188,316
10/24/11	197,292	210,368	196,700
10/25/11	194,417	207,669	188,939
10/26/11	202,331	213,160	199,053
10/27/11	195,050	208,104	188,929
10/28/11	201,723	212,208	199,075
10/29/11	195,958	206,802	180,336
10/30/11	202,531	210,250	194,254
10/30/11	195,951	206,783	181,617
10/31/11	209,583	212,593	202,767
11/01/11	207,571	208,914	201,288
11/02/11	207,145	212,189	205,037
11/03/11	199,564	209,370	202,249
11/04/11	199,148	209,011	303,835
11/05/11	205,724	213,453	254,761
11/06/11	196,086	208,637	188,429
11/07/11	202,324	212,850	193,350
11/08/11	187,053	199,393	176,717
11/09/11	180,646	193,110	162,786
11/10/11	203,307	162,353	89,670
11/11/11	213,536	000,000	000,000
11/12/11	000,000	000,000	000,000
11/13/11	000,000	198,099	166,344
11/14/11	204,033	212,579	196,439
11/15/11	221,760	225,540	211,080
11/16/11	162,840	180,180	202,920
11/17/11	223,200	227,955	250,920
11/18/11	217,560	223,020	251,640
11/19/11	218,880	225,540	359,040
11/20/11	119,880	176,715	93,720
11/21/11	219,000	226,800	219,120
11/22/11	145,440	172,620	122,040

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Date	}	WDW-1	WDW-2	WDW-3
mm/dd/yy	1	(gallons)	(gallons)	(gallons)
11/23/11	l	211,680	226,800	210,120
11/24/11	1	195,840	210,420	1 705,000
11/25/11	I	128,160	151,305	55,200
11/26/11	Ì	195,840	210,315	188,760
11/27/11	i	171,360	190,260	151,080
11/28/11	1	197,160	209,160	188,520
11/29/11	i	151,200	166,320	96,360
11/30/11	Ì	220,320	223,020	212,760
12/01/11	Ì	181,440	194,040	166,920
12/02/11	1	175,800	202,860	187,200
12/03/11	I	200,160	219,240	208,800
12/04/11	t	185,760	197,820	171,240
12/05/11	1	181,440	202,860	186,000
12/06/11	I	940,320	197,820	185,880
12/07/11	ł	118,080	134,820	000,000
12/08/11		210,360	214,305	191,400
12/09/11	1	138,120	149,940	840
12/10/11	1	210,240	214,305	208,800
12/11/11	I	200,040	209,160	198,840
12/12/11	ł	208,800	215,460	210,360
12/13/11	1	192,840	205,275	191,520
12/14/11	I	159,840	177,660	139,920
12/15/11	ļ	210,240	219,135	214,680
12/16/11	I	210,240	217,875	210,360
12/17/11	1	205,920	214,200	204,360
12/18/11	1	207,480	216,825	220,200
12/19/11	I	201,600	225,540	217,680
12/20/11	1	217,560	224,385	175,560
12/21/11	I	205,800	211,785	211,800
12/22/11	4	204,600	182,700	159,240
12/23/11	l	171,360	177,660	162,600
12/24/11	I	154,080	160,020	128,400
12/25/11	I	154,080	211,680	200,280
12/26/11	ł	940,320	201,600	182,640
12/27/11	l	200,040	207,900	000,000
12/28/11	1	213,120	219,240	218,520
12/29/11	1	200,160	211,680	162,600
12/30/11	I	131,040	156,345	88,080
12/31/11	1	164,160	183,855	1 151,560
01/01/12	ļ	201,480	217,875	1 105,600
01/02/12	!	184,320	209,160	211,440
01/03/12	l	203,040	217,980	204,360
01/04/12		195,640	214,200	208,680
01/05/12	1	200,100	217,875	211,000
01/00/12	1	195,000	1 204 120	1 123, 120
01/07/12		100 610	1 204,120	1 107 100
01/00/12	1	183 000	1 202,000	1 10 360
01/10/12	I	144 000	1 166 215	
01/11/12	I I	149 760	172 620	1 147,120
~ _ / /	1	···//	1 1,2,020	1

Date	WDW-1	1	WDW-2		WDW-3	
mm/dd/yy	(gallons)	ł	(gallons)	I	(gallons)	
01/12/12	168,480	1	191,520		183,240	
01/13/12	145,440	I	168,840	L	129,600	
01/14/12	184,320		204,120	I.	185 , 520	
01/15/12	123,600	Τ	173 , 880	L	135,720	
01/16/12	. 168,480	1	191 , 520	1	153 , 720	
01/17/12	188,640	T	204,120	L	194,640	
01/18/12	177,240		200,340	L	188,640	
01/19/12	182,880	1	202,860	L	223,560	
01/20/12	185 , 760	l	202,860	L	192,720	
01/21/12	181,440	1	205,275	1	59,400	
01/22/12	145,560	1	170,100	ł	166,320	
01/23/12	138,240	Τ	162,435	L	193,680	
01/24/12	139,680	Ι	163,695		305,040	
01/25/12	113,760	T	118,440		75,960	
01/26/12	113,760	Τ	117,180		000,000	
01/27/12	113,760	L	118,440	L	000,000	
01/28/12	184,320	I.	204,120		192,960	
01/29/12	187,200	Ι	202,860	L	<u>188,640</u>	
						Total Volume
Sub Totals (above)	<u>97,707,317</u>	1	<u>104,096,353</u>	I.	<u>97,505,713</u>	299,309,384
Total before 9/30/10	1,326,473,337	12	732,996,868	12	257 ,7 57 , 772	2,317,227,977
Total Volumes	1,424,180,654	18	<u>337,093,221</u>	1	<u>355,263,485</u> 1	<u>2,616,537,361</u>

APPENDIX E-3

PredictW INFORMATION

PREDICTW - RESERVOIR PRESSURE INCREASE PROGRAM

The pressure response for radial flow of a slightly compressible fluid in a planar (porous) injection layer with spatially-constant properties is determined by the well-known diffusivity equation (Lee, 1982):

 $\frac{\partial^2 p}{\partial r^2} + \frac{1}{r} \frac{\partial p}{\partial r} = \frac{\phi \mu c_t}{0.000264k} \frac{\partial p}{\partial t},$ Equation 1

where ϕ, μ, c_t , and k refer to porosity, viscosity (cp), compressibility (psi⁻¹), and permeability (md), respectively. The pressure, p, is expressed in psi; radial distance, r, is in feet; and time, t, is indicated in hours. For an infinite reservoir of thickness h (ft) with $p \rightarrow p_o$ (initial pressure) as $r \rightarrow \infty$, the transient pressure, p (r, t), for a single line source injector at r = 0 is determined from Equation 1 as (Muskat, 1937):

$$p(r,t) = p_o - \frac{70.6 q\mu}{kh} Ei \left(\frac{-39.5 \phi \mu c_t r^2}{kt} \right),$$
 Equation 2

where Ei represents the exponential integral defined by:

Ei (-x) =
$$-\int_{x}^{\infty} \frac{e^{-\varepsilon}}{\varepsilon} d\varepsilon$$
,

and q represents the (constant) injection rate in barrels per day (bbl/day). Time, t, in Equation 2 is expressed in days.

For the general case of multiple wells in a single layer, in which injection from each is represented by a succession of piece-wise constant flow rate intervals, the pressure response is readily obtained by superposition of elementary solutions given by Equation 1. In terms of Cartesian coordinates, the pressure transient at an arbitrary point (x, y) is given by:

$$p(x,y,t) = p_{o} + \sum_{j=1}^{N} \frac{70.6 q_{i}^{j} \mu}{kh} \operatorname{Ei} \left(\frac{-39.5 \phi \mu c_{t} \left[(x-x_{j})^{2} + (y-y_{j})^{2} \right]}{kt} \right) \\ + \sum_{j=1}^{N} \sum_{i=1}^{n_{j-1}} \frac{70.6 \left[(q_{i+1}^{j} - q_{i}^{j}) \mu \right]}{kh} \operatorname{Ei} \left(\frac{-39.5 \phi \mu c_{t} \left[(x-x_{j})^{2} + (y-y_{j})^{2} \right]}{k(t-t_{i}^{j})} \right)$$

Equation 3

for all $t_i^j < t$. In Equation 3, the following notation is employed:

N = number of wells injecting into the reservoir n_j = number of constant flow rate increments for well j operative over time t i = flow rate summation index $(1 < i < n_j)$ j = well number summation index (1 < j < N)t_i^j = cumulative time corresponding to the end of injection rate interval i for well j x_j, y_j = cartesian coordinates of well j q_i^j = flow rate from well j during flow increment i

Equation 3 forms the basis for determining the cone of influence for a general multi-well system.

To determine shutin or flowing pressures at a generic wellbore location, Equation 3 is modified to include a dimensionless skin factor, s_b , which reflects the effects of altered properties in the near-wellbore region (Van Everdingen, 1953). The associated augmentation, Δp_{skin}^b , of the theoretical flowing pressure is assumed to be of the form:

$$\Delta p_{skin}^{b} (psi) = 141.2 \frac{q_{i}^{b} \mu}{kh} s_{b}$$
 Equation 4

Incorporation of Equation 4 into Equation 3 and replacement of the quantity $[(x-x_b)^2 + (y-y_b)^2]$ in the Ei-function argument by $r_{w,b}^2$ (wellbore radius squared) leads to the following expression for the transient flowing pressure at a generic wellbore (b):

$$p_{wf}^{b}(x_{b}, y_{b}, t) = p_{o} + \sum_{j=1}^{N} \frac{70.6 q_{i}^{j} \mu}{kh} \operatorname{Ei} \left(\frac{-39.5 \phi \mu c_{t} [(x_{b} - x_{j})^{2} + (y_{b} - y_{j})^{2}]}{kt} \right) + \sum_{j=1(j \neq b)}^{N} \sum_{i=1}^{n_{j-1}} \frac{70.6 (q_{i+1}^{j} - q_{i}^{j}) \mu}{kh}}{kh} \operatorname{Ei} \left(\frac{-39.5 \phi \mu c_{t} [(x_{b} - x_{j})^{2} + (y_{b} - y_{j})^{2}]}{k(t - t_{i}^{j})} \right) + \frac{70.6 q_{i}^{b} \mu}{kh} \left[\operatorname{Ei} \left(\frac{-39.5 \phi \mu c_{t} r_{w,b}^{2}}{kt} \right) - 2s_{b} \right] + \sum_{i=1}^{n_{j-1}} \frac{70.6 (q_{i+1}^{b} - q_{i}^{b}) \mu}{kh} \left[\operatorname{Ei} \left(\frac{-39.5 \phi \mu c_{t} r_{w,b}^{2}}{k(t - t_{i}^{b})} \right) - 2s_{b} \right] \right]$$

Equation 5

where x_b , y_b denote the wellbore coordinates at well b where the pressure response is evaluated.

Application of Equations 3 and 5 to address actual operational conditions often requires inclusion of many wells (including image injectors), each having several hundred flow rate increments. Accordingly, a Visual Basic computer program, PREDICTW, was created to evaluate these equations. When isobaric contours at a given time in a given injection zone are desired, Equation 3, actually $p - p_o$, is evaluated at each node of a predefined uniform grid. The resulting Δp -x-y array is then input/into a 3-D graphics routine, SURFER (® Golden Software, Inc.), to generate selected isobaric contours. When transient wellbore responses are desired to determine flowing pressures at a given well or to simulate pressure falloff tests, Equation 5 is utilized. The output for this case consists of a record of $\Delta p = p - p_o$ at a single well location over a specified time interval.

REFERENCES:

Lee, J., 1982, Well Testing: SPE Textbook Series, Vol. 1, Dallas, Texas.

Muskat, M., 1937, The Flow of Homogeneous Fluids Through Porous Media: McGraw Hill.

Van Everdingen, A. F., 1953, The Skin Effect and Its Influence on the Productive Capacity of a Well: SPE, Presented at the Petroleum Branch Fall Meeting, Fall 1953.

VISCOSITY OF FORMATION FLUID

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APPENDIX E-4



September 16, 1995 Receiving Date: 09/01/96 Sample Type: Water Project No: NA Project Location; Wastewater Wells - Artesia ANALYTICAL RESULTS FOR NAVAJO REFINING Attantion: Dertell Noore 501 E. Main Artesta, NM 88210

Prep Date: 09/02/98 Analysis Date: 09/11/98 Sampling Date: 07/31/98 Sample Condition: Intect & Cool Sample Received by: MS Project Name: NA

After 16 hours @ 130 F

TA#	Field Code	POTASSIUM (mg/L)	MAGNESIUM (mg/L)	CALCIUM (mg/L)	SODIUM (mg/L)	
T103911	Upper Zone	120	152	215	4,470	· · · · · · · · · · · · · · · · · · ·
T103912	Lower Zone	403	166	372	11,000	
T103993	Upper Zone 2:1	92	111	175	2,960	
T103904	Upper Zone 1:1	74	91	156	2,280	
T103995	Upper Zone 1:2	55	70	170	1,630	
T103996	Lower Zone 2:1	264	122	314	8,309	
T103997	Lower Zona 1:1	203	86	272	6,230	
T103998	Lower Zone 1:2	139	77	237	4,400	
ICV		24	25	26	25	
OCV.		24	26	25	26	
Reporting Limit		0.50	0.60	0.50	0.50	
NETHOD BLANK		< 0.50	<0. 50	<0.60	<0.50	
RPD		· 2	1	1	5	
% Extraction Accuracy		120	93	\$4	105	
% Instrument Accuracy		99	102	104	104	

METHODS: EPA200.7. CHEMIST: RR SPIKE: 1,000 mg/L POTASSIUM, MAGNESIUM, CALCIUM, SODRUM. CV: 25 mg/L POTASSIUM, MAGNESIUM, CALCIUM, SODRUM.

9-16-58

Director, Dr. Blair Leftwich

Date



September 16, 1998 Receiving Date: 08/01/98 Sample Type: Water Project No: NA Project Location; Wastewater Welts - Artesia ANALYTICAL RESULTS FOR NAVAJO REFINING Attention: Darrell Noore 501 E. Main Artesia, NM 68210 Prep Date: 08/11/98 Analysis Date: 08/18/98 Sampling Date: 07/31/98 Sample Condition: Intact & Cool Sample Received by: MS Project Name: NA

ROOM TEMPERATURE

TAS	Field Code	POTASSIUM (mg/L)	NAGNESIUM (mg/L)	CALCIUM (mgAL)	sodium (ing/L)	
T103911	Upper Zone	51	126	276	4,785	
T103912	Lower Zone	213	143	390	12,770	
T103993	Upper Zone 2:1	26	5 0	214	3,114	
T103094	Upper Zone 1:1	16	65	282	2,491	
T103995	Upper Zone 1:2	5.3	39	213	1,875	
T103996	Lower Zone 2:1	138	99	384	8,920	
T103997	Lower Zone 1:1	89	70	277	6,778	
T103998	Lower Zone 1:2	54	43	291	4,547	
ICV		25	25	25	26	
CCV		25	25	25	26	
Reporting Limit		. 0.50	0.50	0.50	0.59	
METHOD BLANK		●.50	<0.50	<0.50	<0.50	
RPD		2*	0*	0°	0*	
% Extraction Acouracy		96*	100*	104*	101°	
% Instrument Accuracy		100	100	100	104	

NOTE: Used LCS for Extraction Accuracy and RPD due to high concentration in sample.

METHODS: EPA 200.7.

CHEMIST: RR

SPIKE 100 mga. POTASSNIM, MAGNESIUM, CALCIUM, SODIUM.

CV: 25 mgal POTASSIUM, MAGNESIUM, CALCIUM, SODIUM.

9-16-98

Dete

Director, Dr. Blair Leftwich

	8/01 Aberdeen / 4725 Riplay Aver	Avenue, Suite 9 nue, Suite A ANA	LL bbock, Ti El Pasa, Ta El NLYTICAL	Data 75424 800 • Axas 79922 888 • Mail Labertocean RESULTS FO	378+1238 (116+794+12 586+3443 915+565+34 alysis.com R	236 1AX 808+79 443 FAX 915+5	14 - 1298 15 + 4944		
September Receiving L Sample Typ Project No:	18, 1993 Date: 08/01/98 He: Water NA	Atte 501 Arte	AJU REF ntion: Der E. Main Sia, NM 8	INING rell Moore 8210		Sampling Co Sample Co Sample Ra Project Nar	Date: 07/31/98 ndition: & C ceived by: MS ne: NA		
Project Loc	ation: Wastewater We	lis - Artesia Kocht TXX		RE					
TA#	FIELD CODE	NO (111	3-N° 19/L)	TSS (mg/L)	TDS (mg/L)	FLUORIDE (mg/L)	CHLORIDE (mg/L)	SULFATE (mg/L)	
T103911 T103912	Upper Zone Lower Zone	•	10	46 170	15,000 33,000	3.7 2.6	8,500 19,000	1,800 2,200	
ICV CCV			.8 .8			0.97 0.94	12 12	12	
RPO			4	0	ð	8	0	1	
% Extraction % instrument	n Accuracy nt Accuracy	ŝ	5 77		98	104 97	96 98	99 98	
REBARTIN			0			•••			
			U			0.1	0.3	05	
PREP DATE	DATE	08/0 08/0 ALKA	16/98 16/98 Linity	08/09/98 08/09/98 SPECIFIC	08/06/98 08/08/98 SPECIFIC	08/07/98 08/07/98	08/06/98 08/06/96	08/06/98 08/06/98	
		(mg/L al HC03	CaCo3) C03	GRAVITY (g/mL)	CONDUCTANCE (uMHOS/cm)	рН (s.u.)			
T103911	Upper Zone	1,400	<1.0	1.018	27,000	7.6			
T103912 T103994	Lower Zone Upper Zone 1:1	1,000	<1.0 8	1.034	52,000 13,000	8,1 8,5			
ICV		1,100	1,100		1,396	70			
CCV		1,130	1,080		1,387	7.0			
RPD		1	1	0	1	0			
> Extraction	Accuracy Accuracy	 91	91	-	· 98 99	100			
REPORTING	3 LIMIT								
		06/4		00/00/04	00/07/09	02/00/04			
ANALYSIS I 'NOTE: OW METHODS: CHEMIST	DATE L of helding time for EPA 150.1, 300.0, 16 H/TSS: BP N03-h	08/1 103-N. 10.2, 160.1, 3 1/FLUORIDE	1/98 1/98 340.2, 120 S/CHLORI	08/08/95 1, 310.1; AST DE/SULFATE/	08/07/98 08/07/98 M 0854-92. SPECIFIC GRAVIT	C8/09/95			

.

805+794+1796 6/01 Aberdeen Avenue, Suite 9 Lubbock, Texes 70424

4725 Ripley Avenue, Suite A

800=378+1296 El Poso, Texas 79972 889+588+3443 E-Mail. labor acomalysis com

FAX 808+794+1298 915+585+3443 FAX 915+585+4544

Sampling Date: 07/31/98

Sample Condition: I & C

Sample Received by: MS

Project Name: NA

ANALYTICAL RESULTS FOR NAVAJO REFINING Attention: Dameil Moore 501 E. Main

Artesia, NM 55210

September 16, 1998 Receiving Date: 08/01/98 Sample Type: Water Project No: NA Project Location: Wastewater Wells - Artesia

ROOM TEMPERATURE

TA#	FIELD CODE	0M (m	3-N* g/L)	(mg/L)	TDS (mg/L)	FLUORIDE (mg/L)	CHLORIDE (mg/L)	SULPATE (mg/L)
T103003	Lines Zong 2.1		10	540	11.000		5.000	4 400
	opper conto an				11,000	(14) (14)	0,000	(,400
					-	0.37	11	12
		4	.0	, 6 6 1		0.34	11	72
RPD			4	0	8	6	5	1
% Extractio	n Accuracy	5	16			104	93	99
% instrume	nt Accuracy	ę	17		98	97	93	98
REPORTIN	GLIMIT	1	0	÷		0.1	0.5	0.5
PREP DATE ANALYSIS DATE		OB/OG/98 08/08/98 ALKALINITY		08/09/96 08/09/98 SPEC1FIC	08/08/98 08/08/98 SPECIFIC	08/07/98 08/10/98 08/07/98 08/10/98	08/08/98 08/08/98	
		(mg/L at	L CáČo3)	GRAVITY	CONDUCTANCE	pН		
		HC03	ເຜ່	(g/mL)	(uMHOS/cm)	(s.u.)		
T102002	Lioper Zone 2:1	700	<10	1.010	18,000	. 87		
ICV		1 100	1 100		1 398	70		
CCV		1,130	1,060		1,387	7.0		
RPD		1	1	0	1	0		
% Extraction	Accuracy				98			
% instrumer	nt Accuracy	91	91	***	99	100		
REPORTIN	g limet	_						
PREP DATE	E DATE	08/1 08/1	1 /98 1 /98	08/06/98 08/06/98	08/07/98 08/07/96	08/09/98 06/00/98		

"NOTE: Out of holding time for N03-N.

METHODS: EPA 150.1, 300.0, 160.2, 160.1, 340.2, 120.1, 310.1; ASTM D854-92. CHEMIET: phytss: BP NO3-N/FLUORIDE/CHLORIDE/SULFATE/SPECIFIC GRAVITY; JS TDS/SPECIFIC CONDUCTANCE/ALKALINITY: RS NO3-N SPIKE: 125 mg/L NO3-N. FLUORIDE SPIKE: 10 mg/L FLUORIDE. CHLORIDE SPIKE: 1,260 mg/L CHLORIDE. SULFATE SPIKE: 312.5 mg/L SULFATE.

N03-N CV: 5.0 mg/L N03-N. FLUORIDE CV: 1.0 mg/L FLUORIDE. CHLORIDE CV: 12.5 mg/L CHLORIDE. SULFATE CV: 12.5 mg/L SULFATE.

9-16-58 DATE

Director, Dr. Bleir Leftwich

970: Aberdeen Avenue, Suite 9 Lutonce, Texas 79474 800-378=1295 806-794=1295

4725 Ripley Avenue, Suite A

FAX 806+794+1298 El Paso, Texes 79922 888+588=3443 915+585+3443 FAX 915+585+4544

E-Mail. lab@traceanalysis.com ANALYTICAL RESULTS FOR

NAVAJO REFINING Attention: Darrall Moora 501 E. Main Artesia, NM 88210

Sampling Date: 07/31/98 Sample Condition: I & C Sample Received by: MS Project Name: NA

Project Location: Wastewater Wells - Artesia

September 16, 1998 Receiving Date: 08/01/98

Sample Type: Water

Project No: NA

ROCH	TEMPERATURE

TA#	FIELD CODE	NC . (П)	g/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	SULFATE (mg/L)
T103996	Upper Zone 1:2	<	10	320	8,000	24	2,600	960
T103996	Lower Zone 2:1	¢	10	530	23.000	13	14.000	1.700
T103997	Lower Zone 1:1	<،	10	430	18,000	20	12,000	1.500
T103998	Lower Zone 1:2	4.	10	230	13,000	23	13.000	1,100
ICV		4	.8		_	0.97	12	12
CCV		4	.8		-	0.94	12	12
RPO			1	0	8	8	1	4
% Extraction	Accuracy	10	36		-	104	90	109
% Instrumen	t Accuracy	9	7	—	98	97	97	97
REPORTING	3 LIMIT	1	0	-		0.1	0.5	0.5
PREP DATE ANALYSIS DATE		08/0 08/0 Alkai	08/08/98 08/08/98 ALKALINITY		08/05/98 08/08/98 SPECIFIC	08/07/98 08/08/98 08/07/98 08/08/98	08/05/98 08/06/98	
		(mg/L #	CaCo3)	GRAVITY	CONDUCTANCE	ρΗ		
		HC03	C03	(g/mL)	(uMHOS/cm)	(s. u.)		
T103996	Upper Zone 1:2	340	4	1.010	9,300	8.5		
T103996	Lower Zone 2:1	570	<1.0	1.019	44,000	8.2		
T103897	Lower Zone 1:1	540	2.0	1.023	34.000	8.4		
T103995	Lower Zone 1:2	370	10	1.009	20,000	8.6		
ICV		1,100	1,100		1,395	7.0		
CCV		1,130	1,050		1,387	7.0		
RPD		1	1	0	1	0		
% Extraction	Accuracy				98			
% Instrumen	(Accunacy	91	81	-	28	100		
REPORTING					·			
PREP DATE ANALYSIS C	ATE	08/1 08/1 NG3_M	1/98 1/98	08/06/98 08/06/98	08/07/98 08/07/98	08/09/98 08/09/98		
METHODS: CHEMIST: p TDS	EPA 150.1, 300.0, 10 H/TSS: BP N03-A S/SPECIFIC CONDUC	U.2, 100.1, 3 UFLUORIDE	40.2, 120. CHLORU KALINITY:	1, 310.1; AST DE/SULFATE RS	'M D854-92. 'SPECIFIC GRAVIT	Y: JS		
NO3-N SPIKE	125 mg/L N03-N.				N03-N CV: 5.0 m	g/L N03-N.		
FLUORIDES	PIKE: 10 mg/L FLUC	DRIDE.			FLUORIDE CV: 1			
CHLORIDE	PIKE: 312.5 mg/L C	HLORIDE.						
						- vo mgre over	.	
<u></u>	182	2			•	9-16	- 1° 8	

Director, Dr. Blair Leftwich

DATE

••••

6701 Aberdeen Averue, Surte H UNDOCK, Texas 79424 800+794+1290 FAX 800-794+1290

ANALYTICAL RESULTS FOR

NAVAJO REFINING

Artesia, NM 88210

501 E Main

Attention: Darrell Moore

4725 Hipley Avenue, Suite A

Luhbock, Texas 79424 803+378+1299 El Peso, Texas 79922 888+588+3443 E-Meiit: let:@trocasnalvsis.com

808+794+1290 FAX 808+794+1299 915+585+3443 FAX 915+585+4944

> Sampling Date: 07/31/98 Semple Condition: I & C Sample Received by: MS Project Name: NA

Project Location: Wastawster Wells - Artesia After 16 hours @ 130 ° F

September 16, 1998

Semple Type: Water

Project No: NA

Receiving Date: 08/01/98

TA#	FIELD CODE	N0 (m	3-N* 19/L)	TSS (mg/L)	TDS (mg/L)	FLUORIDE (mg/L)	CHLORIDE (mg/L)	SULFATE (mg/L)
T103911	Upper Zone	<	10	3,200	17,000	2.7	7,200	1.800
T103912	Lower Zone	<	10	1,040	38.000	2.0	22,000	2.100
T103993	Upper Zone 2:1	<	10	1,900	11,000	12	49,000	1,300
ίς ν		4	.7		-	0.97	11	12
CCV			.7		—	0.95	11	11
RPD			3	3	1	0	5	Q
% Extractio	n Accuracy	1	05			100	93	110
% Instrume	nt Accuracy	9	6	-	101	97	93	97
REPORTIN	g limit	1	0			0.1	0.5	0.5
PREP DATE ANALYSIS DATE		08/2	6/98	08/12/98	08/10/98	08/12/98	08/10/98	08/10/98
		08/26/98 ALKALINITY		08/12/98 SPECIFIC	08/10/98 SPECIFIC	08/12/98	08/10/98	08/10/98
		(mo/L a		GRAVITY	CONDUCTANCE	BH 1		
		HC03	C03	(g/mL)	(uMHOS/cm)	(s.u.)		
T103911	Upper Zone	720	36	1.018	27.000	8.6		
T103912	Lower Zone	570	8.0	1.036	68.000	8.4		
T103993	Upper Zone 2:1	480	24	1.016	18,000	8.8		
ICV	.,	1,080	1.100		1,335	7.0		
CCV		1,040	1,120		1,327	7.0		
RPD .	».	1	t	0	2	0		
% Extraction	Accuracy				94			
% Instrumer	nt Accuracy	90	80	-	94	100		
REPORTIN	3 LIMIT				_	_		
PREP DATE	DATE	08/1 08/1	4/98 4/98	08/11/98 08/11/98	08/10/98 08/10/98	08/12/98 08/12/98		
METHODS: CHEMIST:	t of holding time for EPA 150.1, 300.0, 16 pH/TSS: BP N03-1	NU3-N. 10.2, 160.1, 3 NFLUORIDI	340.2, 120. CHLORI	1, 310.1; AST DE/SULFATE	'M D854-92. 'SPECIFIC GRAVIT	Y: J8		
TD No3-n Spik	expredific condu E: 125 ma/L NO3-N	GIANCE/AL	KALINITY	no.	N03-N CV: 5.0 m	a/L NO3-N.		
FLUORIDE	SPIKE: 10 mo/L FLUI	ORIDE.			FLUORIDE CV: 1	a ma/L FLUG	JRIDE.	

FLUORIDE SPIKE: 10 mg/L FLUORIDE. Chloride spike: 1,250 mg/L Chloride. Sulfate spike: 1,250 mg/L sulfate. NO3-N CV: 5.0 mg/L NO3-N. FLUORIDE CV: 1.0 mg/L FLUORIDE. CHLORIDE CV: 12.5 mg/L CHLORIDE. SULFATE CV: 12.5 mg/L SULFATE.

Director, Dr. Blair Leftwich

81

DATE

9-16-98

AMALY TICAL RESULTS FOR NAVAJO REFINING Septembor 16, 1998 Attention: Darrel Moore Sempling Date: 07/31/98 Receiving Date: 08/01/98 601 E. Main Semple Condition: I & C Sample Type: Water Artesia Semple Condition: I & C Project No: NA Project Name: NA Project Name: NA Project Location: Wastewater Welts - Artesia M03-N* T6% TDS Aff text 16 housts 6 130 °F N03-N* T6% TDS TAst FIELD CODE (mg/L) (mg/L) (mg/L) (mg/L) (mg/L) T103994 Upper Zone 1:1 <10 370 8,700 17 3,500 1,100 T103996 Lower Zone 2:1 <10 300 27,000 12 14,000 1,800 RCV 4.7 0.97 11 11 CCV 4.7 0.98 11 11 RPD 3 3 1 0 2 2 % Extraction Accuracy 98	nbar 16, 1990 ing Date: 08/ • Type: Wats No: NA • Location: W juit FIEL • FIEL • Uppe • Lowe
Project Location: Weits - Artesia After 16 hours 6 130 °F N03-N* TSS TDS FLUCRIDE CHLORIDE SULFAT TA# FIELD CODE (mg/L)	FIEL FIEL V Uppe S Uppe S Lowe
TA# FIELD CODE N03-N* (mg/L) TES (mg/L) TDS (mg/L) FLLIORIDE (mg/L) CHLORIDE (mg/L) CHLORIDE (mg/L) SULFAT (mg/L) T103994 Upper Zone 1:1 <10 370 8,700 17 3.500 1,100 T103995 Upper Zone 1:2 <10 300 26,600 24 2,400 880 T103996 Lower Zone 2:1 <10 300 27,000 12 14,000 1,900 KCV 4.7 0.97 11 11 CCV 4.7 0.98 11 11 RPD 3 3 1 0 2 2 % Extraction Accuracy 105 100 92** 95** % Instrument Accuracy 98 101 97 93 95 REPORTING LIMIT 10 - 0.1 0.5 0.5	FIELI 14 Uppe 15 Uppe 16 Lowe
T103994 Upper Zone 1:1 <10	94 Uppe 95 Uppe 96 Lowe
4.7 0.97 11 11 CCV 4.7 0.98 11 11 RPD 3 3 1 0 2 2 $\%$ Extraction Accuracy 105 100 92^{-6} 95^{-6} $\%$ instrument Accuracy 96 101 97 93 95 REPORTING LIMIT 10 0.11 0.5 0.5	
RPD 3 3 1 0 2 2 % Extraction Accuracy 105 100 92** 95** % Instrument Accuracy 98 101 97 93 95 REPORTING LIMIT 10 0.1 0.5 0.5	
% instrument Accuracy 98 101 97 93 95 REPORTING LIMIT 10 0.1 0.5 0.5	action Accure
REPORTING LIMIT 10 0.1 0.5 0.5	ument Accur
	RTING LIMIT
PRIEP DATE 08/25/98 05/12/98 08/10/98 05/12/98 05/10/98 08/10/98 ANALYSIS DATE 08/26/06 08/12/98 08/10/98 08/10/98 08/10/98 ALKALINITY SPECIFIC SPECIFIC	date 1919 date
(mg/Las CaCo3) GRAVITY CONDUCTANCE pH HC03 C03 (g/mL) (uMHOS/cm) (a.u.)	
T103994 Upper Zone 1:1 520 58 1.012 14.000 8.7 T103996 Upper Zone 1:2 270 20 1.004 11.000 9.0 T103998 Lower Zone 2:1 430 8.0 1.021 48.000 8.5	14 Upper 16 Upper 18 Lowe
CV 1,080 1,100 — 1,335 7.0 CCV 1,040 1,120 — 1,327 7.0	
RPD 1 1 0 2 0 W Extraction Accuracy	iction Acourt
M Instrument Accuracy 90 90 94 100 REPORTING LIMIT	ument Accurs ITING LIMIT DATE

MU	ULLUM MULLU	TIM	RACE	Anal	<u>ysis, Inc</u>	Mille		
	6701 Aberdeen A 4725 Rigter Aven	Menzie, Suite 9 Nie, Suite A	Lubbock, Te	228 79424 8004 228 79422 8884	9378=1296 608=794=12 9588=3443 915=985=12	798 - FAX 308+7; 143 - FAX 918+4;	54 • 1290 R5= 4944	
			E	Mail. lab@tracear	alysis.com		00 - 40 - 40	
		ANA		RESULTS FO	R			
September	16 1998	Alto	ntion Dan	ning Moora		Samalina F	Nate: 07/24/08	
Receiving D	Data: 08/01/98	501	E. Main			Semple Co	ndition: i & C	
Sample Typ	oe: Water	Arte	nin, NM Si	8210		Sample Re	ceived by: MS	
Project No:	NA cline: Manterster Mat					Project Nar	ne: NA	
Freject Coc	After 16 hou		n °					
	WE CARE TA HOT	54 9 43 NO	3-N°	237	TDS			RI I SATE
TA#	# FIELD CODE		g/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
T103997	Lower Zone 1:1	۲	10	160	22,000	15	11,000	1.500
T103996	Lower Zone 1:2	٩	10	340	15,000	22	7.100	1,000
	195 Lower Zone 1:2 <10 4.7 4.7				0.97	11	11	
	4.7		./			0.98	11	12
RPD	3		3	3	1	0	1	1
% Extraction	PD Extraction Acouracy Instrument Accuracy		05			100	91	93
% Instrume	% Instrument Accuracy		96		101	97	94	97
REPORTIN	g limit	10		-		0.1	0.5	0.5
PREP DATI	e Date	08/2 08/2 ALKAI (mg/L as HC03	08/26/98 08/26/98 ALKALINITY (mg/L 25 C2C03) HC03 C03		08/10/98 06/10/98 SPECIFIC CONDUCTANCE (UMHOS/cm)	08/12/98 08/12/98 pH (s.u.)	08/10/98 08/10/98	08/10/98 08/10/98
T103997	Lower Zone 1:1	240	22	1.012	37,000	8.6		
T103998	Lower Zone 1:2	300	16	1.009	26,000	8.8		
ICV		1,090	1,100		1,335	7.0		
CCV		1,040	1,120	-	1,327	7.0		
RPD		1	1	o	. 2	0		
% Extraction	Accuracy	-			94			
REPORTING	nt Accuracy 3 LIMIT		. 90	-	94 	100		
PREP DATE ANALYEIS (L DATE	08/14 08/14	4/98 4/98	08/11/98 08/11/98	08/10/98 08/10/98	08/12/98 08/12/98		
"NOTE: Out	t of holding time for N	103-N.						
METHODS: CHEMIST: p TD: NO2 AL	EPA 150.1, 300.0, 180 M/TSS: 8P NO3-N/ S/SPECIFIC CONDUC	1.2, 160.1, 3 Fluoride Tance/Ali	40.2, 120. VCHLORIC KALINITY:	1, 310.1; AST DE/BULFATE/ RS	M D854-92. SPECIFIC GRAVIT	P. JS		
					TTUUTIT UV. U.U IT			

FLUORIDE SPIKE: 12 mg/L NUSH. FLUORIDE SPIKE: 10 mg/L FLUORIDE. CHLORIDE SPIKE: 62.5 mg/L CHLORIDE. BULFATE SPIKE: 62.5 mg/L SULFATE.

FLUORIDE CV: 1.0 mg/L FLUORIDE. CHLORIDE CV: 12.5 mg/L FLUORIDE. SULFATE CV: 12.5 mg/L SULFATE.

5-16-91 -----

Director, Dr. Blair Leftwich

DATE

4211 Freidzich Laur, Subte 196, Austin, TX 78744 A 9320 Up Biver Band, Carpes Christi, TX 78409 (\$12) 444-5896 • TAX (\$12) 447-6766

Client	Trace Analysis, I	inc.	
Atta:	Nell Green		
Addres	6701 Aberdeen A	Ave, Ste. 9	
	Labboek,	Tx	79424
Phones	(806) 794-1296	FAX: (80	6) 794-1298

Report #/Lab ID#:92840 Report Date: 8/31/98 Project ID: Sample Name: 103911 Sample Matrix: water Date Received: 8/5/98 Time: 10:00:00 Date Sampled: Not specific Time: 00:00:00

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA

Parameter	Result	Units	RQL ^s	Blank	Date	Method	Prec. ²	Recoy.3	CCV ⁴	LCS ⁴
Viscosity	0.6	срб			B/26/98	Brookfield	:			

Room Temperature - Appen Zone Nore: Could not run heard sample due to sulfide hazand.

This easilytical report respectfully submitted by AnalySys, Inc. The exclused results have been	1. Quality assurance data reported is for the lot analyzed which included this sample
reviewed and in the best of my knowledge the analytical results are consistent with AnalySys,	2. Precision (Proc.) is the absolute value of the relative percent (%) difference between
Inc.'s Quality Assurance/Quality Control Program @ Copyright 1998 AualySys, Inc., Austin,	duplicase measurements.
Tenas. All rights reserved. No part of this publication may be reproduced or transmit- ted in	3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample.
any form or by any means without the express written permission of AnalySys, Inc.	4. Calibration Vertification (CCV) and Lab Control Sample (LCS) results expressed as
Respectfully Submitted	the percent (%) recovery of unalyte from a known standard.
	5. Reporting Quastitation Limit. The Practical Quantitation Limit (PQL) or the
Rechard Taitin	Method Detection Lineit (MDL) reported for the analyte.
	6. Method mambers typically denote USEPA procedures. Less than ("<") values reflect
Richard Laster	nominal quantitation limits, adjusted for any required dilution.

CINCLYSYS.

4231 Freidrich Lene, Suite 190, Austin, TX 78744 & 9326 Up River Raad, Corpus Christi, TX 78409 (512) 444-5296 - VAX (512) 447-4766

Report #/Lab [D#:9284]

Sample Name: 103912

Sample Matrix water

Date Received: 8/5/98

Date Sampled: Not specific Time: 00:00:00

2

Project II):

Client: Trace Analysis, Inc. Atta: Nell Green A ddress: 6701 Aberdeen Ave, Ste. 9 Lubbock, Tx 79424

Phone: (806) 794-1296 FAX: (806) 794-1298

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA

Time: 10:00:00

Report Date: 8/31/98

Parameter	Result	Units	RQLS	Blank	Date	Method	Prec.2	Recov.3	CCY4	LCS ⁴
Vixensity	0.7	сря			8/26/98	Brookfield				

how Tonycrotane - Lover zone Note: Could not ven heared sample due to sulfile hagand

This andutical report respectfully submitter by AnalySus for. The exclosed results have been	1. Quality assurance data concerted is for the lat and word which included this comple					
	2 De trie (Des) tale to the trie of the many and when the more than the set of the					
reviewed and to the best of my showledge the thatytical results are consistent with Analysys,	2 Treasion (Free.) is the toscilute value of the resultive percent (%) difference between					
Inc.'s Quality Assurance/Quality Control Program & Copyright 1998 AsslySys, Inc., Ausia,	duplicate measurements.					
Texas. All rights reserved. No part of this publication may be repruchased or transmit- ted in	3. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample.					
any furmur by any means without the capress written permission of AnalySys, Inc.	4. Calibration Verification (CCV) and Lab Control Sample (LCS) results expressed as					
Respectfully Submitted.	the percent (%) receivery of analyte from a known standard.					
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (POL) or the					
Richard Parts	Method Detection Limit (MDL) reported for the analyte.					
tarin tarin	6 Method minibers typically denote USEPA procedures. Less than ("<") whose reflect					
Richard Laster	nominal quantitation limits, adjusted for any required dilution.					

CINCLYSYS.

Client: Trace Analysis, inc. Atta: Nell Gmen Addiress: 6701 Aberdeen Ave, Sto. 9 Lubbock, Tx 79424

Phone: (806) 794-1296 FAX: (806) 794-1298

REPORT OF ANALYSIS

4211 Frailrich Lans, Suite 198, Austin, TK 78744 A 9318 Up River Read, Corpus Christi, TK 78409 (582) 444-5296 • FAX (512) 447-4766

Report #/Lab ID#:92842 Report Date: 8/31/98 Project ID: Sample Name: 103993 Sample Matrix: water Date Received: 8/5/98 Time: 10:00:00 Date Sampled: Not specific Time: 00:00:00

OUALITY ASSURANCE DATA

Parameter	Result	Units	RQL ^s	Blank	Date	Mcthed	Prec. ¹	Recov.3	CCV4	LCS ⁴
Viscosity	0.6	cps			8/26/98	Brookfield				

Room Tanp - apple 2me 2:1 Nove: Could not more heated sample due to sulfide hayand

This analytical report respectfully submitted by AnalySys, Inc. The enclosed results have been	I. Quality assurance data reported is for the lot analyzed which included this sample.					
reviewed and to the best of my knowledge the malytical results are consistent with AnalySys,	2. Precision (Proc.) is the absolute value of the relative percent (%) difference between					
Inc.'s Quality Assurance/Quality Control Program & Cupyright 1998 AnalySys, Inc., Austin,	duplicate measurements.					
Texas. All rights reserved. No part of this publication may be reproduced or transmit- ted in	3. Recovery (Recow.) is the percent (%) of analyte recovered from a spiked sample.					
may form or by any means without the express written permission of AnalySys, Inc	4. Calibration Venification (CCV) and Lab Control Sample (LCS) results expressed as					
Respectfully Submitted.	the percent (%) recovery of analyte from a known standard.					
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (FQL) or the					
Richard Taiter	Method Detection Limit (MDL) separated for the analyte.					
	6 Method numbers typically denote USRPA procedures. Less than ("<") values reflect					
Rachard Laster	wominal eventiation limits, withsted for any semired diktion.					

CINCLYSYS

Client: Trace Analysis, Inc. Atta: Nell Green Address: 6701 Aberdeen Ave, Str. 9 Lubbock, Tx 79424

Phone: (806) 794-1296 FAX: (806) 794-1298

REPORT OF ANALYSIS

4223 Preideich Lane, Suite 196, Austin, TK. 78746 & 5226 dip River Rend, Corpus Christi, TX. 78409 (512) 444-5896 - FAX (512) 447-6766

Report #/Lab ID#:92843 Report Date: 8/31/98 Project ID: Sample Name: 103994 Sample Matrix: water Date Received: 8/5/98 Thme: 10:00:00 Date Sampled: Not specific Time:00:00:00

QUALITY ASSURANCE DATA¹

Parameter	Result	Units	RQL ⁵	Blank	Date	Method	Prec.2	Recov.3	CCV4	LCS4
Viscosity	0.6	cps			8/26/98	Brookficki				

Noon Tongeratere - Upper Ime 1:1 Nore: Could not sun heated sample due to Sulfide hazand

This analytical report respectfully submitted by AnalySys, Inc. The enclosed results have been	1. Quality assumance data reported is for the kut analyzed which included this sample.
reviewed and to the best of my knowledge the analytical results are consistent with AnalySys,	2. Precision (Prec.) is the absolute value of the relative percent (%) difference between
Inc's Quality Assumace/Quality Control Program. O Cupyright 1998 AnalySys, Inc., Austin,	duplicate mensurements.
Toxas. All rights sessived. No past of this publication may be reproduced or transmit- ted in	3. Becovery (Recov.) is the percent (%) of analyte recovered from a spiked sample.
any form or by any means without the express written permission of AnalySys, Inc.	4. Calibration Verification (CCV) and Lah Control Sample (LCS) results expressed as
Respectfully Submitted.	the percent (%) secovery of analyte from a known standard.
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (PQL) or the
Kehord Taster	Method Detection Limit (MDL) reported for the analyse.
	6 Method numbers typically denote USEPA procedures. Less than ('<") values reflect
Richard Laster	acaninal quantitation limits, adjusted for any required dilution.

CINCLYSYS

4221 Freideleb Lane, Suite 190, Austin, TX 78744 A 5320 Up River Mand, Corpus Christi, TX 78409 (512) 444-5896 • FAX (512) 447-5766

Report #/Lab ID#:92844

Date Sampled: Not specific Time:00:00:00

Sample Name: 103995

Sample Matrix water Date Received: 8/5/98

Project ID:

Client: Trace Analysis, Inc. Atta: Nell Geen Address: 6701 Abendeen Ave, Ste. 9 Lubbock, Tx 79424 Phone: (806) 794-1296 FAX: (806) 794-1298

REPORT OF ANALYSIS

OUALITY ASSURANCE DATA¹

Time: 10:00:00

Report Date: 8/31/98

Parameter	Result	Units	RQI. ³	Blank	Date	Method	Prec. ²	Recov.3	CCV4	LCS ⁴
Viscosity	0.6	cps			8/26/98	Brookfield				

Room Tampinorani - lyppen Zone 1:2 Note: Could not run heated sample due to suffile hayand

This analytical report respectfully submitted by AnalySys, Inc. The enclosed results have been	1. Quality as surance data reported is for the lot analyzed which included this sample.
reviewed and to the best of my knowledge the analytical results are consistent with AnalySys,	2. Precision (Prec.) is the absolute value of fue relative percent (%) difference between
Inc.'s Quality Assurance/Quality Control Program @ Copyright 1998 AnalySys, Inc., Austin,	diplicate measurements.
Texas. All rights reserved. No part of this publication may be reproduced or transmit-ted in	1. Recovery (Recov.) is the percent (%) of analyte recovered from a spiked sample.
any form us by any means without the express written permission of AnalySys, Inc.	4. Calibration Venification (OCV) and Lab Control Sumple (LCS) results expressed as
Respectfully Submitted	the percent (%) monvery of saulyte from a known standard.
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (PQL) or the
Richard Taite	Method Detection Limits (MDL.) seported for the analyte.
	6. Method sumbers typically denote USEPA procedures. Less than ("<") values reflect
Richard Laster	nominal quantitation limits, adjusted for any required dilution.

Page#i l

4223 Freidrich Lane, Butte 190, Auslin, TK 78744 A 9320 Up River Read, Corpus Christi, TX 78489 (512) 444-5834 • FAX (512) 447-4766

Client: Trace Analysis, inc. Atim: Nell Green Address: 6701 Aberdeen Ave, Ste. 9 Lubbock, Tx 79424

Phone: (806) 794-1296 FAX: (806) 794-1298

REPORT OF ANALYSIS

OUALITY ASSURANCE DATA

Time: 10:00:00

Report Date: 8/31/98

Parameter	Result	Units	RQLS	Blank	Date	Method	Prec.2 Recov.	CCV4	LCS4
Viscosity	0.1	сря			8/26/98	Brookfield			

Room Tongenture - Lawer Zone 2:1 Note: Could not un beated sample due to sulpide hagaed

This analytical report respectfully submitted by AnalySys, hec. The enclosed results have been	1. Quality assurance data reported is for the lot analyzed which included this sample.
reviewed and to the best of my knowledge the analytical setults are consistent with AnalySys,	2. Precision (Prec.) is the absolute value of the relative percent (%) difference between
Inc.'s Quality Assurance/Quality Control Program.@ Copyright 1998 AnalySys, Inc., Austin.	duplicate measurements.
Texas. All rights reserved. No part of this publication may be reproduced or transmit- ted in	3. Recovery (Recev.) is the percent (%) of analyte recovered from a spiked sample.
any form or by any means without the express written permission of AnalySys, Inc.	4. Calibration Ventication (CCV) and Lab Coatrol Sample (LCS) results expressed as
Respectfully Submitted.	the percent (%) secovery of analysis from a known standard.
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (PQL) or the
Richard Tatte	Method Detection Limit (MDL) reported for the analyte.
	6. Method sumbers typically denote USEPA procedures. Less than ("<") values reflect
Richard Laster	nominal quantitation limits, adjusted for any some sed dilution.

Page#: I

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Report #/Lab ID#:92845

Date Sampled: Not specific Time: 00:00:00

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Sample Name: 103996

Sample Matrix water Date Received: 8/5/98

Project ID:

CINCLYSYS

4121 Freidrich Lano, Suite 199, Austin, YX 78744 A 9.128 Lip River Roud, Coopus Christi, YX 78469 (522) 444-5876 - YAX (513) 447-6766

Client	Trace Analysis, I	nc.	
Attn:	Nell Green		
Address	16701 Aberdeen A	lve, Sta. 9	
	Labback,	Tx	79424
Phone	(806) 794-1296	FAX: (80	6) 794-1298

Report #/Lab 1D#:92846Report Date:8/31/94Project 1D:
Sample Name: 103997Sample Name: 103997Sample Matrix: waterDate Received: 8/5/98Time: 10:00:00Date Received: 8/5/98Time: 00:00:00Date Sampled: Not specific Time: 00:00:00

REPORT OF ANALYSIS

QUALITY ASSURANCE DATA

Parameter	Result	Units	RQL ⁵	Blank	Date	Method	Prec. ²	Recov.3	CCV ⁴	LCS4
Viscosity	0.6	срі			8/26/98	Broukfield				

Room Tomp - Lower Zone 1:1 Note: Could not van heated Sample due to Sulfide hagand

This analytical report respectfully submitted by AnalySys, Inc. The enclosed results have been	1. Quality assurance data reported is for the lut analyzed which included this sample.
reviewed and to the best of my knowledge the analytical results are consistent with AnalySyr,	2. Procisica (Proc.) is the absolute value of the relative percent (%) difference between
Inc.'s Quality Assurance/Quality Control Program @ Copyright 1998 AnalySys, Inc., Austin,	duplicate measurements.
Texas. All rights reserved. No part of this publication may be repruduced or transmit- ted in	3. Recovery (Rouw.) is the percent (%) of analyte recovered from a spiked sample.
any form or by any means without the appress written permission of AnalySys, Inc.	4. Calibration Verification (CCV) and Lab Control Sample (LCS) results expressed as
Respectfully Submitted	the percent (%) recovery of analyte from a known standard.
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (PQL) or the
Richard Teste	Method Detection Limit (MDL) reported for the analyte.
	6. Method numbers typically denote USEPA procedures. Less than ("<") values reflect
Richard Laster	nominal quantitation limits, adjusted for any sequered dilution.

Page#:1

CINCLYSYS

Cligni: Trace Analysis, Inc. Atta: Nell Green Address: 6701 Aberdeen Ave, Stc. 9 Lubbock, Tx 79424

Phone: (\$06) 794-1296 FAX: (806) 794-1298

REPORT OF ANALYSIS

4221 Freidrich Long, Sulie 190, Austin, TX 78744 2: 9326 Up River Rond, Curpus Christi, TX 78409 (512) 444-5896 • FAX (512) 447-4766

OUALITY ASSURANCE DATA¹

Report #/Lab ID#:92847	Report Date: 8/31/98
Project ID:	-
Sample Name: 103998	
Sample Matrix: water	
Date Received: 8/5/98	Time: 10:00:00
Date Sampled: Not specific	Time: 00:00:00

Parameter Result Units RQ1.5 Blank Date Method Prec.2 Recov.5 CCV4 LCS4 Viscosity 0.5 cps 8/26/98 Bronkfield 0

Room Temp - Lower Zone 1:2 Note: Cauld not un faited sample due to Sulfide hazard

This analytical report respectfully submitted by AnalySys, Inc. The enclosed results have been	1. Quality assurance data reported is for the lot analyzed which included this sample.
reviewed and to the best of my knowledge the analytical results are consistent with AnalySys,	2. Procision (Proc.) is the absolute value of the relative present (%) difference between
ine 's Quality Assumance/Quality Control Program.@ Copyright 1998 AnalySys, Inc., Auntin,	chiplicate mensuraments.
Texas. All rights reserved. No part of this publication may be reproduced or transmit- ted in	3. Recovery (Rucov.) is the precent (%) of analyte recovered from a spiked sample.
any form or hy any means without the express written permission of AnalySys, Inc.	4. Calibration Verification (CCV) and Lub Control Sample (LCS) results expressed as
Respectfully Submitted.	the percent (%) recovery of analyte from a known standard.
	5. Reporting Quantitation Limit. The Practical Quantitation Limit (PQL) or the
Richard Tatter	Method Detection Limit (MDL) reported for the analyte.
	6. Method numbers typically denote USEPA pronclures. Loss than (*<*) values setlect
Richard Laster	numinal quantitation limits, adjusted for any required dilution.

Page#: 1

APPENDIX E-5

COMPRESSIBILITY OF FORMATION FLUID

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APPENDIX E-5





COMPRESSIBILITY OF PORE VOLUME AND DISTILLED WATER





Source: Matthews and Russell, 1967, Pressure Buildup and Flow Tests in Wells

PREDICTED BHP CALCULATIONS

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APPENDIX E-6

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APPENDIX E-6 Predicted Bottomhole Pressure Calculations Navajo Refining Company, L.L.C.

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Rate in V	Vell No. 1	- 40	0 gpm		Rate in W	vell No. 1	400) gpm		Rate in V	Vell No. 1	40	0 gpm		Rate in V	Veli No. 1	267	gpm	
Rate in V	Vell No. 2	40	0 gpm		Rate in W	veil No. 2	C) gpm		Rate in V	Veli No. 2	(0 gpm		Rate in V	Vell No. 2	266	gpm	
Rate in V	Vell No. 3		0 gpm		Rate in W	vell No. 3	400) gpm		Rate in V	Veli No. 3	40	0jgpm		Rate in V	Vell No. 3	267	gpm	
Permeab	ility	52	1 md		Permeab	ility	250) md		Permeab	ility	52	1 md		Permeat	vility	521	mđ	
Prosoity		109	К		Prosoity		10%	5		Prosoity		109	6		Prosoity		10%		
Thicknes	s	8	5 feet		Thickness	s	85	feet		Thicknes	s	8	5 feet		Thicknes	s	85	feet	
Compres	sability	8.40E-0	6 /psi		Compres	sability	8.40E-06	i /psi		Compres	sability	8.40E-0	6 /psi		Compres	sability	8.40E-06	/psi	
Pressur	e Buildup a	at Well No. 3	(X= 0 feet, Y=	= 0 feet)	Pressure	e Buildup	at Well No	. (X= 0 feet, Y	= 0 feet)	Pressu	re Buildup	at Well No.	.∶(X= 0 feet, Y	= 0 feet)	Pressur	e Buildup	at Well No	. (X= 0 feet, Y	= 0 feet)
1-2					1-3					2-3		•			All				
									Injection					Injection					Injection
				Pressure					Pressure					Pressure					Pressure
				Build					Build					Build					Build
	Cum			at Well No		Cum			at Well No		Cum			at Well No		Cum			at Well No
Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3
(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psí)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)
4257	30.5	1	2/29/2012	3307.661	4257	30.5	1	2/29/2012	4212.419	4257	30.5	1	2/2 9 /2012	4221.755	4257	30.5	1	2/29/2012	3914.691
4287.5	61	2	3/29/2012	3339.688	4287.5	61	2	3/29/2012	4248.371	4287.5	61	2	3/29/2012	4270.71	4287.5	61	2	3/29/2012	3953.662
4318	91.5	3	4/29/2012	3347.924	4318	91.5	3	4/29/2012	4256.676	4318	91.5	3	4/29/2012	4279.375	4318	91.5	3	4/29/2012	3962.063
4348.5	122	4	5/29/2012	3352.776	4348.5	122	4	5/29/2012	4261.552	4348.5	122	4	5/29/2012	4284.376	4348.5	122	4	5/29/2012	3966.973
4379	152.5	5	6/29/2012	3356.226	437 9	152.5	5	6/29/2012	4265.013	4379	152.5	5	6/29/2012	4287. 9 01	4379	152.5	5	6/29/2012	3970.452
4409.5	183	6	7/29/2012	3358.907	4409.5	183	6	7/29/2012	4267.701	4409.5	183	6	7/29/2012	4290.626	4409 .5	183	6	7/29/2012	3973.15
4440	213.5	7	8/29/2012	3361.102	4440	213.5	7	8/29/2012	4269.901	4440	213.5	7	8/29/2012	4292.852	4440	213.5	7	8/29/2012	3975.357
4470.5	244	8	9/29/2012	3362.964	4470.5	244	8	9/29/2012	4271.767	4470.5	244	8	9/29/2012	4294.736	4470.5	244	8	9/29/2012	3977.227
4501	274.5	9	10/29/2012	3364.583	4501	274.5	9	10/29/2012	4273.388	4501	274.5	9	10/29/2012	4296.371	4501	274.5	9	10/29/2012	3978.852
4531.5	305	10	11/29/2012	3366.017	4531.5	305	10	11/29/2012	4274.824	4531.5	305	10	11/29/2012	4297.818	4531.5	305	10	11/29/2012	3980.291
4562	335.5	11	12/29/2012	3367.305	4562	335.5	11	12/29/2012	4276.114	4562	335.5	11	12/29/2012	4299.116	4562	335.5	11	12/29/2012	3981.583
4592.5	366	. 12	1/29/2013	3368.476	4592.5	366	12	1/29/2013	4277.286	4592.5	366	12	1/29/2013	4300.295	4592.5	366	12	1/29/2013	3982.757
4623	396.5	13	2/28/2013	3369.55	4623	396.5	13	2/28/2013	4278.362	4623	396.5	13	2/28/2013	4301.377	4623	396.5	13	2/28/2013	3983.834
4653.5	427	14	3/29/2013	3370.544	4653.5	427	14	3/29/2013	4279.356	4653.5	427	14	3/29/2013	4302.376	4653.5	427	14	3/29/2013	3984.83
4684	457.5	15	4/29/2013	3371.468	4684	457.5	15	4/29/2013	4280.281	4684	457.5	15	4/29/2013	4303.305	4684	457.5	15	4/29/2013	3985.756
4714.5	488	16	5/29/2013	3372.333	4714.5	488	16	5/29/2013	4281.147	4714.5	488	16	5/29/2013	4304.175	4714.5	488	16	5/29/2013	3986.623
4745	518.5	17	6/29/2013	3373,147.	4745	518.5	17	6/29/2013	4281.961	4745	518.5	17	6/29/2013	4304.992	4745	518.5	17	6/29/2013	3987.438
4775.5	549	18	7/29/2013	3373.915	4775.5	549	18	7/29/2013	4282.73	4775.5	549	18	7/29/2013	4305.764	4775.5	549	18	7/29/2013	3988.208
4806	579.5	19	8/29/2013	3374.644	4806	579.5	19	8/29/2013	4283.459	4806	57 9 .5	19	8/29/2013	4306.496	4806	579.5	19	8/29/2013	3988.938
4836.5	610	20	9/29/2013	3375.337	4836.5	610	20	9/2 9 /2013	4284.152	4836.5	610	20	9/29/2013	4307.191	4836.5	610	20	9/29/2013	3989.632
4867	640.5	21	10/29/2013	3375.998	4867	640.5	21	10/29/2013	4284.814	4867	640.5	21	10/29/2013	4307.855	4867	640.5	21	10/29/2013	3990.294
4897.5	671	22	11/29/2013	3376.63	4897.5	671	22	11/29/2013	4285.446	4897.5	671	22	11/29/2013	4308.489	4897 .5	671	22	11/29/2013	3990.927
4928	701.5	23	12/29/2013	3377.236	4928	701.5	23	12/29/2013	4286.053	4928	701.5	23	12/29/2013	4309.097	4928	701.5	23	12/29/2013	3991.533

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APPE. -6 Predicted Bottomhole Pressure Calculations Navajo Refining Company, L.L.C.

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Rate in V	Vell No. 1	40	0 മാന		Rate in V	Vell No. 1	400) gom		Rate in V	/eli No. 1	40	0 gom		Rate in V	Vell No. 1	267	/ gpm	
Rate in V	Vell No. 2	40	0 gpm		Rate in V	Vell No. 2	() gom		Rate in V	/ell No. 2) gom		Rate in V	Vell No. 2	266	j gpm	
Rate in V	Veli No. 3		0 gpm		Rate in V	Veli No. 3	400			Rate in V	/eli No. 3	40) gom		Rate in V	Vell No. 3	267	/ gpm	
Permeat	ility	52	1 m.d		Permeab	ility	250	md	•	Permeab	ility	52	1 md		Permeab	oility	521	md	
Prosoity	,,,,,,	109	- ···-		Prosoity	,	10%			Prosoity		109	6		Prosoity	·	10%	, s	
Thicknes		207	5 feet		Thicknes	د	85	feet		Thicknes		8	5 feet		Thicknes	s	85	feet	
Compres	s sahility	8 40F-0	6 /osi		Compres	- sability	8.40E-06	/osi		Compres	sability	8.40E-0	5 /osi		Compres	sability	8.40E-06	j /psi	
Droceu	e Buildun :	at Well No. 3	X= 0 feet Y	= 0 feet)	Pressur	e Buildun	at Well No	X= 0 feet. Y	= 0 feet)	Pressu	e Buildup	at Well No.	(X= 0 feet. Y	= 0 feet)	Pressur	e Buildup	at Well No	. (X= 0 feet. Y	= 0 feet)
1.2	e bundop i		() o icci, i	- 0 (223)	1-3					2-3				• • • • • •	All	,		• • • • • •	
1-2									Injection					Injection					Injection
				Pressure					Pressure					Pressure					Pressure
				Build					Build					Build					Build
	Cum			at Well No		Cum			at Well No		Cum			at Well No		Cum			at Well No
Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3
(hours)	(hours)	Months	(mm/dd/www)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)
4958 5	732	24	1/29/2014	3377.818	4958.5	732	24	1/29/2014	4286.635	4958.5	732	24	1/29/2014	4309.681	4958.5	732	24	1/29/2014	3992.116
49894	762.5	25	2/28/2014	3378.379	4989	762.5	25	2/28/2014	4287.196	4989	762.5	25	2/28/2014	4310.243	4989	762.5	25	2/28/2014	3992.677
5019 5	793	26	3/29/2014	3378.919	5019.5	793	26	3/29/2014	4287.736	5019.5	793	26	3/29/2014	4310.785	5019.5	793	26	3/29/2014	3993.218
5050	823.5	27	4/29/2014	3379.441	5050	823.5	27	4/29/2014	4288.259	5050	823.5	27	4/29/2014	4311.308	5050	823.5	27	4/29/2014	3993.741
5080.5	854	28	5/29/2014	3379.946	5080.5	854	28	5/29/2014	4288.764	5080.5	854	28	5/29/2014	4311.815	5080.5	854	28	5/29/2014	3994.246
5111	884.5	29	6/29/2014	3380.435	5111	884.5	29	6/29/2014	4289.253	5111	884.5	29	6/29/2014	4312.305	5111	884.5	· 29	6/29/2014	3994.736
5141.5	915	30	7/29/2014	3380.909	5141.5	915	30	7/29/2014	4289.727	5141.5	915	30	7/29/2014	4312.78	5141.5	915	30	7/29/2014	3995.21
5172	945.5	31	8/29/2014	3381.369	5172	945.5	31	8/29/2014	4290.188	5172	945.5	31	8/29/2014	4313.242	5172	945.5	31	8/29/2014	3995.671
5202.5	976	32	9/29/2014	3381.817	5202.5	976	32	9/29/2014	4290.636	5202.5	976	32	9/29/2014	4313.69	5202.5	976	32	9/29/2014	3996.119
5233	1006.5	33	10/29/2014	3382.253	5233	1006.5	33	10/29/2014	4291:071	5233	1006.5	33	10/29/2014	4314.127	5233	1006.5	33	10/29/2014	3996.555
5263.5	1037	34	11/29/2014	3382.677	5263.5	1037	34	11/29/2014	4291.496	5263.5	1037	34	11/29/2014	4314.552	5263.5	1037	34	11/29/2014	3996.98
5294	1067.5	35	12/29/2014	3383.09	5294	1067.5	35	12/29/2014	4291.91	5294	1067.5	35	12/29/2014	4314.966	5294	1067.5	35	12/29/2014	3997.394
5324.5	1098	36	1/29/2015	3383.494	5324.5	1098	36	1/29/2015	4292.313	5324.5	1098	36	1/29/2015	4315.371	5324.5	1098	36	1/29/2015	3997.797
5355	1128.5	37	2/28/2015	3383.888	5355	1128.5	37	2/28/2015	4292.707	5355	1128.5	37	2/28/2015	4315.765	5355	1128.5	37	2/28/2015	3998.192
5385.5	1159	38	3/29/2015	3384.273	5385.5	1159	38	3/29/2015	4293.092	5385.5	1159	38	3/29/2015	4316.151	5385.5	1159	38	3/29/2015	3998.577
5416	1189.5	39	4/29/2015	3384.649	5416	1189.5	39	4/29/2015	4293.469	5416	1189.5	39	4/29/2015	4316.528	5416	1189.5	39	4/29/2015	3998.953
5446.5	1220	40	5/29/2015	3385.017	5446.5	1220	40	5/29/2015	4293.837	5446.5	1220	40	5/29/2015	4316.897	5446.5	1220	40	5/29/2015	3999.322
5477	1250.5	41	6/29/2015	3385.378	5477	1250.5	41	6/29/2015	4294.198	5477	1250.5	41	6/29/2015	4317.258	5477	1250.5	41	6/29/2015	3999.683
5507.5	1281	42	7/29/2015	3385.731	5507.5	1281	42	7/29/2015	4294.551	5507.5	1281	42	7/29/2015	4317.612	5507.5	1281	42	7/29/2015	4000.036
5538	1311.5	43	8/29/2015	3386.077	5538	1311.5	43	8/29/2015	4294.897	5538	1311.5	43	8/29/2015	4317.958	5538	1311.5	43	8/29/2015	4000.382
5568.5	1342	44	9/29/2015	3386.417	5568.5	1342	44	9/29/2015	4295.237	5568.5	1342	44	9/29/2015	4318.298	5568.5	1342	44	9/29/2015	4000.722
5599	1372.5	45	10/29/2015	3386.75	5599	1372.5	45	10/29/2015	4295.57	5599	1372.5	45	10/29/2015	4318.632	55 9 9	1372.5	45	10/29/2015	4001.055
5629.5	1403	46	11/29/2015	3387.077	5629.5	1403	46	11/29/2015	4295.897	5629.5	1403	46	11/29/2015	4318.959	5629.5	1403	46	11/29/2015	4001.382

APPE, ∠-6 Predicted Bottomhole Pressure Calculations Navajo Refining Company, L.L.C.

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		40	0		Data in 1		400			Data in M					Data in 1		767		
Rate in v	Well NO. 1	40	0 gpm		Rate in v	vell NO. 1	400	gpm		Rate in v	Vell NO. 1	400) gpm		nate in t	Vell NO. 1	207	8pm	
Rate in V	Well No. 2	40	0 gpm		Kate in V	Vell No. 2	L.	gpm		Rate in V	Vell No. 2	() gpm		Ratein	vell NO. 2	. 200	gpm	
Rate in 1	Well No. 3		0 gpm		Rate in V	Vell No. 3	400	gpm		Rate in V	Vell No. 3	400) gpm		Rate in V	Vell No. 3	267	gpm	
Permeal	bility	52	1 md		Permeab	ility	250	md		Permeab	ility	521	lmd		Permeat	bility	521	md	
Prosoity	•	109	6		Prosoity		10%	. •		Prosoity		109	6		Prosoity		10%	•	
Thickne	ss	8	5 feet		Thicknes	5	85	feet		Thicknes	s	85	5 feet		Thicknes	5	85	feet	
Compre	ssability	8.40E-0	6 /psi		Compres	sability	8.40E-06	i /psi		Compres	sability	8.40E-06	5 /psi		Compres	sability	8.40E-06	/psi	
Pressu	re Buildup a	at Well No. 3	(X= 0 feet, Y	= 0 feet)	Pressur	e Buildup	at Well No	. (X= 0 feet, Y	= 0 feet)	Pressur	e Buildup	at Well No.	:(X= 0 feet, Y	= 0 feet)	Pressu	e Buildup	at Well No	.(X= 0 feet, Y	= 0 feet)
1-2					1-3					2-3					All				
									Injection					Injection					Injection
				Pressure					Pressure					Pressure					Pressure
				Build					Build					Build					Build
	Cum			at Well No		Cum			at Well No	•	Cum			at Well No		Cum			at Well No
Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3
(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)
5660	1433.5	47	12/29/2015	3387.398	5660	1433.5	47	12/29/2015	4296.218	5660	1433.5	47	12/29/2015	4319.281	5660	1433.5	47	12/29/2015	4001.704
5690.5	1464	48	1/29/2016	3387.713	5690.5	1464	48	1/29/2016	4296.533	5690.5	1464	48	1/29/2016	4319.596	5690.5	1464	48	1/29/2016	4002.019
5721	1494.5	49	2/29/2016	3388.023	5721	1494.5	49	2/29/2016	4296.843	5721	1494.5	49	2/29/2016	4319.907	5721	1494.5	49	2/29/2016	4002.329
5751.5	1525	50	3/29/2016	3388.328	5751.5	1525	50	3/29/2016	4297.148	5751.5	1525	50	3/29/2016	4320.212	5751.5	1525	50	3/29/2016	4002.634
5782	1555.5	51	4/29/2016	3388.628	5782	1555.5	51	4/29/2016	4297.448	5782	1555.5	51	4/29/2016	4320.512	5782	1555.5	51	4/29/2016	4002.934
5812.5	1586	52	5/29/2016	3388.923	5812.5	1586	52	5/29/2016	4297.743	5812.5	1586	52	5/29/2016	4320.807	5812.5	1586	52	5/29/2016	4003.229
5843	1616.5	53	6/29/2016	3389.213	5843	1616.5	53	6/29/2016	4298.033	5843	1616.5	53	6/29/2016	4321.098	5843	1616.5	53	6/29/2016	4003.52
5873.5	1647	54	7/29/2016	3389.499	5873.5	1647	54	7/29/2016	4298.319	5873.5	1647	54	7/29/2016	4321.384	5873.5	1647	54	7/29/2016	4003.806
5904	1677.5	55	8/29/2016	3389.78	5904	1677.5	55	8/29/2016	4298.601	5904	1677.5	55	8/29/2016	4321.666	5904	1677.5	55	8/29/2016	4004.087
5934.5	1708	56	9/29/2016	3390.058	5934.5	1708	56	9/29/2016	4298.878	5934.5	1708	56	9/29/2016	4321.944	5934.5	1708	56	9/29/2016	4004.365
5965	1738.5	57	10/29/2016	3390.331	5965	1738.5	57	10/29/2016	4299.152	5965	1738.5	57	10/29/2016	4322.218	5965	1738.5	57	10/29/2016	4004.638
5995.5	1769	58	11/29/2016	3390.6	5995.5	1769	58	11/29/2016	4299.421	5995.5	1769	58	11/29/2016	4322.487	5995.5	1769	58	11/29/2016	4004.908
6076	1799.5	59	12/29/2016	3390.866	6026	1799.5	59	12/29/2016	4299.687	6026	1799.5	59	12/29/2016	4322.753	6026	1799.5	59	12/29/2016	4005.174
6056.5	1830	60	1/29/2017	3391.128	6056.5	1830	60	1/29/2017	4299.949	6056.5	1830	60	1/29/2017	4323.016	6056.5	1830	60	1/29/2017	4005.436
6087	1860.5	61	2/28/2017	3391.387	6087	1860.5	61	2/28/2017	4300.208	6087	1860.5	61	2/28/2017	4323.274	6087	1860.5	61	2/28/2017	4005.694
6117.5	1891	62	3/29/2017	3391.642	6117.5	1891	62	3/29/2017	4300.463	6117.5	1891	62	3/29/2017	4323.53	6117.5	1891	62	3/29/2017	4005.95
6148	1921.5	63	4/29/2017	3391.894	6148	1921.5	63	4/29/2017	4300.715	6148	1921.5	63	4/29/2017	4323.782	6148	1921.5	63	4/29/2017	4006.201
6178 5	1952	64	5/29/2017	3392.142	6178.5	1952	64	5/29/2017	4300.963	6178.5	1952	64	5/29/2017	4324.03	6178.5	1952	64	5/29/2017	4006.45
6209	1982.5	65	6/29/2017	3392.387	6209	1982.5	65	6/29/2017	4301.209	6209	1982.5	65	6/29/2017	4324.276	6209	1982.5	65	6/29/2017	4006.695
6239 5	2013	66	7/29/2017	3392.63	6239.5	2013	66	7/29/2017	4301.451	6239.5	2013	66	7/29/2017	4324.519	6239.5	2013	66	7/29/2017	4006.938
6270	2043.5	67	8/29/2017	3392.869	6270	2043.5	67	8/29/2017	4301.69	6270	2043.5	67	8/29/2017	4324.758	6270	2043.5	67	8/29/2017	4007.177
6300 5	2074	68	9/29/2017	3393.106	6300.5	2074	68	9/29/2017	4301.927	6300.5	2074	68	9/29/2017	4324.995	6300.5	2074	68	9/29/2017	4007.414
6331	2104.5	69	10/29/2017	3393.339	6331	2104.5	69	10/29/2017	4302.161	6331	2104.5	69	10/29/2017	4325.229	6331	2104.5	69	10/29/2017	4007.648

APPE. .-6 Predicted Bottomhole Pressure Calculations Navajo Refining Company, L.L.C.

Rate in V	Vell No. 1	40	0 gpm		Rate in M	Vell No. 1	400) gpm		· Rate in V	Veli No. 1	400	0 gpm		Rate in V	Veli No. 1	267	gpm	
Pate in V	Veli No. 3	40	0 gpm		Rate in v	Vell NO. 2	400) gpm		Rate in v	Vell No. 2	() gpm		Kate in V	Vell NO. 2	266	gpm	
Dermesh	ility	57	1 md		Permeah	ility) md		Perment	ilie.	400	J gpm		Rate in v	veli NO. 3	20/	gpm	
Prosoity		109	4		Prosoity	int y	1.094			Prosoity	mty	323	, ma		Permeac	mty	104	ma	
Thicknes	<i>د</i>	8	s feet		Thickness		89	, faat		Thicknes	F	107	b E faat		Thickner		107	fact	
Compres	- sability	8.405-0	5 /osi		Comores	, sahility	8 40F-06			Compres	a cability	8 405-06			Compror	s shilitu	9 ADE-DE	/ori	
Pressur	e Buildup a	at Well No. 3	(X= () feet. Y:	= () feet)	Pressure	e Buildun	at Well No	(X=0 feet Y	= () feet)	Pressu	e Buildun	at Wall No	'/μsi '/Y−Ωfeet V	- () feet)	Drossur	a Buildun	at Well No	/ysi . /Y= 0 feat V	- () (ant)
1-2			(0 1000, 1	e leeg	1-3	c oundap	01 11 21 110		- 0 1000	2-3	e bunuup	at wenno.		- 0 (221)	All	e bundup	at wen no	. (~- 0 1001, 1	- o leet)
					- •				Injection					Injection	~				Injection
				Pressure					Pressure					Pressure					Pressure
				Build					Build					Build					Build
	Cum			at Well No		Cum			at Well No		Cum			at Well No		Cum			at Well No
Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3
(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)
6361.5	2135	70	11/2 9/ 2017	3393.571	6361.5	2135	70	11/29/2017	4302.392	6361.5	2135	70	11/29/2017	4325.46	6361.5	2135	70	11/29/2017	4007.879
6392	2165.5	71	12/29/2017	3393.799	6392	2165.5	71	12/29/2017	4302.62	6392	2165.5	71	12/29/2017	4325.689	6392	2165.5	71	12/29/2017	4008.107
6422.5	2196	72	1/29/2018	3394.025	6422.5	2196	72	1/29/2018	4302.846	6422.5	2196	72	1/29/2018	4325.915	6422.5	2196	72	1/29/2018	4008.333
6453	2226.5	73	2/28/2018	3394.248	6453	2226.5	73	2/28/2018	4303.069	6453	2226.5	73	2/28/2018	4326.138	6453	2226.5	73	2/28/2018	4008.557
6483.5	2257	74	3/29/2018	3394.469	6483.5	2257	74	3/29/2018	4303.29	6483.5	2257	74	3/29/2018	4326.359	6483.5	2257	74	3/29/2018	4008.777
6514	2287.5	75	4/29/2018	3394.687	6514	2287.5	75	4/29/2018	4303.508	6514	2287 .5	75	4/29/2018	4326.578	6514	2287.5	75	4/29/2018	4008.996
6544.5	2318	76	5/29/2018	3394.903	6544.5	2318	76	5/29/2018	4303.725	6544.5	2318	76	5/29/2018	4326.794	6544.5	2318	76	5/29/2018	4009.212
6575	2348.5	77	6/29/2018	3395.117	6575	2348.5	77	6/29/2018	4303.938	6575	2348.5	77	6/29/2018	4327.008	6575	2348.5	77	6/29/2018	4009.426
6605.5	2379	78	7/29/2018	3395.329	6605.5	2379	78	7/29/2018	4304.15	6605.5	2379	78	7/29/2018	4327.22	6605.5	2379	78	7/29/2018	4009.638
6636	2409.5	79	8/29/2018	3395.538	6636	2409.5	79	8/29/2018	4304.359	6636	2409.5	79	8/29/2018	4327.429	6636	2409.5	79	8/29/2018	4009.847
6666.5	2440	80	9/29/2018	3395.745	6666.5	2440	80	9/29/2018	4304.567	6666.5	2440	80	9/29/2018	4327.637	6666.5	2440	80	9/29/2018	4010.054
66 9 7	2470.5	81	10/29/2018	3395.95	6697	2470.5	81	10/29/2018	4304.772	6697	2470.5	81	10/29/2018	4327.842	6697	2470.5	81	10/29/2018	4010.26
6727.5	2501	82	11/29/2018	3396.154	6727.5	2501	82	11/29/2018	4304.975	6727.5	2501	82	11/29/2018	4328.045	6727.5	2501	82	11/29/2018	4010.463
6758	2531.5	83	12/29/2018	3396.355	6758	2531.5	83	12/29/2018	4305.176	6758	2531.5	83	12/29/2018	4328.247	6758	2531.5	83	12/29/2018	4010.664
6788.5	2562	84	1/29/2019	3396.554	6788.5	2562	84	1/29/2019	4305.376	6788.5	2562	84	1/29/2019	4328.446	6788.5	2562	84	1/29/2019	4010.863
6819	2592.5	85	2/28/2019	3396.752	6819	2592.5	85	2/28/2019	4305.573	6819	2592.5	85	2/28/2019	4328.644	6819	2592.5	85	2/28/2019	4011.061
6849.5	2623	86	3/29/2019	3396.947	6849.5	2623	86	3/29/2019	4305.769	6849.5	2623	86	3/29/2019	4328.839	6849.5	2623	86	3/29/2019	4011.256
6880	2653.5	87	4/29/2019	3397.141	6880	2653.5	87	4/29/2019	4305.962	6880	2653 .5	87	4/29/2019	4329.033	6880	2653.5	87	4/29/2019	4011.45
6910.5	2684	88	5/29/2019	3397.333	6910.5	2684,	88	5/29/2019	4306.154	6910.5	2684	88	5/29/2019	4329.225	6910.5	2684	88	5/29/2019	4011.642
6941	2714.5	89	6/29/2019	3397.523	6941	2714.5	89	6/29/2019	4306.344	6941	2714.5	89	6/29/2019	4329.415	6941	2714.5	89	6/29/2019	4011.832
6971.5	2745	90	7/29/2019	3397.711	6971.5	2745	90	7/29/2019	4306.533	6971.5	2745	90	7/29/2019	4329.604	6971.5	2745	90	7/29/2019	4012.021
7002	2775.5	91	8/29/2019	3397.898	7002	2775.5	91	8/29/2019	4306.72	7002	2775.5	91	8/29/2019	4329.791	7002	2775.5	91	8/29/2019	4012.208
7032.5	280 6	92	9/29/2019	3398.083	7032.5	2806	92	9/29/2019	4306.905	7032.5	2806	92	9/29/2019	4329.976	7032.5	2806	92	9/29/2019	4012.393

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APPEN-E-6 Predicted Bottomhole Pressure Calculations Navajo Refining Company, L.L.C.

Rate in V	Veli No. 1	40	0 gpm		Rate in V	Veli No. 1	400) gpm		Rate in V	Vell No. 1	40	0 gpm		Rate in \	Nell No. 1	267	^f gpm	
Rate in V	Vell No. 2	40	0 gpm		Rate in V	Vell No. 2	C) gpm		Rate in V	Vell No. 2	(0 gpm		Rate in V	Vell No. 2	266	j gpm	
Rate in V	Vell No. 3		0 gpm		Rate in V	Vell No. 3	400) gpm		Rate in V	Vell No. 3	400	0 gpm		Rate in V	Vell No. 3	267	' gpm	
Permeat	oility	52	1 md		Permeab	ility	250) md		Permeab	ility	52:	1 md		Permeat	oility	521	md	
Prosoity		109	6		Prosoity		10%	6		Prosoity		109	6		Prosoity		10%	,	
Thicknes	s	8	5 feet		Thicknes	5	85	i feet		Thicknes	5	8	5 feet		Thicknes	is	85	feet	
Compres	sability	8.40E-0	6 /psi		Compres	sability	8.408-06	i /psi		Compres	sability	8.40E-00	6 /psi		Compres	sability	8.40E-06	i /psi	
Pressu	re Buildup a	at Well No. 3	(X= 0 feet, Y	= 0 feet)	Pressur	e Buildup	at Well No	. (X= 0 feet, Y	= 0 feet)	Pressu	re Buildup	at Well No.	∴(X= 0 feet, Y	= 0 feet)	Pressur	re Buildup	at Well No	. (X= 0 feet, Y	= 0 feet)
1-2					1-3					2-3					All				
									Injection					Injection					Injection
				Pressure		•			Pressure					Pressure					Pressure
				Build					Build					Build					Build
	Cum			at Well No		Cum			at Well No		Cum			at Well No		Cum			at Well No
Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3
(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)
7063	2836.5	93	10/29/2019	3398.267	7063	2836.5	93	10/29/2019	4307.088	7063	2836.5	93	10/29/2019	4330.16	7063	2836.5	93	10/29/2019	4012.576
7093.5	2867	94	11/29/2019	3398.449	7093.5	2867	94	11/29/2019	4307.27	7093.5	2867	94	11/29/2019	4330.342	7093.5	2867	94	11/29/2019	4012.758
7124	2897.5	95	12/29/2019	3398.629	7124	2897.5	95	12/29/2019	4307.451	7124	2897.5	95	12/29/2019	4330.522	7124	2897.5	95	12/29/2019	4012.939
7154.5	2928	96	1/29/2020	3398.808	7154.5	2928	96	1/29/2020	4307.63	7154.5	2928	96	1/29/2020	4330.701	7154.5	2928	96	1/29/2020	4013.118
7185	2958.5	97	2/29/2020	3398.985	7185	2958.5	97	2/29/2020	4307.807	7185	2 958 .5	97	2/29/2020	4330.879	7185	2958.5	97	2/2 9 /2020	4013.295
7215.5	2989	98	3/29/2020	3399.161	7215.5	2989	98	3/29/2020	4307.983	7215.5	2989	98	3/29/2020	4331.055	7215.5	2989	98	3/29/2020	4013.471
7246	3019.5	99	4/29/2020	3399.336	7246	3019.5	99	4/29/2020	4308.158	7246	3019.5	99	4/29/2020	4331.229	7246	3019.5	99	4/29/2020	4013.646
7276.5	3050	100	5/29/2020	3399.509	7276.5	3050	100	5/29/2020	4308.331	7276.5	3050	100	5/29/2020	4331.403	7276.5	3050	100	5/29/2020	4013.819
7307	3080.5	101	6/29/2020	3399.681	7307	3080.5	101 ·	6/29/2020	4308.502	7307	3080.5	101	6/29/2020	4331.574	7307	3080.5	101	6/29/2020	4013.991
7337.5	3111	102	7/29/2020	3399.851	7337.5	3111	102	7/29/2020	4308:673	·7337.5	3111	102	7/29/2020	4331.745	7337.5	3111	102	7/29/2020	4014.161
7368	3141.5	103	8/29/2020	3400.02	7368	3141.5	103	8/29/2020	4308.842	7368	3141.5	103	8/29/2020	4331.914	7368	3141.5	103	8/29/2020	4014.33
7398.5	3172	104	9/29/2020	3400.188	7398.5	3172	104	9/29/2020	4309.01	7398.5	3172	104	9/29/2020	4332.082	7398.5	3172	104	9/29/2020	4014.498
7429	3202.5	105	10/29/2020	3400.354	7429	3202.5	105	10/29/2020	4309.176	7429	3202.5	105	10/29/2020	4332.248	7429	3202.5	105	10/29/2020	4014.664
7459.5	3233	106	11/29/2020	3400.519	7459.5	3233	106	11/29/2020	4309.341	7459.5	3233	106	11/29/2020	4332.413	7459.5	3233	106	11/29/2020	4014.829
7490	3263.5	107	12/29/2020	3400.683	7490	3263.5	107	12/29/2020	4309.505	7490	3263.5	107	12/29/2020	4332.577	7490	3263.5	107	12/29/2020	4014.993
7520.5	3294	108	1/29/2021	3400.846	7520.5	3294	108	1/29/2021	4309.668	7520.5	3294	108	1/29/2021	4332.74	7520.5	3294	108	1/29/2021	4015.156
7551	3324.5	109	2/28/2021	3401.007	7551	3324.5	109	2/28/2021	4309.829	7551	3324.5	109	2/28/2021	4332.902	7551	3324.5	109	2/28/2021	4015.318
7581.5	3355	110	3/29/2021	3401.168	7581.5	3355	110	3/29/2021	4309.989	7581.5	3355	110	3/29/2021	4333.062	7581.5	3355	110	3/29/2021	4015.478
7612	3385.5	111	4/29/2021	3401.327	7612	3385.5	111	4/29/2021	4310.149	7612	3385.5	111	4/29/2021	4333.221	7612	3385.5	111	4/29/2021	4015.637
7642.5	3416	112	5/29/2021	3401.485	7642.5	3416	112	5/29/2021	4310.307	7642.5	3416	112	5/29/2021	4333.379	7642.5	3416	112	5/29/2021	4015.795
7673	3446.5	113	6/29/2021	3401.641	7673	3446.5	113	6/29/2021	4310.463	7673	3446.5	113	6/29/2021	4333.536	7673	`3446.5	113	6/29/2021	4015.952
7703.5	3477	114	7/29/2021	3401.797	7703.5	3477	114	7/29/2021	4310.619	7703.5	3477	114	7/29/2021	4333.692	7703.5	3477	114	7/29/2021	4016.107
7734	3507.5	115	8/29/2021	3401.952	7734	3507.5	115	8/29/2021	4310.774	7734	3507.5	115	8/29/2021	4333.847	7734	3507.5	115	8/29/2021	4016.262

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APPE\ .-6 Predicted Bottomhole Pressure Calculations Navajo Refining Company, L.L.C.

Rate in W	/ell No. 1	40	0 gpm		Rate in V	Vell No. 1	400) gpm		Rate in V	Vell No. 1	40	0 gpm		Rate in V	Veli No. 1	267	gpm	
Rate in W	/ell No. 2	40	0 gpm		Rate in V	Vell No. 2	C) gpm		Rate in V	Vell No. 2	(0 gpm		Rate in V	Vell No. 2	266	gpm	
Rate in W	/ell No. 3	(0 gpm		Rate in V	Veil No. 3	400) gpm		Rate in V	Vell No. 3	400	0 gpm		Rate in V	Vell No. 3	267	gpm	
Permeab	ility	52:	1 md		Permeab	ility	250) md		Permeab	ility	52:	1 md		Permeab	ility	521	md	
Prosoity		109	6		Prosoity		10%	5		Prosoity		109	6		Prosoity		10%	,	
Thickness	5	8	5 feet		Thicknes	s	85	i feet		Thicknes	\$	8	5 feet		Thicknes	s	85	feet	
Compres	sability	8.40E-06	5 /psi		Compres	sability	8.40E-06	i /psi		Compres	sability	8.40E-00	6 /psi		Compres	sability	8.40E-06	/psi	
Pressur	e Buildup at	t Well No. 3	(X= 0 feet, Y :	= 0 feet)	Pressur	e Buildup	at Well No	. (X= 0 feet, Y	= 0 feet)	Pressue	re Buildup	at Well No.	.: (X≈ 0 feet, Y ∶	= 0 feet)	Pressur	e Buildup	at Well No	.(X= 0 feet, Y	= 0 feet)
1-2					1-3					2-3					All				
									Injection					Injection					Injection
				Pressure					Pressure					Pressure					Pressure
				Build					8uild					Build					Build
	Cum			at Well No		Cum			at Well No		Cum			at Well No		Cum			at Well No
Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3	Time	Time		Date	3
(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)	(hours)	(hours)	Months	(mm/dd/yyyy)	(psi)
77 64 .5	3538	116	9/29/2021	3402.105	7764.5	3538	116	9/29/2021	4310.927	7764.5	3538	116	9/29/2021	4334	7764.5	3538	116	9/29/2021	4016.416
77 9 5	3568.5	117	10/29/2021	3402.258	7795	3568.5	117	10/29/2021	4311.08	77 9 5	3568.5	117	10/29/2021	4334.153	77 9 5	3568.5	117	10/29/2021	4016.568
7825.5	3599	118	11/29/2021	3402.409	7825.5	3599	118	11/29/2021	4311.231 ·	7825.5	3599	118	11/29/2021	4334.304	7825.5	3599	118	11/29/2021	4016.72
7856	3629.5	119	12 /29/2021	3402.559	7856	3629.5	119	12/29/2021	4311.382	7856	3629.5	119	12/29/2021	4334.455	7856	3629.5	119	12/29/2021	4016.87
7886.5	3660	120	1/29/2022	3402.709	7886.5	3660	120	1/29/2022	4311.531	7886.5	3660	120	1/29/2022	4334.604	7886.5	3660	120	1/29/2022	4017.019
7917	3690.5	121	2/28/2022	3402.857	7917	3690.5	121	2/28/2022	4311.679	7917	3690.5	121	2/28/2022	4334.753	7917	3690.5	121	1/30/2022	4017.168

APPENDIX E-7

PLUME RADIUS EVALUATION

APPENDIX E-7 PLUME RADIUS EVALUATION

$r_c = [(0.1337 v t) / (0.8 \pi \theta h)]^{1/2}$

 $r_{d} = 2.3 (C_{d} r_{c})^{1/2} + r_{c}$

(r _c) Radius of Concentrated Plume	
(r _d) Radius of Dispersed Plume	
(v) volume of average annual injected volume in gallons	88,668,260
Factor to compensate for Immovable Connate Water	0.8
(θ) Formation Porosity	0.1
(h) Thickness of the Injection Reservior	85
(t) Years of Injection	10
(cd) Coefficient of Dispersion; for limestone = 65	65
Constant	2.3

The Mewbourne Well No. 1 is approximately 7,900 feet from Gaines Well No. 3, the test well. The Chukka Well No. 2 is approximately 3,130 feet from the Gaines Well No. 3.

$r_{c} = [(0.1337 v t) / (0.8 \pi \theta h)]^{1/2}$

 $r_{d} = 2.3 (C_{d} r_{c})^{1/2} + r_{c}$

(r_c) Radius of Concentrated Plume

(r _d) Radius of Dispersed Plume	
(v) volume of average annual injected volume in gallons	70,030,453
Factor to compensate for Immovable Connate Water	0.8
(θ) Formation Porosity	0.1
(h) Thickness of the Injection Reservior	85
(t) Years of Injection	10
(cd) Coefficient of Dispersion; for limestone = 65	65
Constant	2.3

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The Mewbourne Well No. 1 is approximately 7,900 feet from Gaines Well No. 3, the test well. The Chukka Well No. 2 is approximately 3,130 feet from the Gaines Well No. 3.

Chukka Well Number 2

	Corrected
Time	Time
1	-10.6667
2	-9.66667
3	-8.66667
4	-7.66667
5	-6.66667
6	-5. 66 667
7	-4.66667
8	-3.66667
9	-2.66667
10	-1.66667
11	-0.66667
11.6667	3.33E-05
12.66667	1
13.66667	2
14.66667	3
15.66667	4
16.66667	5
17.66667	6
18.66667	7
19.66667	8
20.66667	9
21.66667	10

Gaines Well Number 3

2.3

	Correcte	ed		
Time	Time		rc	r _d
1	L	-3	745.1613	749.1058
2		-2	1053.817	1057.831
3	3	-1	1290.657	1294.712
· 4	Ļ	0	1490.323	1494.406
5	5	1	1666.231	1670.338
ε	5	2	1825.265	1829.39
7	,	3	1971.512	1975.653
8	}	4	2107.634	2111.789
9) ·	5	2235.484	2239.651
10)	6	2356.407	2360.585
11	L	7	2471.42	2475.609
12	2	8	2581.314	2585.512
13	}	9	2686.717	2690.923
14	Ļ	10	2788.138	2792.352

r,	r _d
662.2312	666.1525
936.5364	940.5262
1147.018	1151.049
1324.462	1328.522
1480.794	1484.876
1622.12 <u>9</u>	1626.23
1752.099	1756.216
1873.073	1877.203
1986.694	1990.836
2094.159	2098.313
2196.373	2200.536
2261.954	2266.123
2356.898	2361.077
2448.167	2452.353
2536.153	2540.346
2621.187	2625.387
2703.548	2707.755
2783.473	2787.686
2861.166	2865.385
2936.805	2941.029
3010.543	3014.773
3082.519	3086.753

APPENDIX E-7 PLUME RADIUS EVALUATION

. .

$r_c = [(0.1337 v t) / (0.8 \pi \theta h)]^{1/2}$

$r_{d} = 2.3 (C_{d} r_{c})^{1/2} + r_{c}$

.

(r_c) Radius of Concentrated Plume

121,555,892
0.8
0.1
85
10
- 65
2.3

The Mewbourne Well No. 1 is approximately 7,900 feet from Gaines Well No. 3, the test well. The Chukka Well No. 2 is approximately 3,130 feet from the Gaines Well No. 3.

	Corrected		
Time	Time	r,	r _d
1	-10.5833	872.4774	876.4531
2	-9.58333	1233.869	1237.915
3	-8.58333	1511.175	1515.262
. 4	-7.58333	1744.955	1749.071
5	-6.58333	1950.919	1955.058
6	-5.58333	2137.125	2141.282
7	-4.58333	2308.358	2312.532
8	-3.58333	2467.739	2471.927
9	-2.58333	2617.432	2621.633
10	-1.58333	2759.016	2763.227
11	-0.58333	2893.68	2897.902
11.58333	0	2969.416	2973.642
12.58333	. 1	3094.939	3099.174
13.58333	2	3215.566	3219.809
14.58333	3	3331.828	3336.079
15.58333	4	3444.168	3448.427
16.58333	5	3552.958	3557.223
17.58333	6	3658.515	3662.786
18.58333	7	3761.11	3765.387
19.58333	8	3860.98	3865.262
20.58333	9	3958.331	3962.619
21.58333	10	4053.344	4057.637

Mewbourne Well Number 1

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• - •. FORMATION FLUID ANALYTICAL DATA

APPENDIX F

APPENDIX F-1

FORMATION FLUID ANALYTICAL DATA NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

Chamical	Mewbourne Well	Chukka Well	Gaines Well	Average	
Chemical	No. 1	No. 2	No. 3	Average	
Date	July 31, 1998	June 14, 1999	Nov 8, 2006		
Fluoride (mg/l)	2.6	9.7	Not Detected	6.15	
Chloride	10,000	15,000	10 447	14,815.67	
(mg/L)	19,000	15,000	10,447		
NO3-N (mg/L)	<10	<10		<10	
SO4 (mg/L)	2,200	2000	1,908	2,036	
CaCO3 (mg/L)	1000	1210		1105	
Specific	1 034	1 0240		1 0205	
Gravity (g/L)	1.004	1.0249	_	1.0295	
TDS (mg/L)	33,000	20,000	-	26,500	
Specific				i	
Conductance	52,000	43,000	-	47,500	
(uMHOs/cm)					
Potassium	213	235	85.5	177.83	
(mg/L)	210	200	00.0	111.00	
Magnesium	1/13	128	155	1/2	
(mg/L)	145	120	100	172	
Calcium (mg/L)	390	609	393	464	
Sodium (mg/L)	12,770	8,074	6,080	8,974.67	
pH (s.u.)	8.1	7.2		7.65	

The data in the above table was referenced from "Discharge Plan Application and Application for Authorization to Inject per Oil Conservation Division Form C-108, into Class I Wells WDW-1 and Proposed WDW-2 and WDW-3" and the "Discharge Permit Approval Conditions", "Reentry and Completion Report Waste Disposal Well No. 2", and "Reentry and Completion Report Waste Disposal Well No. 3".

APPENDIX G

PRESSURE FALL-OFF TEST RESULTS



2.9

للتستبيب الالاراب المراجعة والمتروجة المتروح المترارين			
SUBSURFACE	Subsurface Technology, Inc	Report File:	2008_WDW-3.pan
	PanSystem		
HOLYTON, TX «DATION FOLING, LA «NATHERINAD, IN	Well Test Analysis Report		
Company	Navajo Re	fining Company	
Location	Artesia, N	ew Mexico	
Well	WDW-3		
Date	April 1 - 2.	2008	
Test	Falloff		
Gauge Depth	7660 feet		
Injection Interval	7570 feet	- 8399 feet	
Completion Type	Perforated	1	
Top of Fill	N/A		
Last Stabilization	January 2	008	
Analyst	TWW		
Subsurface Project No.	70G6142		



Report File:

2008_WDW-3.pan

PanSystem

HOUSTON IX +BARONROUGH EX + SOUTH BEND IN

Well Test Analysis Report

Reservoir Description

Fluid type : Water Well orientation : Vertical Number of wells : 1 Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	175.0000 ft
Average formation porosity	0.1000
Water saturation	0.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	8.4000e-6 psi-1
Layer pressure	3430.266493 psia
Temperature	0.000000 deg F

Well Parameters Data

	WDW-3
Well radius	0.3281 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	0.1000 bbl/psi
Storage Amplitude	-100.000000 psi
Storage Time Constant	0.010000 hr
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Well offset - x direction	0.0000 ft
Well offset - y direction	0.0000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	0.000000 psia
Check Temperature	0.000000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000000 psia
Oil density	0.000 lb/ft3
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.720 cp
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1

SUBSURFACE

Subsurface Technology, Inc

Well Test Analysis Report

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21 B. 🕈

Report File:

IN A REPORT OF GRANN AND THE REST. IN

PanSystem

Layer 1 Correlations

Not Used

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

	Layer 1	
Permeability	1322.0700 md	
Skin factor (Well 1)	107.0280	

Rate Change Data

Time	Pressure	Rate		Time	Pressure	Rate
Hours	psia	STB/day		Hours	psia	STB/day
-2071.863056	3457.960000	0.000000		-1087.863056	3457.960000	-3397.371429
-2047.863056	3457.960000	-812.914286		-1063.863056	3457.960000	-3492.685715
-2023.863056	3457.960000	-721.371429	and the second	-1039.863056	3457.960000	-3396.685715
-1999.863056	3457.960000	-2408.228572		-1015.863056	3457.960000	-3473.142858
-1975.863056	3457.960000	-4733.485715		-991.863056	3457.960000	-3557.485715
-1951.863056	3457.960000	-5046.171429		-967.863056	3457.960000	-3493.028572
-1927.863056	3457.960000	-4780.800001		-943.863056	3457.960000	-3498.514286
-1903.863056	3457.960000	-4393.371429		-919.863056	3457.960000	-3541.028572
-1879.863056	3457.960000	-4379.657143		-895.863056	3457.960000	-3363.771429
-1855.863056	3457.960000	-4000.114286		-871.863056	3457.960000	-3350.057143
-1831.863056	3457.960000	-3507.771429		-847.863056	3457.960000	-3357.600000
-1807.863056	3457.960000	-4653.257143		-823.863056	3457.960000	-3362.057143
-1783.863056	3457.960000	-3842.057143		-799.863056	3457.960000	-3303.771429
-1759.863056	3457.960000	-4548.342858		-775.863056	3457.960000	-3346.971429
-1735.863056	3457.960000	-5261.142858		-751.863056	3457.960000	-3373.028572
-1711.863056	3457.960000	-7843.885715		-727.863056	3457.960000	-7593.257144
-1687.863056	3457.960000	-5715.771429		-703.863056	3457.960000	-7176.685715
-1663.863056	3457.960000	-4275.428572		-679.863056	3457.960000	-6956.228572
-1639.863056	3457.960000	-5074.971429		-655.863056	3457.960000	-5682.857144
-1615.863056	3457.960000	-5097.257143		-535.863056	3457.960000	0.000000
-1591.863056	3457.960000	-5001.942858		-511.863056	3457.960000	-3868.457143
-1567.863056	3457.960000	-5920.114286		-367.863056	3457.960000	-7889.142858
-1543.863056	3457.960000	-5555.657144		-343.863056	3457.960000	-6718.285715
-1519.863056	3457.960000	-5428.800001		-295.863056	3457.960000	-7427.314287
-1495.863056	3457.960000	-5272.457144		-271.863056	3457.960000	-8015.314287
-1471.863056	3457.960000	-4341.600001		-223.863056	3457.960000	-7303.542858
-1447.863056	3457.960000	-3908.228572		-127.863056	3457.960000	-6829.714287
-1423.863056	3457.960000	-3815.657143		-79.863056	3457.960000	-7286.057144
-1399.863056	3457.960000	-5433.257144		-79.513056	4026.630000	-7547.314287
-1375.863056	3457.960000	-4945.714286		-76.829722	3930.290000	-7812.342858
-1351.863056	3457.960000	-5194.628572		-76.363056	3556.080000	0.000000
-1327.863056	3457.960000	-4909.371429		-76.313056	3840.010000	-3903.428572
-1303.863056	3457.960000	-3945.257143		-76.229722	3952.690000	-6434.742858
-1279.863056	3457.960000	-3068.571429		-76.129722	3982.110000	-6957.600001
-1255.863056	3457.960000	-2256.000000		-76.079722	3987.520000	-7229.485715
-1231.863056	3457.960000	-3494.400000		-75.979722	4004.370000	-7408.114287
-1207.863056	3457.960000	-3530.400000		-75.846389	4012.010000	-7640.228572
 -1183.863056	3457.960000	-3493.714286		-73.429722	4036.500000	-7787.657144
-1159.863056	3457.960000	-3476.228572		-71.463056	4036.500000	-7933.028572
-1135.863056	3457.960000	-3540.685715		-65.046389	4000.480000	-8104.114287
-1111.863056	3457.960000	-3542.400000	ļ	-63.596389	3977.630000	-6902.057144

	Rate Change Data (cont)				
Time Pressure			Rate		
	Hours	psia	STB/day		
	-1087.863056	3457.960000	-3397.371429		
	-1063.863056	3457.960000	-3492.685715		
	-1039.863056	3457.960000	-3396.685715		
	-1015.863056	3457.960000	-3473.142858		
	-991.863056	3457.960000	-3557.485715		
	-967.863056	3457.960000	-3493.028572		
	-943.863056	3457.960000	-3498.514286		
	-919.863056	3457.960000	-3541.028572		
	-895.863056	3457.960000	-3363.771429		
	-871.863056	3457.960000	-3350.057143		
	-847.863056	3457.960000	-3357.600000		
	-823.863056	3457.960000	-3362.057143		
	-799.863056	3457.960000	-3303.771429		
	-775.863056	3457.960000	-3346.971429		
	-751.863056	3457.960000	-3373.028572		
	-727.863056	3457.960000	-7593.257144		
	-703.863056	3457.960000	-7176.685715		
	-679.863056	3457.960000	-6956.228572		
	-655.863056	3457.960000	-5682.857144		
	-535.863056	3457.960000	0.000000		
	-511.863056	3457.960000	-3868.457143		
	-367.863056	3457.960000	-7889.142858		
	-343.863056	3457.960000	-6718.285715		
	-295.863056	3457.960000	-7427.314287		
	-271.863056	3457.960000	-8015.314287		
	-223.863056	3457.960000	-7303.542858		
	-127.863056	3457.960000	-6829.714287		
	-79.863056	3457.960000	-7286.057144		
	-79.513056	4026.630000	-7547.314287		
ļ	-76.829722	3930.290000	-7812.342858		
	-76.363056	3556.080000	0.000000		
	-76.313056	3840.010000	-3903.428572		
	-76.229722	3952.690000	-6434.742858		
	-76.129722	3982.110000	-6957.600001		
	-76.079722	3987.520000	-7229.485715		
	-75.979722	4004.370000	-/408.114287		
	-75.846389	4012.010000	-/640.228572		
	-73.429722	4036.500000	-/787.657144		
	L _71 463056	4036 500000	-7433 028572		



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Subsurface Technology, Inc

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Well Test Analysis Report

Rate Change Data (cont)			
Time	Pressure	Rate	
Hours	psia	STB/day	
-60.679722	4031.570000	-7828.457144	
-48.013056	4031.570000	-7582.971430	
-38.263056	4036.500000	-7865.828572	
-24.179722	4036.500000	-7445.485715	
-22.213056	4099.720000	-7586.742858	
-21.463056	4139.380000	-9244.457144	
-20.346389	4144.320000	-9345.257144	
-19.446389	4145.720000	-9936.000001	
-14.229722	4164.040000	-1.0074e4	
-9.932790	4154.180000	-9727.542858	
1.131247	4014.179168	-9579.771430	
2.203142	3919.189261	-9406.628573	
28.919168	3440.498262	0.000000	
29.230873	3859.753237	-9516.342858	
30.766006	3859.753237	-8220.000001	
34.536942	3850.008925	-7853.828572	
39.470289	3850.629760	-7736.914287	
47.336948	3851.055995	-7618.285715	
50.903554	3850.454873	-7831.542858	
53.762149	3851.623879	-8044.457144	
57.829612	3855.226121	-8182.285715	
59.164704	3851.989116	-7919.314287	
61.269438	3848.212610	-7648.800001	
63.226082	3843.379716	-7514.400001	
71.135402	3866.884031	-7803.771430	
75.392998	3866.683766	-7990.628572	
102.920278	4009.300000	-7845.942858	
106.036944	4023.540000	-7584.685715	
107.386944	4036.500000	-7739.314287	
112.136944	4036.500000	-7557.257144	





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Quick Match Results

Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

	Value
Wellbore storage coefficient	0.1000 bbl/psi
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Permeability	1322.0700 md
Permeability-thickness	2.3136e5 md.ft
Skin factor	107.0280
Computed initial pressure	3430.269056 psia



WDW-3 Radial Flow Plot Model Results Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

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	Value
Permeability	1322.071461 md
Permeability-thickness	2.3136e5 md.ft
Radius of investigation	7008.111172 ft
Flow efficiency	0.095170
dP skin (constant rate)	442.391874 psi
Skin factor	107.028375
Extrapolated pressure	3430.266493 psia

Quick Match Results

Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

	Value
Wellbore storage coefficient	0.1000 bbl/psi
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Permeability	1322.0700 md
Permeability-thickness	2.3136e5 md.ft
Skin factor	107.0280
Computed initial pressure	3430.269056 psia

WDW-3 Radial Flow Plot Line Details



Report File:

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Well Test Analysis Report

Line type : Radial flow Slope : 4.75876 Intercept : 3430.27 Coefficient of Determination : 0.998783

	Radial flow	
Extrapolated pressure	3430.266493 psia	
Pressure at dt = 1 hour	3443.109169 psia	

Number of Intersections = 0

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WDW-3 Log-Log Plot Model Results Radial homogeneous - Infinitely acting

Value
8.4899e-3 bbl/psi
479.634571
1326.624884 md
2.3216e5 md.ft

Time Stepped Wellbore Storage

Quick Match Results

Skin factor

Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

	Value
Wellbore storage coefficient	0.1000 bbl/psi
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Permeability	1322.0700 md
Permeability-thickness	2.3136e5 md.ft
Skin factor	107.0280
Computed initial pressure	3430.269056 psia

WDW-3 Log-Log Plot Line Details

Line type : Radial flow Slope : 0 Intercept : 0.000218953 Coefficient of Determination : Not Used

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HOUSTON TX #RATONROL GELLA #NORTH HIS/D, DV

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Well Test Analysis Report

Line type : Wellbore storage Slope : 1 Intercept : 4.90779 Coefficient of Determination : Not Used Number of Intersections = 0

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SUBSURFACE	Subsurface Technology, Inc	Report File:	2008_WDW-3.pan	
	PanSystem			
HORATON, TX + DATE OF NOTSELTA + NORTH 1922D IN	Well Test Analysis Report			
Company	Navajo Re	fining Company		
Location	Artesia, N	ew Mexico		
Well	WDW-3			
Date	April 1 - 2,	April 1 - 2, 2008		
Test	Falloff	Falloff		
Gauge Depth	7660 feet	7660 feet		
Injection Interval	7570 feet	7570 feet - 8399 feet		
Completion Type	Perforated			
Top of Fill	N/A			
Last Stabilization	January 2008			
Analyst	TWW			
Subsurface Project No.	70G6142			

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HORATON, I X & BALLACKOLGE, LA & NORTH BEDD IN

Well Test Analysis Report

Reservoir Description

Fluid type : Water Well orientation : Vertical Number of wells : 1 Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	175.0000 ft
Average formation porosity	0.1000
Water saturation	0.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	8.4000e-6 psi-1
Layer pressure	3430.266493 psia
Temperature	0.000000 deg F

Well Parameters Data

	WDW-3
Well radius	0.3281 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	0.1000 bbl/psi
Storage Amplitude	-100.000000 psi
Storage Time Constant	0.010000 hr
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Well offset - x direction	0.0000 ft
Well offset - v direction	0.0000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	0.000000 psia
Check Temperature	0.000000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000000 psia
Oil density	0.000 lb/ft3
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.720 cp
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1

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Well Test Analysis Report

Layer 1 Correlations Not Used

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

	Layer 1
Permeability	1322.0700 md
Skin factor (Well 1)	107.0280

Rate Change Data

Time	Pressure	Rate
Hours	psia	STB/day
-2071.863056	3457.960000	0.000000
-2047.863056	3457.960000	-812.914286
-2023.863056	3457.960000	-721.371429
-1999.863056	3457.960000	-2408.228572
-1975.863056	3457.960000	-4733.485715
-1951.863056	3457.960000	-5046.171429
-1927.863056	3457.960000	-4780.800001
-1903.863056	3457.960000	-4393.371429
-1879.863056	3457.960000	-4379.657143
-1855.863056	3457.960000	-4000.114286
-1831.863056	3457.960000	-3507.771429
-1807.863056	3457.960000	-4653.257143
-1783.863056	3457.960000	-3842.057143
-1759.863056	3457.960000	-4548.342858
-1735.863056	3457.960000	-5261.142858
-1711.863056	3457.960000	-7843.885715
-1687.863056	3457.960000	-5715.771429
-1663.863056	3457.960000	-4275.428572
-1639.863056	3457.960000	-5074.971429
-1615.863056	3457.960000	-5097.257143
-1591.863056	3457.960000	-5001.942858
-1567.863056	3457.960000	-5920.114286
-1543.863056	3457.960000	-5555.657144
-1519.863056	3457.960000	-5428.800001
-1495.863056	3457.960000	-5272.457144
-1471.863056	3457.960000	-4341.600001
-1447.863056	3457.960000	-3908.228572
-1423.863056	3457.960000	-3815.657143
-1399.863056	3457.960000	-5433.257144
-1375.863056	3457.960000	-4945.714286
-1351.863056	3457.960000	-5194.628572
-1327.863056	3457.960000	-4909.371429
-1303.863056	3457.960000	-3945.257143
-1279.863056	3457.960000	-3068.571429
-1255.863056	3457.960000	-2256.000000
-1231.863056	3457.960000	-3494.400000
-1207.863056	3457.960000	-3530.400000
-1183.863056	3457.960000	-3493.714286
-1159.863056	3457.960000	-3476.228572
-1135.863056	3457.960000	-3540.685715
-1111.863056	3457.960000	-3542.400000

Rate Change Data (cont)

Time	Pressure	Rate
Hours	psia 🕓	STB/day
-1087.863056	3457.960000	-3397.371429
-1063.863056	3457.960000	-3492.685715
-1039.863056	3457.960000	-3396.685715
-1015.863056	3457.960000	-3473.142858
-991.863056	3457.960000	-3557.485715
-967.863056	3457.960000	-3493.028572
-943.863056	3457.960000	-3498.514286
-919.863056	3457.960000	-3541.028572
-895.863056	3457.960000	-3363.771429
-871.863056	3457.960000	-3350.057143
-847.863056	3457.960000	-3357.600000
-823.863056	3457.960000	-3362.057143
-799.863056	3457.960000	-3303.771429
-775.863056	3457.960000	-3346.971429
-751.863056	3457.960000	-3373.028572
-727.863056	3457.960000	-7593.257144
-703.863056	3457.960000	-7176.685715
-679.863056	3457.960000	-6956.228572
-655.863056	3457.960000	-5682.857144
-535.863056	3457.960000	0.000000
-511.863056	3457.960000	-3868.457143
-367.863056	3457.960000	-7889.142858
-343.863056	3457.960000	-6718.285715
-295.863056	3457.960000	-7427.314287
-271.863056	3457.960000	-8015.314287
-223.863056	3457.960000	-7303.542858
-127.863056	3457.960000	-6829.714287
-79.863056	3457.960000	-7286.057144
-79.513056	4026.630000	-7547.314287
-76.829722	3930.290000	-7812.342858
-76.363056	3556.080000	0.000000
-76.313056	3840.010000	-3903.428572
-76.229722	3952.690000	-6434.742858
-76.129722	3982.110000	-6957.600001
-76.079722	3987.520000	-7229.485715
-75.979722	4004.370000	-7408.114287
-75.846389	4012.010000	-7640.228572
-73.429722	4036.500000	-7787.657144
-71.463056	4036.500000	-7933.028572
-65.046389	4000.480000	-8104.114287
-63.596389	3977.630000	-6902.057144



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Well Test Analysis Report

Rate Change Data (cont)			
Time	Pressure	Rate	
Hours	psia	STB/day	
-60.679722	4031.570000	-7828.457144	
-48.013056	4031.570000	-7582.971430	
-38.263056	4036.500000	-7865.828572	
-24.179722	4036.500000	-7445.485715	
-22.213056	4099.720000	-7586.742858	
-21.463056	4139.380000	-9244.457144	
-20.346389	4144.320000	-9345.257144	
-19.446389	4145.720000	-9936.000001	
-14.229722	4164.040000	-1.0074e4	
-9.932790	4154.180000	-9727.542858	
1.131247	4014.179168	-9579.771430	
2.203142	3919.189261	-9406.628573	
28.919168	3440.498262	0.000000	
29.230873	3859.753237	-9516.342858	
30.766006	3859.753237	-8220.000001	
34.536942	3850.008925	-7853.828572	
39.470289	3850.629760	-7736.914287	
47.336948	3851.055995	-7618.285715	
50.903554	3850.454873	-7831.542858	
53.762149	3851.623879	-8044.457144	
57.829612	3855.226121	-8182.285715	
59.164704	3851.989116	-7919.314287	
61.269438	3848.212610	-7648.800001	
63.226082	3843.379716	-7514.400001	
71.135402	3866.884031	-7803.771430	
75.392998	3866.683766	-7990.628572	
102.920278	4009.300000	-7845.942858	
106.036944	4023.540000	-7584.685715	
107.386944	4036.500000	-7739.314287	
112.136944	4036.500000	-7557.257144	



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Quick Match Results

Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

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	Value
Wellbore storage coefficient	0.1000 bbl/psi
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Permeability	1322.0700 md
Permeability-thickness	2.3136e5 md.ft
Skin factor	107.0280
Computed initial pressure	3430.269056 psia



WDW-3 Radial Flow Plot Model Results Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

	Value
Permeability	1322.071461 md
Permeability-thickness	2.3136e5 md.ft
Radius of investigation	7008.111172 ft
Flow efficiency	0.095170
dP skin (constant rate)	442.391874 psi
Skin factor	107.028375
Extrapolated pressure	3430.266493 psia

Quick Match Results

Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

	Value
Wellbore storage coefficient	0.1000 bbl/psi
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Permeability	1322.0700 md
Permeability-thickness	2.3136e5 md.ft
Skin factor	107.0280
Computed initial pressure	3430.269056 psia

WDW-3 Radial Flow Plot Line Details


Report File:

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PanSystem

HOUSTON, IN ADATOMBOUGH, UN ANOUTH BEND, IN

Well Test Analysis Report

Line type : Radial flow Slope : 4.75876 Intercept : 3430.27 Coefficient of Determination : 0.998783

	Radial flow
Extrapolated pressure	3430.266493 psia
Pressure at dt = 1 hour	3443.109169 psia

Number of Intersections = 0



WDW-3 Log-Log Plot Model Results Radial homogeneous - Infinitely acting

Time Stepped Wellbore StorageWellbore storage coefficientValueWellbore storage coefficient8.4899e-3 bbl/psiDimensionless wellbore storage479.634571Permeability1326.624884 mdPermeability-thickness2.3216e5 md.ftSkin factor107.421824

Quick Match Results

Radial homogeneous - Infinitely acting

Time Stepped Wellbore Storage

	Value
Wellbore storage coefficient	0.1000 bbl/psi
Second Wellbore Storage	5.0000e-3 bbl/psi
Time Change for Second Storage	8.0000e-3 hr
Permeability	1322.0700 md
Permeability-thickness	2.3136e5 md.ft
Skin factor	107.0280
Computed initial pressure	3430.269056 psia

WDW-3 Log-Log Plot Line Details

Line type : Radial flow Slope : 0 Intercept : 0.000218953 Coefficient of Determination : Not Used

SUBSURFACE	Subsurface Techn	ology, Inc	Report File:	2008_WDW-3.pan
	PanSyster	n		
HER MONTEX + BATENBOUGH, LA + MERTHERZAD, IN	Well Test Analysi	s Report		
Line type : Wellbore storage				
Siope : 1 Intercent : 4 90779	· · ·			
Coefficient of Determination : I	Not Used			
Number of Intersections = 0	4			
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SUBSURFACE	Production Optimization Systems	Report File:	Navajo Well No. 3 Gaines 2
	PanSystem Version 3.5		
HOURTON, TX + BATTIN ROLKEE, LA + SOUTH BEND, IN	Well Test Analysis Report	÷	
Company	Navajo F	Refining Company	
Location	Artesia,	New Mexico	
Well	Gaines	Vell #3	
Date	August 2	24 - 30, 2009	
Test	Injection	/Falloff	
Gauge Type/Serial Number	Spartek.	#80780	
Gauge Depth	7,663 fe	et	
Injection Interval	7,660 fe	et - 8,620 feet	
Completion Type	Perforate	ed	·
Top of Fill	8,986 fe	et	
		. •	
Analyst	LKM		
Subsurface Project No.	70A6365	5	

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Report File:

Navajo Well No. 3 Gaines :

HOUSTON, TX + BAYON ROUGE, LA + &OUTH BEND, IN

PanSystem Version 3.5

Well Test Analysis Report

Reservoir Description

Fluid type : Water Well orientation : Vertical Number of wells : 1 Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	175.0000 ft
Average formation porosity	0.1000
Water saturation	0.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	8.4000e-6 psi-1
Layer pressure	3475.675745 psia
Temperature	114.820000 dea F

Well Parameters Data

	Well 1
Well radius	0.3646 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	0.043509 bbl/psi
Storage Amplitude	0.000000 psi
Storage Time Constant	0.000000 hr
Second Wellbore Storage	0.035103 bbl/psi
Time Change for Second Storage	0.016000 hr
Well offset - x direction	0.0000 ft
Well offset - v direction	0.0000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	3484.080000 psia
Check Temperature	114.820000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000C00 psia
Oil density	0.000 lb/ft3
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.540 cp

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Fluid Parameters Data (cont)

	Layer 1
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1

Layer 1 Correlations Not Used

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

	Layer 1
Permeability	718.830698 md
Skin factor (Well 1)	15.588053

Rate Change Data

Time	Pressure	Rate
Hours	psia	STB/day
-925.483330	0.000000	-7006.000000
-901.483330	0.000000	-7073.940000
-877.483330	0.000000	-6813.490000
-853.483330	0.000000	-7164.460000
-829.483330	0.000000	-7021.020000
-805.483330	0.000000	-7107.950000
-781.483330	0.000000	-7208.180000
-757.483330	0.000000	-7508.980000
-733.483330	0.000000	-7197.630000
-709.483330	0.000000	-7375.970000
-685.483330	0.000000	-7304.950000
-661.483330	0.000000	-7168.640000
-637.483330	0.000000	-6937.170000
-613.483330	0.000000	-6870.560000
-589.483330	0.000000	-7152.810000
-565.483330	0.000000	-6632.390000
-541.483330	0.000000	-6736.960000
-517.483330	0.000000	-6677.310000
-493.483330	0.000000	-6495.640000
-469.483330	0.000000	-6562.180000
-445.483330	0.000000	-6656.030000
-421.483330	0.000000	-6903.070000
-397.483330	0.000000	-7067.910000
-373.483330	0.000000	-6741.210000
-349.483330	0.000000	-6845.950000
-325.483330	0.000000	-7010.790000
-301.483330	0.000000	-6822.860000
-277.483330	0.000000	-6786.210000
-253.483330	0.00000	-6905.040000

Rate Change Data (cont)

J .		
Time	Pressure	Rate
Hours	psia	STB/day
-229.483330	0.000000	-7031.590000
-205.483330	0.000000	-7052.840000
-181.483330	0.000000	-7064.320000
-157.483330	0.000000	-7042.000000
-133.483330	0.000000	-6504.350000
-109.483330	0.000000	-6133.120000
-85.483330	0.000000	-8259.030000
-72.983330	0.000000	-1.0413e4
-61.483330	0.000000	-1.0585e4
-37.483330	0.000000	-1.0407e4
-13.483330	0.000000	-1.0446e4
0.000007	3641.573000	-1.0323e4
73.037550	3484.078000	0.000000



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Cartesian Plot Model Results Radial homogeneous - Infinitely acting

Classic Wellbore Storage

	Value
Wellbore storage coefficient	0.13295 bbl/psi
Dimensionless wellbore storage	6082.395108

Cartesian Plot Line Details

Line type : Wellbore storage Slope : -3235.16 Intercept : 3627.89 Coefficient of Determination : 0.994898

Number of Intersections = 0

.





Log-Log Plot Model Results Radial homogeneous - Infinitely acting

Classic Wellbore Storage

	Value
Wellbore storage coefficient	0.106338 bbl/psi
Dimensionless wellbore storage	4864.896562
Permeability	713.747176 md
Permeability-thickness	1.2491e5 md.ft
Skin factor	15.427202

Log-Log Plot Line Details Line type : Wellbore storage Slope : 1 Intercept : 0.391834 Coefficient of Determination : Not Used

Line type : Radial flow Slope : 0 Intercept : 0.000305222 Coefficient of Determination : Not Used

Number of Intersections = 0

SUBSURFACE	Production Optimization Systems	Report File:	2010 Gaines we
	PanSystem Version 3.5	Analysis Date:	12/02/2010
BOLSTORETX +BATCH KOUGS LA +SOUTH DEND, IS	Well Test Analysis Report		
Company	Navajo Refining Comp	pany	
Location	Artesia, New Mexico		
Well	Gaines Well No. 3		
Date	November 8 - 13, 201	0	
Gauge Type / Serial Number Guage Depth	Spartek / Top No. 7658 7660 feet	85 & Bottom No. 76648	
Injection Interval Completion Type	7660 feet to 8620 feet Perforated 8986 feet		
	0300 1661		
Analyst	RLS		
Subsurface Project No	70A6516	ل ه	
Remarks:			
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SUBSURFACE	Produc	tion Optimization Syster	ns	Report File:	2010 Gaines Well-3.par
	Pa	InSystem Version 3.5		Analysis Date:	12/02/2010
HOR STOPLEX & BATCH ROLOG, LA & SPRITH (1993) IS	We	II Test Analysis Report			
Reservoir Description		<u></u>			
Fluid type : Water					
Well orientation : Vertical					
Number of wells : 1					
Number of layers : 1		•			
Layer Parameters Data					
	Layer	1			
Formation thickness	175.000)O ft			
Average formation porosity	0.100	0 0			
Water saturation	0.000	0			·
Gas saturation	0.000	0			
Formation compressibility	0.00000	00 psi-1			
Total system compressibility	8.4000e	-6 psi-1			
Layer pressure	3622.16493	36 psia			
Temperature	0.00000)Ó deg F			
Well Parameters Data			•		
		Well 1			
Well radius		0.3246 ft			
Distance from observation to	active well	0.000000 ft			· .
Wellbore storage coefficient		0.040651 bbl/psi	•		
Storage Amplitude		0.00000.051			

Wellbore storage coefficient0.040651 bbl/psiStorage Amplitude0.00000 psiStorage Time Constant0.000000 hrSecond Wellbore Storage0.000000 bbl/psiTime Change for Second Storage0.000000 hrWell offset - x direction0.00000 ftWell offset - y direction0.00000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	3622.870000 psia
Check Temperature	0.000000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000000 psia
Oil density	0.000 lb/ft3
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.570 cp
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1



Production Optimization Systems

PanSystem Version 3.5

Report File:

2010 Gaines Well-3.pan

Analysis Date:

12/02/2010

HOLSTON, 3X #BATON ROLOG, LA #SORTED BEED, P

Well Test Analysis Report

Layer 1 Correlations

Not Used

Layer Boundaries Data

Layer 1 Boundary Type : Infinitely acting

	Layer 1
L1	0.000000 ft
L2	0.000000 ft
L3	0.000000 ft
L4 📉 🔨	0.000000 ft
Drainage area	0.000000 acres
Dietz shape factor	0.000000

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

	Layer 1
Permeability	567.835809 md
Skin factor (Well 1)	14.63743

Rate Change Data

Time	Pressure	Rate
Hours	psia	STB/day
-896.530000	0.000000	-6556.478291
-800.530000	0.000000	-6601.295752
-752.530000	0.000000	-6527.197437
-680.530000	0.000000	-6455.564906
-560.530000	0.000000	-6495.140172
-488.530000	0.000000	-6447.882191
-416.530000	0.000000	-6579.061020
-392.530000	0.000000	-6494.151021
-368.530000	0.000000	-6407.507286
-344.530000	0.000000	-6502.572720
-320.530000	0.000000	-6550.762753
-296.530000	0.000000	-6537.209766
-272.530000	0.000000	-7090.581141
-224.530000	0.000000	-6405.124987
-176.530000	0.000000	-6511.595238
-152.530000	0.000000	-6457.245522
-80.530000	0.000000	-6400.552384
-56.530000	0.000000	-6553.585991
-32.530000	0.000000	-6481.716753
-8.530000	0.000000	-6357.386028
22.640735	3754.422743	-6388.006784
51.435332	3761.219618	-6599.617354
57.610353	3764.865451	-6928.849572
82.475272	3765.713641	-6857.001709
117.500343	3634.618056	0.000000



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Cartesian Plot Model Results Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value
Wellbore storage coefficient	0.030117 bbl/psi
Dimensionless wellbore store	ge 1738.340434

Cartesian Plot Line Details

Line type : Wellbore storage Slope : -9486.62 Intercept : 3780.53 Coefficient of Determination : 0.923237 Number of Intersections = 0



Radial Flow Plot Model Results Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value
Permeability	567.835778 md
Permeability-thickness	9.9371e4 md.ft
Extrapolated pressure	3622.164936 psia
Radius of investigation	5910.461759 ft
Flow efficiency	0.433697
dP skin (constant rate)	81.291998 psi
Skin factor	14.637429

Radial Flow Plot Line Details Line type : Radial flow Slope : 6.39394 Intercept : 3622.16 Coefficient of Determination : Not Used

	Radial flow	
Extrapolated pressure	3622.164936 psia	
Pressure at dt = 1 hour	3640.793976 psia	

Number of Intersections = 0



Log-Log Plot Model Results Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value	
Wellbore storage coefficient	0.040651 bbl	/psi
Dimensionless wellbore storage	2346.361416	
Permeability	567.56878 md	
Permeability-thickness	9.9325e4 md	.ft
Skin factor	14.627163	
Log-Log Plot Line Details Line type : Radial flow Slope : 0 Intercept : 0.000405157 Coefficient of Determination : No	t Used	
Line type : Wellbore storage Slope : 1 Intercept : 1.02498 Coefficient of Determination : No	ot Used	
Number of Intersections = 0		

SUBSURFACE	Subsurface Technology, Inc	Report File:	2011 Gaines Well-3 rev.pa
	PanSystem Version 3.5		
HOLATON EX #BATON KOLOG LA #SOR TH NEND, IN 11	Well Test Analysis Report		
Company	Navajo Refining Com	pany	
Location	Artesia, New Mexico		
Well	Gaines Well No. 3		
Date	January 21 - 28, 2012	2	
Gauge Type / Serial Number	Spartek / Top No. 771	20 & Bottom No. 76404	L I
Guage Depth	7660 feet		
Injection Interval	7660 feet to 8620 fee	t	
Completion Type	Perforated		
Top of Fill	8986 feet		
Analyst	RIS		
Subsurface Project No.	70A6645		· .

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PanSystem Version 3.5

Report File:

HOLSTON TX + MATORIEULGE LA + STATELERO IN

Well Test Analysis Report

Reservoir Description

Fluid type : Water Well orientation : Vertical Number of wells : 1 Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	175.0000 ft
Average formation porosity	0.1000
Water saturation	0.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	8.4000e-6 psi-1
Layer pressure	3622.164936 psia
Temperature	0.000000 deg F

Well Parameters Data

	Well 1
Well radius	0.3246 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	0.11809 bbl/psi
Storage Amplitude	0.000000 psi
Storage Time Constant	0.000000 hr
Second Wellbore Storage	0.000000 bbl/psi
Time Change for Second Storage	0.000000 hr
Well offset - x direction	0.0000 ft
Well offset - y direction	0.0000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	3622.870000 psia
Check Temperature	0.000000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000000 psia
Oil density	0.000 lb/ft3
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.570 cp
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1

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Report File:

TX+BATOS ROLGE, LA+SOCHUREND, P

Well Test Analysis Report

PanSystem Version 3.5

Layer 1 Correlations Not Used

Layer 1 Model Data

Layer 1 Model Type : Radial homogeneous

	Layer 1
Permeability	596.528914 md
Skin factor (Well 1)	27.240663

Rate Change Data

Time	Pressure	Rate	Time	Pressure	Rate
Hours	psia	STB/day	Hours	psia	STB/day
-11208.000000	0.000000	-6398.265381	-10224.000000	0.000000	-6098.977400
-11184.000000	0.000000	-6398.265381	-10200.000000	0.000000	-6098.977400
11160.000000	0.000000	-6398.265381	-10176.000000	0.000000	-6248.622698
11136.000000	0.000000	-6547.910679	-10152.000000	0.000000	-6098.977400
1112.000000	0.000000	-6398.265381	-10128.000000	0.000000	-6248.622698
1088.000000	0.000000	-6398.265381	-10104.000000	0.000000	-5949.334717
1064.000000	0.000000	-6540.428467	-10080.000000	0.000000	-6106.459612
1040.000000	0.000000	-6398.265381	-10056.000000	0.000000	-6098.977400
1016.000000	0.000000	-6098.977400	-10032.000000	0.000000	0.000000
0992.000000	0.000000	-6398.265381	-10008.000000	0.000000	-6547.910679
0968.000000	0.000000	-6547.910679	-9984.000000	0.000000	-6398.265381
0944.000000	0.000000	-6398.265381	-9960.00000	0.000000	-6547.910679
0920.000000	0.000000	-7433.133022	-9936.00000	0.000000	-6398.265381
0896.000000	0.000000	-7141.325160	-9912.000000	0.000000	-6540.428467
0872.000000	0.00000	-6398.265381	-9888.00000	0.000000	-6547.910679
0848.000000	0.000000	-6398.265381	-9864.000000	0.000000	-6248.622698
0824.000000	0.000000	-6256.104911	-9840.000000	0.000000	-6248.622698
800.000000	0.000000	-6248.622698	-9816.000000	0.000000	-6098.977400
776.000000	0.000000	-6248.622698	-9792.000000	0.00000	-6398.265381
52.000000	0.000000	-6547.910679	-9768.000000	0.000000	-6398.265381
728.000000	0.000000	-6398.265381	-9744.000000	0.000000	-6248.622698
'04.000000	0.000000	-6398.265381	-9720.000000	0.000000	-5804.850900
380.00000	0.000000	-6398.265381	-9696.000000	0.000000	-5949.334717
656.000000	0.000000	-6547.910679	-9672.000000	0.000000	0.000000
632.000000	0.000000	-6248.622698	-9648.000000	0.000000	0.000000
000000.8060	0.000000	-6540.428467	-9624.000000	0.000000	0.000000
0584.000000	0.000000	-6842.037179	-9600.000000	0.000000	-6690.071150
)560.000000	0.000000	0.000000	-9576.000000	0.000000	-6398.265381
536.000000	0.000000	0.000000	-9552.000000	0.000000	-6547.910679
512.000000	0.000000	-6540.428467	-9528.000000	0.000000	-6405.747593
0488.000000	0.000000	-6248.622698	-9504.000000	0.000000	-6547.910679
0464.000000	0.000000	-6241.140485	-9480.00000	0.000000	-6547.910679
0440.000000	0.000000	-6398.265381	-9456.000000	0.000000	-6405.747593
0416.000000	0.000000	-6398.265381	-9432.000000	0.000000	-6540.428467
0392.000000	0.000000	-6398.265381	-9408.000000	0.000000	-6697.553362
0368.000000	0.000000	-6547.910679	-9384.000000	0.000000	-6547.910679
0344.000000	0.00000	-6398.265381	-9360.00000	0.000000	-6547.910679
0320.000000	0.000000	-6405.747593	-9336.000000	0.000000	-6248.622698
0296.000000	0.000000	-6248.622698	-9312.00000	0.000000	-6248.622698
0272.000000	0.000000	-6098.977400	-9288.000000	0.000000	-6398.265381
0248.000000	0.000000	-6248.622698	-9264.000000	0.000000	-6547.910679

Rate Change Data (cont)



Report File:

2011 Gaines Well-3 rev.pan

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PanSystem Version 3.5

Well Test Analysis Report.

Rate Change	Data (cont)		Rate Change D	ata (cont)	
Time	Pressure	Rate	Time	Pressure	Rate
Hours	psia	STB/day	Hours	psia	STB/day
-9240.000000	0.00000	0 -6547.910679	-8064.000000	0.000000	-5655.205601
-9216.000000	0.00000	0 -6547.910679	-8040.00000	0.000000	0.000000
-9192.000000	0.00000	0 -6697.553362	-8016.000000	0.000000	-6842.037179
-9168.000000	0.00000	0 -6248.622698	-7992.000000	0.000000	0.000000
-9144.000000	0.00000	0 -6697.553362	-7968.000000	0.000000	-6697.553362
-9120.000000	0.00000	0 -6697.553362	-7944.000000	0.000000	-6547.910679
-9096.000000	0.00000	0 -6690.071150	-7920.000000	0.000000	-6398.265381
-9072.000000	0.00000	0 -6547.910679	-7896.00000	0.000000	-6697.553362
-9048.000000	0.00000	0 -6398.265381	-7872.000000	0.000000	-7290.970459
-9024.000000	0.00000	0 -6547.910679	-7848.00000	0,000000	-4463.213065
-9000.000000	0.00000	0 -6547.910679	-7824.00000	0.000000	0.000000
-8976.000000	0.00000	0 -6540.428467	-7800.00000	0.000000	-5949.334717
-8952.000000	0.00000	0 -6398.265381	-7776.000000	0.000000	0.000000
-8928.000000	0.00000	0 -6547.910679	-7752.000000	0.000000	-149.336406
-8904.000000	0.00000	0 -6547.910679	-7728.00000	0.000000	-4612.858364
-8880.000000	0.00000	0 -6547.910679	-7704.00000	0.000000	-4762.501046
-8856.000000	0.0000	0 -6398.265381	-7680.00000	0.000000	-3570.508248
-8832.000000	0.00000	0 -6547.910679	-7656.000000	0.000000	0.000000
-8808.000000	0.00000	0 -6398.265381	-7632.000000	0.000000	-4463.213065
-8784.000000	0.00000	0 -6547.910679	-7608.000000	0.000000	-4762.501046
-8760.000000	0.00000	0 -6398.265381	-7584.000000	0.000000	-4313.570382
-8736.000000	0.00000	0.000000	-7560.000000	0.000000	-5949.334717
-8712.000000	0.00000	0 -5949.334717	-7536.00000	0.000000	-5520.525251
-8688.000000	0.00000	0 -6547.910679	-7512.000000	0.000000	-6547.910679
-8664.000000	0.00000	0 -6398.265381	-7488.000000	0.000000	-4612.858364
-8640.000000	0.00000	0 -6697.553362	-7464.000000	0.000000	0.000000
-8616.000000	0.00000	0 -6547.910679	-7440.000000	0.000000	-5206.272845
-8592.000000	0.00000	0 0.000000	-7416.000000	0.000000	-6697.553362
-8568.000000	0.00000	0 -3.0 346e 4	-7392.000000	0.000000	-5505.560826
-8544.000000	0.00000	0 -575.822689	-7368.000000	0.000000	0.000000
-8520.000000	0.00000	0 -6091.495187	-7344.000000	0.000000	-6398.265381
-8496.000000	0.00000	0 0.000000	-7320.000000	0.000000	-5804.850900
-8472.000000	0.00000	0 0.000000	-7296.00000	0.000000	-6098.977400
-8448.000000	0.00000	0 -6697.553362	-7272.000000	0.000000	0.000000
-8424.000000	0.00000	0 -6909.119176	-7248.000000	. 0.000000	-6398.265381
-8400.000000	0.00000	0 -4919.370117	-7224.000000	0.000000	-5855.419922
-8376.000000	0.00000	0 0.000000	-7200.000000	0.000000	-5804.850900
-8352.000000	0.00000	0 -4019.441267	-7176.000000	0.000000	-6398.265381
-8328.000000	0.00000	0 -3420.865566	-7152.000000	0.000000	-6098.977400
-8304.000000	0.00000	0 -4455.730852	-7128.000000	0.000000	0.000000
-8280.000000	0.00000	0 -4612.858364	-7104.000000	0.000000	-5949.334/1/
-8256.000000	0.00000	0 -5206.272845	-7080.000000	0.000000	-4612.858364
-8232.000000	0.00000	0 -5505.560826	-7056.000000	0.000000	0.000000
-8208.000000	0.00000	0 -5655.205601	-7032.000000	0.000000	-1490.9/1854
-8184.000000	0.00000	0 -5056.630162	-7008.000000	0.000000	-4422.857143
-8160.000000	0.00000	0 -5942.110421	-6984.000000	0.000000	-5385.714111
-8136.000000	0.00000	0 -5206.272845	-6960.000000	0.000000	-4902.857143
-8112.000000	0.00000	U -5505.560826	-6936.00000	0.000000	-5179.999826
-8088.00000	0.00000	0 0.000000		0.000000	-5074.285714

SUBSURFACE

Subsurface Technology, Inc

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Report File:

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2011 Gaines Well-3 rev.pan

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PanSystem Version 3.5

Well Test Analysis Report

Rate Change D	ata (cont)			_	Rate Change D	ata (cont)	
Time	Pressure	Rate			Time	Pressure	Rate
Hours	psia	STB/da	у		Hours	psia	STB/day
-6888.00000	0.00	0000 -5131	428746		-5712.000000	0.000000	-5071.428746
-6864.000000	0.00	0000 -4797.	143032		-5688.000000	0.000000	-5211.428571
-6840.000000	0.00	0000 -4694.	285889		-5664.000000	0.000000	-5591.428397
-6816.000000	0.00	0000 -2602	857056		-5640.000000	0.000000	-5588.571429
-6792.000000	0.00	0000 -4800.	000000		-5616.000000	0.000000	-5588.571429
-6768.000000	0.00	0000 -4800	000000		-5592.000000	0.000000	-5591.428397
-6744.000000	0.00	0000 0.	000000		-5568.000000	0.000000	-5237.142857
-6720.000000	0.00	0000 -7502	856968		-5544.000000	0.000000	-5754.285540
-6696.000000	0.00	0000 0.	000000		-5520.000000	0.000000	-5242.857317
-6672.000000	0.00	0000 -4662	857143		-5496.000000	0.000000	-4731.428571
-6648.000000	0.00	0000 -4425	.714111		-5472.000000	0.000000	-5242.857317
-6624.000000	0.00	0000 -5074	285714		-5448.000000	0.000000	-5011.428746
-6600.000000	0.00	0000 -3500	000087		-5424.000000	0.000000	-5242.857317
-6576.000000	0.00	0000 -4974	285540		-5400.000000	0.000000	-5108.571429
-6552.000000	0.00	0000 -5177.	142857		-5376.000000	0.000000	-5242.857317
-6528.000000	0.00	0000 -5214	285540		-5352.000000	0.000000	-5042.856968
-6504.000000	0.00	0000 -5080	000174		-5328.000000	0.000000	-5071.428746
-6480.000000	0.00	0000 -5314	285714		-5304.000000	0.000000	-5142.857143
-6456.000000	0.00	0000 0	000000		-5280.000000	0.000000	-5145.714111
-6432.000000	0.00	0000 -5177	142857		-5256.000000	0.000000	-5140.000174
-6408.000000	0.00	0000 -5177	142857		-5232.000000	0.000000	-5174.285889
-6384.000000	0.00	0000 -5348	571429		-5208.000000	0.000000	-5143.661237
-6360.000000	0.00	0000 0	000000		-5184.000000	0.000000	-5137.054269
-6336.000000	0.00	0000 -5108	571429		-5160.000000	0.000000	-5142.857143
-6312.000000	0.00	0000 -4971	428571	· · · ·	-5136.000000	0.000000	-5174.285889
-6288.000000	0.00	0000 -5214	285540		-5112.000000	0.000000	-5074.285714
-6264.000000	0.00	0000 -5108	571429		-5088.000000	0.000000	0.000000
-6240.000000	0.00	0000 -4800	000000		-5064.000000	0.000000	-5042.856968
-6216.000000	0.00	0000 -5102	856968		-5040.000000	0.000000	0.000000
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-6168.000000	0.00	0000 -4865	714460		-4992.000000	0.000000	-5102.856968
-6144.000000	0.00	0000 -5382	857143		-4968.000000	0.000000	0.000000
-6120.000000	0.00	0000 -5145	.714111		-4944.000000	0.000000	-5108.571429
-6096.000000	0.00	0000 -5042	856968		-4920.000000	0.000000	-5074.285714
-6072.000000	0.00	0000 -5239	999826		-4896.000000	0.000000	0.000000
-6048.000000	0.00	0000 -5217	143032		-4872.000000	0.00000	-4114.285714
-6024.000000	0.00	0000 -5280	000000		-4848.000000	0.000000	-5105.714460
-6000.000000	0.00	0000 -5214	285540		-4824.000000	0.000000	-5074.285714
-5976.000000	0.00	0000 -5179	999826		-4800.000000	0.000000	-5040.000000
-5952.000000	0.00	0000 -5211	428571		-4776.000000	0.000000	-5042.856968
-5928.000000	0.00	0000 -5208	571603		-4752.000000	0.000000	-5008.571254
-5904.000000	0.00	0000 -5179	999826		-4728.000000	0.000000	-5077.142683
-5880.000000	0.00	0000 -5248	571254		-4704.000000	0.000000	-5080.000174
-5856.000000	0.00	0000 -5140	.000174		-4680.000000	0.000000	0.000000
-5832.000000	0.00	0000 -4968	571603		-4656.000000	0.000000	-4974.285540
-5808.000000	0.00	0000 -5080	.000174		-4632.000000	0.000000	-4688.571429
-5784.000000	0.00	0000 -5114	285889		-4608.000000	0.000000	-4834.285714
-5760.000000	0.00	0000 -5074	285714	· ·	-4584.000000	0.000000	0.000000
-5736.000000	0.00	0000 -5111	428397	1	-4560.000000	0.00000	-5005.714286

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Subsurface Technology, Inc

Report File:

PanSystem Version 3.5

Well Test Analysis Report

Rate Change	Data (c	ont)	<u> </u>		Rate Change I	Data (cont)	
Time	Press	sure	Rate		Time	Pressure	Rate
Hours	psia		STB/day		Hours	psia	STB/day
-4536.00000	0	0.000000	-4834.285714		-3360.000000	0.00000	-4937.142857
-4512.00000	0	0.000000	-4771.428746		-3336.000000	0.00000	-4837.142683
-4488.00000	0	0.000000	-4971.428571		-3312.000000	0.00000	-4974.285540
-4464.00000	0	0.000000	-5008.571254		-3288.000000	0.00000	-5037.143032
-4440.00000	0	0.000000	-4902.857143		-3264.000000	0.00000	-4942.857317
-4416.00000	0	0.000000	-4797.143032		-3240.000000	0.00000	-4937.142857
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-4320.00000	0	0.000000	0.000000		-3144.000000	0.000000	0.000000
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-4272.00000	0	0.000000	-4934.285889		-3096.000000	0.00000	-5239.9 9982 6
-4248.00000	0	0.000000	0.000000		-3072.000000	0.000000	-5208.571603
-4224.00000	0	0.000000	-4937.142857		-3048.000000	0.00000	-4668.571603
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-4008.00000	0	0.000000	-4974.285540		-2832.000000	0.000000	-4871.428397
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-3840.00000	0	0.000000	-4902.857143		-2664.000000	0.000000	-4902.857143
-3816.00000	0	0.000000	-5002.857317		-2640.000000	0.000000	-1242.857143
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-3720.00000	0	0.000000	0.000000		-2544.000000	0.000000	-4634.285889
-3696.00000	0	0.000000	-4/65./14286		-2520.000000	0.00000	-4668.571603
-3672.00000	U	0.000000	-4931.428397		-2496.000000	0.000000	-4/31.4285/1
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-3528.00000		0.000000	4937.142037		-2352.000000	0.00000	0.000000
		0.000000	-4901.42009/		-2328.000000	0.000000	
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-3430.00000		0.000000	-0007.140032		-2200.000000		-4403.702301
-3432.00000		0.000000	-4037.142003		-2230.00000	0.00000	-4003.331018
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-3304.00000	U.	0.000000	-4931.420397	1	-2208.000000	0.000000	-4/39.30320/

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Report File:

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PanSystem Version 3.5

Well Test Analysis Report

Rate Change D	Data (cont)		R	ate Change D	ata (cont)	
Time	Pressure	Rate	Π <u></u>	ime	Pressure	Rate
Hours	psia	STB/day	H	ours	psia	STB/day
-2184.000000	0.00000	0 -4498.311508] [-	-1008.000000	0.000000	-3331.428484
-2160.000000	0.00000	0 -4739.888558		-984.000000	0.000000	-5111.428397
-2136.000000	0.00000	-4293.713624		-960.000000	0.000000	-5008.571254
-2112.000000	0.00000	-4625.099950		-936.000000	0.000000	-4865.714460
-2088.000000	0.00000	-4324.223628		-912.000000	0.000000	-5242.857317
-2064.000000	0.00000	-4827.789104		-888.000000	0.000000	-5182.857317
-2040.000000	0.00000	0 -4792.579034		-864.000000	0.000000	-4179.999913
-2016.000000	0.00000	0 -4881.841105		-840.000000	0.000000	-5042.856968
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-1968.000000	0.00000	0 -7234.171048		-792.000000	0.000000	-3871.428484
-1944.000000	0.00000	0 -6065.735284		-768.000000	0.000000	-3057.142770
-1920.000000	0.00000	0 -4486.401207		-744.000000	0.000000	-4768.571254
-1896.000000	0.00000	0 -4603.563244		-720.000000	0.000000	-4348.571516
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-1512.000000	0.00000	0 -5002.857317		-336.000000	0.000000	-3502.857056
-1488.000000	0.00000	0 -1.6786 e 4		-312.000000	0.000000	-4362.857143
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-1440.000000	0.00000	0 -4494.285540		-264.000000	0.000000	-4417.142683
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-1272.000000	0.00000	0 -49/1.4285/1		-96.000000	0.000000	-1414.285714
-1248.000000		U -4U//.142//U	ļ ļ	-70.289593	3041.704422	-3900.000000
-1224.000000	0.00000	0 -4428.5/1603		-55.92/602	3842.748942	-4011.4285/1
-1200.000000	0.00000	U -4425./14111		-30.569832	3852.797833	-/202.856968
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-1152.000000	0.00000	U -4557.143032		37.273743	3800.553372	0.000000
-1128.000000	0.00000	U -19.999999				
-1104.000000	0.00000	U -49/1.428571	. ·			
-1080.000000	0.00000	u -4/34.285540				
-1056.000000	0.00000	0 -5008.571254				
-1032.000000	0.00000	0 -4560.000000				







Expanded View of Radial Flow Plot Model Results Radial homogeneous - Infinitely acting

Fair Wellbore Storage

	Value
Permeability	596.873593 md
Permeability-thickness	1.0445e5 md.ft
Extrapolated pressure	3792.337923 psia
Radius of investigation	6251.168856 ft
Flow efficiency	0.382731
dP skin (constant rate)	37.990201 psi
Skin factor	27.261314

Expanded View of Radial Flow Plot Line Details Line type : Radial flow

Slope : 1.60439 Intercept : 3792.34 Coefficient of Determination : 0.899916

Radial flow Extrapolated pressure 3792.337923 psia Pressure at dt = 1 hour 3804.910506 psia

Number of Intersections = 0



Log-Log Plot Model Results Radial homogeneous - Infinitely acting

radial nomogeneous - inimitely aci

Fair Wellbore Storage

	Value
Wellbore storage coefficient	0.11809 bbl/psi
Dimensionless wellbore storage	6816.114987
Permeability	596.528914 md
Permeability-thickness	1.0439e5 md.ft
Skin factor	27.240663
Log-Log Plot Line Details Line type : Wellbore storage Slope : 1 Intercept : 0.352838 Coefficient of Determination : No	ot Used
Line type : Radial flow Slope : 0 Intercept : 0.000385487 Coefficient of Determination : No	ot Used
Number of Intersections = 0	

APPENDIX G

Comparison of Permeability, Transmissibility, Skin, False Extrapolated Pressure, and Fill Depth

Date of Test	Permeability (k)	Transmissibility (kh/u)	Skin (s)	False Extrapolated Pressure (p*)	Fill Depth
January 22 - 27, 2012	597 md	183,293 md-ft/cp	27.26	3792.34 psia	8,986 feet
November 10 - 13, 2010	568 md	174,376 md-ft/cp	14.64	3622.16 psia	8,986 feet
August 27 – 30, 2009	719 md	233,008 md-ft/cp	54.07	3,475.68 psia	8,986 feet
April 1 - 2, 2008	1,322 md	321,411 md-ft/cp	107	3,430.27 psia	N/A
Permit Parameters	250 md	40,094 md-ft-cp	N/A	N/A	N/A

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APPENDIX H

WDW-3 CONSTRUCTION INFORMATION





RE-ENTRY AND COMPLETION REPORT WASTE DISPOSAL WELL NO. 3

NAVAJO REFINING COMPANY Artesia, New Mexico

SUBSURFACE PROJECT NO. 70F5826

December 2006

PREPARED BY

SUBSURFACE CONSTRUCTION CORP. 6925 Portwest Dr., Suite 110 Houston, Texas77024



February 5, 2006

Mr. Darrell Moore Navajo Refining Company P.O. Box 159 Artesia, NM 88211

RE: Re-Entry and Completion Report Waste Disposal Well No. 3; Subsurface Project No. 70F5826

Dear Darrell:

Enclosed are four (4) copies of the above-referenced report. Four copies have been included for your records and for the State of New Mexico Energy Minerals and Natural Resources Department, Oil Conservation Division.

If you should have any questions, please feel free to contact me at (713) 880-4640.

Very truly yours, Rusty L. Smith

Project Engineer, EIT

RLS/bl

Enclosures

Moore I_Ltr

Subsurface Construction Corp.

6925 Portwest Drive Suite 110 Houston TX 77024 713/880-4640 Fax 713/880-3248 1-800-535-4105

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70F5826/Navajo/Re-entry & Completion Report for WDW-3

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EXECUTIVE SUMMARY

Navajo Refining Company (Navajo) contracted Subsurface Technology, Inc. (Subsurface), to prepare an Application for Permit and to Re-enter a Plugged and Abandoned (P&A) Oil and Gas Well. The Application for Permit to Drill or Re-enter and the Sundry Notices and Reports on Wells was submitted to the Department of the Interior, Bureau of Land Management (BLM), on June 29, 2006, and approved. The Application for Permit to Drill, Re-enter, Deepen, Plug Back, or add a Zone was submitted to the State of New Mexico Oil Conservation Commission (OCD) on June 29, 2006, and approved.

Subsurface prepared an engineering plan to re-enter the P&A' oil and gas well formally owned by Mewbourne Oil Company. The original well name was Caulk Bluff Federal No. 1 (API number 30-015-26575), and a Change of Operator application was submitted to the OCD on December 5, 2000, and approved under the well name of WDW-3. Under contract to Navajo, Subsurface commenced field operations on September 25, 2006. The existing location was cleared and prepared for re-entry operations. An earthen lined reserve pit was dug to catch returns. All depths, unless stated, are referenced to workover rig floor at six feet to seven feet above ground level. The rig floor was moved from six feet to seven feet after drilling out the cast iron bridge plugs.

A workover rig and reverse unit was placed on location and the existing wellhead was removed. The first cast iron bridge plug (CIBP) at 7010 feet was drilled and the perforated interval from 7050 feet to 7102 feet was squeezed off with neat cement and successfully pressured tested to six hundred eighty pounds per square inch gauge pressure (680 psig). The second and third CIBP at 7190 feet and 7279 feet was drilled. There appeared to be ten feet of cement on top of the third CIBP. The perforated interval from 7262 feet to 7278 feet and from 7304 feet to 7314 feet was squeezed with neat cement. The squeezed interval was pressure tested to 920 psig and would not hold. A second cement squeeze was performed across the perforated interval from 7262 feet to 7278 feet and form 7304. The interval was pressure tested to 630 psig and continued to lose pressure at a rate of two pounds per square inch every thirty minutes (2 psi/30 min). The fourth CIBP at 7595 feet was drilled and at 7838 feet a cement plug was



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encountered and drilled through. Cement was tagged twenty nine (29) feet above the top of the liner at 9022 feet. The hole was circulated clean and prepared for logging.

A Cement Bond Log (CBL), Variable Density Log (VDL), caliper log, and temperature survey were performed. The CBL/VDL showed that the top of the cement (TOC) behind the 7-inch casing was located 900 feet from the surface. The OCD was notified and approved the existing well condition. The casing was perforated from 7660 feet to 8450 feet and from 8540 feet to 8620 feet at 2-JSPF on sixty degree (60°) phasing.

A packer was set at 7546 feet with 2 7/8-inch PH-6 tubing, the well was swabbed back and samples of the formation fluid were recovered. It was estimated that two hundred twenty six barrels (226 bbls) of formation fluid was returned to the surface. A pressure test on the annulus between the 7-inch and 2-7/8-inch was performed at 660 psig with the annulus losing pressure at a rate of 8 psi/hr.

An injection test was performed on the well down the 2-7/8-inch tubing with the annulus open to the bottom of the well. The open annulus will allow for the calculation of the bottom hole pressure while pumping down the 2-7/8-inch tubing with out the influence of tubing friction pressure on the bottom hole calculations. The injection rates were from two barrels per minute (2 bpm) to ten barrels per minute (10 bpm). From the data collected during the injection test it appears that the well will be able to accept an injection rate up to 10 bpm at the permitted pressure of 1550 psig with 4-1/2-inch, 11.6 pound per foot (11.6 lb/ft) tubing in the wellbore.

At the request of the OCD, Subsurface went back into the wellbore with a retrievable bridge plug (RBP) to test the casing and isolate any leaks to within 1000 feet. The RBP was set at 7550 feet and the packer was set at 6985 feet to isolate the squeezed interval from 7050 feet to 7314 feet. The squeezed interval was pressure tested to 490 psig and the annulus to 632 psig. The squeezed interval was losing pressure at a rate of 6 psi/hr and the annulus was gaining pressure due to thermal affects. The RBP was moved up the wellbore to 1255 feet and casing pressure tested to 569 psig. The casing above 1255 feet was losing pressure at a rate of 2 psi/hr. The casing leaks were isolated to the squeezed interval from 7050 feet to 7314 feet and in the interval from surface to 1255 feet. The



OCD was called and approved the 300PSI sealing application to stop the casing leaks across the two intervals.

The 4-1/2-inch tubing was run into the wellbore and the Arrow X-1 packer was set at 7575.73 feet with 37,000 lbs of tension. Prior to running the 4-1/2-inch tubing a new Superior hanging spool was installed. Prior to setting the tubing packer, the annulus between the 4-1/2-inch tubing and the 7-inch casing was filled with inhibited brine, with the 300psi sealant across the squeezed perforations and across the upper section of the 7-inch casing. Once the packer was set and tubing hung off in the spool, a new Superior wellhead was installed and the P-seals were pressure tested to 3000 psig. After the wellhead was assembled the annulus was squeezed at 545 psig for four hours (4 hrs), as specified by the sealant manufacture representative on site. The annulus was then pressure tested to 480 psig overnight with no pressure loss. The workover rig was disassembled and moved off location with all associated equipment.

A 12-hr pump-in and falloff test was performed down the 4-1/2-inch tubing. To maintain a surface injection pressure that was below the permitted pressure of 1550 psi the injection rate was lowered to 9 bpm at the end of the pump-in procedure. The BHP gauge was placed at 8630 feet for 14 hrs to monitor BHP. When the gauge was pulled, five minute (5 min) gradient stops were made every 1000 feet with the first stop at 7000 feet. The equipment used to perform the falloff testing was moved off location to prepare for mechanical integrity testing (MIT).

The MIT consisted of an annulus pressure test and a radioactive tracer survey. The temperature survey was performed during the CBL/VDL logging event and will be used as a baseline for any future temperature surveys. The annulus pressure test was performed at 530 psia and lost 2.5 psi over a one-hour period, which was within the OCD requirements of five percent (5%) over a 30 minute time interval. The radioactive tracer survey showed no signs of fluid flow out of the permitted interval above 7650 feet. The OCD witnessed the annular pressure test and the first half of the radioactive tracer survey.



The annulus monitoring system will be installed and tested in March 2007. After the installation of the well annulus monitoring system, the well will be turned over to Navajo for injection.

70F5826/Navajo/Re-entry & Completion Report for WDW-3

1.0 INTRODUCTION

Navajo re-entered, tested, and completed WDW-3 for the injection of plant waste effluent. The well is located in Section 1, Township18 South, Range 27 East (S1-T18S-R27E) approximately 11.5 miles east-southeast of Artesia, New Mexico in Eddy County. A Well Location and Acreage Dedication plat of the well location is located in Appendix 2.0-2. The construction and testing of this well was performed in compliance with the provisions of the New Mexico Water Quality Control Commission Regulations (NMWOCCR) Subpart V, Section Nos. 5204 and 5205, New Mexico Oil Conservation Division Underground Injection Control (UIC) Program Manual, and the Environmental Protection Agency (EPA) Code of Federal Regulations 40 CFR 16.12, Subpart B.

Subsurface was contracted by Navajo to re-enter and test WDW-3. The construction and testing of this Non-Commercial Class I Nonhazardous Waste Disposal Well was permitted by the BLM and the OCD. All work associated with WDW-3 was completed in accordance with the provisions specified in the permit approved by the BLM and OCD.

The following report and contracted work on WDW-3 was designated as Subsurface Project No. 70F5826. The following report summarizes all work performed on the WDW-3 and includes the fillings of the necessary documents. The report is broken down into four parts Summary of Daily Activities, Mechanical Integrity Testing, Reservoir Evaluation, and Regulatory Compliance. For continuity this report is written in the same structure as the report completed on WDW-2. The well reentry procedure can be found in 1.0-1.

2.0 SUMMARY OF DAILY OPERATIONS

The reentry, testing, and completion operations for WDW-3 are presented in this section. Details of certain operations are referenced in the text and included as figures, exhibits, tables, and appendices. Appendix 2.0-1 contains a Chronology of Field Activities from the Field Activity Reports.



The original wellbore was designated as the Mewbourne Oil Company, Chalk Bluff Federal No. 1 (API No. 30-015-26575), installed March 7, 1991, as a producing oil & gas well. The wellbore was constructed with 13-3/8-inch, 54.5 lb/ft surface casing set to 400 feet in a 17-1/2-inch hole and was cemented to the surface. A 9-5/8-inch, 36 lb/ft intermediate casing was set at 2600 feet in a 12-1/4-inch hole and cemented to the surface. The 7-inch, 26 lb/ft and 29 lb/ft production casing was set at 9450 feet in an 8-3/4-inch hole and was cemented to 900 feet below ground level (GL). On March 7, 1991, the well was deepened to 10,119 feet and a 4-1/2inch, 11.6 lb/ft liner was installed from 9051 feet to 10,119 feet and cemented in place with 175 sks of cement. The well was plugged and abandoned on August 14, 1995. The well was acquired by Navajo on November 27, 2000. The current well configuration is presented in Figure 2.0-1 and Table 2.0-1.

Navajo submitted the application to recomplete the well to both the BLM and the OCD on June 6, 2006, and received approval from the OCD on August 11, 2006, (Appendix 2.0-3 and Appendix 2.0-4). The Sundry Notices and Reports on New Wells notification was submitted to the BLM on June 6, 2006, (Appendix 2.0-5). The New Mexico Energy, Minerals and Natural Resources Department sent a letter of approval to discharge according to UIC-CLI-008-3 on June 23, 2004, which was later modified to raise the top of the injection interval from 7750 feet to 7650 feet (Appendix 2.0-6)

2.1 LOCATION CLEARING AND RIG MOBILIZATION

On September 27, 2006, Banta's roustabout crew arrived at the job site with two back holes and a three man crew. The location was cleared of all overgrowth and a thirty feet by thirty feet by five feet (30 ft x 30 ft x 5 ft) lined pit was dug to hold returns. An eight foot by seven foot by three foot (8 ft x 7 ft x 3 ft) cellar was dug around the wellhead in order to inspect the lower section of the wellhead for repairs. New valves and fittings were installed on the existing wellhead. Rig support equipment started to arrive at the job site.

On September 28, 2006, the roustabout crew framed in the cellar and the Basic workover rig arrived at the job site. The rig was spotted and the remaining support



equipment arrived at the job site. The derrick was erected and the rig crew repaired the sand line break and replaced the drilling line. The 2-7/8-inch work string was tallied at 9413.59 feet with a bottom hole assembly of 126.45 feet (See Table 2.1-1).

On September 29, 2006, the wellhead was inspected by a Superior Wellhead technician and was found to be an eleven inch, three thousand pound, by seven inch, five thousand pound $(11^3 \times 7^5)$ Cameron type spool. The Cameron type spool attached to the wellhead had been discontinued and Superior suggested that the spool be replaced. The remaining support equipment arrived at the job site and was rigged up for drilling. The annular blow out preventer (BOP) was attached up to the wellhead and the rig crew went into the wellbore with 2-7/8-inch, 7.9 lb/ft, PH-6 tubing, four 4-3/4-inch drill collars, 46.67 lb/ft, and a 6-1/8-inch Baker Hughes Rock bit. The rig crew tagged bottom at 7001 feet.

2.2 DRILLING OF CAST IRON BRIDGE PLUGS AND CEMENT SQUEEZING OF THE PERFORATIONS

On September 30, 2006, the sand line brake on the rig would not hold and operations were shut down until the brake was repaired. On October 1, 2006, first CIBP was drilled out with no show of cement or drilling mud. The second CIBP was tagged at 7190 feet. The well was circulated clean with brine water and an injection test was performed. The rig crew tripped out of the hole (TOOH) with the work string and tripped into the hole (TIH) with the work string excluding the bit and drill collars (open ended) to spot cement for squeeze operations.

On October 2, 2006, the first cement squeeze was executed across the perforations from 7050 feet to 7102 feet. Halliburton spotted eighty sacks (80 sks) of Premium Plus neat 14.8 ppg cement across the perforations. The rig crew pulled nine stands to get out of the cement and circulated out any excessive that was trapped in the work string. Halliburton was able to pump four barrels (4 bbls) of cement into the formation before reaching a squeeze pressure of 2000 psig. The well was shut-in over night with 680 psig left on the wellhead.



On October 3, 2006, the rig crew tagged cement at 6873 feet assuming the hole was full of cement to the CIBP. At 7190 feet there were 12.1 bbls of cement left in the wellbore. The total amount of cement spotted in the wellbore was 18.7 bbls leaving 6.6 bbls of cement either place in the formation or circulated out of the wellbore. It was estimated that 3.5 bbls were circulated out of the tubing during the clean out, leaving 3.1 bbls placed into the formation (Halliburton Report Appendix 2.1-1). The cement in the wellbore was drilled out to the top of CIBP at 7190 feet and the well was pressure tested to 578 psig. The well lost 123 psi over a thirteen and half hour period at 9.1 psi/hr (1.58%).

On October 4, 2006, the second CIBP was drilled out and the third CIBP was tagged at 7278.96 feet. It was estimated that there was 9 feet of cement on top of the third CIBP. The third CIBP was drilled out and the formation started to take fluid at a rate of 1.0 bpm to 1.25 bpm. It was estimated that during circulation 180 bbls of 8.7 ppg brine was lost to the formation. The fourth CIBP was tagged at 7591 feet. The hole was circulated clean to prepare for the second cement squeeze operation. A pump-in test was performed and the well would take fluid at a rate of 4.5 bpm at 710 psig. The rig crew TOOH with collars and bit and TIH open ended to spot cement for squeeze operations.

On October 5, 2006, the bottom of the work string was placed at 7321 feet. Halliburton pumped 100 sks of 14.8 ppg Premium Plus neat cement across the perforations. The rig crew pulled ten stands and Halliburton started to squeeze into the formation using a hesitation squeeze method. The cement was squeezed into the formation in seven stages 10 minutes apart with 1.5 bbls of cement pumped between each stage. After the first stage the wellhead pressure was 78 psig and after the seventh stage the wellhead pressure was 1973 psig. The well was shut-in with 1970 psig for 2 hours and then was bled off and an additional eight stands were pulled and the tubing was circulated to clear the tubing of any excessive cement (see Halliburton Report Appendix 2:1-2). The well was shut-in over night with 930 psig on the wellhead.

On October 6, 2006, the rig crew drilled through soft cement and tagged bottom at 7554 feet, which was 37 feet above the previous spot at 7591 feet. The well would



not hold pressure and squeeze perforation were taking fluid at 25 gpm with 920 psig on the wellhead. A second cement squeeze was required to seal off the perforations.

On October 7, 2006, Halliburton was not available to do the third squeeze job so Key Pumping Services was called and performed the third cement squeeze. Rig crew TOOH with collars and bit and TIH open ended (without collars and bit). The bottom of the work string was placed at 7290 feet. On October 8, 2006, Key Pumping Services placed 80 sks of 14.8 ppg Premium Plus neat cement across the perforations. The rig crew pulled eight stands of pipe and circulated the pipe free of excessive cement. Key Pumping Services pumped 6 bbls of cement into the formation at 750 psig. At a squeeze pressure of 1975 and additional 1.5 bbls was pumped into the formation. Key Pumping Service stopped pumping for 10 min to allow the pressure to fall then pumped another 1.5 bbls into the formation before the formation refused to take any addition fluid at 1940 psig (see Key's Report in Appendix 2.1-3). The well was shut-in for the night with 1830 psig on the wellhead.

On October 9, 2006, Rig crew tagged hard cement at 6981 feet and drilled hard cement to 7312 feet. The estimated amount of cement left in the pipe was 12.7 bbls out of a total of 18.8 bbls pumped with no sign of returned cement. The rig crew tagged bottom at 7559 feet and the wellbore was circulated clean. On October 10, 2006, the casing was pressure tested for twelve hours with a starting pressure 630 psig. At the end of the twelve hour period, the pressure was 568 psig. The wellhead pressure was recorded every thirty minutes and, after six hours the rate of pressure loss was maintaining 2 psi/ 30 minutes. The annulus valve between the 7-inch casing and the 9-5/8-inch casing was opened and contained pressure. A gauge was placed on the 7-inch by 9-5/8-inch annulus and monitored for 18 hours with no apparent increase in pressure (Table 2.1-2). The 7-inch by 9-5/8-inch annulus was initially bled off before the BOP was placed on the wellhead.

On October 11, 2006, rig crew drilled through the fourth CIBP at 7595 feet and while drilling though the plug the plug dropped to 7776 feet. At 7780 feet mud contaminated cement was encountered. At 7838 feet the rig crew had drilled though the cement plug and TIH to the top of the 4-1/2-inch liner (TOL). The rig crew

tagged bottom at 9022 feet 28 feet above the TOL. It appears that there is a 28 foot cement plug across the top of the liner at 9051 feet. The wellbore was circulated clean from 9022 feet to surface. On October 12, 2006 the rig crew TIH with a casing scraper and circulated the hole to prepare for logging. Wood Group Logging Services arrived at the job site and spotted equipment.

2.3 LOGGING AND PERFORATING THE INJECTION INTERVAL

On October 13, 2006, Wood Group ran a CBL/VDL log, temperature survey, and a caliper log. The CBL/VDL log showed top of cement behind the 7-inch casing at 900 feet below the ground level (Appendix 2.3-1). The temperature log showed no major anomalies throughout the wellbore (Appendix 2.3-2). The caliper log showed some minor ware in the casing wall below the top of the injection interval (Appendix 2.3-3).

The CBL/VDL log was difficult to evaluate due to the fast formation responses. It appears that there is cement behind the 7-inch casing from the packer at 7575 feet up to 1500 feet with areas that appear to have a micro annulus. Isolation from 1500 feet to 1000 feet is spotty with little or no cement. From 900 feet to the surface, the CBL and VDL show no cement behind the casing.

The temperature survey showed no anomalies in the temperature curve. The fluid level in the well was found at 296 feet. The static bottom hole temperature (BHT) at 7575 feet was 126° F, at 8140 feet the BHT was 132.5° F, and at 9020 feet the BHT was 142.6° F.

The caliper log showed 7-inch, 29 lb/ft casing and 7-inch, 26 lb/ft casing mixed throughout the casing string. A bad spot in the 7-inch casing string was discovered at 7604 feet. There appears to be some additional corrosion from 8662 feet to 8705 feet.

From October 14, 2006 through October 15, 2006, Wood Group perforated the intervals from 7660 feet to 8450 feet and from 8540 feet to 8620 feet. Perforating was done using a 40 foot steel hollow carrier gun that produced a 0.5-inch hole at



two shots per foot on 60° phasing. On the first day 12 perforating runs were made completing the interval from 8540 feet to 8620 feet and 400 feet of the interval from 8050 feet to 8450 feet. On the second day 10 perforating runs were made completing the interval from 7660 feet to 8050 feet. There were no misfires during both days and all perforating charges went off as planned.

2.4 FORMATION SAMPLE COLLECTION AND INJECTION TESTING OF THE WELL

On October 15, 2006, the well was swabbed back from 2400 feet to surface to collect formation samples. Four samples were collected at different volumes of returned fluid. The first sample was collected after twelve runs estimated volume at 151 bbls. The second sample was taken after fourteen runs estimated volume at 201 bbls, and the fourth sample was taken after eighteen runs estimated volume of 226 bbls. Samples were delivered to the Navajo Refining Facility in Artesia, New Mexico. Between runs seven through nine hydrogen sulfide gas was encountered and all personnel not active in the swabbing process were moved off the location. The formation fluid sample lab results can be found in Appendix 2.4-1. A standard API water analysis of the formation water samples and brine water samples was completed by Texas Oil Tech Laboratories.

On October 18, 2006, Key Pumping services arrived at the job site to perform the injection test. Key Pumping services started the injection testing down 2-7/8-inch, PH-6 tubing. Key's pump truck broke down after pumping 80 bbls. Key Pumping services returned on October 19, 2006. The wellhead was shut-in with the bottom of the pipe left open ended. Pressure gauges were placed on the annulus and on the wellhead. Key Pumping services circulated the wellbore at 2 bpm and caught returns after 37 bbls. The test commenced starting at 2 bpm and increasing in 1 bpm increments to 10 bpm. Both the wellhead pressure and annulus pressure were monitored during the testing. The annulus pressure will allow for a calculation of the BHP with out the affect of the 2-7/8-inch pipe friction. The brine fluid weight that was pumped into the well was measured at 8.6 ppg.



Key pumping was able to reach 10 bpm for a short five minute period before the deck engine over heated and the pump shut down. The wellhead tubing pressure at 10 bpm was 5087 psig the annulus pressure was estimated at 660 psig. With a hydrostatic pressure of 3488.16 psi calculated to 7800 feet, the BHP is 4148 psi. The pressure gradient is 0.53 psi/ft, which is below the fracture gradient. According to the data collected from the annulus pressure gauge, it appears that it would be possible to pump into the well at 10 bpm and still stay below the fracture gradient and the permitted wellhead pressure of 1550 psig (Table 2.4-1).

2.5 FINDING AND REPAIRING CASING LEAKS

The State of New Mexico OCD requested that Navajo Refining try to find all the casing leaks to within 1000 feet. For two days from October 20, 2006 to October 22, 2006, a retrievable bridge plug (RBP) and packer were placed in the wellbore to isolate sections of the casing within 1000 foot intervals. The additional testing that was performed after each perforation cement squeeze revealed that there were two intervals that were suspect of casing leaks; the interval across the squeezed perforations and the interval from 1000 feet to surface.

The first suspected interval was across the squeezed perforations. The RBP was set at 7550 feet and the packer was set at 6985 feet. The isolated interval was pressure tested to 490 psig and the annulus between the 2-7/8-inch tubing to the packer was pressure tested to 632 psig. The pressure loss across the squeezed interval stabilized after two hours and was losing 6 psi/hr. The annulus gained pressure due to thermal affects and would not stabilize.

The next suspect interval in the casing was in the upper 1000 feet to surface interval. The RBP was set at 1255 feet and the entire casing interval form 1255 feet to surface was pressure tested to 570 psig. The pressure stabilized after two hours and maintained a pressure loss of 2 psi/hr over a twelve hour period. The two tested intervals accounted for the majority of the 7-inch casing leaks. The OCD was called and approved the pumping of a sealant treatment provided by 300 PSI, Inc. as a solution to sealing off the 7-inch casing leaks. The treatment would be pumped ahead of and be hind the inhibited packer fluid.



2.6 RUNNING THE 4 1/2-INCH 11.6 LB/FT TUBING AND SETTING THE PACKER

On October 23, 2006, Superior Wellhead replaced the existing Cameron spool with a new Superior Wellhead spool. The BOP was reseated and Allen's Casing Crews started into the hole with the Weatherford Arrow X-1 7-inch by 3-inch packer. The Packer would not go past 50 feet before getting hung up in the casing. The packer was pulled and examined, and it was discovered Weatherford had brought out the wrong packer. Kenco, out of Artesia, was called and they delivered a new Arrow X-1, 7-inch by 2-7/8-inch (Figure 2.6-1) packer to the location. The Weatherford packer was made with a 3-inch EUE thread and the Kenco packer had a 2-7/8-inch REG thread. As a result of the Weatherford cross over not threading up to Kenco's packer, Kenco had an integral cross over made and brought to the location.

On October 24, 2006, Allen's Casing crew started into the wellbore with 4-1/2-inch tubing and Arrow X-1 packer. The tubing was torqued to specifications at 1600 lbs. The bottom of the packer was set at 7575.73 feet with 37,000 lbs of tension on the packer. Before the packer was set the wellbore was circulated with approximately 240 bbls. 300PSI pumped 23.8 bbls of sealant followed by 95 bbls of 8.7 ppg inhibited brine (55 gals Baker Petrolite CRW 132 inhibitor fluid) and 14.29 bbls of sealant. At the end of the pumping the packer was set with 37,000 lbs of tension and the slips placed into the hanging spool. The BOP was removed and the wellhead installed.

2.7 INSTALLATION OF THE WELLHEAD

On October 25, 2006, the rig crew finished rigging up the wellhead. Superior arrived and pressure tested the P-seals to 3000 psig. The rig crew filled the annulus with 2.5 bbls of 8.7 ppg brine water and 300 psi applied 545 psig to the 4-1/2-inch by 7-inch annulus using nitrogen. The pressure was maintained for four hours. The pressure was bled off and the annulus was pressure tested to 490 psig with brine for one-hour and recorded on a circular chart (Appendix 2.7-1). The annulus was bled down and retested overnight to 480 psig with no pressure loss. From October 25,



2006 to October 28, 2006, the rig was demobilized and moved off location with all support equipment. Key Energy services started moving frac tanks onto the location for the pressure build up and falloff testing. The pipe tally for the 4-1/2-inch tubing can be found in Table 2.7-1. A schematic of the as-built wellhead can be located in Figure 2.7-1.

2.8 PRESSURE BUILD UP AND FALLOFF TESTING

On November 2, 2006, Key Energy services placed fourteen frac tanks on the location and were in the process of filling them. On November 3, 2006, Banta Roustabout service installed the pump-in flange on the wellhead. Six temperatures were taken at the mid-point in the frac tanks to determine the brine fluid temperature, so that the stress that would be applied to the packer, due to temperature changes in the wellbore could be calculated. The average water temperature of brine that would be used to perform the pump-in procedure portion of the pressure build up was 60.6° F. The shear pins in the packer were set at 80,000 lbs and the maximum amount of shear stress that would be applied to the packer was determined to be less than 60,000 lbs. All the brine located in the frac tanks were treated with biocide and the tanks were rolled with a Key vacuum truck.

On November 4, 2006, Petroplex Pumping service rigged up to the injection side of the wellhead and a Key Energy kill truck rigged up to the annulus side of the wellhead. The kill truck will maintain 700 psig on the annulus in order to help reduce tubing and packer stresses. Petroplex Pumping service started pumping at 3 bpm and after 28 bbls the well caught pressure at 162 psig. The rate was slowly increased to 10 bpm with a wellhead pressure of 1278 psig. The rate was maintained at 10 bpm until the wellhead pressure started to approach the 1400 psig mark and at that time the rate was decreased to 9 bpm at a wellhead pressure of 1170 psig. Based on strap measurements from the frac tanks it was estimated that 6700 bbls of 8.8 ppg brine were pumped into the well (Table 2.8-1 and Appendix 2.8-1).

Two hours prior to ending the pumping procedure, Schlumberger Slickline service lowered a bottom-hole pressure gauge into the well at 8630 feet. While lowering



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the tool, the rate was decreased to 5 bpm in order to get the tool passed through the upper section of the wellbore. At 9:00 PM pumping was stopped with the BHP tool at 8630 feet, and the well was closed in with 50 psig on the annulus and no pressure on the wellhead. On November 5, 2006, at 10:20 a.m. Schlumberger Slickline service started out of the hole, with the BHP gauge taking gradient stops every 1000 feet, starting at 7000 feet. Once the BHP tool was out of the wellbore the annulus was bled down and the well shut-in (Appendix 4.1-2). All but one frac tank were removed from the location.

2.9 LOCATION CLEANUP AND STATE REQUIRED TESTING

On November 13, 2006, Banta Roustabout service cleared the location of debris, hauled off trash, filled in cellar with pea gravel, removed diesel contaminated soil around the location, and leveled the location. The well cuttings and contaminated soils were placed in the reserve pit. The returned solids that remain in the reserve pit will have to be profiled prior to disposal and cannot be disposed of under the oil field exemption. The cuttings and returned solids that remain in the reserve pit will be hauled off once the profile of the material is complete.

On November 14, 2006, Wood Group was unable to rig up to the wellhead due to high winds and the OCD delayed testing until November 15, 2006.

On November 15, 2006, Wood Group logging services, Petroplex Pumping services, and OCD inspectors arrived at the job site. Wood Group Logging services performed an annulus pressure test, and radioactive tracer survey. Petroplex Pumping services provided pumps for the annulus pressure test and the chase down portion of the radioactive tracer survey.

The 4-1/2-inch by 7-inch annulus was pressure tested to 530 psia over a one-hour period and lost 1.99 psi. This represents a 0.37% pressure loss which is well within the OCD requirement of 5% for 30 minutes at a minimum pressure of 300 psig. The annulus pressure test was witnessed by the OCD representatives. The radioactive tracer test was run without any sign of radioactive material being pumped out of the injection interval. The first part of the radioactive tracer survey was witnessed by



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the OCD representatives (Appendix 2.8-1, Attachment 2.8-1, Table 2.8-1, Figure 2.8-1). At the end of the job the annulus was again pressure tested to 300 psig and held pressure for 1-1/2-hrs before being bled off.

3.0 MECHANICAL INTEGRITY TESTING

The demonstration of the mechanical integrity of WDW-3, required by New Mexico Water Quality Control Commission Regulations (NMWQCCR) Subpart V, Section 5204 (A) to (D) and Section 5205(A)(1)(a), included a casing caliper inspection on the 7-inch protective casing, pressure testing of the 7-inch protective casing, CBL/VDL of the 7-inch casing, a radioactive tracer survey, a differential temperature survey, and an annulus pressure test. Results of these tests demonstrated that the well had internal and external mechanical integrity.

3.1 CALIPER CASING INSPECTION LOG

On October 13, 2006, Wood Group Logging services ran a caliper log to determine the condition of the existing casing wall thickness and to check for anomalies (Appendix 2.2-3). Overall the 7-inch protective casing looked good. The caliper log revealed that there was 26 lb/ft and 29 lb/ft casing in the wellbore. There was one anomaly found that occurred at 7604 feet, which appeared to be a gouge in the casing wall. The upper section of the 7-inch casing string appeared to be in better condition than the lower section. There appeared to be some corrosion and scale build up in a section of the casing just above and below the 8700 feet. The data obtained from the caliper log may be used as a baseline for future comparisons.

3.2 CEMENT BOND LOGGING

On October 13, 2006, Wood Group Logging services ran a CBL/VDL log (Exhibit 2.2-1). The CBL/VDL revealed cement had not been circulated to the surface behind the 7-inch protective casing, as was indicated in the state records. The TOC behind the 7-inch protective casing was located at 900 feet and the cement bond quality was poor down to 1200 feet. There were indications on the log that a micro annulus may be present below the 1200 foot interval. The intervals above the



injection interval from 2662 feet to 2160 feet, from 4876 feet to 5372 feet, and from 6750 feet to 7600 feet indicated that there was good bonding between the 7-inch casing and the cement to isolate the injection interval. The OCD was called and they approved the existing wellbore for injection and did not request that any additional cement be placed behind the 7-inch casing (Attachment 3.2-1).

3.3 CASING PRESSURE TESTING

After performing each perforation squeeze, the wellbore was drilled out and the casing was pressure tested. The casing pressure test that was performed across the squeezed interval from 7050 feet to 7102 feet had a loss rate of 9.1 psi/hr with a starting pressure of 580 psig. The pressure was run for 13.5 hours with the final reading at 455 psig.

The second perforation squeeze was over the perforated interval from 7262 feet to 7278 feet and 7304 feet to 7314 feet. The second cement squeeze would not hold pressure. A third cement squeeze was performed across the interval and the casing was pressure tested to 630 psig for a period of 12 hours. The final casing pressure was 568 psig with a average pressure loss of 2 psi/hr.

The OCD was notified of the pressure losses on the casing pressure test and requested that Navajo attempt to isolate the leakoff in the casing to within 500 feet to 1000 feet. A 2-7/8-inch by 7-inch packer and an RBP were run into the wellbore to isolate the squeezed interval. The RBP was set at 7550 feet and the packer was set at 6985 feet. The annulus between the 2-7/8-inch work string and the 7-inch protective casing was pressure tested to 632 psig and appeared to gain pressure due to a thermal heating effect in the wellbore. The tubing was pressure tested to 490 psig with a loss rate of 6 psi/hr down the 2-7/8-inch tubing.

The 7-inch protection casing interval from 900 feet to the surface did not appear to have cement behind it, therefore, it was necessary to determine if that interval mechanically sound. The RPB was set at the shallowest point possible at 1255 feet and the casing was pressure tested to 570 psig. Over a 13 hour period the wellhead pressure dropped to 540 psig with a loss rate of 2 psi/hr.



The request by the OCD was completed. The intervals across the squeezed perforations and the interval from 1255 feet to surface both showed signs of a casing leak. The leak-off rate across both intervals was small and within the regulator requirements of 5%. Again the OCD was contacted and they requested that Navajo attempt to seal off the leaks. A casing sealant was pumped with the inhibited brine down the 4-1/2-inch by 7-inch annulus before setting the 2-7/8-inch by 7-inch Arrow X-1 injection packer. The sealant treatment was performed by 300PSI Inc. and approved by the OCD (Attachment 3.2-1). The packer was set and the sealant was squeezed. An annulus pressure test was recorded with the initial annulus pressure at 490 psig, after one-hour the annulus pressure maintained 490 psig, there was no measurable loss over the one-hour period. A copy of the chart is in Appendix 2.7-1.

3.4 ANNULUS PRESSURE TEST

The State of New Mexico required an annulus pressure test which was performed on November 15, 2006, in conjunction with a radioactive survey. The well was allowed to sit idle for 10 days to attain a thermal equilibrium in the wellbore prior to running the annulus pressure test. Wood Group Logging service monitored the annulus pressure and Petroplex Pumping Service provided the pressure pumping equipment. The OCD representatives were present to witness the annular pressure test.

The annulus was pressurized using a high pressure, low volume triplex pump isolated from the pressure source. The official annular pressure test began at 11:32:30 AM at a pressure of 530.94 psia. The tubing pressure was 0 psi. After one-hour, the pressure decreased to 528.95 psia. This represents a loss of 1.99 psi, or 0.37%, which complies with the OCD allowable of 5% per 30-minute test period at a minimum test pressure of 300 psi. The annulus pressure test data are presented as Table 2.9-1. The pressure gauge calibration certificate is presented as Appendix 3.4-1.



3.5 RADIOACTIVE TRACER SURVEY

A radioactive tracer survey was performed on the WDW-3 on November 15, 2006, following the annulus pressure test. The first part of the radioactive tracer survey was witnessed by the OCD representatives. The radioactive tracer survey consisted of running two statistical checks, two baseline gamma ray surveys, and injecting four slugs of radioactive material. Two (2) of the slugs were injected during the time-drive surveys and two were injected during the moving surveys. All tests were conducted while injecting nonhazardous brine water into the well. Wood Group Logging service performed the logging services and Petroplex Pumping service provided the pumping equipment.

The radioactive tracer tool was lowered to a total depth of 9,020 feet and a presurvey baseline log was then run from 9,020 feet to 7,350 feet. Five-minute statistical surveys were conducted at 7,550 feet and at 7,640 feet.

The injection rate was set at 102 gallons per minute (gpm) and a slug of radioactive iodine was ejected at 7,375 feet. A total of seven passes were made during the first moving survey, until the slug dissipated into the permitted injection interval from 7,650 feet to 8,830 feet.

The radioactive tracer tool was repositioned at 7,375 feet and a second slug of radioactive iodine was ejected. The injection rate was 102 gpm. A total of five passes were made during the second moving survey, until the slug dissipated into the permitted injection interval from 7,650 feet to 8,894 feet.

The first stationary time-drive survey was performed with the lower detector at 7,640 feet with an injection rate of 102 gpm. A slug of radioactive iodine was ejected and monitored on time drive for 15 minutes.

The second stationary time-drive survey was performed with the lower detector at 7,640 feet. The injection of brine water was maintained at 102 gpm. A 2-second slug of radioactive iodine was ejected and monitored on time-drive for 15 minutes.



No upward fluid movement was observed during the two chase downs or the two time-drive surveys. There does not appear to be any upward movement of fluid out of the injection interval from 7,650 feet to 8,884 feet.

Injection into WDW-3 was terminated and a post-survey gamma ray log was run from 9,016 to 7,342 feet. The initial and post-survey gamma ray logs were comparable.

The radioactive tracer log is presented as Appendix 2.9-1. The corresponding letter of interpretation of the radioactive tracer log, dated November 27, 2006, by Wood Group is presented as Appendix 3.5-1.

3.6 DIFFERENTIAL TEMPERATURE SURVEY

A baseline differential temperature survey was performed on October 13, 2006, (Exhibit 2.2-2) after the CBL/VDL logging run. The baseline differential temperature survey will be used to evaluate future temperature surveys to confirm mechanical integrity of the well. No anomalies were observed during the differential temperature survey.

The temperature log was run from 9020 feet to the surface. The fluid level in the wellbore was at 296 feet with 8.6 ppg brine water in the wellbore. The wellbore temperature at 560 feet was 68.1° F, at 1000 feet the wellbore was temperature 74.6° F, at 7650 feet the temperature was 127° F, at 8850 feet the temperature was 140.2 ° F, and at 9020 feet the temperature was 142.9° F. The gradient from 7650 feet to 9020 feet was 1.16° F / 100 ft.

4.0 **RESERVOIR EVALUATION**

The bottom-hole pressure testing, which was conducted on the WDW-3 following the completion of the well, was designed to obtain the best estimate of the permeability and mobility-thickness in the reservoir. The pressure testing consisted of an injection falloff test and a gradient survey. Petroplex Pumping Service



provided the pumping equipment for the injection period of the testing and Schlumberger Slickline Services provided the BHP equipment.

The calculated value for the skin does not appear to correspond with the pump-in surface pressure values or the injection test valves. It is possible that the offset wells, WDW-1 and WDW-2, influenced the bottom hole pressure response of the bottom hole pressure gauge during the pressure falloff test. Historically, the calculation for the permeability appears to be in the range that was anticipated from previous falloff testing conducted on WDW-1 and WDW-2. WDW-1 and WDW-2 are completed in the same zone of interest.

Due to the proximity of WDW-3 to both the WDW-1 and the WDW-2 and the procedure used by Navajo for injecting into the wells, consideration needs to be given to monitoring the bottom hole pressure in the two offset wells while performing a fallout test the target well. This should allow for a better understanding of the pressure behavior in the reservoir.

4.1 PRESSURE FALLOFF TEST

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Petroplex Pumping Services rigged up on WDW-3 on November 4, 2006. Injection into WDW-3 was initiated at 0919 hours at an injection rate of 126 gpm. The injection rate was gradually increased to 420 gpm. At 1800 hours, Schlumberger rigged up and the injection rate was decreased to 210 gpm in order to run the bottom-hole pressure gauges into the well. The tandem memory gauges were positioned at 8,630 feet below ground level and the injection rate was increased to 378 gpm.

At 2100 hours, the injection pumps began to lose suction and WDW-3 was subsequently shut in. The final injection rate was 189 gpm with a final injection pressure at 8,630 feet of 4,577.59 psia.

The pressure falloff test was terminated after 13.57 hours with a final shut-in pressure of 3,804.87 psia. Gradient stops were made at 1000-foot intervals while removing the pressure gauges from the well.



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The pressure data obtained from the falloff test were analyzed with the assistance of the commercially available PanSystem pressure transient analysis software. The PanSystem output for the falloff analysis has been included as Appendix 4.1-1 and includes the input reservoir parameters used in the reservoir analysis. The pressure and temperature data recorded during the pressure falloff testing are included as Appendix 4.1-2.

Figure 4.1-1 shows the pressure response recorded by the bottom-hole pressure gauge from the time the tool was in place through the 13.57-hour shut in period. Figure 4.1-2 is a cartesian plot of the pressure falloff data. The superposition time function was used to account for the rate changes during the pressure build up portion of the testing. Figure 4.1-3 is a log-log diagnostic plot of the falloff data, showing change in pressure and pressure derivative versus equivalent shut in time.

The reservoir permeability was determined from the radial flow region of the superposition Horner plot, Figure 4.1-4. The radial flow regime occurs between Horner times of 486 and 196. Figure 4.1-5 shows an expanded view of the radial flow regime. The slope of the radial flow period was determined to be 0.473785 psi/cycle.

An estimate of mobility-thickness, kh/μ , for the reservoir was determined to be 2,223,895 md-ft/cp from the following equation:

$$\frac{\mathrm{kh}}{\mathrm{\mu}} = 162.6 \,\frac{\mathrm{q\,B}}{\mathrm{m}}$$

where,

kh/μ =		formation mobility-thickness, millidarcy-feet/centipoise
q	=	rate prior to shut in (6,480 bbl/day)
В		formation volume factor (1.0 reservoir bbl/surface bbl)
m		slope of the infinite acting radial flow period (0.473785 psi/cycle)



Substituting,

$$\frac{k h}{\mu} = 162.6 \frac{(6,480)(1.0)}{0.473785}$$
$$= 2,223,895 \text{ md-ft/cp}$$

The permeability-thickness, kh, was determined to be 1,601,204 md-ft by multiplying the mobility-thickness by 0.72 centipoise, the viscosity of the reservoir fluid (μ res).

kh =
$$\left(\frac{kh}{\mu}\right)\mu_{res}$$

= $(2,223,895)(0.72)$
= 1,601,204 md-ft

The average reservoir permeability was determined to be 1,840 md using the total perforated interval thickness of 870 feet:

$$k = \frac{(kh)}{h} = \frac{1,601,204}{870} = 1,840 \,\mathrm{md}$$

4.2 STATIC GRADIENT SURVEY

On November 5, 2006, the pressure gauges were removed from WDW-3. Static gradient stops were made at 8,630 feet, 7,000 feet, 6,000 feet, 5,000 feet, 4,000 feet, 3,000 feet, 2,000 feet, 1,000 feet, and at the surface. The bottom-hole pressure and temperature after 13.57 hours of shut in at 8,630 feet were 3,804.87 psia and 135.88° F, respectively. The static fluid level was determined to be at 420 feet.

A summary of the static gradient survey results is provided in Table 4.2-1 and are graphically depicted in Figure 4.2-1.



5.0 Regulatory Compliance

The construction of WDW-3 was performed in accordance with the regulatory considerations and standards specified in the approved modification to the Discharge Plan UIC-CLI-008-3 Dated June 23, 2004; the OCD Permit, Dated June 29, 2006; the BLM Sundry Notices and Reports on Wells Dated June 29, 2006; NMWQCCR, Subpart V, Section Nos. 5204 and 5205; and the United States Environmental Protection Agency 40 CFR 146.12.

5.1 Siting

Navajo re-entered, tested, and completed a plugged and abandoned wellbore located in Section 1, T18S, R27E, Unit Letter N, approximately 11 miles east-southeast of Artesia, in Eddy County, New Mexico. The modification to Discharge Plan UIC-CLI-008-3 includes provisions for the location, depth of the injection interval, and specific reentry and completion requirements. The Navajo WDW-3 will inject plant effluent into a the Cisco and Brushy Canyon formations, which are beneath the lowermost formation contained within one quarter of a mile of the wellbore, with ground water having 10,000 mg/l total dissolved solids or less. A plat of the Navajo WDW-3 well location is shown in Appendix 2.0-2.

5.2 Casing Cementing

The existing casing and wellbore configuration was used and the only modifications to the wellbore were the removal of four existing CIBP's in the original wellbore configuration and the squeeze cementing of existing perforations. Table 2.0-1 and Figure 2.0-1 contain a detailed description of the current wellbore configuration.

5.3 Tubing and Packer

The Installation of the tubing and packer were in accordance with NMWQCCR Subpart V, Section 5205(B)(3).



The WDW-3 injection tubing is a 4-1/2-inch, 11.6 lb/ft, J-55, LTC 8rd connection, carbon steel pipe. The injection tubing was connected into the Arrow X-1, 2-7/8-inch by 7-inch packer via an integral 2-7/8-inch by 4-1/2-inch crossover. The packer was set with 37,000 lbs of tension in a competent area of the 7-inch casing with the bottom of the packer at 7575 feet, which is approximately 85 feet above the upper most perforation. The tubing was designed and selected based on its ability to withstand the chemical affect of the injectorate and its burst pressure, collapse pressure, and tensile stresses, which may be experienced during the operational life of the well. Table 2.0-1 is a detailed tubular list of the existing pipe and the installed pipe. Figure 5.3-1 is a schematic of the Kenco packer system, and Table 2.6-1 is an inspection tally of the tubing that was used. All the injection tubing that was placed in the well was inspected and threads cleaned prior to installation.

5.4 Directional Surveys

Deviation checks were obtained prior to re-entering WDW-3 and were based on prior deviation surveys obtained from state records, which were in accordance with NMWQCCR Subpart V, Section 5205 (A)(4)(a). Attachment 5.4-1 contains the deviation surveys that were obtained from the State of New Mexico record archives submitted to the OCD.

5.5 Logging Program

The logging program for WDW-3 was completed in accordance with the regulations specified in NMQCCR Subpart V, Section 5205(A)(4)(b).



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	Type of Hole	Interval	Document
Type of Log	Logged	Logged (ft)	Reference
Dual Induction			
Laterolog	Open Hole	2595 - 9448	Appendix 5.5-1
Spectral Density Dual			
Spaced Neutron Log	Open Hole	0 – 9448	Appendix 5.5-2
Cement Bond Log	· · · ·		
(CBL/VDL)	Cased Hole	0 - 9020	Appendix 2.2-1
Temperature Log	Cased Hole	0-9020	Appendix 2.2-2
Casing Inspection	-		
Caliper Log	Cased Hole	0 - 9000	Appendix 2.2-3
Radioactive Tracer			
Survey	Cased Hole	7375 - 9008	Appendix 2.9-1

5.6 MECHANICAL INTEGRITY TESTING

The demonstration of the mechanical integrity of the WDW-3, required by NMWQCCR Subpart V, Section 5204 (A) to (D) and Section 5202 (A)(1)(a), is discussed in detail in Section 3.0 of this report. The associated logs and interpretation of the results obtained from the mechanical tests are also included in Section 3.0 of this report.

5.7 PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE FORMATION FLUIDS

In accordance with NMWQCCR Subpart V, Section 5202(A)(3)(h), an analysis describing the physical and chemical characteristics of the formation fluids, extracted from the Cisco and Upper Canyon Formation, is presented as Appendix 2.3-1.

The well materials used to construct WDW-3 were compatible with fluids which the material may be expected to come into contact. Well material would be deemed to have compatibility as long as the materials used in the construction of the well meet or exceed standards developed for such materials by the American Petroleum

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Institute (API), The American Society for Testing Materials (ASTM), or comparable standards acceptable to the NMWQCCR.

5.8 **REGULATORY WITNESSING**

In accordance with NMWQCCR Subpart V, Section 5205(A)(5), notification prior to commencement of the reentry, cementing and casing, well logging, and mechanical integrity testing was communicated with the BLM, Carlsbad, New Mexico and the OCD, Artesia, New Mexico offices. The BLM and the OCD had an opportunity to witness all installations, logging, and testing as required in the Application for Permit to Drill, Re-enter, Deepen, Plugback, or Add a Zone and in NMWQCCR Section 5205(A)(5).

6.0 FUTURE TEST RECOMMENDATIONS

As stated earlier, due to the proximity of WDW-3 to both the WDW-1 and the WDW-2 and the procedure used by Navajo for injecting into the wells, consideration needs to be given to monitoring the bottom hole pressure in the two offset wells while performing a fallout test in the target well (WDW-3). This should allow for a better understanding of the pressure behavior in the reservoir. This may further enhance reservoir pressure forecast and increase Navajo's ability to proactively respond to reservoir and wellbore conditions.

A proposed procedure for falloff testing on the three injection wells, consist of placing BHP gauges in each well prior to starting injection into WDW-3. The injection period would consist of maintaining a constant injection rate into WDW-3 for a period 24 hours. At the end of the 24-hour injection period, shut-in WDW-3 and shift the waste injection stream to WDW-1. This would be in line with the current Navajo injection procedures. Continue injection into WDW-1 for 12 hours, and then shift the injection stream to WDW-2 for a period of 12 hours. At the end of the 12 hour injection period in WDW-2 shut down injection operations and remove the BHP tools from each wellbore. Once the BHP gauges have been removed from the wells, return to normal injection operations.



APPENDIX 2.0-1

CHRONOLOGY OF FIELD ACTIVITIES



APPENDIX 2.0-1

CHRONOLOGY OF FIELD ACTIVITIES

Tuesday, July 25, 2006

Rusty Smith, with Subsurface Construction, Inc. traveled to Artesia, New Mexico and met with David Alvarado, District Manager of Basic Energy, to inspect the two rigs that they will have available on August 7th. Only one rig was available; the other could not be released. The Cooper 500 with a 250K lb derrick was the rig that was inspected. The rig was well maintained, has no pipe racks, work string, and no power swivel. The rig is used mainly for workover operations. Inspected the well site where the workover rig unit will be located. Well site needs to be scraped clean and the barbed wire fence, which surrounds the area where the old tank used to be, needs to be removed. The wellhead needs some work. Pictures of the Basic rig and well location were taken.

Wednesday, July 26, 2006

Rusty Smith left Artesia, New Mexico and traveled to Farmington, New Mexico. The rig and well location inspection summary were completed and e-mailed to Subsurface personnel for review. Included in the inspection summary were photos of the rig and location.

Wednesday, August 30, 2006

Subsurface personnel traveled to Artesia, New Mexico to meet with David Alvarado, District Manager of Basic Energy, to develop a location layout for equipment and assist Joe Konicki. Talked with Julian Carrillo, the rig tool pusher, because David Alvarado was on vacation, and he informed Subsurface that the rig was no longer available because Yates Energy had changed its position and would not release it. Set up meetings with Darrel Moore and the new Project Engineer at the Navajo plant to discuss the current job situation and introduce Joe Konicki. Joe and I talked with Key Energy about the possibility of acquiring a rig.



Thursday, August 31, 2006

Rusty Smith measured the current WAMS units on Disposal Well No. 1 and Disposal Well No. 2 and acquired photos of Well No. 1 WAMS and the current well configuration. The well location inspection summary was completed. All photos, drawings, and the inspection summary were e-mailed to Subsurface personnel for review. Rusty Smith and Joe Konicki. left Artesia, New Mexico for Houston, Texas.

Monday, September 25, 2006

Rusty Smith traveled to Artesia, New Mexico to prepare the location for the reentry project on WDW–3, formally owned by Mewbourne Oil Company and known as Chalk Bluff Federal No. 1. The sundry notice to the BLM for the transfer of ownership was submitted on May 5, 2003. The OCD Change of Operator Notice was submitted on October 5, 2000.

Tuesday, September 26, 2006

Subsurface personnel called Knight Oil Tools & Rental and spoke with Francisco about work string and pipe. He wanted to know what type of crossovers, bit sub, safety clamp, and elevators would be needed. Spoke with Basic and they did not have any handling tools for the PH6 tubing and would need elevators and a safety valve. Knight said that they would provide elevators and a safety valve with the work string. Talked with Allen, of Key Fishing Tools, and he said that they would provide all the crossovers and bit subs. Basic was in agreement with the supplied tools.

Banta Oilfield Services will arrive tomorrow to clear the location and dig 30 foot x 30 foot x 3 foot pit. Key Energy Services will deliver tanks tomorrow and start filling them up. Portable toilets will arrive tomorrow from Sani-Tech Rentals. Young's Mobile Homes will deliver a small office trailer on Thursday. Knight Oil Tools will provide



work string, elevators, and the safety valve to be delivered September 27, 2006. Key Fishing Tools and Rental will provide reverse unit, subs, collars, bit, BOP (Allen), which are scheduled to arrive on Thursday, after noon. The rig is also scheduled to arrive on Thursday. Steve L., with Halliburton, has been notified and will need 48 hours notice. Contacted Aztec Rental about a fork lift and they will send account information to the office to be filled out by Subsurface's accountant. Once the account is approved, they will deliver a fork lift on September 27, 2006.

Wednesday, September 27, 2006

Subsurface personnel arrived at the job site at 7:00 a.m. MST. Banta's roustabout crew called and said that were having problems finding the location. Therefore, I met them at the ATOKA compressor station and led them to the location. Banta arrived with two backhoes and proceeded to clear the location of over growth and remove all fencing. Key Energy arrived at the job site with three frac tanks, two sets of pipe racks, catwalk, and Knight Oil Tools arrived with 150 joints of 2-7/8-inch PH-6 tubing. Knight Oil Tools will not charge for the pipe until the remaining 148 joints pipe and tools are delivered. Aztec Rental arrived on the job site with an extended boom fork lift. Julian, with Basic, called and said that they should be able to move onto the location by noon tomorrow.

The roustabout crew dug a 30 feet x 30 feet x 5 feet lined pit, cleared the location of over growth, removed the barbed wire fence, and dug out cell. The roustabout crew will return tomorrow to frame in the cellar. Key will start filling the frac tanks tomorrow and Knight Oil Tools will deliver the remaining pipe and handling tools. Subsurface left the jobsite at 6:30 p.m.

Thursday, September 28, 2006

Subsurface personnel arrived at the location at 7:20 a.m. MST. The roustabout crew arrived at 8:00 a.m. The roustabout crew completed the cellar. The Basic rig crew arrived on the location at 12:30 p.m. with a mechanic to repair the sand line brake. The



rig crew raised the derrick and replaced the drilling line. Rig mats had to be placed under the derrick for support. The rig mats were acquired from G&L Tools a division of Basic Energy Services. The rig crew completed repairs on the rig and left the location at 7:20 p.m. Key finished loading the frac tanks with water and brine. Key delivered the reverse unit and open top flow back tank, and the reverse unit operator will arrive tomorrow with BOP, collars, and handling tools.

Knight had problems getting the remaining work string delivered before nightfall. Knight will have the remaining pipe delivered in the morning. Young's delivered a 10 foot x 30 foot office trailer and Aztec delivered a light plant to the location. Superior Wellhead was notified and will have a man on the job site in the morning to inspect the hanger and wellhead before installing the BOP. The 150 joints of 2-7/8-inch PH-6 tubing were tallied at 4691.06 ft. Subsurface left the location at 7:45 p.m.

Friday, September 29, 2006

Subsurface personnel arrived on the jobsite at 6:45 a.m. MST. Basic rig crew arrived on location at 7:30 a.m. Subsurface and Basic crews spotted catwalk & pipe racks. The last load of pipe from Knight Tools arrived at the location with handling tools. The rig crew moved pipe and off-loaded pipe onto the pipe racks. The BOP from Key Energy arrived at the job site and was flanged up to the wellhead. The Superior wellhead technician arrived at the job and inspected the tubing hanger spool and found it to be $11_3 \times 7_5$ Cameron hanger and profile. The Superior wellhead technician suggested that the tubing hanger spool be replaced as the Cameron spool has been discontinued and is hard to find parts for. Key Energy's reverse unit operator arrived at the job site with 3-1/2-inch collars and handling tools.

The reverse unit (pump & tank) were rigged up to the wellhead. Portable toilets arrived at the job site. The rig crew tallied the top layer of PH-6 tubing, drill collars, bit, and started into the hole with the BHA at 1:30 p.m. The first plug was tagged at 7001 feet, at



7:10 p.m. The rig crew pulled a single joint of tubing from the wellbore, the well was shut in, and operations were shut down for the night.

Saturday, September 30, 2006

Subsurface personnel arrived on the jobsite at 7:20 a.m. MST. Basic rig crew arrived on location at 7:30 a.m. Basic rig crew and Key's reverse unit operator rigged up the swivel. At 10:30 a.m., Basic could not get the brake to hold on the sand line. Operations were shut down until Basic could repair the brake on the sand line and the reverse unit operator was put on stand by. Basic estimated that it will take all day to repair the brake. Basic finished repairing the brake at 7:00 p.m. Drilling operations will commence Sunday morning. Halliburton was notified to be ready to perform a perforation squeeze job on Monday. Pipe tally was checked and verified at 297 joints of 2-7/8-inch tubing for a total footage of 9413.59 feet, including the BHA at 126.45 feet. The well was shut in and operations were shut down for the night.

Sunday, October 1, 2006

Subsurface personnel arrived on the job site at 7:20 a.m. MST. Basic rig crew arrived on location at 7:30 a.m. At 8:00 a.m. Key's reverse unit operator started to drill out CIBP after circulating bottoms up (40 bbls) and there did not appear to be any cement on top of the plug. Current ROP is about 1 ft/hr while circulating returns to pit. The reverse unit operator will change over to tank once fluid cleans up. The returns appear to contain trace amounts of oil with no mud. RPM on the swivel is at 50 with a pump pressure between 250 psi to 300 psi with brine water. Drilled through plug at 9:45 a.m. and circulated hole clean. Rig crew started back into hole to tag second plug. Tagged second plug at 7190 feet, rig crew hooked up swivel to circulate hole and perform an injection test. The injection test revealed the following: 1 bpm at 300 psi, 1.5 bpm at 550 psi, and 2 bpm at 980 psi. After the pump-in test, the falloff went from ISIP of 950 psi to 200 psi in 22 minutes. Key Energy Service removed 250 bbls of water from earthen pit.



Rig crew tripped out of hole (TOOH) with pipe to prepare for cement squeeze job. Rig crew tripped in hole (TIH) open ended with tubing to spot cement for squeeze job, with bottom of the tubing at 7101.49 feet. Contacted Halliburton and ordered 80 sks of cement (cmt) for squeeze job into upper perforations.

Monday, October 2, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Halliburton was on the jobsite waiting on cement to arrive. Cement arrived at the location at 7:30 a.m. Halliburton rigged up their cement pump while waiting on a crossover for the PH-6 tubing. Halliburton did not bring a crossover to the PH-6 thread to 8rd, so Key Fishing Tools had one delivered.

Cement squeeze went well at 2000 psi squeeze pressure. Pressured up to 2001 psi. After 10 minutes, pressure fell to 1950 psi and re-pressured to 2007 psi. After one hour, pressure dropped to 1990 psi with 2.2 bbls, released pressure and recovered about 2 bbls. Re-pressured well to 2001 psi and held for 5 minutes at 1990 psi. The ring gasket began to leak around BOP. Halliburton released pressure and recovered 1.9 bbls. Halliburton rigged down and the rig crew TOOH with tubing. Hole remained full while tripping pipe. Rig crew tightened BOP flange head bolts. Key reverse unit operator pressured up well to 680 psi, with no apparent leaks, and the well was shut-in over night, while waiting on cement (WOC).

Tuesday, October 3, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. and TIH with the collars and bit. Rig crew tagged cement at 6873 feet on joint No. 215 plus 20 feet. Assuming hole is full of cement to CIBP at 7190 feet, there are 12.1 bbls of cement in the hole and 6.6 bbls of cement were circulated out and/or squeezed into the formation. It was estimated that 3.5 bbls were circulated out leaving 3.1 bbls of cement having been squeezed into the near wellbore. Rig crew drilled out cement and



circulated hole clean at 4:00 p.m. The well was shut-in to prepare for a pressure test on the squeeze perforation for 12 hours at 500 psi.

Started 500 psi pressure test at 4:30 p.m. Pressured up well to 590 psi and after one hour pressure fell to 530 psi. Re-pressured well to 580 psi and after one hour pressure was at 578 psi. At 5:30 p.m. well was at 578 psi and holding. Shut down operations overnight.

Wednesday, October 4, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. At 7:00 a.m., the pressure on the well was 455 psi. The well lost 123 psi over 13.5 hour, for a 9.1 psi/hr (1.58%/hr) loss. Rig crew rigged up swivel and continued to drill out CIBPs at 7190 feet and (estimated third plug depth) at 7294 feet. While drilling through the second plug at 7190 feet metal cuttings were being retrieved across screen. Third CIBP was found at 7278.96 and it was estimated that there was 9 feet of cement on top of both plugs, which places the second plug at 7199 feet and third plug. At 3:00 p.m., driller punched through the third plug. The formation started taking fluid at a rate of 1.0 to 1.25 bpm while pumping, lost 180 bbls of 8.7 ppg brine water to the formation.

Rig crew TIH and tagged the forth CIBP at 7591 feet then pulled up 20 feet and reversed circulated the wellbore clean. The reverse unit operator completed the pump in test for the perforations from 7262 feet to 7278 feet and from 7304 feet to 7314 feet. The maximum rate was 4.5 bpm (max that the pump could deliver) at 710 psi with no pressure build up. The ISIP was about 580 psi and fell to 170 psi in 9 minutes. At 4:45 p.m., rig crew TOOH with collars and bit. Halliburton will be out tomorrow afternoon with 100 sks of Class C cement to squeeze off perforations. At 7:30 pm, the rig crew was out of the hole with the collars. The well was shutin and operations were shut down.


Thursday, October 5, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:20 a.m. and TIH open ended, placing the bottom of the work string at 7321 feet; 7 feet below the bottom perf at 7314 feet. Key filled fresh water and salt water tanks while we waited for a Halliburton pump truck to arrive. Halliburton arrived on the location at 11:30 a.m. At 12:44 p.m. Lines were pressure tested to 3000 psi. Halliburton broke circulation and caught returns with 6.3 bbls pumped. At 12:52 p.m., Halliburton started mixing cement and pumped 23.5 bbls of cement, followed by 35.5 bbls of fresh water. Rig crew pulled 10 stands (630 feet) and Halliburton started to squeeze the cement into the formation. The squeeze was performed in 7 stages, each 10 minutes apart, pumping approximately 1 to 1.5 bbls per stage.

After the first stage the wellhead pressure was 78 psi. After the 7th and last stage, the wellhead pressure had increased to 1973 psi. A total of 9 bbls were pumped during the squeeze job. The well was shut-in with 1970 psi on the wellhead. Subsurface allowed the well to remain shut-in for an additional 2 hours, after which the wellhead pressure was bled off and 8 stands (500 feet) of pipe were TOOH to insure that no cement remained around the pipe. The well was pressured up to 930 psi and shut-in overnight to WOC.

Friday, October 6, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. and TOOH with work string. The wellhead pressure this morning, after 14 hours, was 850 psi. With a loss of 80 psi over a 14-hour period after the squeeze or 5.7 psi/hr. At 10:00 a.m., rig crew TIH with work string, collars, and a new bit. At 12:30 p.m., rig crew tagged soft cement at 7052 feet and quickly drilled through the cement. At 7092 feet, hard cement was encountered. Rig crew drilled through cement to 7338 feet and tagged bottom at 7554 feet (previous tag 7591 feet). Well would not hold pressure during test and reverse unit operator was able to pump into the well at ~20 to 25



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gpm at 920 psi. A second cement squeeze on the second set of perforations will be required. Well was shut in over night.

Saturday, October 7, 2006

Subsurface personnel arrived at the location at 7:20 a.m. MST. Rig crew arrived at 7:30 a.m. and TOOH with work string, collars, and bit. A new Key reverse unit operator arrived at the location. Halliburton was called to confirm a third cement squeeze job. Halliburton informed Subsurface that they would not have a pump truck available until Wednesday. Key Pumping service was contacted and retained to provide the service on Sunday afternoon. Due to unavailability of cement pumping services to do the third cement squeeze, the estimated schedule has been pushed back 2 days.

At 10:50 AM the rig crew had collars and bit out of the hole and TIH with open ended work string to just above the bottom set of perforations at 7314'. The open ended work string was placed at 7290 feet, 24 feet above the bottom set of perforations (1 bbl of casing volume). The well was shut-in while waiting on a cement pump truck to arrive.

Sunday, October 8, 2006

Subsurface personnel arrived at the location at 10:10 a.m. MST. Rig crew arrived at 10:20 a.m. Key Pressure Pumping Services arrived at the location at 10:30 a.m. Key pumping crew rigged up pump and bulk truck. The mix water for the cement squeeze in the frac tank was contaminated with brine water and a load of city water was called in for mix water. At 2:00 p.m., fresh mixed water arrived on location. Key pumping pressure tested lines to 2500 psi and then circulated 12 bbls to fill the wellbore with fluid. At 3:04 p.m., Key started mixing cement and pumped 10 bbls of FW ahead followed by 18.5 bbls of 14.8 ppg cement. The cement was displaced with 35.5 bbls of FW. Rig crew TOOH with 8 stands (500 feet) and the well was reversed circulated with 40 bbls of FW. At 4:03 p.m., Key pumping started to squeeze the well with an initial rate of 0.5 bpm at



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750 psi. After 6 bbls the rate was decreased to 0.3 bpm at 1890 psi. After 7.5 bbls at 1975 psi pumping was stopped to allow the pressure to fall.

At the end of 10 minutes, the wellhead pressure had fallen to 1063 psi and pumping was resumed. An additional 1.5 bbls was pumped before the pressure reached 1940 psi. The wellhead pressure fell to 1914 psi after 20 minutes and did not appear to fall any further. The well was shut-in and Key rigged down their pumps. After one hour, the wellhead pressure had fallen to 1860 psi. At 6:00 p.m., the well was shut-in for the night with 1830 psi on the wellhead to WOC.

Monday, October 9, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. and TOOH with open ended work string. Rig crew TIH with work string, collars, and bit to drill out cement. The wellhead pressure this morning after the 80 sk cement squeeze job was 1825 psi. Reverse unit operator tagged cement at 6981 feet and found hard cement at about 7003 feet. At 4:43 p.m., driller broke through the cement at 7312 feet. The estimated cement plug length left in casing was 331 feet or 12.7 bbls out of 18.8 bbls of cement. Driller tagged bottom at 7559 feet, rig crew pulled up off bottom approximately 20 feet, and the reverse unit operator circulated the wellbore. The well was shut-in and pressure tested to 610 psi at 6:45 p.m. for a 12-hour test.

Tuesday, October 10, 2006

Subsurface arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. Wellhead pressure at the end of 13 hours was 480 psig, down from 610 psig; a pressure loss of 130 psi over the 13-hour period. The decision was made by Subsurface personnel to retest the casing after the squeeze for an additional 12 hours. At 8:03 a.m., the wellhead pressure was increased to 630 psig and monitored every thirty minutes. At 9:30 a.m., the 7-inch x 9-5/8-inch annulus valve was opened to see if it had any effect on the casing pressure. Casing pressure fell slightly faster from 2 psi/30 minutes to 5 psi/30



minutes. Once the annulus casing valve was closed, the pressure loss maintained a 2 psi/30 min loss.

When the casing valve was first opened it smelled like natural gas. The annulus casing valve was closed and a pressure gauge placed on the annulus and monitored. At 2:03 p.m., the wellhead pressure was falling at a rate of 2 psi/30 minutes with less than 5 psi on the casing annulus. At 5:03 p.m., wellhead pressure was maintaining a falloff rate of 2 psi/30 minutes. At 8:03 p.m., after 12 hours, the wellhead pressure was 568 psig.

Wednesday, October 11, 2006

Subsurface arrived at the location at 7:00 a.m. MST. The wellhead pressure was 523 psig. At 7:03 a.m., maintaining a 2 psi/30-minute pressure loss. Rig crew arrived at 7:30 a.m. and rigged up swivel and broke circulation. At 8:00 a.m., reverse unit operator tagged bottom and started to drill out plug at a circulation rate of 2 bpm, with 500 psi of pressure. At 9:30 a.m., reverse unit operator tagged the top of the plug at 7595 feet and started to drill through the plug. While drilling out the plug, the plug dropped to 7776 feet and, reverse unit operator continued to drill out the plug. Reverse unit operator drilled 2 feet through the plug and tagged mud contaminated cement at 7780 feet. Continued to drill through the cement.

At 2:00 p.m., reverse unit operator drilled through cement plug at 7838 feet, then circulated for 30 minutes before the rig crew TIH to tag the top of the liner (TOL). The well was taking fluid at a rate of about 1/2 bpm once the cement plug was drilled through. Rig crew tagged cement on TOL at 9022 feet and broke circulation. At 3:30 p.m., the reverse unit operator commenced circulating the hole clean to 9022 feet. Reverse unit operator circulated 347 bbls of 8.6 ppg brine water. At 5:30 p.m., the rig crew started TOOH with work string, bit, and collars. Tomorrow, the rig crew will TIH with casing scraper to prepare the well for logging operations.



Thursday, October 12, 2006

Subsurface arrived on location at 7:00 a.m. MST. Wood Group logging crew was at the job site spotting equipment. Rig crew arrived at the location at 7:30 a.m. and continued to TOOH with work string, collars, and bit. At 10:00 a.m., rig crew TIH with casing scraper to 9022 feet. At 12:30 p.m., rig crew TOOH with casing scraper. At 3:30 p.m., Wood Group Wireline Services rigged up to the wellhead to run the CBL/VDL into the wellbore. At 4:30 p.m., the well was shut-in for the night.

Friday, October 13, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Wood Group logging crew arrived at the job site at 7:10 a.m. Rig crew arrived at the location at 7:30 a.m. and Wood Group started into the wellbore with CBL/VDL logging tool. Fikes Truck Lines arrived at the location with 4-1/2-inch, 11.6 lb/ft, J-55, LTC tubing, from C&R Industries, and the rig crew unloaded 174 joints of tubing. Wood Group completed CBL/VDL logging and ran into the wellbore with the temperature logging tool. The temperature log was completed at 3:00 p.m. with no anomalies. At 3:15 p.m., Wood Group ran the caliper logging tool into the wellbore. The CBL/VDL log showed that the TOC was located at 900 feet with good to fair bonding to 9020 feet. The VDL indicated that cement was placed into the squeezed perforations.

At 6:40 p.m., Wood Group was out of the wellbore with the caliper log and there did not appear to be any major anomalies in the 7-inch casing from 9020 feet to surface. The well was shut-in for the night and Wood Group will be back tomorrow to perforate. The time needed to perforate well was estimated to be two days.



Saturday, October 14, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Wood Group logging crew arrived at the job site at 7:00 a.m. Rig crew arrived at the location at 7:30 a.m. and Wood Group started into the wellbore with a 40 foot perforating gun. Basic provided two men to assist Wood Group as needed with the rig. Wood Group made 12 perforating runs, completing the interval from 8540 feet to 8620 feet and 400 feet of the interval from 8050 feet to 8450 feet. Wood Group will complete the remaining 390 feet tomorrow from 7660 feet to 8050 feet. The well was shutin for the night.

Sunday, October 15, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Wood Group logging crew arrived at the job site at 7:00 a.m. Rig crew arrived at the location at 7:20 a.m. and Wood Group started into the wellbore with a 40 foot perforating gun. Basic provided two men to assist Wood Group as needed with the rig. Wood Group made 10 perforating runs, completing the interval from 7660 feet to 8050 feet. A total of 22 perforating runs were made and there were no misfires during any of the runs. All the retrieved hollow steel carrier guns shot 2-JSPF on a 60° phasing. The two man rig crew assisted Wood Group with rigging down the logging equipment. The well was shutin for the night.

Monday, October 16, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. and started to lay down collars. Kenco packer and operator arrived at the job site at 8:30 a.m.. Kenco did not have the proper x-over for the PH-6 to 8rd and had to wait for a cross-over before the rig crew could run the packer. Cross-over arrived at the location and the rig crew TIH with the 7-inch x 2-7/8-inch packer. Packer was set at 7546 feet and the rig crew started to swab back the well. The first formation fluid sample was taken after 12 runs to 2400 feet (estimated 151 bbls), the second sample was taken



after 14 runs (estimated 176 bbls), the third sample taken after 16 runs (estimated 201 bbls), and fourth sample was taken after 18 runs (estimated 226 bbls). Had H_2S gas present between runs 7 through 9 (estimated at 88 and 113 bbls). Well was shutin over night.

Tuesday, October 17, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:20 a.m. Rig crew loaded collar and swivel onto Key's trailers. While waiting on Key's pump truck to arrive, reverse unit operator pressured up on 2.875-inch x 7-inch annulus with packer set at 7546 feet to perform an annulus pressure test. Initial pressure was 660 psi at 8:15 a.m. After 2 hours the pressure loss started to stabilize at about 4 psi/30 minutes. At 12:30 p.m., Key Pressure Pumping was called to verify that a pump truck was coming. Apparently there was a mix-up by the dispatcher and the pump was sent to another job. Key informed Subsurface that they will have a pump on the jobsite tomorrow afternoon.

At 1:30 p.m., the wind had picked up to a point that the rig crew could not TOOH with the packer and pipe. Therefore, the annulus pressure test will be continued for the remainder of the day. Rig crew worked on rig until 3:30 p.m. and then shut-in the well for the night. Subsurface monitored pressure until 6:30 p.m.

Wednesday, October 18, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:20 a.m.. Reverse unit operator arrived at 7:30 a.m. Subsurface delivered field copies of the logs to Navajo Refining and contacted Darrel Moore. Rusty Smith informed Darrel of the need to contact the State of New Mexico for approval to use the well, even though cement did not come all the way to the surface around the 7-inch x 9-5/8-inch casing annulus (900 feet from the surface). Darrel approved Subsurface's request to



contact the appropriate state officials for approval and to take necessary steps as the State of New Mexico directs.

At 10:30 a.m., the reverse unit operator pressured up the annulus between the tubing and the 7-inch casing to 700 psig for the injection test and left the location. Key Pumping Service arrived at the job site at 3:30 p.m. and started pumping down the 2-7/8-inch tubing at 4:20 p.m. with produced water in the wellbore and 650 psi on the annulus. The initial rate was 2.2 bpm (inline flow meter) at 300 psig on the tubing. After 43 bbls the pressure stabilized at 150 psi, with a total of 50 bbls pumped. The rate was increased to 4.1 bpm with an initial pressure of 830 psi. After 20 bbls, the tubing pressure stabilized at 900 psi. The pump broke down with a total of 80 bbls pumped (tubing volume 43 bbls). The ISIP was about 630 psi. Rig crew shut-in the well for the night and Key Pumping will return tomorrow morning to complete the job. (Note: pump wire harness fell into the drive shaft ripping it apart along with some hydraulic hoses)

Thursday, October 19, 2006

Subsurface personnel arrived at the location at 7:30 a.m. MST. Rig crew arrived at 9:00 a.m. Reverse unit operator arrived at 8:00 a.m.. At 9:00 a.m., Key pumping supervisor called and said that they were 45 minutes out and were given directions to the location. Subsurface released the down hole packer and will monitor both the backside and tubing pressure during the pump-in testing.

Key Pumping circulated the wellbore at 2 bpm to fill the wellbore with fluid & caught returns after 37 bbls. At 2 bpm tubing pressure (Pt) was 183 psig and backside pressure (Pa) was 28 psig. At 3 bpm, Pt was 638 psig & Pa was 148 psig. At 4 bpm, Pt was 1132 psig & Pa was 250 psig. At 5 bpm, Pt was 1678 psig & Pa was 320 psig. At 6 bpm, Pt was 2343 psig & Pa was 408 psig. At 7bpm, Pt was 3108 psig & Pa was 518 psig. At 8 bpm, Pt was 3748 psig and Pa was 535 and at 9 bpm, Pt was 4522 psig Pa was 590 psig. Key was able to reach 10 bpm but the engine over heated and was shut down. The Pt was 5087 psig at shut down and no Pa was recorded but estimated at 660 psig. Well went on



a vacuum once pumping had stopped. The best estimate for ISIP 230 psig total volume of brine water pumped was 280 bbls.

Rig crew started out of the wellbore with the packer and went back into the hole with RBP and packer to test casing below squeezed perforations. We first tested across squeezed perforations and then the annulus above the perforation. RBP was set at 7550 feet packer was set above the RBP and RBP was pressure tested for leaks and packer was released. At 6:00 p.m., 640 psig was left on the annulus with the well shut-in overnight.

Friday, October 20, 2006

Subsurface personnel arrived at the location at 6:45 a.m. MST. At 7:00 a.m., the wellhead had 770 psig from 640 psig over 13 hours, a net pressure build of 130 psi. Rig crew arrived at 7:20 a.m. Subsurface and Navajo Refining received approval from the State of New Mexico after they reviewed the revised procedure and CBL/VDL log to complete the well for injection without additional cementing. The State of New Mexico requested that we try to find the leak in the casing within 500 feet to 1000 feet of the leak. Rig crew pulled 8 stands and one joint of pipe and the packer was set at 6985 feet to isolate the cement squeezed perforated interval. The squeeze interval was initially pressure tested to 490 psig and the annulus was initially pressure tested to 632 psig. The pressure test ran for 5 hours and appeared to stabilize after 2 hours.

After 2 hours, the squeezed interval was losing 6 psi/hr while the annulus was gaining about 0.75 psi/hr due to thermal effects. The final pressure for the squeezed interval was 458 psig and the final pressure for the annulus was 640 psi. At 2:30 p.m., the rig crew picked up the RBP and TOOH to 1255 feet where the RBP was reset. At 5:30 p.m., the casing was pressure tested from surface to 1255 feet with an initial pressure of 570 psig. At 6:00 p.m., the well was shut-in over night with 569 psig on the casing.



Saturday, October 21, 2006

Subsurface personnel arrived at the location at 6:45 a.m. MST. At 7:00 a.m., the wellhead had 540 psig from 569 psig over a 13 hour period, a net pressure loss of 29 psi at a rate of 2 psi/hr with the RBP set at 1255 feet (48 bbl). Rig crew arrived at 7:30 a.m. Continued to monitor pressure to verify loss rate. At 7:30 a.m., pressure was 539 psig and at 8:00 a.m. pressure was 538 psi. Packer hand released RPB and rig crew TOOH with packer and RBP. Charlie's Services inspected the 4-1/2-inch tubing. Rig crew TIH and TOOH with work string and started laying down the work string as they came out of the hole. Charlie's inspection crew found two bad joints of 4-1/2-inch tubing as marked on their tally. Rig crew finished laying down the work string and loaded 4-1/2-inch tubing onto the pipe rack. Well was shut-in for the night.

Sunday, October 22, 2006

Pipe, location, and rig personnel are ready for casing crew. Wellhead, packer, and annulus fluid to arrive on Monday.

Monday, October 23, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew arrived at 7:30 a.m. and replaced the old Cameron 7-1/16-inch 5M x 11-inch 3M spool with a new Superior 7-1/16-inch 5M x 11-inch 3M spool. P-seals were pressure tested for 15 minutes to 3000 psi with no leakoff. BOP was reseated on the new spool to run the casing into the wellbore. At 12:00 p.m., casing crew started into the wellbore with packer and 4-1/2-inch tubing. Packer would not go past the 50-foot mark therefore, packer was pulled out of the hole and inspected.

Weatherford had brought to location, a packer for 7", 24 lb/foot casing. The casing in the wellbore was 7 inches, 29 lb/ft casing. Weather had to go back to Hobbs, New Mexico to



pick up the correct packer. Kenco was called, and they had an Arrow X-1 Packer in the shop. Kenco delivered a new 7-inch Arrow X-1 packer to the job site but brought out the wrong size cross-over. At 4:15 p.m., Weatherford brought out a rebuilt 29 lb/ft packer to replace the 24 lb/ft packer that was originally brought out to location. Kenco will have a cross-over on the job site in the morning and Weatherford was sent back to Hobbs. Kenco will install the packer. The well was shut in for the night.

Tuesday, October 24, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Rig crew and casing crew arrived at 7:30 a.m. The crews started running casing at 8:00 a.m. There were no problems getting Kenco's new Arrow Packer into the wellbore. Kenco also used an integral cross over rather than a sedge and casing collar for a cross. At 2:30 p.m., casing crew ran 7567 feet of casing into the hole and each joint was torqued to specifications at 1600 lbs. The wellbore was circulated full of fluid (240 bbls), then 300 PSI pumped 23.8 bbls of squeeze chemical. The reverse unit operator pumped 95 bbls of inhibited brine water followed by 14.29 bbls of squeeze chemical, leaving 7.23 bbls of brine in the bottom of the annulus. The weight of the brine circulated and the inhibited brine in the annulus was 8.7 ppg. The weight of the squeeze chemical was 10.2 ppg.

At 5:30 p.m., the bottom of the Arrow packer was set at 7575.73 feet with 37K lb in tension within 7 minutes after we stopped pumping with the well taking fluid at ~0.5 bpm. The length of the packer was 7.2 feet and the length of the cross over was 0.54 feet. Casing slips were set in the spool and the BOP was removed and a rough cut made on the casing. Once all equipment was removed from the area the 4-1/2-inch tubing was dressed off and the wellhead installed. At 7:00 p.m., the well was shut-in for the night.

Wednesday, October 25, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Superior Wellhead arrived at the job site at 7:20 a.m. and pressure tested the P-seals to 3000 psig. Rig crew



and casing crew arrived at 7:30 a.m. Rig crew started mobilizing the rig. The reverse unit operator pumped the annulus full with 2.5 bbls. At 10:00 a.m. 300 PSI arrived at the job site and performed a 545 psi squeeze for 4 hours with no pressure loss. At 3:00 p.m., an annulus pressure test was performed and recorded for one hour by 300 PSI, at a pressure of 490 psig on the chart. At 4:00 p.m., the annulus pressure test showed no pressure loss over the hour. Left 480 psig on the annulus (at 4:30 p.m.) overnight to watch for pressure leaks. At 6:00 p.m., annulus was maintaining 480 psig. Well was shut-in for the night.

Thursday, October 26, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. At 7:00 a.m., EL Farmer trucking was at the job site waiting on someone to load the 2-7/8-inch, PH-6 tubing onto the truck. At 7:15 a.m., Subsurface started loading tubing onto the EL Farmer truck. At 7:30 a.m., Renco Equipment arrived at the job site with a fork lift and completed loading up truck. The first truck picked up slips, stabbing tool, safety valve, and 150 joints of pipe. At 8:00 a.m., annulus was maintaining 480 psig and showed no signs of pressure loss over the 14-hour period. The second truck arrived at 8:05 p.m. and was loaded with 147 joints of pipe. At 8:30 a.m., two Key Fishing Tool trucks arrived at the job site to pick up pump, open top tank, pipe racks, BOP, and catwalk. Key Energy delivered 4 frac tanks to the job site and started to fill the tanks with fresh water and brine. At 4:30 p.m., G&L Tool Rental picked up rig mat boards. At 5:30 p.m., annulus was maintaining 480 psig and showed no signs of pressure loss over the night.

Friday, October 27, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Key will not have all 14 frac tanks spotted and filled by this Saturday therefore the pressure build up/falloff test will have to be postponed until Saturday, November 4th, due to the availability of pump trucks to perform the pressure build up portion of the test.



Trailer and light plant will remain on the job site for another week, as we will need the light plant for the 12 hours of pumping. At 10:00 a.m., Medina's Hot Shot service arrived at the job site and delivered a flange, ring gasket, and bolts from Superior Wellhead to cover the injection line valve. At 3:00 p.m., Key delivered one frac tank to the job site and repaired a leak around the bottom valve on one of the tanks that was delivered yesterday.

Saturday, October 28, 2006

Rusty Smith traveled to Houston and will return on Thursday, November 2, 2006 to oversee the pressure build up and falloff test.

Thursday, November 2, 2006

Rusty Smith traveled to Artesia, New, Mexico and arrived at the jobsite at 2:30 p.m. MST. Key had 14 frac tanks on the site and should have them filled by tomorrow afternoon. Tried to find a 1-13/16-inch hammer wrench for flange bolts and could not find any in Artesia. Contacted Banta to install side flange for pump-in test, Banta will have hammer wrenches for flange. Subsurface acquired fuel containers for light plant. Key will roll frac tanks tomorrow.

Friday, November 3, 2006

Subsurface personnel arrived at the location at 7:30 a.m. MST. Banta Roustabout Service arrived at the location at 8:15 a.m. and installed the injection side flange. Six temperatures were taken at midpoint in the frac tanks to determine the current water temperatures. The shear pin in the packer was set at 80K lbs, which is well above the stress being applied due to temperature changes. Petroplex treated all tanks with biocide and Key came out and rolled the tanks with a vacuum truck.



Alex, with Schlumberger Slickline, was on notice for tomorrow at 3:00 p.m. MST. After rolling the tanks, the average water temperature in the tanks was 60.6° F. Key left the job site at 5:30 p.m.

Saturday, November 4, 2006

Subsurface personnel arrived at the location at 6:20 a.m. MST. Petroplex Pumping Service arrived at the location at 7:10 a.m. and started to rig up their pumps. Key's kill truck arrived at 7:12 a.m. and rigged up to the annulus to hold pressure on the annulus. At 9:15 a.m., treating lines were pressure tested to 4400 psi. Started pumping at 9:19 a.m. at 3 bpm to fill hole and after 28 bbls we caught pressure with 162 psig on the wellhead and 535 psig on the annulus. At 9:42 a.m., with 50 bbls into the well, the rate was increased to 5 bpm at 385 psig and 463 psig on the annulus. At 9:55 a.m., the rate was 5 bpm with 525 psig on the wellhead and 118 bbls pumped. At 10:00 a.m., the second pump was brought on line and the first pump was taken out of service due to a leaking hydraulic hole. At 10:10 a.m., the rate was 5 bpm at 700 psig on the wellhead with 215 bbls pumped. At 10:45 a.m., the rate was increased to 10 bpm at 1200 psig and 542 psig on the annulus with 438 bbls pumped. At 110:55 a.m., the rate was being maintained at 10 bpm at 1278 psig with 673 bbls pumped.

Petroplex is sending out another pump to the location. The backup Petroplex pump arrived at 12:10 p.m. and the crew rigged up two additional pumps in the treating line for backup. At 1:00 p.m., the rate was 10 bpm at 1185 psig with 1785 bbls pumped, annulus pressure was 775 psig. At 2:30 p.m., the rate was 10 bpm at 1387 psig with 713 psig on the annulus, 2307 bbls pumped. At 3:30 p.m., the rate was lowered to 9 bpm at 1209 psig with 725 psig on the annulus, 3028 bbls pumped. At 5:30 p.m., the rate was 9 bpm at 1171 psig with 719 psig on the annulus. At 6:00 p.m., Schlumberger arrived at the job site and rigged up the slickline unit. At 7:17 p.m., the rate was lowered to 5 bpm to allow the BHP memory tool into the wellbore. At 7:30 a.m., the rate was increased to 5 bpm at



344 psig. At 7:41 p.m., the rate was increased to 9 bpm at 1104 psig. At 9:00 p.m., the pumps started to lose suction pressure and the pumping job was ended (est. 6700 bbls). Well was closed in with 50 psig on the annulus and no pressure on the wellhead. Petroplex rigged down and left location at 11:00 p.m.

Sunday, November 5, 2006

Subsurface personnel arrived at the location at 8:30 a.m. MST, with 800 psig on the annulus. Schlumberger slickline crew arrived at the location at 10:20 a.m. and started out of the hole with memory tool at 8630 feet (10:35 a.m.), taking gradient stops every 1000 feet for 5 minutes. The length of the tool was 27 feet with the top of the tool placed at 8630 feet. First stop was at 7000 feet at 10:40 a.m.. At 12:35 p.m., Schlumberger completed the rig down process and left location at 1:00 p.m. The office trailer was cleaned out and disconnected from the light plant. The light plant was rigged down and made ready for pickup. The well annulus was bled down and left open and the wellhead shut-in. Schlumberger left their 4-1/2-inch 8rd EUE x 2-7/8-inch female 8rd tubing swedge in the top of the wellhead.

Monday, November 6, 2006

Subsurface personnel traveled to Houston and will return on Monday, November 13, 2006, to oversee the temperature survey, radioactive tracer survey, and annulus pressure test. Called Young's to pickup office trailer, Sani-Tech to pick up portable toilets, and Aztec to pickup light plant. Larry at Key was notified to leave one frac tank on location and pickup the remaining frac tanks. Banta was notified for waste removal of pit and location cleanup for the week of November 13th.

Sunday, November 12, 2006

Rusty Smith traveled to Artesia, New Mexico, and arrived at the job site at 5:00 p.m. MST. Key Energy emptied the frac tank bottoms and the tanks are ready to be



disconnected and picked up. Aztec and Sani-Tech still have not removed the equipment from the location. The equipment was taken off rental on November 6, 2006.

Monday, November 13, 2006

Subsurface arrived at the location at 7:30 a.m. MST. Banta roustabout service arrived at the job site at 8:15 a.m. to remove well cutting and clear location of debris, fill in cellar with gravel, and haul off trash. Navajo refining requires that that all produced cuttings and debris contained in the pit be profiled prior to disposal (cannot be disposed under oil field exemption). Key started to remove frac tanks from the location. The OCD pushed back the annulus pressure test, and radioactive tracer survey one day to November 15th. Wood Group Logging services will arrive tomorrow afternoon for testing on the 15th. Petroplex Pumping will provide a pump truck for the radioactive tracer test.

Tuesday, November 14, 2006

Subsurface personnel arrived at the location at 8:30 a.m. MST. Wayne, with the OCD, was emailed at 5:00 p.m. MST November 13, 2006, informing the OCD of the annulus pressure test and radioactive tracer survey set for November 15, 2006. Included in the email were directions to the well and a short testing procedure. Wood Group and Petroplex were contacted to verify the job for tomorrow. Key has filled one frac tank with one load of brine and three loads of fresh water to chase down the radioactive slug. Wind gusted up to 50 mph and Key could not haul any more frac tanks for the day, in accordance with DOT regulations. Because of the high wind speed Wood Group will rig up tomorrow. OCD called and said that they will arrive at 10:00 a.m. tomorrow morning.

Wednesday, November 15, 2006

Subsurface personnel arrived at the location at 7:00 a.m. MST. Petroplex was on location. At 7:50 a.m., Petroplex hooked up to the frac tank and started to circulate the tank and will circulate for +2 hours. Wood Group started to rig up at 8:30 a.m. and



completed the rig up at 10:00 a.m. OCD representatives arrived at the location to witness the annulus pressure test. The annulus was pressure tested to 530 psia and over a one hour period and lost 2.5 psi. According to the OCD, the well passed the annulus pressure test.

The radioactive survey was started and during the 5-minute check, the upper gamma ray sensor malfunctioned and the sensor had to be pulled and replaced. Once the sensor was replaced, the remainder of the survey went as planned and there did not appear to be any radioactive material above the packer or being pumped out of the injection interval.

There were some undocumented perforations below 8600 feet that were taking fluid. During the first chase down, additional RA material was released as a result of the well being on a vacuum. At the end of the job the annulus was pressure tested to 300 psig and held pressure for 1.5 hours and was then bled off and left open. Wood Group rigged down at 8:30 p.m.

Thursday, November 16, 2006

Subsurface personnel called Key to release frac tank and went to location to check well and sign invoices from Basic and G&L Tools in Artesia, NM. Subsurface personnel travel to Houston, Texas.

Subsurface personnel will return to Artesia in \pm one month to install WAMS. Subsurface is waiting on the unit to be built.



APPENDIX I

INJECTION ZONE PERMEABILITY DATA

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APPENDIX I CALCULATION OF PERMEABILITY FROM DST NO. 5 MEWBOURNE OIL COMPANY, CHALK BLUFF 31, STATE NO. 1

The permeability of the interval tested is calculated to be 597 md, as follows from test data in Attachment VIII-9:

where:

- k = permeaibility, md
- q = production rate (bbl/day)
- B = formation volume factor, (reservoir bbl)/(stock tank bbl)

 μ = viscosity, centipoise (cp)

- m = slope of Horner plot, psi/cycle
- h = reservoir thickness, feet

The production rate, q, is calculated from the total volume of fluid, 78.7 bbl, produced during DST No. 5, which lasted for 90 minutes (the sum of lengths of the first and second flow periods). Using these values, q is equal to 1259 bbl/day. The formation volume factor, B, is assumed to be 1. The viscosity, μ , of reservoir brine with 25,000 ppm chlorides (approximately 2% salinity) at a bottom-hole temperature of 130°F is 0.53 cp, taken from the charge in Attachment VI-7. The slope of the Horner plot, m, is taken form the Horner plot for the second flow period of DST no. 5, or 5.348 psi/cycle (page 22 of Attachment VIII-9). The reservoir thickness, h, is the thickness of the interval tested during DST No. 5, or 34 feet (7851 feet – 7817 feet). Substituting these values into the equation above gives:

 $k = 162 \ \frac{(1259)(1)(0.53)}{(34)(5.348)}$

= 597 md

APPENDIX J

INJECTED FLUID MONITORING PLAN





INJECTED FLUID MONITORING PLAN

NAVAJO REFINING COMPANY, L.L.C. ARTESIA, NEW MEXICO

SUBSURFACE PROJECT NO. 60A6781

SUBMITTED JUNE 2012

SUBSURFACE TECHNOLOGY, INC. HOUSTON, TEXAS

Subsurface Technology, Inc. 8212 Kelwood Ave., Baton Rouge, LA 70806 (225) 753-2561 / Fax (225) 925-2530 / e-mail: pfbr@subsurfacegroup.com

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SUBSURFACE

ii

1.0 INTRODUCTION

This injected fluid monitoring plan (plan) has been prepared per the requirements of 20.6.2.5207B NMAC. This plan allows for consistent characterization of the injected fluids that are being injected into the three nonhazardous waste injection wells operated by Navajo Refining Company, L.L.C. (Navajo) at their refinery in Artesia, New Mexico. The plan shall be updated as necessary to remain accurate and the analysis remains representative of the fluids being injected into the three nonhazardous waste injection wells.

2.0 INJECTED FLUID DESCRIPTION

The fluid injected into all three Navajo injection wells is comprised of exempt and nonexempt nonhazardous oilfield waste that is generated in the refining process. Waste waters from process units, cooling towers, boilers, streams from water purification units, desalting units, recovered and treated ground water, and general waste waters, all waters will be blended to form the injected fluid into the injection wells.

3.0 INJECTED FLUID CHARACTERIZATION SAMPLING PROGRAM

The following sampling program shall be used to collect a representative sample of the injected fluid for chemical analysis to demonstrate the consistency of the fluid composition.

3.1 Sampling Frequency

The injected fluid shall be sampled on a quarterly basis unless a change in the injected fluid composition occurs as a result of operating changes at the Navajo refinery. If the injected fluid composition does change, a representative sample of the waste stream shall be collected at that time and reported to OCD.



3.2 Sampling Location

A representative sample of the injected fluid shall be obtained from the discharge side of the wastewater transfer pump that sends wastewater to the wellheads. The sample port is located at the refinery's wastewater treatment unit.

3.3 Sample Collection Equipment

The fluid samples shall be collected directly from the sample port on the wastewater transfer line into appropriately prepared sample containers required for specific analyses.

3.4 Sample Containers

The injected fluid sample shall be collected in new and previously unused sample containers as provided by the off-site commercial laboratory performing the analyses.

3.5 Sampling Methodology

The injected fluid sample shall be poured directly into the new and previously unused sample containers provided by the off-site commercial laboratory performing the analyses.

3.6 Sample Preservation

EPA and/or ASTM sampling protocols shall be used, including provisions for preserving samples when required. Sampling personnel shall verify that appropriate preservatives are present in sample containers if required by analytical protocol.



3.7 Field Measurements

Field measurements of pH, specific conductance, and temperature shall be recorded on a representative sample of the injected fluid during each quarterly monitoring event.

3.8 Sampling Personnel

Navajo environmental staff or qualified contractor sampling personnel shall be responsible for collecting the injected fluid samples in accordance with the procedures presented in this plan.

4.0 FIELD DOCUMENTATION

The following procedures shall be implemented to properly document each injected fluid characterization sampling event as described in Section 3.0.

4.1 Water Sampling Log

A water sampling log shall be completed at the time the sample is collected. The type of information to be recorded on the water sampling log includes, but is not limited to, the following:

- Date and time of sampling
- Weather conditions
- Sampling location
- Sampling method
- Sample identification
- Field measurements
- Laboratory analyses
- Sampling personnel

4.2 Sample Container Label

Each laboratory provided sample container shall have a label adhered to the outside of the container providing pertinent information identifying the sample,



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location and time the sample was collected, analytical parameters, preservatives, and sampler identification.

4.3 Chain-of-Custody Form

A chain-of-custody form shall be completed and accompany each shipment of samples to the off-site commercial laboratory. Each transfer of sample custody shall be signed by both parties on the chain-of-custody form.

4.4 Custody Seal

A custody seal shall be affixed over the opening of the ice chest used to store and transport samples to the receiving laboratory. The laboratory shall note in their Check-In Form that the seal is properly attached and has not been broken.

4.5 Field Equipment Calibration Log

Calibration and maintenance of field equipment (pH, specific conductance, turbidity, and temperature meters) shall be in compliance with the manufacturers' recommended calibration or maintenance procedures. Field logs shall be completed in the field to properly document all calibration and maintenance activities to field equipment.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

A trip blank will be prepared during each waste stream characterization sampling event as described in Section 3.0.

6.0 SAMPLE CUSTODY AND TRANSPORT

Injected fluid characterization samples shall be maintained in the custody of the sampling personnel until the samples are transported to the laboratory or transferred to a representative of the receiving laboratory. Upon transfer of custody, the chain-of-custody record shall be completed and signed by the sampling personnel. The signed chain-of-custody record shall be placed in a plastic bag inside the shipment cooler containing the properly labeled injected fluid



samples. A signed and dated custody seal shall be placed over the lid of the opening of the sample cooler to indicate if the cooler has been opened during delivery prior to receipt by the laboratory.

The chain-of-custody record shall be signed and returned by the laboratory no later than the date the analytical results are available. If the samples are delivered in person by the sampling personnel or picked up by a laboratory employee, the chain-of-custody record shall be signed by the laboratory representative immediately upon relinquishment of the samples by the sampling personnel. One of the copies shall be maintained by the sampling personnel and the remaining copies kept with the samples.

7.0 WASTE STREAM ANALYTICAL PROGRAM

The following describes the injected fluid characterization analytical program.

7.1 Laboratory Requirements

The laboratory performing the analytical services for this project shall be an accredited laboratory. The laboratory shall possess a quality control/ quality assurance (QA/QC) manual prepared in accordance with the requirements of the NELAC certification program. A current copy of the plan shall be sent by the laboratory to the project manager in charge. When the manual is updated by the laboratory the updated version of the manual shall be sent to the project manager. The previously issued copy of the manual must be archived by the project manager to insure traceability of the data generated using the applicable QA/QC manual.

Navajo is currently utilizing ALS Environmental, a commercial laboratory located in Houston, Texas. ALS is a NELAC accredited laboratory.

7.2 Analytical Parameters and Methods

The injected fluid samples are analyzed for the following listing of parameters that are representative of the injected fluid:



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- VOC (EPA Method 8260)
- SVOC (EPA Method 8270)
- Total Metals (EPA Method 6020/7000)
- RCI
- Chloride
- Sulfate
- Alkalinity
- TDS
- pH
- Conductivity

The parameter listing shall be updated as necessary to remain accurate and the waste analysis remains representative of the injected fluid being injected.

8.0 **REPORTING**

The laboratory performing the injected fluid characterization analyses shall generate a report of the analytical results. These analytical results shall be compiled with the field measurement results and tabularized. The results of each waste stream characterization sampling event, including tabularization of analytical results, copies of laboratory reports, and copies of water sampling logs, shall be provided to OCD within 90 days following each sampling episode. The report shall document any obvious fluctuations in the injected fluid composition.



APPENDIX K

INJECTION WELL CLOSURE PLAN

S<u>ub</u>surface

APPENDIX K

INJECTION WELL CLOSURE PLAN NAVAJO REFINING COMPANY, L.L.C. (WDW-3)

Final Testing Program

After ceasing injection in the well and prior to commencing physical closure procedures of the injection well, a pressure falloff test will be conducted in order to determine if the transient pressure data have conformed with predicted values within the injection interval. The brine injected for the falloff test will be nonhazardous and will also act as a buffer between the injectate and the well. Appropriate mechanical integrity testing shall also be conducted to ensure the integrity of the long casing string and cement that will remain in the ground after closure. Notify the OCD of mechanical integrity and pressure falloff testing procedures of the long casing string and cement that will remain.

Mechanical Integrity Testing

An annular pressure test and radioactive tracer survey will be conducted prior to removing the injection tubing and packer. Subsequent to tubing and packer removal, a casing inspection and a cement bond/variable density log will be conducted from total depth to the surface.

Pressure Falloff Testing

A wireline unit with pressure control equipment will be rigged up to run in the hole with a surface recording bottom-hole pressure transducer with temperature capabilities to position the transducer at the top of the injection interval. The transducer will be stabilized prior to injecting brine.

Two thousand barrels of brine will be injected at a constant rate. The brine will be compatible with the injection zone reservoir fluid as determined by compatibility testing. The pressure buildup will be recorded. After pumping is ceased, the pressure falloff will be recorded for a minimum of 24 hours after shut in. The pressure derivative curve to will be monitored confirm the test has investigated beyond the wellbore storage effect.



APPENDIX K (Continued)

Regulatory Notification

Navajo will notify OCD at least 60 days before commencing plugging and abandonment procedures on any waste disposal well.

Plug and Abandonment Procedures

The balance plug method will be employed to plug and abandon this well. This technique involves displacing the cement through a work string which has been run into the casing. The cement slurry is pumped down the work string and up the annulus to a calculated height which would balance the cement inside and outside the work string. The work string is then slowly pulled out of the cement leaving a solid, uniform plug.

Heavy drilling mud is placed between the cement plugs. This mud establishes a hydrostatic gradient that will exceed the static bottom-hole pressure at the time of plugging and any anticipated pressures which would result from future injection activity in these particular formations.

Finally, after all cement plugs are set, the well casings will be cut off 3 feet below grade and capped by welding a $\frac{1}{2}$ inch steel plate to the outermost casing string.

The plugging and abandonment procedures for a typical well are described as follows:

- 1. Prepare the well and location for plugging. Remove the well monitoring equipment and wellhead injection piping.
- 2. Notify the OCD of the MIT schedule. Conduct an annulus pressure test and a radioactive tracer survey to satisfy OCD mechanical integrity requirements.
- 3. Move in and rig up the frac tanks and pump for the pressure falloff test. Fill frac tanks with 2,000 barrels of brine.
- 4. Rig up the wireline unit with pressure control equipment. Run into the hole with a surface recording bottom-hole pressure transducer with temperature capabilities and position the transducer at the top of the perforated injection interval. Allow the transducer to stabilize prior to injecting brine.



APPENDIX K (Continued)

- 5. Commence injecting 2,000 barrels of brine at a constant rate. The brine will be compatible with the injection zone reservoir fluid, as determined by compatibility testing. Record the pressure buildup. Cease pumping and record the pressure falloff. Measure the pressure falloff for a minimum of 24 hours after shut in. Monitor the pressure derivative curve to confirm the test has investigated beyond the wellbore storage effect.
- 6. Rig down the wireline unit.
- 7. Move in and rig up the well service unit with BOP equipment and a 2 7/8 inch work string.
- 8. Remove the wellhead and install the BOP equipment and stripper head.
- 9. Unseat the seal assembly from the packer and displace the annular fluid by flushing with 200 bbls of brine. Trip out of the hole laying down the 4 ½ -inch injection tubing.
- 10. Rig up the wireline unit and run a casing inspection log and a cement bond/variable density log from total depth to the surface. Pick up and run a wireline set cement retainer at 9,022 feet. Rig down the wireline unit.
- 11. Rig up cement service equipment. Cement shall be Class "A" (or comparable), weighing 15.6 pounds/gallon. Pressure test the surface lines as required.
- 12. Run in the well with the work string and sting into the cement retainer at 9,022 feet. Establish a pump-in rate into the injection perforations and pump 100 sx of Class "A" cement below the retainer. Pull out of the retainer and spot sufficient Class "A" (or comparable) cement slurry to develop a 100-foot plug above the cement retainer. Pull the tubing up above the top of cement and reverse out excess cement. Catch a sample of cement to check curing time and compressive strength. Allow the cement to set overnight (8-hour minimum) before tagging top of plug to confirm proper setup and location. Pressure test the plug to the pressure recommended by the OCD.
- 13. Set a balanced cement plug using Class "A" cement from the top of cement at approximately 9,022 feet to the surface.



APPENDIX K (Continued)

- 14. Cut casing strings ± 3 feet below ground level.
- Weld a ½ inch steel plate across the 13-3/8-inch casing. Inscribe on plate, in a permanent manner, the following information: (1) operator name, (2) closure date, and (3) UIC permit number.
- 16. Release all equipment and clean up the location.
- 17. Submit closure data to the TCEQ.

Once closure operations are complete and the well is officially plugged and abandoned, a closure report certifying that the well or wells were closed in accordance with applicable requirements, will be submitted to the OCD within 30 days. The report will include any newly constructed or discovered wells or information, including proposed well data, within the area of review. When plugging and abandonment is complete, Navajo will submit certification to the OCD that the injection well has been closed in accordance with applicable OCD regulations.



APPENDIX L

FINANCIAL ASSURANCE DOCUMENTATION



Ferra () & () ()-1 Actigned 6-17/17 Refigned 5-1-07

STATE OF NEW MEXICO

ONE-WELL PLUGGING BOND

For CHAVES. EDDY, LEA. MCKINLEY, RIO ARRIVA, ROOSEVELT. SANDOVAL, AND SAN JUAN COUNTIES <u>ONLY</u>

BOND NO.	6186995
AMOUNT OF BOHD	195,000
COUNTY	Addy

NCITE: For wolls less ites \$ 200 locs deep, the minimum bond in \$3,000 bb* For wells 5,000 to 10,000 fort deep, the minimum bond is \$7,500.60* For wells more than 10,000 fort deep, the minimum bond is \$16,000.00

"Under certain conditions, a well being drilled under a \$3,000.08 or \$7,500.00 band may be permissing to be drilled as much as \$30 fact despite than the normal maximum depth, e.g., a well being drilled under a \$3,000.00 bond may be permissed to go to 5,500 feet and a well being drilled under a \$7,500,00 bond may be permissed to go to 10,500 feet. [See Rule 183]

File with Oli Conservation Division, 1229 South Salat Francis, Sumen Fe, 1914, 87545

ENOW ALL MEN BY THREE PREBENTS:

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That <u>NAVE 10</u> <u>Be f111118</u> <u>CONDAINY</u> (as individual) (a evertal participation) (a conversal, limited listikity company or limited permatrikity arguetzed in the flate of <u>Debty-1200</u> grad and an individual in the flate of <u>Debty-1200</u> grad and arguetzed in the basic of the flate of <u>Debty-1200</u> grad and basic of a basic of the flate of <u>Debty-1200</u> grad and basic of the basic of

The conditions of this obligation are such that:

WHEREAS, the PRINCIPAL has contracted or may contracte the drilling of one west to a depth not to exceed 5,000 float, to prospect for and/or produce oil or gas, cashon storido gas, bettern prove being minute, or door own or operate, or may sequire, own or operate such well, the identification and location of said well being:

WDW #3. Unit N	forment 790 feet from the S 2055	(Some)
Wante of well 2250 foot from the	13 ASA Party line of Section 1 Township	18 (123)
(South), Rasso 27 (East) (Ecil),	NMPM_ Eddy County, New Mexico.	

NOW, THEREPORE, if the FRINCIPAL and SURETY or ether of them, or their seconsors or settiges or any of duce, shall cause said well to be properly plagged and obserdened when by or when no longer productive or mobil for other basicficial pupper, in accordance with the noise and unders of the DIVISION, including but not likelised to Risks 101 [19.15.3.10] NMAC] and 202 [19.15.A.202 NMAC], at much sules now exist or may hereafter be assembled;

THEN AND IN THAT EVENT, this obligation shall be stall and wold, enherning and in definit of complete complement with any and all of said obligations, size same shall remain in fail force and effect.

Navaia Refining Company 100 Crescent Court Ste 1600 75201-6927 TAXAR Dalles Iom C tradition.

Vice President

If PRINCIPAL is a corporation, mily corporate seal bere

Safeco	Insurance Co of America	
Adams	Bldg, ADH-3, 4634 154th Pl	l ne
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<u>MM</u>	ABGOTA A	
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Gary	Attorney-In-Fact	

S. Gary Sime



ACKNOWLEDGMENT FORM FOR MOIVIDUAL STATE OF COUNTY OF This intrustent was acknowledged before me on Notary Public SEAL My Commission Expires ACKNOWLEDCHENT FORM FOR PARTNERSHIP, CORPORATION OR LIMITED LIBAILATY COMPANY STATE OF TEXAS countros Dallas 4rplys dedged before me pa This ins Lon ice PATTY SEN COS SEC **.**.... 200 My Commission Explore ACKNOWLEDGMENT FORM FOR CORPORATE SUBETY STATE OF New Mexico COUNTY OF Eddy ont was acknowledged before me on 4-1Tois ins Gary Sime Heigh Safeco Insurance Co of Ameri OFFICIAL MEAN 1 **6**. L 81 NORMELY PUBLIC-STATE OF NEW MEXICO 8-6-2007 My convertiging emplo 8-6-2007 · My Commission Brotimes Corporate Survey was els Forner of Alterney APPROVED BY: OIL CONSERVATION DIVISION OF NEW MEXICO Det

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POWER OF ATTORNEY RAFECO INBURANCE COMPANY OF AMERICA GENERAL INSURANCE COMPANY OF AMERICA HOME OFFICE: BAFECO PLAZA SEATTLE WALHINGTON 98184

MIKE MCGAVICK, PRESIDENT

No. 10157

KNOW ALL BY THESE PRESENTS:

The SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF ADMERICA, each a Washington corporation, does each hereby appoint

its true and lewist attorney (s)-in-lact, with full authority to execute on its behalf Ideality and surely bonds or undertakings and either documents of a similar character issued in the course of its business, and to bind the respective company thereby,

IN WITNESS WHEREOF, BAPECO INSURANCE COMPANY OF AMERICA and ORNERAL INSURANCE COMPANY OF AMERICA have each executed and oltested livese presents

843. day of - ist And 2004

CHRISTINE IREAD, SECRETARY

CERTIFICATE

Extract from the By-Laws of SAFECO MISURANCE COMPANY OF AMERICA and of GENERAL INGURANCE COMPANY OF AMERICA;

"Article V. Section 13. - PIDELITY AND SURFETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for stat purpose by the officer in charge of surely operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate tides with authority to execute on behalf of the company fidelity and surely bonds and other documents of similar character based by the company in the course of its business... On any instrument making or eldencing such appointment, the signeduces may be attract by facelinite. On any instrument contraining such appointment, the signeduces may be attract by facelinite. On any instrument contraining such appointment, the or on any bond or underlaking of the company, the scal, or a factimite filerand, may be impressed or attend or in any other manner reproduced; provided, however, that the seal and not be necessary to the velicity of any such instrument or undertaking."

> Ediract from a Resolution of the Board of Directors of BAFECO INSURANCE CORPANY OF AREFRICA. and of GENERAL INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

- The provisions of Article V, Section 13 of the By-Laws, and Ø

(i) The provinents of names of related is, carries in a to the unit of them in the provinent in the provine of th

I, Childene Meed, Secretary of BAFECO INSURANCE COMPANY OF AINERICA and of GENERAL INSURANCE COMPANY OF AINERICA, do hereby certify wet the foregoing extracts of the By-Lows and of a Resolution of the Board of Directors of these corporations, and of a Power of Altorney tested puryuant therets. are true and corrisci, and that both the By-Lews, the Resolution and the Power of Altorney are still in full force and effect.

IN WITHESS WHEREOF, I have hareunio set my hand and allowed the facsimile anal of soid corporation

2004 lst April ÷. day of





CHRISTINE MEAD, SECRETARY

PA sophilated indomatic of BAFECO Composition 94/91/2004 PD7

8-0974/8AEP 241

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WDW-3 OPEN-HOLE LOG

APPENDIX M

SUBSURFACE

APPENDIX O

DRAFT PUBLIC NOTICE



APPENDIX O

PUBLIC NOTICE

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

In accordance with the laws of the State of New Mexico and the particular reference to the provisions of Subsection F in 20.6.2.3108 NMAC, Navajo Refining Company, L.L.C. is applying to renew a discharge permit to operate a Class I nonhazardous injection well located approximately 14 miles east of the refinery in the Empire Oil Field. The petroleum refinery is located at 501 East Main in Artesia, New Mexico 88210. The nonhazardous injection well is designated WDW-3.

The Navajo refinery is a 100,000 barrel per day oil refinery that refines Permian Basin crude oil that is gathered in West Texas and Southeast New Mexico. The fluid injected into WDW-3 is comprised of exempt and nonexempt nonhazardous oilfield waste water that is generated in the refining process.

WDW-3 is one of three nonhazardous injection wells at the Navajo refinery that are permitted to inject at a maximum composite rate of 800 gallons per minute. Subsurface disposal at WDW-3 occurs within a permitted injection zone from approximately 7,303 feet to 8,894 feet below land surface. The total dissolved solid concentration of the permitted injection zone is in excess of 10,000 milligrams per liter and is not considered to be a source of drinking water.

The Oil Conservation Division will accept comments and statements of interest regarding the application and will create a facility-specific mailing list for persons who wish to receive future notices. Interested parties may obtain information, submit comments, and request to be placed on a facility-specific mailing list by contacting the OCD at the following address:

State of New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division Environmental Bureau 1220 South St. Francis Drive Santa Fe, NM 87505 (505) 476-3440

When corresponding, please reference the name of the applicant and the well name.