GW - 28

INSPECTIONS & DATA

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, April 01, 2008 3:33 PM
To: 'DARRELL MOORE'
Cc: 'Jim.Resinger@navajo-refining.com'; 'steve.terry@navajo-refining.com'; Monzeglio, Hope, NMENV
Subject: FW: March 13, 2008 Tank & Other Inspection Items Artesia Refinery (GW-28)

Darrell:

Good afternoon. The OCD likes the liner design with leak detection system for the new tanks. Please find the OCD requests, questions and requirements for cleanup around the tanks in the Draft test below. Please respond with actions to satisfy cleanup around the tanks as noted below and 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) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Chavez, Carl J, EMNRD
Sent: Monday, March 24, 2008 4:57 PM
To: Chavez, Carl J, EMNRD
Cc: Price, Wayne, EMNRD
Subject: DRAFT March 13, 2008 Tank & Other Inspection Items Artesia Refinery (GW-28)

Wayne, what do you think? Tnx.

Darrell, et. al:

The inspection focused on visits to: Tank 450 (where 2 tanks north of Tk 450 are under construction and dual thermal sealed 60-mil HDPE Liners were being tested); Tank 815 (newer tank); Pitch Tanks; and older existing Tanks.

During the inspection, I indicated that I would follow-up with an e-mail requesting the information below:

1) Drawings of the SRUs, Hydrogen Unit & Mild Hydrocracker east of Tk 437are requested.

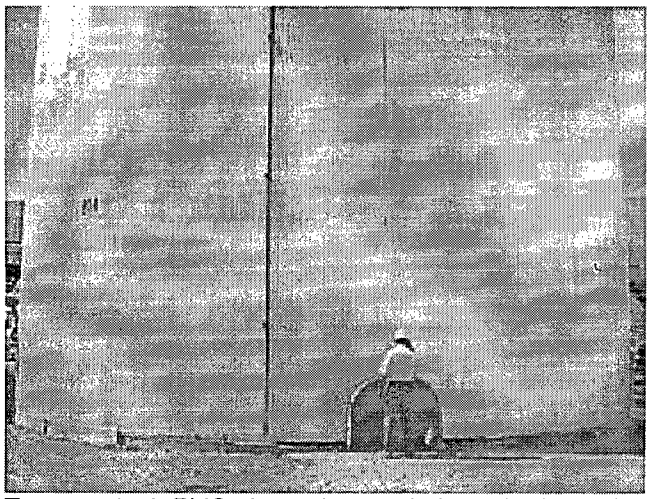
2) Drawings of KWB-8 and SPH recovery system south of the highway on Bolten Road are requested. Estimated flow rate capacity per pump is ~ 8 – 10 gpm. Presently, Navajo is awaiting permit to bore underneath highway to tie them into refinery treatment system. Pumps have been ordered and electricians will install power source within 2 months. Anticipated date of completion April 2008. The OCD recently forwarded recommendations for locations of other SPH recovery wells back toward the refinery and would like to know Navajo's thoughts on automated SPH recovery system at wells showing significant SPH levels?

3) OCD requests proof of contact with NMED over Class V sanitary effluent progress at refinery? Navajo had mentioned plans for disposal of sanitary effluent down EPA Class I injection well(s) east of the refinery. If this is the plan, then OCD is the contact for disposal of sanitary effluent at the refinery and not NMED.

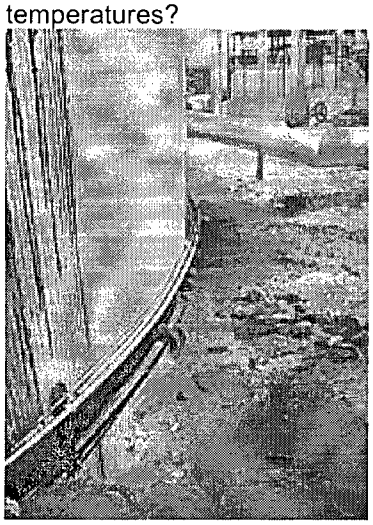
Tank inspection observations:

Pitch Tank Area (Tank 814) Plans for new pitch tank near this one

1) The Pitch Tank appears to be in need of secondary containment as observed from spills along the base (see photos).



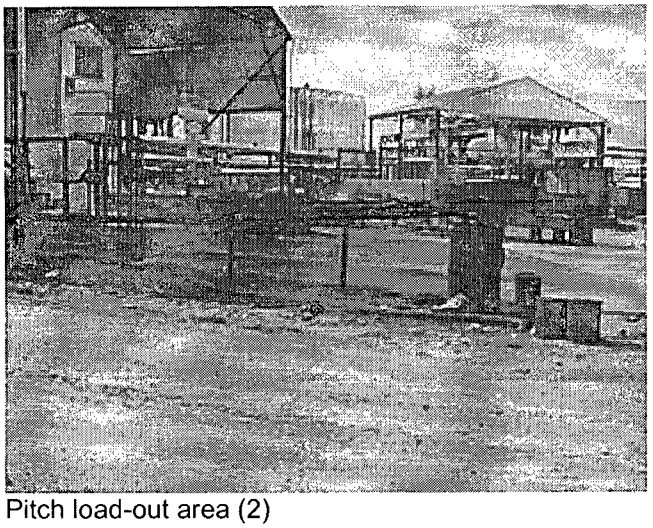
Two one-inch PVC pipes observed along the base through concrete ring observed. Supposedly, a liner exists beneath tank. Darrell will find out the type of liner and mil thickness that can withstand 550 F pitch tar temperatures?



Over flow observed on ground at base of tank needs to be cleaned up. During inspection, water was mentioned as being a cause of agitation and overflow conditions.

2) The Pitch Tank Load-out area is also in need of cleanup as the concern is with PAHs that may impact ground water.

Pitch load-out area (1)

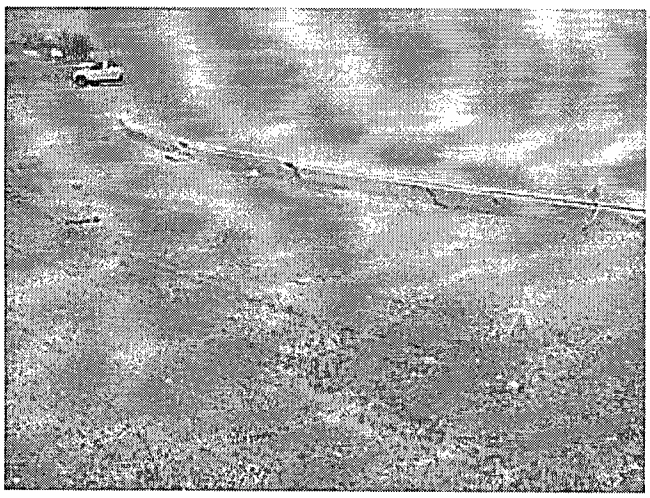


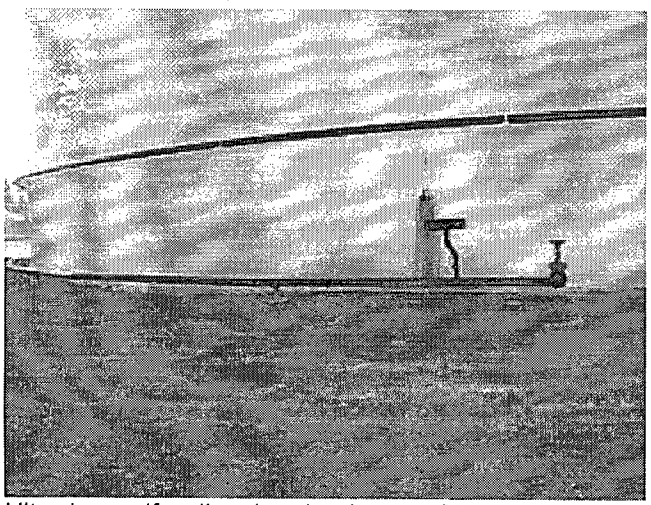
Pitch load-out area (2)

If Navajo can keep this load-out area clean, OCD will not require a curbing or cement area throughout the pitch load-out rack.

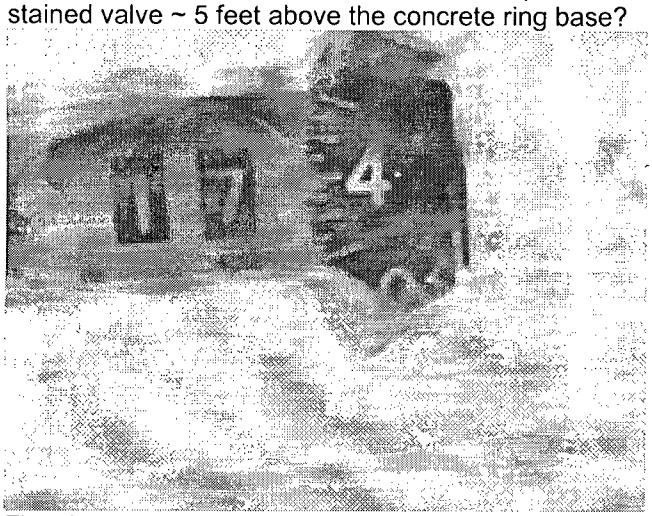
Tank 815

1) Cement fractures were observed along the base of the foundation. The fracturing of the 1.5 foot wide cement rings is thought to be occurring because the outer tank base sits within 4 inches of the edge of the concrete ring and is not centered on it. Rebar was not observed within any of the cracks, and the exact cement mixture was not determined at the time of the inspection; however, Navajo must make a structural engineering decision of whether the structural failure at the base of the tank poses a structural and public health threat to leave it in its present condition? The two tanks currently under construction north of Tank 450 will be set 9 inches from the outer edge of the cement ring or in the center to address the fracture problem. OCD recommends that Navajo ensure the placement of rebar and reevaluate the cement mixture to determine a more suitable cement type for the new tanks? Four 1 inch pipes were observed sticking out of the cement foundation and were construed above the 60-mil HDPE liner system within the cement ring foundation. The tanks under construction north of Tank 450 photos below show the liner construction. A leak was observed along the sample port area and was determined not to be coming from the based of the tank as the fluid level of the tank was above 17 feet, while leakage was not observed to be oozing out from the fractured cement ring base.

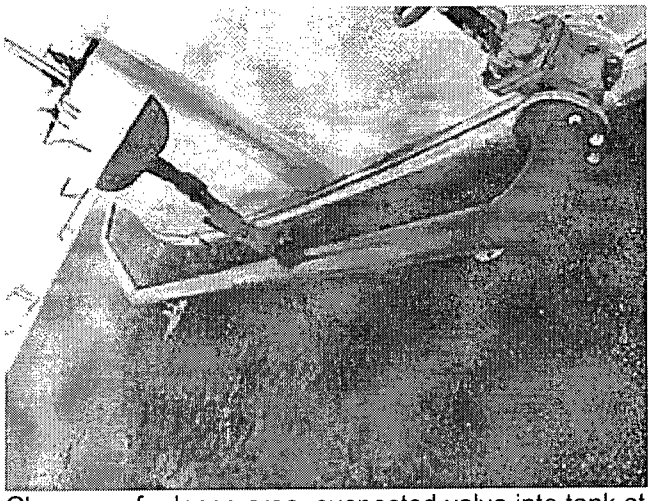




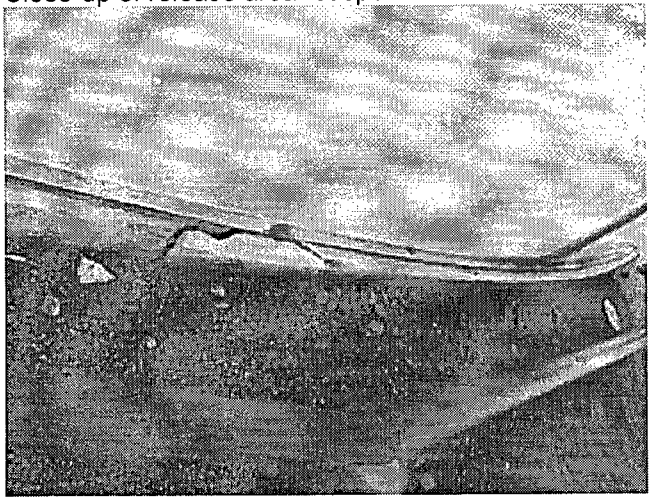
Ultra-low sulfur diesel tank release. Cleanup and determine the nature of the leak? Is it from the tank or the stained valve ~ 5 feet above the concrete ring base?



Fluid level in tank during inspection



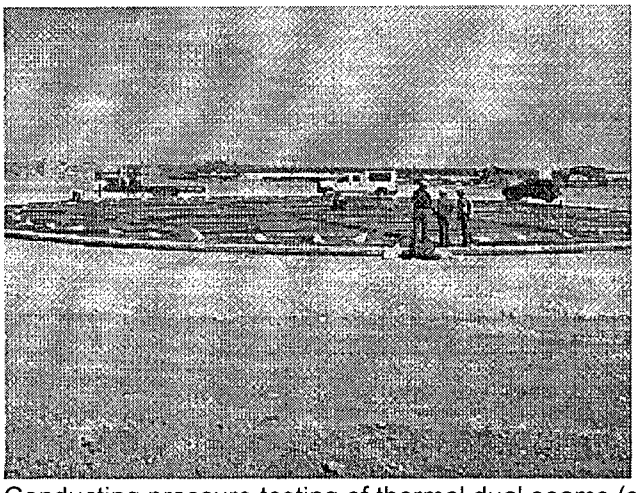
Close-up of release area- suspected valve into tank at top release (sample port for tank)



Concrete fracture(s) every 20-30 feet along the circumference and base of the tank.

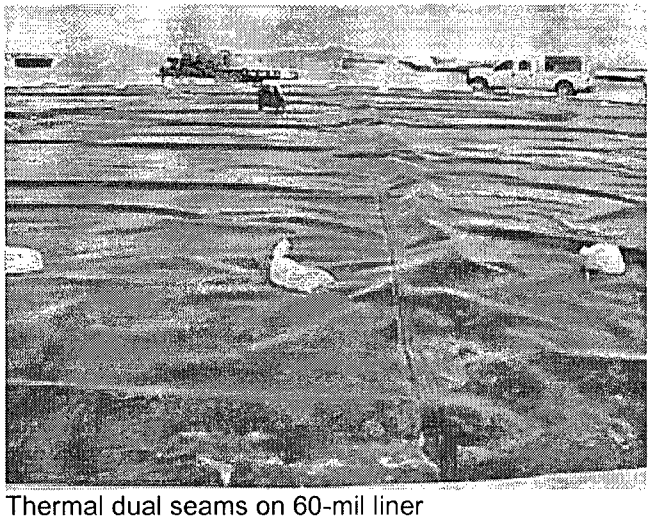
Since the level in the tank was just over 17 feet and the tank did not appear to be oozing chemical from the base, the leak appears to be related to the sample port. This release needs to be cleaned up. The OCD requests to know what Navajo is going to do about the fracturing, since over time the tank may settle and rupture with major leakage from the tank occurring. The fracturing at the base should serve as a warning to Navajo that it should take the tank out of service and reconstruct the tank ring base properly and then place the tank over a solid foundation like those observed in older tank photos, etc.

Tanks under construction north of Tank 450

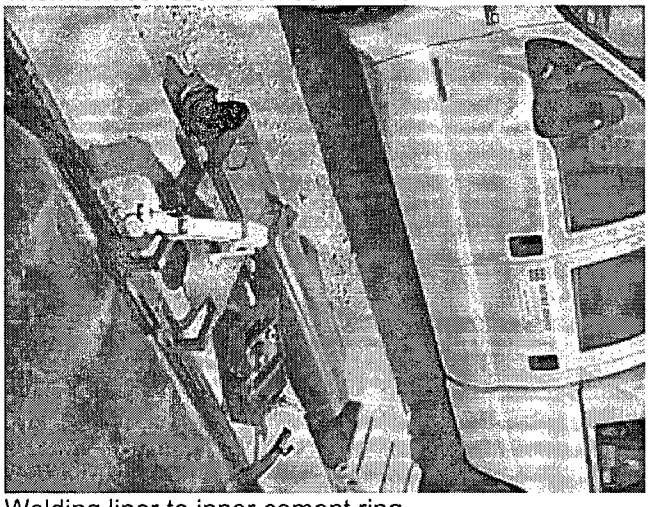


Conducting pressure testing of thermal dual seams (seam rate ~ 8 ft./min) Matrix Services contractor from

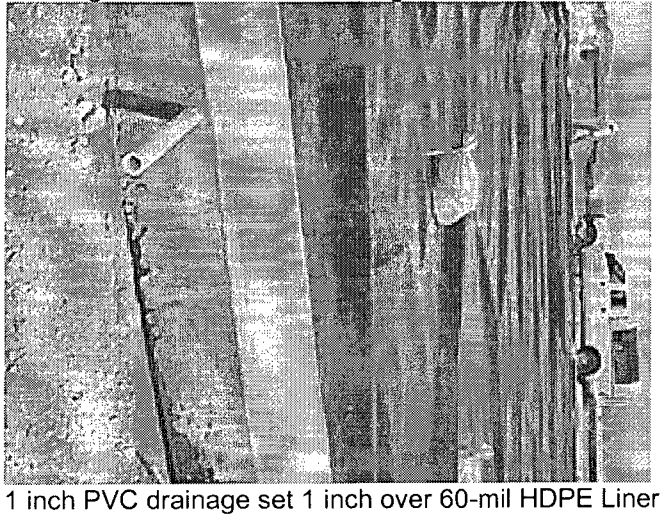
Houston hired for installing 60-mil HDPE, seaming and testing of the liner.



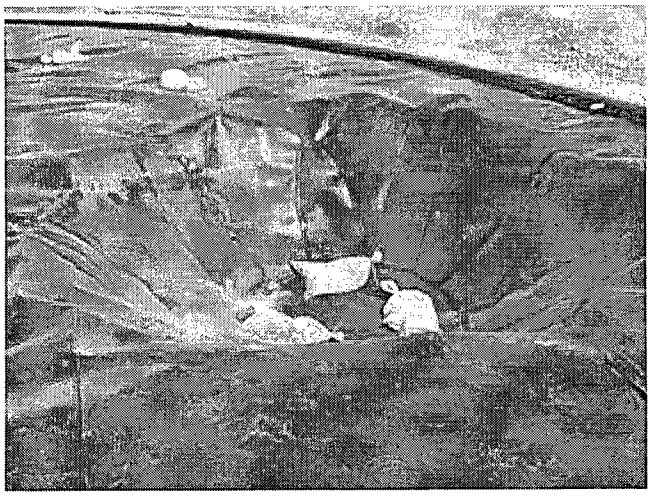
Thermal dual seams on 60-mil liner



Welding liner to inner cement ring.

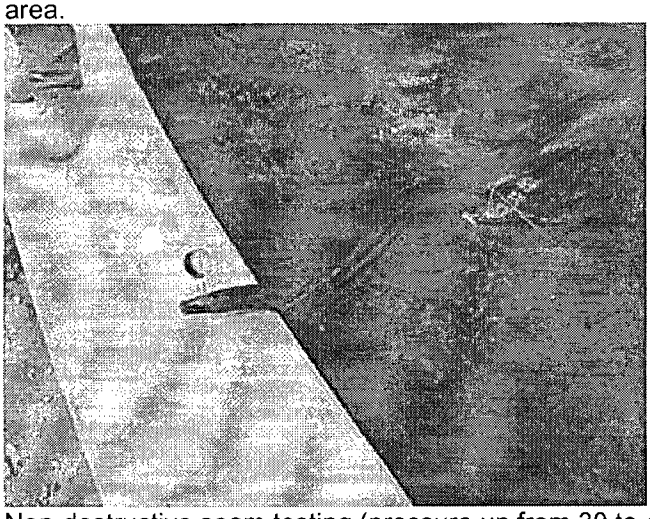


1 inch PVC drainage set 1 inch over 60-mil HDPE Liner (thermal dual seamed) with pea stone set on top of liner to support base of tank set above.



Sump for dewatering

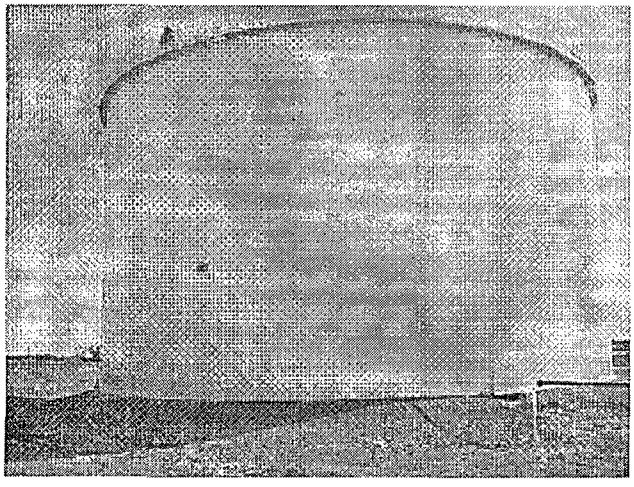
Impermeable liner to be thermally seamed outside of cement ring wall and over and trenched into outer berm area.



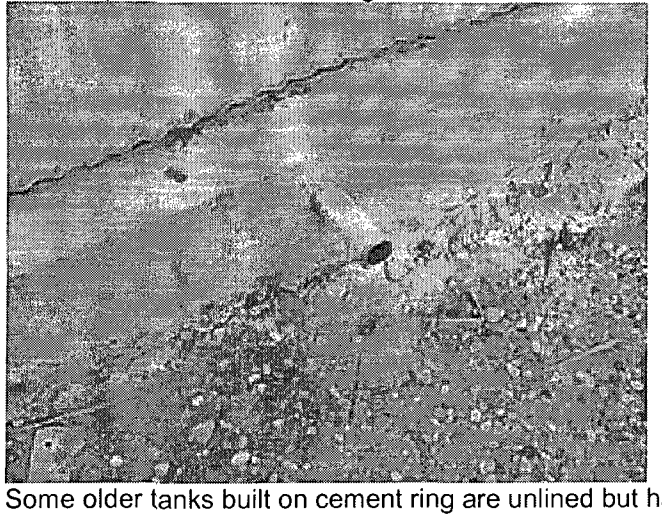
Non-destructive seam testing (pressure up from 30 to 40 psi)

Recording of thermal dual seam non-destruction pressure test results (passed)

Older Tank Photos



Unlined placed over flattened ground surface



Some older tanks built on cement ring are unlined but have 1 inch PVC pipes set beneath tanks

Other inspection items discussed during the visit:

1) Flush Mount wells south of highway on Bolten Road were unsecured. I noticed this at 307 Bolten Road. Please secure and lock the flush mounts and all monitor wells associated with the groundwater monitoring program at the refinery to prevent public access to wells.

2) All fires (small/big) need to be reported from now on. The OCD considers all fires to be "Major Releases" under Rule 116 and needs to know when, where and how they started with follow-up to make sure they don't continue to occur. In the event of a catastrophe and major fire investigation, the OCD does not want to be kept in the dark on any fires that are occurring at the refinery. The permit renewal will include a special condition for fires at Navajo's Lea and Artesia Refineries. This will be clarified in the discharge permit renewals.

3) Submit new waste streams anticipated for discharge permit renewal.

Closure

Navajo understands what OCD is looking for. It is evaluating its options. Big concern is how tanks will be scheduled for retrofit in discharge permit renewal. Navajo is currently working to address recent DAF disposal issue(s).

Thank you for the opportunity to inspect the tank construction north of Tank 450 and the other tanks. Please contact me if you have questions.

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) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

REFINING COMPANY, L.P.

FAX
(505) 746-5283 DIV. ORDERS
(505) 746-5481 TRUCKING
(505) 746-5458 PERSONNEL

501 EAST MAIN STREET • P. O. BOX 159
ARTESIA, NEW MEXICO 88211-0159
TELEPHONE (505) 748-3311

FAX
(505) 746-5419 ACCOUNTING
(505) 746-5451 EXEC/MKTG
(505) 746-5421 ENGINEERING
(505) 746-5480 PIPELINE

March 6, 2007

Mr. Carl Chavez
Environmental Engineer
New Mexico Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

FedEX

Re: Information Provided in Follow-up to Discharge Plan GW-028 Inspection Navajo's Artesia, NM Refinery

Mr. Chavez,

Navajo is providing this letter with enclosures in response to the information requests you made during your February 19 and 20, 2007 inspection, and February 21, 2007 close-out meeting at Navajo's Artesia refinery . This transmittal includes information requested to be submitted within 2 weeks of the inspection, along with additional information related to inquiries during the inspection and other information Navajo believes may be pertinent to the renewal of Discharge Plan GW-028.

A significant amount of information you solicited originated from the October 2001 inspection. A copy of our May 31, 2002 response to the October 2001 inspection questions is enclosed for your convenience. Consistent with your March 2, 2007 email clarifying the scope of the information request, Navajo is providing the below information that follows up on our May 31, 2002 submittal as well as the information you requested during the 2007 inspection.

2001 Inspection Items Follow-up

- API Removal and Closure
  Navajo's May 31, 2002 response addressing items 8 and 12 referenced forthcoming submittals related to the removal and/or closure of various APIs. Navajo has worked closely with NMED on these items as part of Navajo's closure-post closure care permit. Relevant correspondence with NMED is enclosed comprised of two letters from Navajo to NMED and one letter from NMED to Navajo.

- Gas Oil Hydro-Treater (GOHT) Wastewater Lines
  Navajo's May 31, 2002 response addressing item 14 indicated that the plans and drawings for the new GOHT were yet to be prepared. These drawings are now complete and are included in the enclosure.

- SPCC and Stormwater Control
  Navajo's May 31, 2002 response addressing item 19 indicated that the SPCC plan was being updated to reflect stormwater changes. A copy of the current SPCC plan drawing is enclosed along with Navajo's notice of termination (NOT) submitted to (and approved by) EPA. The NOT voided Navajo's NPDES permit for stormwater runoff based upon the successful implementation of stormwater retention measures that eliminated outfalls. These actions negated the need for a stormwater plan (i.e., all stormwater is contained on Navajo's property).

2007 Inspection 2-Week Items

Other than the 2001 inspection responses, the remaining information you requested relates to the GW-028 discharge plan itself. We believe the following fulfills your information request.

- GW-028 Conditions 8 (Below Grade Tanks/Sumps/Pits/Ponds) and 9 (Underground Process/ Wastewater Lines)
  Navajo has enclosed samples of the revised inspection results spreadsheet and hydro-test sheets used by our maintenance department. These have been updated to include repair information and installation dates or date ranges, where known, and the addition of a "pass/fail" section.

  The specific documents provided are the summary spreadsheet and an individual test record form for sewer lines, boxes, hubs, and sumps.

  Navajo has also enclosed drawings of underground process and wastewater lines for the new ROSE unit.

- GW-028 Condition 11 (Housekeeping)
  Enclosed is Navajo's vacuum truck sump pumping record for all refinery sumps which comprise the spill collection/prevention systems. These sumps are inspected two or three times each week. The annulus will be inspected for those sumps equipped with secondary containment. An aerial photo is enclosed which has been marked to indicate the sump locations.

- GW-028 Condition 17.H.i. (Additional Requirements – Update Maps)
  Enclosed is an updated map which will include the existing and proposed retention basins, new recovery wells, and the wastewater line to the underground injection wells.

Other 2007 Inspection Issues

Several other issues were discussed during your 2007 inspection. These are discussed below.

- Chemical Tote Storage
  It is our understanding that you were satisfied with the information (i.e., plot plan of segregated container storage area) provided to you describing Navajo's planned new chemical storage area. Navajo wants to make clear our position that materials stored in containers on concrete slabs draining into the refinery sewer system need no further secondary containment.

- GW-028 Condition 15 (Stormwater Plan)
  Navajo has no plans to line the stormwater retention basins. The water received by these basins is fresh water. As operated, the regulations do not require these basins to be lined. If oily runoff somehow enters these basins, the water will be removed to prevent possible soil contamination.

- Pumps Adjacent to Tank T-400
  You indicated your desire for Navajo to remove the unused pumps located adjacent to gas oil storage tank T-400. Navajo will determine if these pumps are needed for future use. If needed, Navajo will undertake action to improve containment measures. Otherwise, Navajo will remove the pumps from this location.

- Pumps Adjacent to Tank T-437
  You observed that a tramp pump in temporary service (inter-tank transfer between crude tanks T-437 and T-439) did not have spill containment. Navajo will obtain and install spill containment for this pump until a permanent pump equipped with spill containment is installed.

- Stains on Tank T-58
  Navajo is in the process of emptying this tank for inspection, cleaning, and repair. De-inventorying of tank T-58 had already begun because it was on this year's schedule for maintenance.

- Hydrotest of Wastewater Line to Injection Wells
  You indicated that you would like a copy of the procedures Navajo used to hydrotest the wastewater line which runs out to the Class I injection wells. A copy of the procedure and OCD's corresponding acceptance of test results are enclosed.

We believe the information provided in today's transmittal comprises a comprehensive response to your request and will allow you to proceed with renewing Discharge Plan GW-28 for Navajo's Artesia, NM refinery. Please contact me (746-5398) or Darrell Moore (746-5281) if you have any questions regarding our response. We look forward to reviewing your draft of the renewal in the near future.

Sincerely,

Donald E. Whaley, P.E.
Sr. Environmental Specialist

Cc: OCD: Wayne Price, Brad Jones, Ed Hansen
Navajo (Artesia): JER

Elec. cc: Navajo (Artesia): DGM, DBP, JLB, DLB, RAS
Holly: Phil Youngblood, Dave Lamp

Envr. File: *OCD Discharge Permit GW-028 Inspections/Follow-up[Refining: ART.5.E.04.B]*
Nmartnas01/Environmental/OCD-WW-Stormwater-Remed/OCD Inspections/2007-02-19 Inspection/

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, March 02, 2007 9:01 AM
To: Monzeglio, Hope, NMENV
Cc: Price, Wayne, EMNRD; Cobrain, Dave, NMENV
Subject: FW: GW-028 Inspection Scope of Requested Information

Hope:

FYI, please find attached some correspondence from Mr. Don Whaley of the Navajo Artesia Refinery subsequent to the OCD Feb. 19-21, 2007 inspection. You will notice in his comments some reference to the NMED-HWB, since some closure issues associated with the out-of-service API Units at the North/South and Waste Water Plant came up. The API Units have been replaced by the new above ground API Unit. However, Navajo is continuing to use the waste water API to process cat fines from the scrubber system I believe. They do not wish to decommission the N/S Plant API Units because there is an ongoing RCRA Investigation in those areas. In addition, we looked for product in wells east and south of Hwy 82 away from the refinery and did not find any. We notice at KWB-8 where we pulled about 18 inches of floating product that they are hand bailing from the well on a quarterly basis, but it would seem very easy for them to install a automatic product recovery system into the well and route it to back a couple hundred feet to the Mack Sump product collection system to maintain a constant recovery of free product in the vicinity of KWB-8. The OCD said it would discuss this with NMED. In addition, we verified that the new RWs south of Boulton Rd. and Hwy. 82 have been installed and they are working to connect the piping to RW-11 System. There is product there and there was some discussion about finding the leading edge of that plume moving E-SE into the farm field area that we also indicated that the OCD would be in contact with NMED about. I am working to complete the new discharge plan and possible NOV for the Navajo Artesia Refinery subsequent to our inspection. I envision adding certain requirements to the discharge plan to address some of the above issues; however, I expect to discuss any/all issues related to our work with the NMED as I work to finalize the documents.

Please contact me if you have questions. At some point we'll discuss the written requirements; however, we may also agree on a different way to address some or all of the issues. Stay tuned.....

From: Whaley, Don [mailto:Don.Whaley@hollycorp.com]
Sent: Friday, March 02, 2007 8:34 AM
To: Chavez, Carl J, EMNRD
Cc: Jones, Brad A., EMNRD; Price, Wayne, EMNRD; ed.hansen@state.nm.us:; Resinger, Jim; Moore, Darrell; Price, Doug; Byrd, Jeff; Bolding, David; Swafford, Ricky
Subject: GW-028 Inspection Scope of Requested Information

Carl,
Navajo is working to respond to the information requests you made during your February 19 and 20 inspection, and February 21 close-out meeting at Navajo's Artesia refinery. You and Darrell Moore agreed that Navajo would provide OCD with certain information within 2 weeks of the inspection.
We plan to ship our response on Tuesday March 6, so you should receive it on March 7.
In order to assure you receive the desired information, we believe it is best to clarify the scope of the information request. This clarification holds even more significance since an unanticipated urgent matter arose for Darrell resulting in his being out of the office since last Friday.

A significant amount of information you solicited originated from the October 2001 inspection. We identified our May 31, 2002 response to the October 2001 inspection questions and a copy of the response letter is attached for your convenience. Unless you direct otherwise, Navajo will consider the attachment and OCD files to comprise the response to your information requests with respect to the 2001 inspection.

The remaining information you requested relates to the GW-028 discharge plan itself.
We believe the scope of your requests will be met by the following:

Conditions 8 and 9
Navajo plans to provide a sample of the inspection results spreadsheet and hydro-test sheets used by our maintenance department. These have been updated to include repair information and installation dates or date ranges, where known, and the

addition of a "pass/fail" section. Navajo also plans to provide drawings of underground process and wastewater lines for the ROSE unit.

Condition 11
We plan to provide the schedule for Navajo's routine inspection of spill collection/prevention systems.

Condition 17.H
Navajo plans to provide an updated map which will include the existing and proposed retention basins, new recovery wells, and the wastewater line to the underground injection wells.

We believe this covers the scope of your information requests requiring a 2-week response.
Navajo understands that you intend to communicate directly with NMED regarding the post closure permit and other relevant items. We also understand that additional correspondence may be appropriate to assist OCD in renewing Navajo's Discharge Permit.
Please reply to this email to express your concurrence with this scope or to identify other information you requested which we did not identify herein.

Your timely response will be appreciated and will serve to facilitate Navajo in providing you the information you need to renew GW-028.

Don Whaley
Sr. Environmental Specialist
Navajo Refining Company, L.P.
don@navajo-refining.com
phone: 505.746.5398
cell: 505.703.5057
fax: 505.746.5421

LOG OF WELL RW-11-01 (BH-06-02)

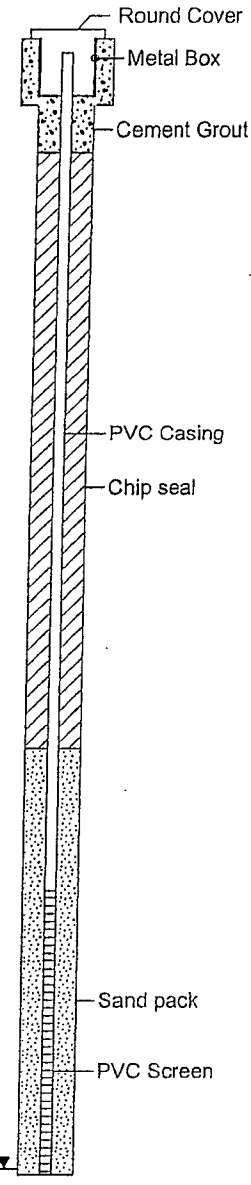
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/28/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/28/06; 1530	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			0-5 ft. SILT, very light brown, dry, no H/C stain or odor
5	ML		5-10 ft. SILT, same as above
10			10-15 ft. SILT, gravelly, very light brown, small gravels to 1/2"
15	CL/CA		15-20 ft. Alternating zones of clay and caliche: Clay 0.6 ft., caliche rock 0.25 ft., clay 0.5 ft., caliche at base of core, hard, fractured, H/C odor
20			

Well: RW-11-01
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 35.15 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-35 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 12.5 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: - -
Sand placement	: 12.5 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 20 ft. screen 15-35 ft., placed sand to 12.5-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

ADDITIONAL INFORMATION:
On 09/29/06 DTW 19.66, Total Depth 35.15, slight odor, no product

Notes:
Borehole located S. of US 82 on Bolton Road, 30 ft. south of MW-57
Drilled as borehole BH-06-02
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-01 (BH-06-02)

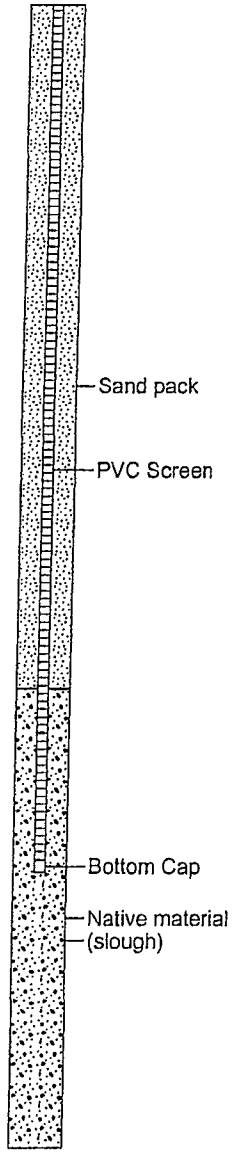
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/28/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/28/06; 1530	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-01
Elev.:

Depth In Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.9 ft. CLAY, brown, plastic, soft, H/C odor
			20.9-21.2 ft. CLAY, limey caliche clay, chalk white
			21.2-22.5 ft. CLAY, brown, soft, H/C odor
	CA		22.5-22.8 ft. CALICHE, chalk color
	CL		22.8-23.4 ft. CLAY, brown, same as above
	CA		23.4-23.7 ft. CALICHE, fractured and gravelly
	CL		
	GP		23.7-24.1 ft. CLAY, brown, same as above
25			24.1-25 ft. GRAVEL, limey (caliche), hard, fractured, wet at base
			25-26.4 ft. CLAY, chalky brown, dry
	CL		26.4-27.1 ft. SILTY CLAY, soft, moist, H/C odor
			27.1-29.1 ft. CLAY, light brown, soft, plastic
	CA		29.1-29.4 ft. CALICHE, fractured, H/C odor
	CL		29.4-30 ft. CLAY, brown, wet
30	CA		(30-30.3 slough)
	CL		30.3-30.4 ft. CALICHE, chalky white, fractured, saturated
	CA		
			30.4-30.8 ft. CLAY, light brown, mottled
	CL		30.8-30.9 ft. CALICHE
			30.9-33.8 ft. CLAY, light brown, mottled
	CA		33.8-34.1 ft. CALICHE
	CL		34.1-34.9 ft. CLAY, light brown
35	CA		34.9-35 ft. CALICHE
			35-40 ft. No recovery, caliche rock in tip
	NR		
40			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 35.15 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 15-35 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 12.5 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: - -
Sand placement	: 12.5 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 20 ft. screen 15-35 ft., placed sand to 12.5-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

ADDITIONAL INFORMATION:
On 09/29/06 DTW 19.66, Total Depth 35.15, slight odor, no product

Notes:
Borehole located S. of US 82 on Bolton Road, 30 ft. south of MW-57
Drilled as borehole BH-06-02
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-02 (BH-06-04)

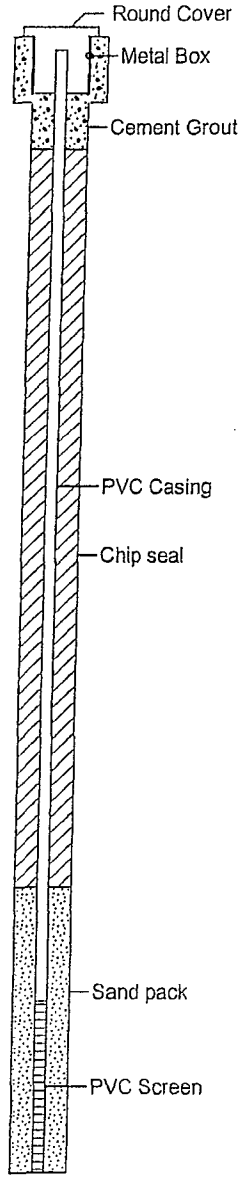
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/29/06; 1230	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/29/06; 1730	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			0-5 ft. SANDY SILT, very light brown, dry
5	ML		5-10 ft. SANDY SILT, very light brown, dry
10			10-15 ft. GRAVELLY SILT, light brown, dry, caliche gravels to 3/4", angular
15	CA		15-15.1 ft. CALICHE, rock and slough
	CL		15.1-16.8 ft. CLAY, brown, dry, no H/C staln or odor
	CA		16.8- 17.1ft. CALICHE, limey white, hard, fractured
	CL		17.1-18.8 ft. CLAY, brown, dry, grading to SILTY CLAY at base, H/C odor
	CA		18.8-19.2 ft. CALICHE, fractured, wet, possible H/C saturation
20			

Well: RW-11-02
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: - -
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 20.16 ft., no product, no H/C odor, developed well with 12 vt. pump, water to sample traller,

Notes:
Borehole located S. of US 82 on Bolton Road and 30 ft. north of MW-57.
Drilled as borehole BH-06-04
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-02 (BH-06-04)

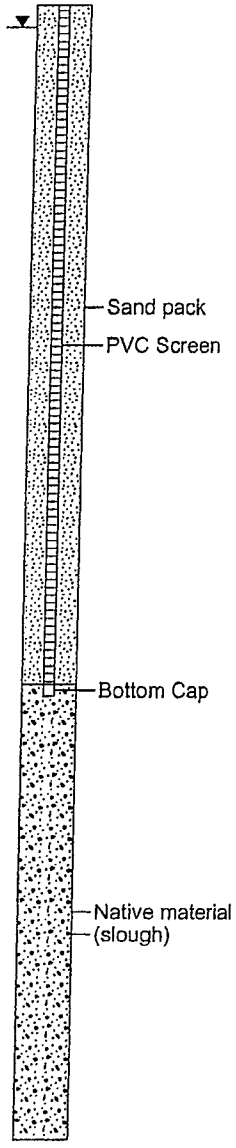
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 09/29/06; 1230	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 09/29/06; 1730	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-02
Elev.:

Depth In Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.8 ft. CLAY, brown, soft, strong H/C odor 20.8-21.2 ft. SILTY CLAY, gray, strong H/C odor 21.2-24.1 ft. CLAY, mottled limey and brown, strong H/C odor 21.9-22.3 ft.
	CA		24.1-24.2 ft. CALICHE, rock jammed in tip
25	CL		25-25.2 ft. CLAY, gray-brown, silty, soft, H/C saturated
	CA		25.2-25.4 ft. CALICHE, fractured, H/C saturated
	CL		25.4-26.2 ft. SILTY CLAY, gray-brown, soft, H/C odor, possible H/C saturation 26.2-27.2 ft. CLAY, brown, H/C odor
	CA/CL		27.2-28.0 ft. CLAY with CALICHE, brown 28.0-28.9 ft. CLAYEY CALICHE, light brown, fractured
30	CL		30-31 ft. CLAY, very light brown, H/C odor 31-31.6 ft. GRAVELLY CLAY, gravels <1/4" 31.6 ft.-33.1 ft. CLAY, mottled brown-chalk color, no H/C odor 33.1-34.7 ft. GRAVELLY CLAY, brown, damp, no H/C odor
35	CL		35-40 ft. CLAY, brown, with occasional thin gravel lenses, no H/C odor
40			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 20 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: --

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: --
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: --
Inner casing, top	: --
Flush mount, top	: --

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 20.16 ft., no product, no H/C odor, developed well with 12 vt. pump, water to sample trailer,

Notes:
Borehole located S. of US 82 on Bolton Road and 30 ft. north of MW-57.
Drilled as borehole BH-06-04
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-03 (BH-06-05)

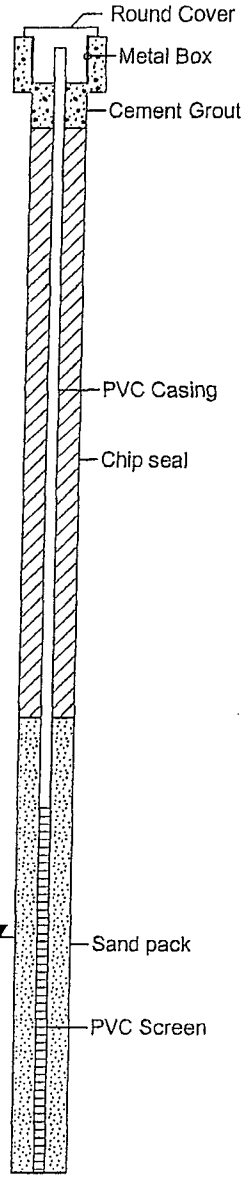
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/03/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/03/06; 1500	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-03
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SANDY SILT, very light brown, dry
5			5-10 ft. SANDY SILT, very light brown, dry
10			10-15 ft. GRAVELIY SILT, light brown, dry, caliche gravels to 3/4", angular
15	CA/CL		15-20 ft. CALICHE rock and CLAY mixed, clay brown, dry, hard, H/C odor at 20 ft.
20	CL/ML		20-20.4 ft. SILTY CLAY/CLAYEY SILT, gray, plastic, with rounded caliche rock, strong H/C odor
	CL		20.4-21.2 SILTY CLAY, light brown, mottled, strong H/C odor
	CA		21.2-22.6 ft. CLAY, brown, dry, stiff, H/C odor
	CL		22.6-23.0 ft. CALICHE, white, soft, H/C odor
25			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: --

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 7 bags 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 11 bags
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: --
Inner casing, top	: --
Flush mount, top	: --

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

Notes:
Borehole located S. of US 82 on Bolton Road and 60 ft. north of MW-57.
Drilled as borehole BH-06-05
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-03 (BH-06-05)

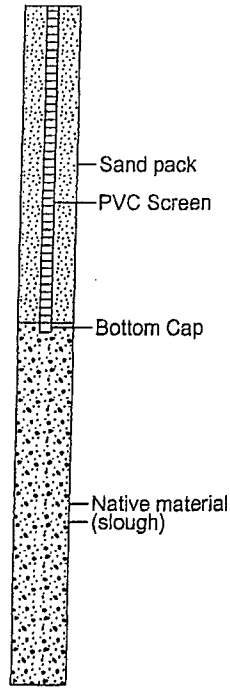
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/03/06; 1030	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/03/06; 1500	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-03
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
25	CL/CA		25-25.4 ft. CLAY and CALICHE, soft, saturated, H/C odor
	CA		25.4-25.7 ft. CALICHE, rock, hard, white to light brown, some cookines, H/C odor
	CL/CA		25.7-26.1 ft. CLAY and CALICHE, mottled brown and chalk white, H/C odor
	CL		26.1-28.2 ft. SILTY CLAY, light brown, occasionally mottled, thin zones of small, fractured caliche rock, H/C odor
30	CL		30-32.4 ft. CLAY, brown, with occasional gravel, no H/C odor
	CA		32.4-33.7 ft. CALICHE, rock, hard, unfractured.
	CL		33.7-34.1 ft. GRAVELLY CLAY, brown, semi-saturated, no H/C odor
	CL		34.1-34.7 ft. CLAY, brown, no H/C odor
35	CL		35-36.3 ft. CLAY, brown, stiff 36.3-36.8 ft. CLAY, mottled 36.8-38.1 ft. CLAY, brown, occasional caliche gravel
	CL/CA		38.1-39.1 ft. CALICHE and CLAY, caliche brown, fractured, saturated, no H/C odor
	CL		39.1-39.6 ft. CLAY, brown, occasional gravel to 3/4 in.
40	CA		39.6-39.9 ft. CALICHE, rock, fractured
45			
50			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 7 bags 3/8" chips
Seal placement	: 2 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 11 bags
Sand placement	: 15 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 2 ft, concrete to surface and pad.

Notes:
Borehole located S. of US 82 on Bolton Road and 60 ft. north of MW-57.
Drilled as borehole BH-06-05
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-04 (BH-06-06)

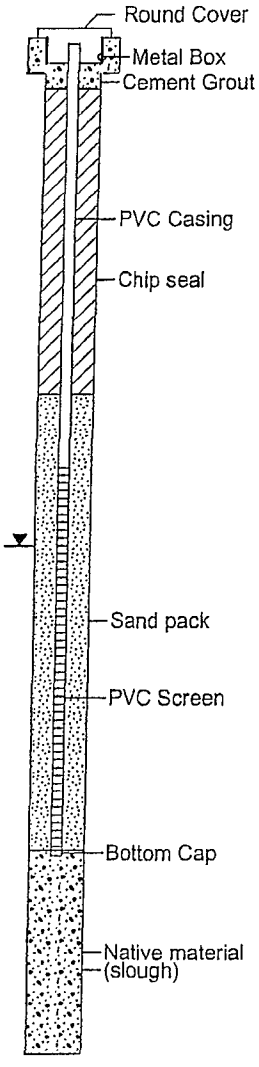
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/04/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/04/06; 1300	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-04
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, very light brown, sandy, dry, no H/C stain or odor
5	SM		5-10 ft. CLAYEY SILTY SAND, light brown, dry, no H/C stain or odor
10	CL		10-15 ft. SANDY SILTY CLAY, light brown, dry, no H/C stain or odor
15	CA		15-15.5 ft. light brown, soft, 15.5-16.2 ft. CALICHE, white, some clay
	CL		16.2-18.9 ft. CLAY, brown, dry, no H/C stain or odor
	CA		
20	CL		18.9-19.3 ft. CALICHE, rock, gray, dry, strong H/C odor
	SM/CL		19.3-19.9 ft. CLAY, brown, some caliche inclusions, dry, H/C odor
	CL		20.0-20.4 ft. CLAY, brown, as above
	ML		
25	CA		20.4-22.2 ft. CLAYEY SILT/SILTY CLAY, gray, damp, very strong H/C odor
	CL		22.2-23.4 ft. CLAY, brown with gray zones, H/C staining and odor
			23.4-23.8 ft. CLAYEY SILT, brown
30	CL		23.8-24.3 ft. CALICHE, fractured rock, H2O saturated. 25-25.3 ft. CALICHE, fractured rock and gravels, saturated
			25.3-27.4 ft. CLAY, silty, brown, soft, strong H/C odor (product on barrel)
35	CL		(30-30.2 ft. slough) 30.2-31.7 ft. CLAY, brown, plastic, slight H/C odor 31.7-35 ft. CLAY, brown, hard, dry, no H/C odor
40			35-40 ft. SILTY CLAY, brown, soft, plastic, saturated H2O in spots, occasional caliche gravels, possible H/C odor (from above?).
45			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: --

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 2 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 5 bags 3/8" chips
Seal placement	: 1.5 - 14 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 16 bags
Sand placement	: 14 - 32 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 32-40 ft.

ELEVATIONS

Ground elevation	: --
Inner casing, top	: --
Flush mount, top	: --

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Set 15 ft. screen 17-32 ft., placed sand to 14-32 ft., placed bentonite to 1.5 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.83 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 90 ft. north of MW-57.
Drilled as borehole BH-06-06
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-05 (BH-06-07)

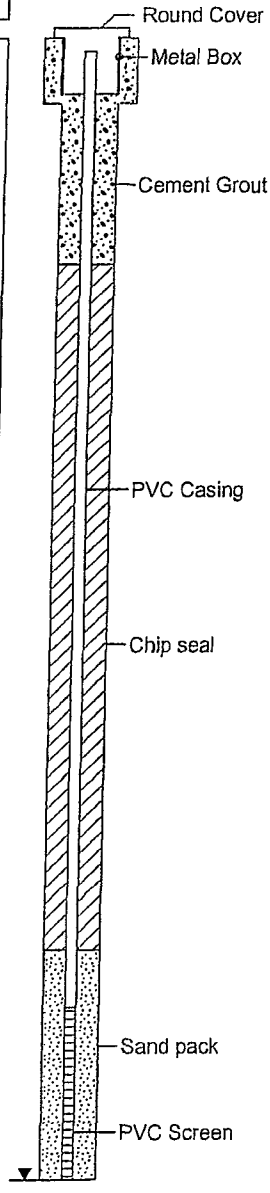
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/05/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/05/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-05
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, very light brown, sandy, dry, no H/C stain or odor
5	SM		5-10 ft. CLAYEY SILTY SAND, light brown, dry, no H/C stain or odor
10	CL		10-15 ft. SANDY SILTY CLAY, light brown, dry, no H/C stain or odor
15	CL/CA		15-20 ft.CLAY and CALICHE, mixture, brown and white, no distinct zones (gravelly clay?), bottom 8 in. gray with H/C odor
20			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: --

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 4 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 5 bags 3/8" chips
Seal placement	: 4 - 16 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 16 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: --
Inner casing, top	: --
Flush mount, top	: --

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 16-32 ft., placed bentonite to 4 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.76 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 120 ft. north of MW-57.
Drilled as borehole BH-06-07
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-05 (BH-06-07)

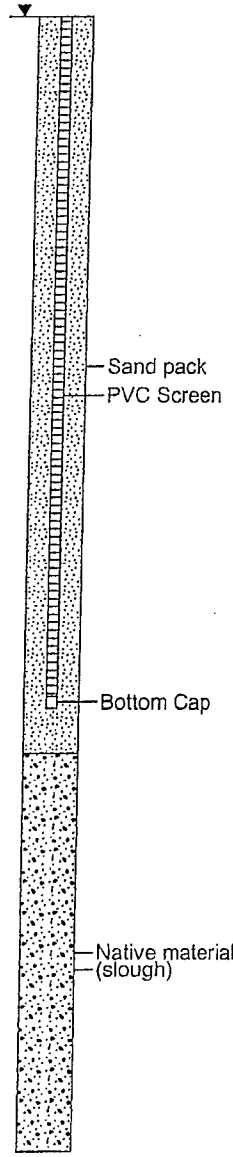
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/05/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/05/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.4 ft. CLAY, brown
	CA		20.4-21 ft. CLAYEY CALICHE, gray, H/C saturated
	CL		21-22.2 ft. CLAY, brown, H/C odor 22.2-23.7 ft. CLAY, gray, soft, H/C odor
	CA		23.7-24.0 ft. CALICHE, light brown, fractured, H/C saturated
25	CL		24.0-24.6 ft. CLAY, brown, plastic (25.0-25.3 ft. slough) 25.3-26.7 ft. CLAY, mottled, soft, H/C odor
	CL		26.7-27.2 ft. CLAY, with caliche, gray
	CA		27.2-27.6 ft. CALICHE, rock, fractured, water and hydrocarbon saturated
	CL		27.6-29.8 ft. CLAY, brown, very plastic, dry (30-30.3 slough)
30	CL		30.3-33.5 ft. CLAY, light brown, stiff, some silt, uniform
	CL		33.5-34.9 ft. SILTY CLAY, with caliche, brown, damp
35	CL		(35-35.3 slough) 35.3-36.1 ft. CLAY, brown, with small, very light brown caliche gravels
	CL		36.1-36.3 ft. CLAY, with caliche, very light brown
	CL		36.3-40 ft. CLAY, light brown, plastic, some silt, very stiff,
40			

Well: RW-11-05
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 4 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 5 bags 3/8" chips
Seal placement	: 4 - 16 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 16 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 16-32 ft., placed bentonite to 4 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.76 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 120 ft. north of MW-57.
Drilled as borehole BH-06-07
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-06 (BH-06-08)

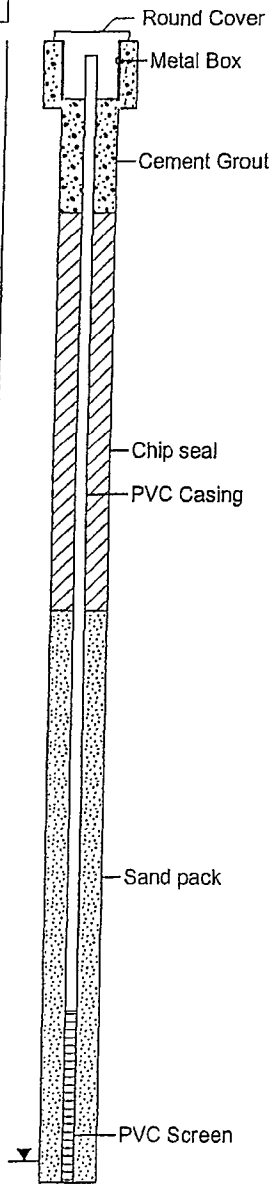
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/09/06; 1000	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/09/06; 1400	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-06
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			
	ML		0-5 ft. SILT, light brown, sandy, dry, no H/C stain or odor
5			
			5-15 ft. CLAYEY SILT grading to SILTY CLAY, brown, dry, plastic (little clay balls), no H/C stain or odor
10	ML/CL		
15			15-15.9 ft. SANDY SILT, light brown with yellow-orange streaks, no H/C stain or odor
	ML		15.9-16.2 ft. SAND with CALICHE GRAVEL, light brown, well graded (non-uniform), no H/C stain or odor
	SW/GW		
	GC		16.2-16.5 ft. CLAY and CALICHE GRAVEL, dry, silty
	SW/GW		SAND and CALICHE GRAVEL (gravelly sand), dry, no H/C stain or odor
	CA/CL		17.1-17.7 ft. CALICHE and CLAY, light brown, dry, no H/C stain or odor
			17.7-18.4 ft. CALICHE and CLAY, gray, H/C odor
20			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 4 bags 3/8" chips
Seal placement	: 3 - 10 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 18 bags
Sand placement	: 10 - 36 ft. BLS
Sand pack type	: Native material (caved
Sand placement	: 36-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 36 ft., placed six bags sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 10-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.38 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 150 ft. north of MW-57.
Drilled as borehole BH-06-08
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-06 (BH-06-08)

Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/09/06; 1000	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/09/06; 1400	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Water Levels
▼ Hydrocarbon Product
▽ Measured Water Level

Well: RW-11-06
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	SC		20-20.3 ft. CLAYEY SAND, brown and gray, dry, H/C odor
	ML		20.3-21.2 ft. CLAYEY SILT, brown and mottled chalky, dry, H/C odor
	CL		21.2-23.6 ft. SILTY CLAY, brown, dry, H/C odor
	CL		23.6-24.0 ft. CALICHE CLAY, gray and brown, some saturation, H/C odor
	CA		24-25 ft. CLAYEY CALICHE, caliche rock, fractured, gray, water and product saturated
25	CA		25-26.9 ft. SANDY, CLAYEY CALICHE, light brown, some gray, water and product saturated
	CL		26.9-28.6 ft. SILTY CLAY, brown, damp, H/C odor
	CA		28.6-28.9 ft. CLAYEY CALICHE, very light brown (chalk color), water saturated
	CL		28.9-30 ft. SILTY CLAY, brown, possible H/C odor
30	CL		30-30.8 ft. CLAY, mottled brown and chalky, dry
	CL/CA		30.8-31.1 ft. CALICHE CLAY, very light brown, water saturated
	CL		31.1-32.3 ft. CLAY, brown, plastic, very stiff, little or no H/C odor
	GW		32.3-32.9 ft. CALICHE GRAVEL, small fragments and clay, brown, wet
35	CL		32.9-35 ft. CLAY, light brown, plastic 35-38 ft. light brown, plastic, very stiff, ocassional gravel and water saturation, no H/C odor
	CL		38-39.2 ft. GRAVELLY CLAY, brown, clay with very small caliche gravels, 1/8-1/4 in., no H/C stain or odor
40	CL		39.2-40 ft. CLAY, light brown, soft, plastic, dry, no H/C stain or odor

PVC Screen
Sand pack
Bottom Cap
Native material (slough)

Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrele hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 4 bags 3/8" chips
Seal placement	: 3 - 10 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 18 bags
Sand placement	: 10 - 36 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 36-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 36 ft., placed six bags sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 10-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.38 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 150 ft. north of MW-57.
Drilled as borehole BH-06-08
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-07 (BH-06-09)

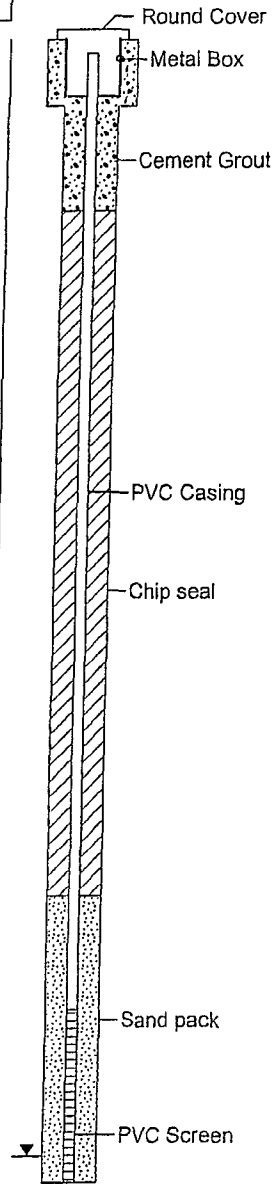
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/10/06; 0830	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/10/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: *8 1/4"*	*Northing Coordinate*	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, light brown, sandy, dry, no H/C stain or odor
5	ML/CL		5-15 ft. CLAYEY SILT grading to SILTY CLAY, brown, dry, plastic (little clay balls), no H/C stain or odor
15	CL		15-16 ft. SILTY CLAY, light brown with rust staining, dry, no H/C stain or odor
	SP/GP		16-17 ft. GRAVELLY CLAYEY SAND, light brown, very fine grained, limestone gravels to 1 in.
	CL		17-18 ft. GRAVELLY CLAY, clay light brown, abundant gravels to 1"
	CA		18-18.2 ft. CALICHE, rock in tip
20			

Well: RW-11-07
Elev.:



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: *Native material (caved)*
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.30 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 180 ft. north of MW-57.
Drilled as borehole BH-06-09
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-07 (BH-06-09)

Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/10/06; 0830	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/10/06; 1330	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Well: RW-11-07
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	CL		20-20.8 ft. CLAY, brown, dry, occasional gravel, slight H/C odor
	CA		20.8-21.3 ft. CALICHE, rock and gravels in clay matrix, light gray to chalk color, strong H/C odor
	CL		21.3-21.6 ft. SILTY CLAY, brown, damp, H/C odor
	CL		21.6-22 ft. GRAVELLY CLAY, gravel in clay matrix, light brown, damp, H/C odor
			22-23 ft. CLAY, brown, stiff, slight H/C odor
25			25-27.3 ft. CLAY, brown, soft, damp, slight or no H/C odor
			27.3-28.5 ft. LIMEY CLAY, chalk color, soft, very plastic, damp, no H/C stain or odor
30	CL		30-31.5 ft. CLAY, brown, plastic, damp, no H/C stain or odor 31.5-31.7 ft. CLAY, limey, very light brown, soft, plastic
			31.7-33.7 ft. CLAY, brown, soft, plastic, sticky, silty from 31.7-32.5 ft., slight H/C odor
35			35-40 ft. CLAY, light brown to brown, mottled in places, hard and stiff to soft and damp. Caliche rock at 35.5 and 37.3 ft. no H/C odor
40			

Sand pack
PVC Screen
Bottom Cap
Native material (slough)

Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.30 ft., no product, H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 180 ft. north of MW-57.
Drilled as borehole BH-06-09
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-08 (BH-06-10)

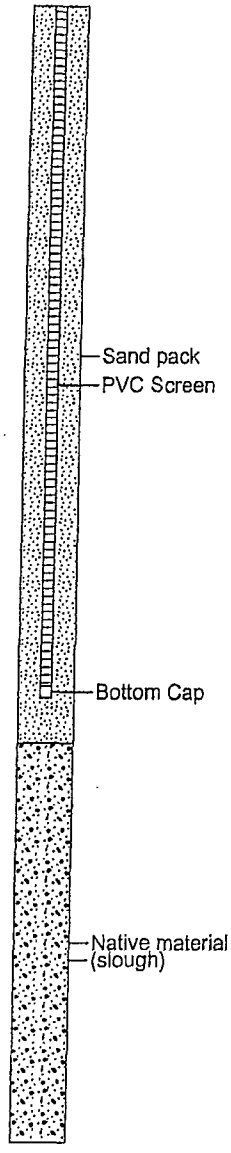
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/11/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/11/06; 1300	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Well: RW-11-08
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
20	GC		20.4-21.3 ft. SILTY CLAY, brown, strong H/C odor
	CL		
	CA		21.3-21.5 ft. CALICHE rock
	CL		21.5-22.3 ft. CLAY, brown, some silt and very fine grained sand, soft, H/C odor
	CA		
	CL		22.3-22.7 ft. CALICHE rock with clay
	CL/CA		22.7-23.5 ft. CLAY, mottled, with thin caliche lens, strong H/C product odor
25			23.5-24.2 ft. CLAY and CALICHE rock, saturated, show of H/C product, H/C odor
	CL		25.3-26.5 ft. SILTY CLAY, brown, soft, occasional caliche gravel, H/C odor
	CA		26.5-26.8 ft. CALICHE rock with clay matrix, very light brown, H/C odor
	CL		26.8-28.2 ft. CLAY, brown, soft, occasional caliche gravel, H/C odor
	CA		28.2-28.4 ft. CALICHE rock with clay matrix, very light brown, H/C odor
	CL		28.4-28.7 ft. CLAY, brown, soft, occasional caliche gravel, H/C odor
30			30-30.9 ft. CLAY, brown, soft, possible H/C odor
	CA		30.9-31.2 ft. CALICHE rock in clay matrix
	CL		31.2-34.2 ft. CLAY, limey, very light brown, soft, with occaslonal small gravel, no H/C stain or odor
			34.2-34.7 ft. CLAY, brown, some mottling
35	GC		35-35.6 ft. GRAVELLY CLAY, gray, H/C odor
	CL		35.6-36.9 ft. SANDY CLAY, light brown, very fine grained sand, water saturated
			36.9-38.1 ft. CLAY, brown, soft, occasional small gravel, possible H/C odor
	CL		38.1-38.4 ft. CALICHE rock, fractured, water saturated, possible H/C odor (from water in core barrel?)
	CA		
	CL		38.4-39.5 ft. CLAY, light brown, very plastic, damp, possible odor (as above)
40	GW		39.5-40 ft. CALICHE GRAVEL, saturated



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, Joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.64 ft., no product, no H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 210 ft. north of MW-57.
Drilled as borehole BH-06-10
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

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LOG OF WELL RW-11-08 (BH-06-10)

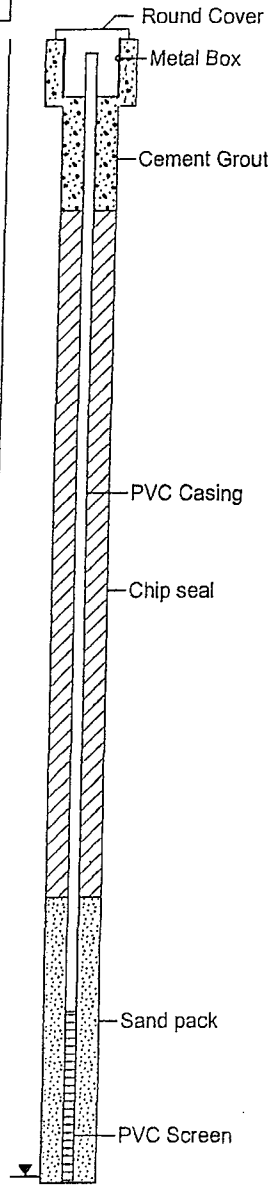
Offsite Hydrocarbon Product Investigation
Navajo Refining Company
Artesia, New Mexico
September - October 2006

Date, Time Started	: 10/11/06; 0900	Drilled By	: Eco/Enviro Drilling
Date, Time Completed	: 10/11/06; 1300	Logged By	: D.G. Boyer, P.G.
Hole Diameter	: 8 1/4"	Northing Coordinate	:
Drilling Method	: Hollow Stem Auger	Easting Coordinate	:
Drilling Equipment	: Foremost-Mobile B-57	Survey By	:

Sample Method
SS Split Spoon (18" or 24")
CB Core Barrel (2.5' or 5')
CT Auger Cuttings
NR No recovery

Well: RW-11-08
Elev.:

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0	ML		0-5 ft. SILT, light brown, sandy, dry, no H/C stain or odor
5	ML/CL		5-15 ft. CLAYEY SILT grading to SILTY CLAY, brown, dry, plastic (little clay balls), no H/C stain or odor
15	CL		15-17.2 ft. SANDY CLAY, light brown with rust staining, black with septic odor at 17.2 ft., dry
	GC		17.2-18.2 ft. SANDY CLAYEY GRAVEL, light brown, caliche gravel and fragments, dry, no H/C odor 18.2-19 ft. SANDY CLAYEY GRAVEL mix, light brown to brown, dry, no H/C odor 20-20.4 ft. SANDY CLAYEY GRAVEL mix, brown-gray-black
20			



Well Construction Information

COMPLETION DATA

Hole Depth	: 40 ft. Below LS
TD Inside casing	: 32.2 ft. Below TOC

CASING, SCREEN & CAP

Material, joints	: PVC, threaded
Diameter	: 2 in. ID
Manufacturer	: MonoFlex
Screen type	: Slotted
Screen length	: 15 ft.
Screen opening	: 0.020 slot
Scrn. placement	: 17-32 ft. BLS
Sump	: None
Bottom Cap	: 0.2 ft PVC
Protector Casing	: Flush-mount steel
Lock Key #	: - -

SEALS & SAND PACK

Cement seal type	: Concrete hand mix
Cem't placement	: 0 - 3 ft. BLS
Annular seal type	: Hole Plug Bentonite
Seal volume	: 6 bags 3/8" chips
Seal placement	: 3 - 15 ft. BLS
Sand pack type	: 8-16 Oglebay silica
Sand volume	: 13 bags
Sand placement	: 15 - 33 ft. BLS
Sand pack type	: Native material (caved)
Sand placement	: 33-40 ft.

ELEVATIONS

Ground elevation	: - -
Inner casing, top	: - -
Flush mount, top	: - -

WELL INSTALLATION:
Drilled to 40 ft. with 8 1/4" auger. Hole caved to 33 ft., placed one bag sand to 32 ft. Set 15 ft. screen 17-32 ft., placed sand to 15-32 ft., placed bentonite to 3 ft, concrete to surface and pad.

WELL DEVELOPMENT:
On 10/20/06 DTW 19.64 ft., no product, no H/C odor. Developed well with 12 vt. pump, water to sample trailer.

Notes:
Borehole located S. of US 82 on Bolton Road and 210 ft. north of MW-57.
Drilled as borehole BH-06-10
See drilling log for sampling information
H/C = Petroleum Hydrocarbon

C:\Documents and Settings\Dave Boyer\My Documents\Navajo\Artesia Refinery\Borings 2006\RW-11-08.bor

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Tuesday, March 13, 2007

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

TEL: (505) 795-1222
FAX (505) 476-3462

RE: Navajo Artesia Refinery

Order No.: 0702246

Dear Carl Chavez:

Hall Environmental Analysis Laboratory, Inc. received 2 sample(s) on 2/22/2007 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001

MAR 14 PM 4 09

4901 Hawkins NE ▫Suite D ▫Albuquerque, NM 87109
505.345.3975 ▫Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT: NM Oil Conservation Division
Project: Navajo Artesia Refinery
Lab Order: 0702246

CASE NARRATIVE

8270 Notes:

The surrogate recovery was poor for 2,4,6-Tribromophenol and 2-Fluorophenol. This sample was analzed 3 times.

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	SW Ret Pond
Lab Order:	0702246	**Collection Date:**	2/19/2007 2:45:00 PM
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8310: PAHS						Analyst: **JMP**
Naphthalene	ND	5.0		µg/L	1	3/8/2007 2:39:24 PM
1-Methylnaphthalene	ND	5.0		µg/L	1	3/8/2007 2:39:24 PM
2-Methylnaphthalene	ND	5.0		µg/L	1	3/8/2007 2:39:24 PM
Acenaphthylene	ND	2.5		µg/L	1	3/8/2007 2:39:24 PM
Acenaphthene	ND	5.0		µg/L	1	3/8/2007 2:39:24 PM
Fluorene	ND	0.80		µg/L	1	3/8/2007 2:39:24 PM
Phenanthrene	ND	0.60		µg/L	1	3/8/2007 2:39:24 PM
Anthracene	ND	0.60		µg/L	1	3/8/2007 2:39:24 PM
Fluoranthene	ND	0.30		µg/L	1	3/8/2007 2:39:24 PM
Pyrene	ND	0.30		µg/L	1	3/8/2007 2:39:24 PM
Benz(a)anthracene	ND	0.050		µg/L	1	3/8/2007 2:39:24 PM
Chrysene	ND	0.20		µg/L	1	3/8/2007 2:39:24 PM
Benzo(b)fluoranthene	ND	0.10		µg/L	1	3/8/2007 2:39:24 PM
Benzo(k)fluoranthene	0.020	0.020		µg/L	1	3/8/2007 2:39:24 PM
Benzo(a)pyrene	ND	0.030		µg/L	1	3/8/2007 2:39:24 PM
Dibenz(a,h)anthracene	ND	0.040		µg/L	1	3/8/2007 2:39:24 PM
Benzo(g,h,i)perylene	ND	0.080		µg/L	1	3/8/2007 2:39:24 PM
Indeno(1,2,3-cd)pyrene	ND	0.080		µg/L	1	3/8/2007 2:39:24 PM
Surr: Benzo(e)pyrene	80.0	68-116		%REC	1	3/8/2007 2:39:24 PM
EPA METHOD 300.0: ANIONS						Analyst: **TES**
Fluoride	1.1	0.10		mg/L	1	2/22/2007 8:08:57 PM
Chloride	72	0.50		mg/L	5	2/22/2007 8:26:21 PM
Bromide	0.33	0.10		mg/L	1	2/22/2007 8:08:57 PM
Nitrate (As N)+Nitrite (As N)	2.2	0.50		mg/L	5	2/24/2007 9:49:37 AM
Phosphorus, Orthophosphate (As P)	ND	0.50	H	mg/L	1	2/22/2007 8:08:57 PM
Sulfate	250	2.5		mg/L	5	2/22/2007 8:26:21 PM
EPA METHOD 7470: MERCURY						Analyst: **CMS**
Mercury	ND	0.00020		mg/L	1	3/2/2007
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **NMO**
Calcium	75	1.0		mg/L	1	3/6/2007 1:39:40 PM
Magnesium	23	1.0		mg/L	1	3/6/2007 1:39:40 PM
Potassium	5.7	1.0		mg/L	1	3/6/2007 1:39:40 PM
Sodium	53	1.0		mg/L	1	3/6/2007 1:39:40 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Aluminum	0.41	0.020		mg/L	1	3/6/2007 4:13:23 PM
Antimony	ND	0.050		mg/L	1	3/7/2007 9:25:25 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	SW Ret Pond
Lab Order:	0702246	**Collection Date:**	2/19/2007 2:45:00 PM
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **NMO**
Arsenic	ND	0.020		mg/L	1	3/7/2007 9:25:25 AM
Barium	0.049	0.020		mg/L	1	3/6/2007 4:13:23 PM
Beryllium	ND	0.0030		mg/L	1	3/7/2007 9:25:25 AM
Boron	ND	0.040		mg/L	1	3/7/2007 9:25:25 AM
Cadmium	ND	0.0020		mg/L	1	3/7/2007 9:25:25 AM
Calcium	82	1.0		mg/L	1	3/7/2007 9:25:25 AM
Chromium	ND	0.0060		mg/L	1	3/7/2007 9:25:25 AM
Cobalt	ND	0.0060		mg/L	1	3/7/2007 9:25:25 AM
Copper	ND	0.0060		mg/L	1	3/7/2007 9:25:25 AM
Iron	0.25	0.050		mg/L	1	3/7/2007 9:25:25 AM
Lead	ND	0.0050		mg/L	1	3/7/2007 9:25:25 AM
Magnesium	24	1.0		mg/L	1	3/7/2007 9:25:25 AM
Manganese	0.026	0.0020		mg/L	1	3/7/2007 9:25:25 AM
Molybdenum	0.069	0.0080		mg/L	1	3/6/2007 4:13:23 PM
Nickel	ND	0.010		mg/L	1	3/6/2007 4:13:23 PM
Potassium	6.1	1.0		mg/L	1	3/7/2007 9:25:25 AM
Selenium	ND	0.050		mg/L	1	3/6/2007 4:13:23 PM
Silver	ND	0.0050		mg/L	1	3/6/2007 4:13:23 PM
Sodium	55	1.0		mg/L	1	3/7/2007 9:25:25 AM
Thallium	ND	0.050		mg/L	1	3/7/2007 2:39:49 PM
Vanadium	ND	0.050		mg/L	1	3/6/2007 4:13:23 PM
Zinc	ND	0.050		mg/L	1	3/7/2007 9:25:25 AM
Silica	2.8	1.1		mg/L	1	3/6/2007 4:13:23 PM
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
Acenaphthene	ND	10		µg/L	1	3/9/2007
Acenaphthylene	ND	10		µg/L	1	3/9/2007
Aniline	ND	20		µg/L	1	3/9/2007
Anthracene	ND	10		µg/L	1	3/9/2007
Azobenzene	ND	10		µg/L	1	3/9/2007
Benz(a)anthracene	ND	15		µg/L	1	3/9/2007
Benzo(a)pyrene	ND	10		µg/L	1	3/9/2007
Benzo(b)fluoranthene	ND	15		µg/L	1	3/9/2007
Benzo(g,h,i)perylene	ND	10		µg/L	1	3/9/2007
Benzo(k)fluoranthene	ND	10		µg/L	1	3/9/2007
Benzoic acid	ND	50		µg/L	1	3/9/2007
Benzyl alcohol	ND	20		µg/L	1	3/9/2007
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	3/9/2007
Bis(2-chloroethyl)ether	ND	15		µg/L	1	3/9/2007
Bis(2-chloroisopropyl)ether	ND	15		µg/L	1	3/9/2007
Bis(2-ethylhexyl)phthalate	ND	15		µg/L	1	3/9/2007

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	SW Ret Pond
Lab Order:	0702246	**Collection Date:**	2/19/2007 2:45:00 PM
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
4-Bromophenyl phenyl ether	ND	10		µg/L	1	3/9/2007
Butyl benzyl phthalate	ND	15		µg/L	1	3/9/2007
Carbazole	ND	10		µg/L	1	3/9/2007
4-Chloro-3-methylphenol	ND	20		µg/L	1	3/9/2007
4-Chloroaniline	ND	20		µg/L	1	3/9/2007
2-Chloronaphthalene	ND	10		µg/L	1	3/9/2007
2-Chlorophenol	ND	10		µg/L	1	3/9/2007
4-Chlorophenyl phenyl ether	ND	15		µg/L	1	3/9/2007
Chrysene	ND	15		µg/L	1	3/9/2007
Di-n-butyl phthalate	ND	10		µg/L	1	3/9/2007
Di-n-octyl phthalate	ND	15		µg/L	1	3/9/2007
Dibenz(a,h)anthracene	ND	10		µg/L	1	3/9/2007
Dibenzofuran	ND	10		µg/L	1	3/9/2007
1,2-Dichlorobenzene	ND	10		µg/L	1	3/9/2007
1,3-Dichlorobenzene	ND	10		µg/L	1	3/9/2007
1,4-Dichlorobenzene	ND	10		µg/L	1	3/9/2007
3,3'-Dichlorobenzidine	ND	15		µg/L	1	3/9/2007
Diethyl phthalate	ND	10		µg/L	1	3/9/2007
Dimethyl phthalate	ND	10		µg/L	1	3/9/2007
2,4-Dichlorophenol	ND	10		µg/L	1	3/9/2007
2,4-Dimethylphenol	ND	10		µg/L	1	3/9/2007
4,6-Dinitro-2-methylphenol	ND	50		µg/L	1	3/9/2007
2,4-Dinitrophenol	ND	50		µg/L	1	3/9/2007
2,4-Dinitrotoluene	ND	10		µg/L	1	3/9/2007
2,6-Dinitrotoluene	ND	10		µg/L	1	3/9/2007
Fluoranthene	ND	10		µg/L	1	3/9/2007
Fluorene	ND	10		µg/L	1	3/9/2007
Hexachlorobenzene	ND	10		µg/L	1	3/9/2007
Hexachlorobutadiene	ND	10		µg/L	1	3/9/2007
Hexachlorocyclopentadiene	ND	50		µg/L	1	3/9/2007
Hexachloroethane	ND	10		µg/L	1	3/9/2007
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	3/9/2007
Isophorone	ND	10		µg/L	1	3/9/2007
2-Methylnaphthalene	ND	10		µg/L	1	3/9/2007
2-Methylphenol	ND	15		µg/L	1	3/9/2007
3+4-Methylphenol	ND	20		µg/L	1	3/9/2007
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	3/9/2007
N-Nitrosodimethylamine	ND	10		µg/L	1	3/9/2007
N-Nitrosodiphenylamine	ND	10		µg/L	1	3/9/2007
Naphthalene	ND	10		µg/L	1	3/9/2007
2-Nitroaniline	ND	50		µg/L	1	3/9/2007

Qualifiers:

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ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	SW Ret Pond
Lab Order:	0702246	**Collection Date:**	2/19/2007 2:45:00 PM
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **BL**
3-Nitroaniline	ND	50		µg/L	1	3/9/2007
4-Nitroaniline	ND	20		µg/L	1	3/9/2007
Nitrobenzene	ND	10		µg/L	1	3/9/2007
2-Nitrophenol	ND	15		µg/L	1	3/9/2007
4-Nitrophenol	ND	50		µg/L	1	3/9/2007
Pentachlorophenol	ND	50		µg/L	1	3/9/2007
Phenanthrene	ND	10		µg/L	1	3/9/2007
Phenol	ND	10		µg/L	1	3/9/2007
Pyrene	ND	15		µg/L	1	3/9/2007
Pyridine	ND	30		µg/L	1	3/9/2007
1,2,4-Trichlorobenzene	ND	10		µg/L	1	3/9/2007
2,4,5-Trichlorophenol	ND	10		µg/L	1	3/9/2007
2,4,6-Trichlorophenol	ND	15		µg/L	1	3/9/2007
Surr: 2,4,6-Tribromophenol	0	16.6-150	S	%REC	1	3/9/2007
Surr: 2-Fluorobiphenyl	78.0	19.6-134		%REC	1	3/9/2007
Surr: 2-Fluorophenol	2.17	9.54-113	S	%REC	1	3/9/2007
Surr: 4-Terphenyl-d14	73.0	22.7-145		%REC	1	3/9/2007
Surr: Nitrobenzene-d5	72.4	14.6-134		%REC	1	3/9/2007
Surr: Phenol-d5	17.6	10.7-80.3		%REC	1	3/9/2007
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Benzene	ND	1.0		µg/L	1	3/4/2007
Toluene	ND	1.0		µg/L	1	3/4/2007
Ethylbenzene	ND	1.0		µg/L	1	3/4/2007
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	3/4/2007
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	3/4/2007
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	3/4/2007
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	3/4/2007
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	3/4/2007
Naphthalene	ND	2.0		µg/L	1	3/4/2007
1-Methylnaphthalene	ND	4.0		µg/L	1	3/4/2007
2-Methylnaphthalene	ND	4.0		µg/L	1	3/4/2007
Acetone	ND	10		µg/L	1	3/4/2007
Bromobenzene	ND	1.0		µg/L	1	3/4/2007
Bromochloromethane	ND	1.0		µg/L	1	3/4/2007
Bromodichloromethane	ND	1.0		µg/L	1	3/4/2007
Bromoform	ND	1.0		µg/L	1	3/4/2007
Bromomethane	ND	2.0		µg/L	1	3/4/2007
2-Butanone	ND	10		µg/L	1	3/4/2007
Carbon disulfide	ND	10		µg/L	1	3/4/2007
Carbon Tetrachloride	ND	2.0		µg/L	1	3/4/2007

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ND	Not Detected at the Reporting Limit	RL	Reporting Limit
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Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	SW Ret Pond
Lab Order:	0702246	**Collection Date:**	2/19/2007 2:45:00 PM
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Chlorobenzene	ND	1.0		µg/L	1	3/4/2007
Chloroethane	ND	2.0		µg/L	1	3/4/2007
Chloroform	ND	1.0		µg/L	1	3/4/2007
Chloromethane	ND	1.0		µg/L	1	3/4/2007
2-Chlorotoluene	ND	1.0		µg/L	1	3/4/2007
4-Chlorotoluene	ND	1.0		µg/L	1	3/4/2007
cis-1,2-DCE	ND	1.0		µg/L	1	3/4/2007
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	3/4/2007
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	3/4/2007
Dibromochloromethane	ND	1.0		µg/L	1	3/4/2007
Dibromomethane	ND	2.0		µg/L	1	3/4/2007
1,2-Dichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,3-Dichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,4-Dichlorobenzene	ND	1.0		µg/L	1	3/4/2007
Dichlorodifluoromethane	ND	1.0		µg/L	1	3/4/2007
1,1-Dichloroethane	ND	2.0		µg/L	1	3/4/2007
1,1-Dichloroethene	ND	1.0		µg/L	1	3/4/2007
1,2-Dichloropropane	ND	1.0		µg/L	1	3/4/2007
1,3-Dichloropropane	ND	1.0		µg/L	1	3/4/2007
2,2-Dichloropropane	ND	2.0		µg/L	1	3/4/2007
1,1-Dichloropropene	ND	1.0		µg/L	1	3/4/2007
Hexachlorobutadiene	ND	2.0		µg/L	1	3/4/2007
2-Hexanone	ND	10		µg/L	1	3/4/2007
Isopropylbenzene	ND	1.0		µg/L	1	3/4/2007
4-Isopropyltoluene	ND	1.0		µg/L	1	3/4/2007
4-Methyl-2-pentanone	ND	10		µg/L	1	3/4/2007
Methylene Chloride	ND	3.0		µg/L	1	3/4/2007
n-Butylbenzene	ND	1.0		µg/L	1	3/4/2007
n-Propylbenzene	ND	1.0		µg/L	1	3/4/2007
sec-Butylbenzene	ND	2.0		µg/L	1	3/4/2007
Styrene	ND	1.5		µg/L	1	3/4/2007
tert-Butylbenzene	ND	1.0		µg/L	1	3/4/2007
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	3/4/2007
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	3/4/2007
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	3/4/2007
trans-1,2-DCE	ND	1.0		µg/L	1	3/4/2007
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	3/4/2007
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,1,1-Trichloroethane	ND	1.0		µg/L	1	3/4/2007
1,1,2-Trichloroethane	ND	1.0		µg/L	1	3/4/2007

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	SW Ret Pond
Lab Order:	0702246	**Collection Date:**	2/19/2007 2:45:00 PM
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Trichloroethene (TCE)	ND	1.0		µg/L	1	3/4/2007
Trichlorofluoromethane	ND	1.0		µg/L	1	3/4/2007
1,2,3-Trichloropropane	ND	2.0		µg/L	1	3/4/2007
Vinyl chloride	ND	1.0		µg/L	1	3/4/2007
Xylenes, Total	ND	3.0		µg/L	1	3/4/2007
Surr: 1,2-Dichloroethane-d4	109	76.6-113		%REC	1	3/4/2007
Surr: 4-Bromofluorobenzene	101	77-117		%REC	1	3/4/2007
Surr: Dibromofluoromethane	110	72.3-121		%REC	1	3/4/2007
Surr: Toluene-d8	104	73-113		%REC	1	3/4/2007
EPA METHOD 310.1: ALKALINITY						Analyst: **KS**
Alkalinity, Total (As CaCO3)	42	2.0		mg/L CaCO3	1	3/1/2007
Carbonate	8.0	2.0		mg/L CaCO3	1	3/1/2007
Bicarbonate	34	2.0		mg/L CaCO3	1	3/1/2007
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **MAP**
Specific Conductance	740	0.010		µmhos/cm	1	3/5/2007
EPA METHOD 160.1: TDS						Analyst: **KS**
Total Dissolved Solids	530	20		mg/L	1	2/26/2007

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	Trip Blank
Lab Order:	0702246	**Collection Date:**	
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-02	**Matrix:**	TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Benzene	ND	1.0		µg/L	1	3/4/2007
Toluene	ND	1.0		µg/L	1	3/4/2007
Ethylbenzene	ND	1.0		µg/L	1	3/4/2007
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	3/4/2007
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	3/4/2007
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	3/4/2007
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	3/4/2007
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	3/4/2007
Naphthalene	ND	2.0		µg/L	1	3/4/2007
1-Methylnaphthalene	ND	4.0		µg/L	1	3/4/2007
2-Methylnaphthalene	ND	4.0		µg/L	1	3/4/2007
Acetone	ND	10		µg/L	1	3/4/2007
Bromobenzene	ND	1.0		µg/L	1	3/4/2007
Bromochloromethane	ND	1.0		µg/L	1	3/4/2007
Bromodichloromethane	ND	1.0		µg/L	1	3/4/2007
Bromoform	ND	1.0		µg/L	1	3/4/2007
Bromomethane	ND	2.0		µg/L	1	3/4/2007
2-Butanone	ND	10		µg/L	1	3/4/2007
Carbon disulfide	ND	10		µg/L	1	3/4/2007
Carbon Tetrachloride	ND	2.0		µg/L	1	3/4/2007
Chlorobenzene	ND	1.0		µg/L	1	3/4/2007
Chloroethane	ND	2.0		µg/L	1	3/4/2007
Chloroform	ND	1.0		µg/L	1	3/4/2007
Chloromethane	ND	1.0		µg/L	1	3/4/2007
2-Chlorotoluene	ND	1.0		µg/L	1	3/4/2007
4-Chlorotoluene	ND	1.0		µg/L	1	3/4/2007
cis-1,2-DCE	ND	1.0		µg/L	1	3/4/2007
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	3/4/2007
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	3/4/2007
Dibromochloromethane	ND	1.0		µg/L	1	3/4/2007
Dibromomethane	ND	2.0		µg/L	1	3/4/2007
1,2-Dichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,3-Dichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,4-Dichlorobenzene	ND	1.0		µg/L	1	3/4/2007
Dichlorodifluoromethane	ND	1.0		µg/L	1	3/4/2007
1,1-Dichloroethane	ND	2.0		µg/L	1	3/4/2007
1,1-Dichloroethene	ND	1.0		µg/L	1	3/4/2007
1,2-Dichloropropane	ND	1.0		µg/L	1	3/4/2007
1,3-Dichloropropane	ND	1.0		µg/L	1	3/4/2007
2,2-Dichloropropane	ND	2.0		µg/L	1	3/4/2007
1,1-Dichloropropene	ND	1.0		µg/L	1	3/4/2007

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-07*

CLIENT:	NM Oil Conservation Division	**Client Sample ID:**	Trip Blank
Lab Order:	0702246	**Collection Date:**	
Project:	Navajo Artesia Refinery	**Date Received:**	2/22/2007
Lab ID:	0702246-02	**Matrix:**	TRIP BLANK

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **LMM**
Hexachlorobutadiene	ND	2.0		µg/L	1	3/4/2007
2-Hexanone	ND	10		µg/L	1	3/4/2007
Isopropylbenzene	ND	1.0		µg/L	1	3/4/2007
4-Isopropyltoluene	ND	1.0		µg/L	1	3/4/2007
4-Methyl-2-pentanone	ND	10		µg/L	1	3/4/2007
Methylene Chloride	ND	3.0		µg/L	1	3/4/2007
n-Butylbenzene	ND	1.0		µg/L	1	3/4/2007
n-Propylbenzene	ND	1.0		µg/L	1	3/4/2007
sec-Butylbenzene	ND	2.0		µg/L	1	3/4/2007
Styrene	ND	1.5		µg/L	1	3/4/2007
tert-Butylbenzene	ND	1.0		µg/L	1	3/4/2007
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	3/4/2007
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	3/4/2007
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	3/4/2007
trans-1,2-DCE	ND	1.0		µg/L	1	3/4/2007
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	3/4/2007
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	3/4/2007
1,1,1-Trichloroethane	ND	1.0		µg/L	1	3/4/2007
1,1,2-Trichloroethane	ND	1.0		µg/L	1	3/4/2007
Trichloroethene (TCE)	ND	1.0		µg/L	1	3/4/2007
Trichlorofluoromethane	ND	1.0		µg/L	1	3/4/2007
1,2,3-Trichloropropane	ND	2.0		µg/L	1	3/4/2007
Vinyl chloride	ND	1.0		µg/L	1	3/4/2007
Xylenes, Total	ND	3.0		µg/L	1	3/4/2007
Surr: 1,2-Dichloroethane-d4	103	76.6-113		%REC	1	3/4/2007
Surr: 4-Bromofluorobenzene	103	77-117		%REC	1	3/4/2007
Surr: Dibromofluoromethane	106	72.3-121		%REC	1	3/4/2007
Surr: Toluene-d8	104	73-113		%REC	1	3/4/2007

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300									
Sample ID: MBLK		*MBLK*			Batch ID: **R22574**		Analysis Date:	2/22/2007 10:17:04 AM	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*			Batch ID: **R22595**		Analysis Date:	2/23/2007 10:32:26 AM	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*			Batch ID: **R22595**		Analysis Date:	2/23/2007 3:32:55 PM	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: LCS ST300-06026		*LCS*			Batch ID: **R22574**		Analysis Date:	2/22/2007 9:42:16 AM	
Fluoride	0.4829	mg/L	0.10	96.6	90	110			
Chloride	4.818	mg/L	0.10	96.4	90	110			
Bromide	2.397	mg/L	0.10	95.9	90	110			
Nitrate (As N)+Nitrite (As N)	3.380	mg/L	0.10	96.6	90	110			
Phosphorus, Orthophosphate (As P)	4.952	mg/L	0.50	99.0	90	110			
Sulfate	9.944	mg/L	0.50	98.0	90	110			
Sample ID: LCS ST300-06026		*LCS*			Batch ID: **R22595**		Analysis Date:	2/23/2007 10:49:51 AM	
Fluoride	0.5116	mg/L	0.10	102	90	110			
Chloride	5.003	mg/L	0.10	100	90	110			
Bromide	2.520	mg/L	0.10	101	90	110			
Nitrate (As N)+Nitrite (As N)	3.553	mg/L	0.10	102	90	110			
Phosphorus, Orthophosphate (As P)	5.036	mg/L	0.50	101	90	110			
Sulfate	10.11	mg/L	0.50	101	90	110			
Method: E310.1									
Sample ID: MB		*MBLK*			Batch ID: **R22655**		Analysis Date:	3/1/2007	
Alkalinity, Total (As CaCO3)	2.000	mg/L CaC	2.0						
Carbonate	ND	mg/L CaC	2.0						
Bicarbonate	2.000	mg/L CaC	2.0						
Sample ID: LCS		*LCS*			Batch ID: **R22655**		Analysis Date:	3/1/2007	
Alkalinity, Total (As CaCO3)	80.00	mg/L CaC	2.0	97.5	80	120			

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8270C									
Sample ID: MB-12384		*MBLK*			Batch ID: **12384**		Analysis Date:		3/9/2007
Acenaphthene	ND	µg/L	10						
Acenaphthylene	ND	µg/L	10						
Aniline	ND	µg/L	20						
Anthracene	ND	µg/L	10						
Azobenzene	ND	µg/L	10						
Benz(a)anthracene	ND	µg/L	15						
Benzo(a)pyrene	ND	µg/L	10						
Benzo(b)fluoranthene	ND	µg/L	15						
Benzo(g,h,i)perylene	ND	µg/L	10						
Benzo(k)fluoranthene	ND	µg/L	10						
Benzoic acid	ND	µg/L	50						
Benzyl alcohol	ND	µg/L	20						
Bis(2-chloroethoxy)methane	ND	µg/L	10						
Bis(2-chloroethyl)ether	ND	µg/L	15						
Bis(2-chloroisopropyl)ether	ND	µg/L	15						
Bis(2-ethylhexyl)phthalate	ND	µg/L	15						
4-Bromophenyl phenyl ether	ND	µg/L	10						
Butyl benzyl phthalate	ND	µg/L	15						
Carbazole	ND	µg/L	10						
4-Chloro-3-methylphenol	ND	µg/L	20						
4-Chloroaniline	ND	µg/L	20						
2-Chloronaphthalene	ND	µg/L	10						
2-Chlorophenol	ND	µg/L	10						
4-Chlorophenyl phenyl ether	ND	µg/L	15						
Chrysene	ND	µg/L	15						
Di-n-butyl phthalate	ND	µg/L	10						
Di-n-octyl phthalate	ND	µg/L	15						
Dibenz(a,h)anthracene	ND	µg/L	10						
Dibenzofuran	ND	µg/L	10						
1,2-Dichlorobenzene	ND	µg/L	10						
1,3-Dichlorobenzene	ND	µg/L	10						
1,4-Dichlorobenzene	ND	µg/L	10						
3,3'-Dichlorobenzidine	ND	µg/L	15						
Diethyl phthalate	ND	µg/L	10						
Dimethyl phthalate	ND	µg/L	10						
2,4-Dichlorophenol	ND	µg/L	10						
2,4-Dimethylphenol	ND	µg/L	10						
4,6-Dinitro-2-methylphenol	ND	µg/L	50						
2,4-Dinitrophenol	ND	µg/L	50						
2,4-Dinitrotoluene	ND	µg/L	10						
2,6-Dinitrotoluene	ND	µg/L	10						
Fluoranthene	ND	µg/L	10						
Fluorene	ND	µg/L	10						
Hexachlorobenzene	ND	µg/L	10						

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8270C									
Sample ID: MB-12384		*MBLK*			Batch ID: **12384**		Analysis Date:		3/9/2007
Hexachlorobutadiene	ND	µg/L	10						
Hexachlorocyclopentadiene	ND	µg/L	50						
Hexachloroethane	ND	µg/L	10						
Indeno(1,2,3-cd)pyrene	ND	µg/L	10						
Isophorone	ND	µg/L	10						
2-Methylnaphthalene	ND	µg/L	10						
2-Methylphenol	ND	µg/L	15						
3+4-Methylphenol	ND	µg/L	20						
N-Nitrosodi-n-propylamine	ND	µg/L	10						
N-Nitrosodimethylamine	ND	µg/L	10						
N-Nitrosodiphenylamine	ND	µg/L	10						
Naphthalene	ND	µg/L	10						
2-Nitroaniline	ND	µg/L	50						
3-Nitroaniline	ND	µg/L	50						
4-Nitroaniline	ND	µg/L	20						
Nitrobenzene	ND	µg/L	10						
2-Nitrophenol	ND	µg/L	15						
4-Nitrophenol	ND	µg/L	50						
Pentachlorophenol	ND	µg/L	50						
Phenanthrene	ND	µg/L	10						
Phenol	ND	µg/L	10						
Pyrene	ND	µg/L	15						
Pyridine	ND	µg/L	30						
1,2,4-Trichlorobenzene	ND	µg/L	10						
2,4,5-Trichlorophenol	ND	µg/L	10						
2,4,6-Trichlorophenol	ND	µg/L	15						
Sample ID: LCS-12384		*LCS*			Batch ID: **12384**		Analysis Date:		3/9/2007
Acenaphthene	62.86	µg/L	10	62.9	11	123			
4-Chloro-3-methylphenol	125.8	µg/L	20	62.9	15.4	119			
2-Chlorophenol	120.9	µg/L	10	60.4	12.2	122			
1,4-Dichlorobenzene	54.26	µg/L	10	54.3	16.9	100			
2,4-Dinitrotoluene	59.24	µg/L	10	59.2	13	138			
N-Nitrosodi-n-propylamine	62.42	µg/L	10	62.4	9.93	122			
4-Nitrophenol	65.96	µg/L	50	33.0	12.5	87.4			
Pentachlorophenol	149.0	µg/L	50	74.5	3.55	114			
Phenol	69.76	µg/L	10	34.9	7.53	73.1			
Pyrene	71.24	µg/L	15	71.2	12.6	140			
1,2,4-Trichlorobenzene	52.92	µg/L	10	52.9	17.4	98.7			
Sample ID: LCSD-12384		*LCSD*			Batch ID: **12384**		Analysis Date:		3/9/2007
Acenaphthene	55.88	µg/L	10	55.9	11	123	11.8	30.5	
4-Chloro-3-methylphenol	113.3	µg/L	20	56.7	15.4	119	10.4	28.6	
2-Chlorophenol	104.3	µg/L	10	52.1	12.2	122	14.8	107	
1,4-Dichlorobenzene	45.84	µg/L	10	45.8	16.9	100	16.8	62.1	
2,4-Dinitrotoluene	51.70	µg/L	10	51.7	13	138	13.6	14.7	

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8270C									
Sample ID: LCSD-12384		*LCSD*			Batch ID:	**12384**	Analysis Date:		3/9/2007
N-Nitrosodi-n-propylamine	51.10	µg/L	10	51.1	9.93	122	19.9	30.3	
4-Nitrophenol	60.10	µg/L	50	30.0	12.5	87.4	9.30	36.3	
Pentachlorophenol	136.8	µg/L	50	68.4	3.55	114	8.55	49	
Phenol	60.44	µg/L	10	30.2	7.53	73.1	14.3	52.4	
Pyrene	65.90	µg/L	15	65.9	12.6	140	7.79	16.3	
1,2,4-Trichlorobenzene	46.98	µg/L	10	47.0	17.4	98.7	11.9	36.4	

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8310									
Sample ID: MB-12381		*MBLK*			Batch ID: **12381**		Analysis Date:	3/5/2007 12:46:34 PM	
Naphthalene	ND	µg/L	5.0						
1-Methylnaphthalene	ND	µg/L	5.0						
2-Methylnaphthalene	ND	µg/L	5.0						
Acenaphthylene	ND	µg/L	2.5						
Acenaphthene	ND	µg/L	5.0						
Fluorene	ND	µg/L	0.80						
Phenanthrene	ND	µg/L	0.60						
Anthracene	ND	µg/L	0.60						
Fluoranthene	ND	µg/L	0.30						
Pyrene	ND	µg/L	0.30						
Benz(a)anthracene	ND	µg/L	0.050						
Chrysene	ND	µg/L	0.20						
Benzo(b)fluoranthene	ND	µg/L	0.10						
Benzo(k)fluoranthene	ND	µg/L	0.020						
Benzo(a)pyrene	ND	µg/L	0.030						
Dibenz(a,h)anthracene	ND	µg/L	0.040						
Benzo(g,h,i)perylene	ND	µg/L	0.080						
Indeno(1,2,3-cd)pyrene	ND	µg/L	0.080						
Sample ID: LCS-12381		*LCS*			Batch ID: **12381**		Analysis Date:	3/5/2007 1:34:33 PM	
Naphthalene	20.85	µg/L	5.0	52.1	33.9	87.9			
1-Methylnaphthalene	19.63	µg/L	5.0	49.0	35.2	85			
2-Methylnaphthalene	19.59	µg/L	5.0	49.0	33.7	83.9			
Acenaphthylene	26.31	µg/L	2.5	65.6	55	97.9			
Acenaphthene	22.80	µg/L	5.0	57.0	42.2	86.6			
Fluorene	2.560	µg/L	0.80	63.8	47.3	85.1			
Phenanthrene	1.280	µg/L	0.60	63.7	53.5	97.3			
Anthracene	1.280	µg/L	0.60	63.7	53.6	93.7			
Fluoranthene	2.850	µg/L	0.30	71.1	60.1	98.5			
Pyrene	2.830	µg/L	0.30	70.6	57.5	108			
Benz(a)anthracene	0.3000	µg/L	0.050	74.8	57.7	106			
Chrysene	1.390	µg/L	0.20	69.2	59.1	112			
Benzo(b)fluoranthene	0.3600	µg/L	0.10	71.9	67	110			
Benzo(k)fluoranthene	0.1900	µg/L	0.020	76.0	63.2	106			
Benzo(a)pyrene	0.1800	µg/L	0.030	71.7	49.7	109			
Dibenz(a,h)anthracene	0.3800	µg/L	0.040	75.8	54.1	111			
Benzo(g,h,i)perylene	0.3900	µg/L	0.080	70.0	51.3	111			
Indeno(1,2,3-cd)pyrene	0.8310	µg/L	0.080	82.9	52.3	103			
Sample ID: LCSD-12381		*LCSD*			Batch ID: **12381**		Analysis Date:	3/7/2007 11:00:12 PM	
Naphthalene	20.88	µg/L	5.0	52.2	33.9	87.9	0.144	32.1	
1-Methylnaphthalene	20.41	µg/L	5.0	50.9	35.2	85	3.90	32.7	
2-Methylnaphthalene	20.37	µg/L	5.0	50.9	33.7	83.9	3.90	34	
Acenaphthylene	26.77	µg/L	2.5	66.7	55	97.9	1.73	38.8	
Acenaphthene	23.71	µg/L	5.0	59.3	42.2	86.6	3.91	38.6	
Fluorene	2.560	µg/L	0.80	63.8	47.3	85.1	0	29.3	

Qualifiers:

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- S Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8310									
Sample ID: LCSD-12381		*LCSD*			Batch ID: **12381**		Analysis Date:		3/7/2007 11:00:12 PM
Phenanthrene	1.350	µg/L	0.60	67.2	53.5	97.3	5.32	25	
Anthracene	1.340	µg/L	0.60	66.7	53.6	93.7	4.58	23.9	
Fluoranthene	2.980	µg/L	0.30	74.3	60.1	98.5	4.46	15.7	
Pyrene	2.870	µg/L	0.30	71.6	57.5	108	1.40	15.3	
Benz(a)anthracene	0.3200	µg/L	0.050	79.8	57.7	106	6.45	19	
Chrysene	1.490	µg/L	0.20	74.1	59.1	112	6.94	16.6	
Benzo(b)fluoranthene	0.3900	µg/L	0.10	77.8	67	110	8.00	21.7	
Benzo(k)fluoranthene	0.2000	µg/L	0.020	80.0	63.2	106	5.13	19.4	
Benzo(a)pyrene	0.1900	µg/L	0.030	75.7	49.7	109	5.41	16.7	
Dibenz(a,h)anthracene	0.4000	µg/L	0.040	79.8	54.1	111	5.13	17.3	
Benzo(g,h,i)perylene	0.4100	µg/L	0.080	82.0	51.3	111	5.00	18	
Indeno(1,2,3-cd)pyrene	0.8840	µg/L	0.080	88.2	52.3	103	6.18	17.7	
Method: SW7470									
Sample ID: 0702246-01CMSD		*MSD*			Batch ID: **12426**		Analysis Date:		3/2/2007
Mercury	0.004974	mg/L	0.00020	99.5	75	125	0.151	20	
Sample ID: LCS-12426		*LCS*			Batch ID: **12426**		Analysis Date:		3/2/2007
Mercury	0.005014	mg/L	0.00020	100	80	120			
Sample ID: 0702246-01CMS		*MS*			Batch ID: **12426**		Analysis Date:		3/2/2007
Mercury	0.004966	mg/L	0.00020	99.3	75	125			

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
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R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW6010A									
Sample ID: 0702246-01C MSD		*MSD*			Batch ID: **R22714**		Analysis Date:		3/6/2007 1:44:27 PM
Magnesium	67.68	mg/L	1.0	89.3	75	125	1.33	20	
Potassium	50.92	mg/L	1.0	82.1	75	125	1.94	20	
Sodium	96.72	mg/L	1.0	86.6	75	125	0.521	20	
Sample ID: 0702246-01C MSD		*MSD*			Batch ID: **R22714**		Analysis Date:		3/6/2007 2:35:27 PM
Calcium	116.6	mg/L	2.0	84.4	75	125	0.623	20	
Sodium	91.93	mg/L	2.0	82.5	75	125	0.552	20	
Sample ID: MB		*MBLK*			Batch ID: **R22714**		Analysis Date:		3/6/2007 12:05:04 PM
Calcium	ND	mg/L	1.0						
Magnesium	ND	mg/L	1.0						
Potassium	ND	mg/L	1.0						
Sodium	ND	mg/L	1.0						
Sample ID: LCS		*LCS*			Batch ID: **R22714**		Analysis Date:		3/6/2007 12:07:54 PM
Calcium	47.88	mg/L	1.0	94.3	80	120			
Magnesium	48.47	mg/L	1.0	95.5	80	120			
Potassium	51.05	mg/L	1.0	92.4	80	120			
Sodium	51.73	mg/L	1.0	102	80	120			
Sample ID: 0702246-01C MS		*MS*			Batch ID: **R22714**		Analysis Date:		3/6/2007 1:41:48 PM
Magnesium	66.79	mg/L	1.0	87.5	75	125			
Potassium	49.94	mg/L	1.0	80.4	75	125			
Sodium	96.22	mg/L	1.0	85.6	75	125			
Sample ID: 0702246-01C MS		*MS*			Batch ID: **R22714**		Analysis Date:		3/6/2007 2:47:58 PM
Calcium	115.8	mg/L	2.0	82.9	75	125			
Sodium	91.42	mg/L	2.0	81.5	75	125			

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QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW6010A									
Sample ID: MB-12394		*MBLK*			Batch ID:	**12394**	Analysis Date:	3/6/2007 4:04:02 PM	
Aluminum	ND	mg/L	0.020						
Barium	ND	mg/L	0.020						
Magnesium	ND	mg/L	1.0						
Molybdenum	ND	mg/L	0.0080						
Nickel	ND	mg/L	0.010						
Selenium	ND	mg/L	0.050						
Silver	ND	mg/L	0.0050						
Vanadium	ND	mg/L	0.050						
Silica	ND	mg/L	1.1						
Sample ID: MB-12394		*MBLK*			Batch ID:	**12394**	Analysis Date:	3/7/2007 9:15:25 AM	
Antimony	ND	mg/L	0.050						
Arsenic	ND	mg/L	0.020						
Beryllium	ND	mg/L	0.0030						
Boron	ND	mg/L	0.040						
Cadmium	ND	mg/L	0.0020						
Calcium	ND	mg/L	1.0						
Chromium	ND	mg/L	0.0060						
Cobalt	ND	mg/L	0.0060						
Copper	ND	mg/L	0.0060						
Iron	ND	mg/L	0.050						
Lead	ND	mg/L	0.0050						
Magnesium	ND	mg/L	1.0						
Manganese	ND	mg/L	0.0020						
Potassium	ND	mg/L	1.0						
Sodium	ND	mg/L	1.0						
Zinc	ND	mg/L	0.050						
Sample ID: MB-12394		*MBLK*			Batch ID:	**12394**	Analysis Date:	3/7/2007 2:32:24 PM	
Thallium	ND	mg/L	0.050						
Sample ID: LCS-12394		*LCS*			Batch ID:	**12394**	Analysis Date:	3/6/2007 4:07:05 PM	
Aluminum	0.4799	mg/L	0.020	96.0	80	120			
Barium	0.4670	mg/L	0.020	93.4	80	120			
Magnesium	49.90	mg/L	1.0	99.5	80	120			
Molybdenum	0.4963	mg/L	0.0080	99.3	80	120			
Nickel	0.4536	mg/L	0.010	90.7	80	120			
Selenium	0.4159	mg/L	0.050	83.2	80	120			
Silver	0.4783	mg/L	0.0050	95.4	80	120			
Vanadium	0.4871	mg/L	0.050	97.4	80	120			
Silica	5.255	mg/L	1.1	98.2	80	120			
Sample ID: LCS-12394		*LCS*			Batch ID:	**12394**	Analysis Date:	3/7/2007 9:19:22 AM	
Antimony	0.5641	mg/L	0.050	107	80	120			
Arsenic	0.5036	mg/L	0.020	101	80	120			
Beryllium	0.5085	mg/L	0.0030	102	80	120			
Boron	0.5039	mg/L	0.040	101	80	120			

Qualifiers:

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QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW6010A									
Sample ID: LCS-12394		*LCS*			Batch ID: **12394**		Analysis Date:	3/7/2007 9:19:22 AM	
Cadmium	0.4889	mg/L	0.0020	97.7	80	120			
Calcium	51.68	mg/L	1.0	102	80	120			
Chromium	0.4976	mg/L	0.0060	99.5	80	120			
Cobalt	0.5046	mg/L	0.0060	101	80	120			
Copper	0.5214	mg/L	0.0060	104	80	120			
Iron	0.5189	mg/L	0.050	98.2	80	120			
Lead	0.4882	mg/L	0.0050	97.6	80	120			
Magnesium	51.72	mg/L	1.0	102	80	120			
Manganese	0.4915	mg/L	0.0020	98.3	80	120			
Potassium	53.98	mg/L	1.0	107	80	120			
Sodium	54.56	mg/L	1.0	108	80	120			
Zinc	0.4767	mg/L	0.050	95.0	80	120			
Sample ID: LCS-12394		*LCS*			Batch ID: **12394**		Analysis Date:	3/7/2007 2:34:54 PM	
Thallium	0.5030	mg/L	0.050	101	80	120			
Method: E160.1									
Sample ID: MB-12387		*MBLK*			Batch ID: **12387**		Analysis Date:	2/26/2007	
Total Dissolved Solids	ND	mg/L	20						
Sample ID: LCS-12387		*LCS*			Batch ID: **12387**		Analysis Date:	2/26/2007	
Total Dissolved Solids	1005	mg/L	20	100	80	120			

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QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8260B									
Sample ID: 5mL rb		*MBLK*			Batch ID: **R22689**	Analysis Date:		3/4/2007	
Benzene	ND	µg/L	1.0						
Toluene	ND	µg/L	1.0						
Ethylbenzene	ND	µg/L	1.0						
Methyl tert-butyl ether (MTBE)	ND	µg/L	1.0						
1,2,4-Trimethylbenzene	ND	µg/L	1.0						
1,3,5-Trimethylbenzene	ND	µg/L	1.0						
1,2-Dichloroethane (EDC)	ND	µg/L	1.0						
1,2-Dibromoethane (EDB)	ND	µg/L	1.0						
Naphthalene	ND	µg/L	2.0						
1-Methylnaphthalene	ND	µg/L	4.0						
2-Methylnaphthalene	ND	µg/L	4.0						
Acetone	ND	µg/L	10						
Bromobenzene	ND	µg/L	1.0						
Bromochloromethane	ND	µg/L	1.0						
Bromodichloromethane	ND	µg/L	1.0						
Bromoform	ND	µg/L	1.0						
Bromomethane	ND	µg/L	2.0						
2-Butanone	ND	µg/L	10						
Carbon disulfide	ND	µg/L	10						
Carbon Tetrachloride	ND	µg/L	2.0						
Chlorobenzene	ND	µg/L	1.0						
Chloroethane	ND	µg/L	2.0						
Chloroform	ND	µg/L	1.0						
Chloromethane	ND	µg/L	1.0						
2-Chlorotoluene	ND	µg/L	1.0						
4-Chlorotoluene	ND	µg/L	1.0						
cis-1,2-DCE	ND	µg/L	1.0						
cis-1,3-Dichloropropene	ND	µg/L	1.0						
1,2-Dibromo-3-chloropropane	ND	µg/L	2.0						
Dibromochloromethane	ND	µg/L	1.0						
Dibromomethane	ND	µg/L	2.0						
1,2-Dichlorobenzene	ND	µg/L	1.0						
1,3-Dichlorobenzene	ND	µg/L	1.0						
1,4-Dichlorobenzene	ND	µg/L	1.0						
Dichlorodifluoromethane	ND	µg/L	1.0						
1,1-Dichloroethane	ND	µg/L	2.0						
1,1-Dichloroethene	ND	µg/L	1.0						
1,2-Dichloropropane	ND	µg/L	1.0						
1,3-Dichloropropane	ND	µg/L	1.0						
2,2-Dichloropropane	ND	µg/L	2.0						
1,1-Dichloropropene	ND	µg/L	1.0						
Hexachlorobutadiene	ND	µg/L	2.0						
2-Hexanone	ND	µg/L	10						
Isopropylbenzene	ND	µg/L	1.0						

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QA/QC SUMMARY REPORT

Client: NM Oil Conservation Division
Project: Navajo Artesia Refinery **Work Order:** 0702246

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SW8260B									
Sample ID: 5mL rb		*MBLK*			Batch ID: **R22689**		Analysis Date:		3/4/2007
4-Isopropyltoluene	ND	µg/L	1.0						
4-Methyl-2-pentanone	ND	µg/L	10						
Methylene Chloride	ND	µg/L	3.0						
n-Butylbenzene	ND	µg/L	1.0						
n-Propylbenzene	ND	µg/L	1.0						
sec-Butylbenzene	ND	µg/L	2.0						
Styrene	ND	µg/L	1.5						
tert-Butylbenzene	ND	µg/L	1.0						
1,1,1,2-Tetrachloroethane	ND	µg/L	1.0						
1,1,2,2-Tetrachloroethane	ND	µg/L	1.0						
Tetrachloroethene (PCE)	ND	µg/L	1.0						
trans-1,2-DCE	ND	µg/L	1.0						
trans-1,3-Dichloropropene	ND	µg/L	1.0						
1,2,3-Trichlorobenzene	ND	µg/L	1.0						
1,2,4-Trichlorobenzene	ND	µg/L	1.0						
1,1,1-Trichloroethane	ND	µg/L	1.0						
1,1,2-Trichloroethane	ND	µg/L	1.0						
Trichloroethene (TCE)	ND	µg/L	1.0						
Trichlorofluoromethane	ND	µg/L	1.0						
1,2,3-Trichloropropane	ND	µg/L	2.0						
Vinyl chloride	ND	µg/L	1.0						
Xylenes, Total	ND	µg/L	3.0						
Sample ID: 100ng lcs		*LCS*			Batch ID: **R22689**		Analysis Date:		3/4/2007
Benzene	19.54	µg/L	1.0	97.7	75.6	111			
Toluene	17.87	µg/L	1.0	89.3	69.6	113			
Chlorobenzene	18.54	µg/L	1.0	92.7	79.7	112			
1,1-Dichloroethene	20.90	µg/L	1.0	105	72.5	121			
Trichloroethene (TCE)	17.25	µg/L	1.0	86.3	63.7	123			

Qualifiers:

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R	RPD outside accepted recovery limits	S	Spike recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name NMOCD SF | Date and Time Received: 2/22/2007

Work Order Number 0702246 | Received by AT

Checklist completed by Anne Thome 2/22/07
Signature | Date

Matrix | Carrier name Client drop-off

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☐	Not Shipped ☑
Custody seals intact on sample bottles?	Yes ☐	No ☑	N/A ☐	
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 ☐		
Water - VOA vials have zero headspace? No VOA vials submitted ☐		Yes ☑	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☑	No ☐	N/A ☐	
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	
Container/Temp Blank temperature?	1°	*4° C ± 2 Acceptable* If given sufficient time to cool.		

COMMENTS:

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

Corrective Action _____

CHAIN-OF-CUSTODY RECORD

QA / QC Package: Std ☑ Level 4 ☐
Other:

Client: NMEMNRD - OCD
Carl Chavez

Address: 1220 N St. Francis DR.
Santa Fe, NM

Phone #: 505-476-3491
Fax #: " " -3462

Project Name: Navajo - Artesia Refinery
Project #:
Project Manager: Carl Chavez
Sampler: Carl Chavez, Ed Hansen, Brad Jones
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative $HgCl_2$	Preservative HNO_3	Preservative H_2SO_4	HEAL No.
2/19/07	14:45	Water	SW Ret Pond					0702246 -1
"	14:48	"	"					
"	14:50	"	"					
"	14:52	"	"			X		
"	14:54	"	"				X	
"	14:56	"	"					-1
			Trip Blank					-2

BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gasoline Only) | TPH Method 8015B (Gas/Diesel) | TPH (Method 418.1) | EDB (Method 504.1) | EDC (Method 8021) | 8310 (PNA or PAH) | RCRA 8 Metals | Anions (F, Cl, NO_3, NO_2, PO_4, SO_4) | 8081 Pesticides / PCB's (8082) | 8260B (VOA) | 8270 (Semi-VOA) | 6010 metals (OCD) | 7471 (2470 Hg) | Anion Cation Balance | Air Bubbles or Headspace (Y or N)

				X		
					X	
X						
					X	
					X	
						2

Date	Time	Relinquished By: (Signature)	Received By: (Signature)	
2/22/07	7:03	Carl Chavez		2/22/07
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)	0713

Remarks: Storm water retension pond samples.
N32.84991 EL. 3332'
W 104.38588

1. DEFINITIONS

1.1 "Acceptance of a sample" means the determination of HEAL to proceed with work following receipt and inspection of such sample.

1.2 "Customer" means the individual or entity who may request laboratory services and his or its heirs, successors, assigns, and representatives.

1.3 HEAL means Hall Environmental Analysis Laboratory its employees, servants, agents, and representative.

1.4 "Price schedule" means HEAL'S standard price schedule, as such, document may be amended from time to time by HEAL.

1.5 "Results" mean data generated by HEAL from the analysis of one or more samples.

1.6 "Terms and Conditions" mean these Terms and Conditions of sale, including the Price Schedule, and any additions or amendments hereto which are agreed to in writing by HEAL as provided in Section 7.1

2. ORDERS

2.1 The customer may order services by submitting a written purchase order to HEAL, by placing a telephone order, which will be subsequently confirmed in writing, or by negotiated contract. Any such order constitutes a) an acceptance by the Customer of HEAL'S offer to do business with the Customer under these Terms and Conditions, and b) an agreement to be bound by these Terms and Conditions. The Customer's delivery of samples to HEAL constitutes the Customer's express assent to be governed by these Terms and Conditions. HEAL reserves the right to refuse to proceed with work at any time based upon an unfavorable customer credit report.

2.2 Any order placed by the Customer under Section 2.1 is subject to a minimum cancellation charge of $250.

3. PAYMENT TERMS

3.1 Services performed by HEAL will be in accordance with prices quoted and later confirmed in writing or as stated on the Price Schedule, which prices are subject to change periodically without notice. The Customer should confirm with HEAL the current price prior to placing an order for work.

3.2 Payment terms are net 30 days from the date of invoice by HEAL. All overdue payments are subject to an additional interest and service charge of one and one-half percent (1.5%) per month or portion thereof from the due date until the date of payment. All payments shall be made in United State currency.

3.3 The prices stated on the Price Schedule do not include any sales, use or other taxes unless specifically stated. Such taxes will be added to invoice prices when required.

4. RECEIPT OF SAMPLES AND DELIVERY OF SERVICES

4.1 Prior to HEAL'S Acceptance of any sample (or after any revocation of Acceptance), the entire risk of loss or damage to such sample will remain with the Customer. In no event will HEAL have any responsibility or liability for the action or inaction of HEAL'S carrier shipping or delivering any sample to or from HEAL'S premises.

4.2 HEAL reserves the absolute right, exercisable at any time to refuse delivery of, refuse to accept, or revoke Acceptance or, any sample which in the sole judgement of HEAL a) is of unsuitable volume, b) unsuitable containers as required for the requested analysis, or c) may be or become unsuitable for, or may pose a risk in, handling, transport or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to HEAL by the Customer.

4.3 Where applicable, HEAL will use analytical methodologies which are in substantial conformity with U.S. Environmental Protection Agency (EPA), state agency, American Society for Testing and Materials (ASTM), Association of Official Analytical Chemist (AOAC), Standard Methods for the examination of Water and Wastewater, or other recognized methodologies. HEAL reserves the right to deviate from these methodologies, if necessary or appropriate due to the nature of composition of the sample or otherwise based on the reasonable judgement of HEAL, which deviation, if any will be made on a basis consistent with recognized standards of industry and/ or HEAL'S Standard Operating Procedures.

4.4 Upon timely delivery of samples, HEAL will use its best efforts to comply with storage, processing and analytical holding time limits as set forth in applicable EPA or state guidelines or otherwise requested by the Customer or set forth on the Price Schedule. However, unless specifically made part of a written agreement between HEAL and the Customer, such time limits cannot be guaranteed. Unless specifically indicated on the Price Schedule or expressly made part of a written agreement between HEAL and the Customer, analytical turnaround times are not guaranteed.

4.5 At HEAL'S sole discretion, verbal Results may be given in advance of the written report of Results. Such verbal Results are TENTATIVE RESULTS ONLY, subject to confirmation or change based on HEAL'S standard quality assurance review procedures.

5. WARRANTIES, LIABILITY AND INDEMNIFICATION

5.1 HEAL warrants only that its services will fulfill obligations set forth in Section 4.3 and 4.4 hereof. This warranty is the sole and exclusive warranty given by HEAL in connection with any such services, and HEAL gives and makes no other representation or warranty of any kind, express or implied. No representative of HEAL is authorized to give or make any other representation or warranty or modify the warranty in any way.

5.2 The liability and obligations of HEAL, and the remedies of the Customer in connection with any services performed by HEAL will be limited to repeating the services performed or, at the sole option of HEAL, refunding in full or in part fees paid by the Customer for such services. HEAL'S obligation to repeat any services with respect to any sample will be contingent on the Customer's providing, at the request of HEAL and at the Customer's expense, an additional sample if necessary. Any reanalysis generating Results consistent with the Original Results will be at the Customer's expense. Except as otherwise specifically provided herein, HEAL shall have no liability, obligation or responsibility of any kind for any losses, costs, expenses, or other damages (including but not limited to any special, indirect, incidental or consequential damages) for any representation or warranty of a kind with respect to HEAL'S Services or Results.

5.3 In no event shall HEAL have any responsibility or liability to the Customer for any failure or delay in performance by HEAL, which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of HEAL. Such cause and circumstance shall include, but not be limited to, acts of God, acts of Customer, acts of orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disputes, difficulties or delays in transportation, mail or delivery services, inability to obtain from HEAL usual sources sufficient services or supplies, or any other cause beyond HEAL'S reasonable control.

5.4 All results provided by HEAL are strictly for the use of its Customers, and HEAL is in no way responsible for the use of such results by Customers or third parties. All results should be considered in their entirety, and HEAL is in no way responsible for the separation, detachment, or other use of any portion of the results.

5.5 The customer represents and warrants that any sample delivered to HEAL will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by the customer. The Customer further warrants that any sample containing any hazardous substance, which is to be delivered to HEAL'S premises will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

5.6 It is understood and agreed that all samples and cuttings of materials containing hazardous contaminants are the property and the responsibility of the Customer. All contaminated samples and laboratory byproducts will be returned to the Customer for disposal. It is understood and agreed that HEAL is not, and has no responsibility as, a generator, treater, storer, or disposer of hazardous or toxic substances found or identified at a site, and the Customer agrees to assume the responsibility for the foregoing.

5.7 The Customer shall indemnify and hold harmless HEAL from and against any and all claims, suits, judgements, damages, losses, liabilities, expenses, payments, taxes, duties, fines and/or other costs (including but not limited to liability to a third party) arising out of a) the presence of hazardous substances in any sample of the Customer regardless of the Customer's compliance with paragraph 5.5 hereof b) accidents occurring during the transport of any sample of the Customer, c) events control, or d) negligence by the Customer in the use, evaluation, or application of Results provided by HEAL.

5.8 Should any Customer sample, due to its matrix or constituents of its matrix, cause the operations of any HEAL instrumentation to be reduced, stopped, or altered, HEAL is entitled to compensation by the Customer for any loss of revenue due to the instrument's downtime, and/or the parts and labor necessary to bring the instruments back to its former operating condition. The amount of compensation is negotiable upon acceptance of these Terms and Conditions and the individual circumstances warranting the reimbursement.

6. ENTIRE AGREEMENT: SEVERABILITY

6.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by HEAL as provided in Section 7.1, embodied the whole agreement of the parties. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein, unless made in accordance with Section 7.1; and these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Customer and HEAL. HEAL specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Customer to HEAL.

6.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions, the intent of the parties being that the provisions be severable.

7. AMENDMENTS AND WAIVERS

7.1 HEAL shall not be subject to or bound by any provision, term or condition which is in addition to or inconsistent or conflicting with these Terms and Conditions. HEAL shall not be deemed to have amended or waived and provision, term or condition, or have given any required consent or approval, or to have waived any breach by the Customer of any of these Terms and Conditions unless specifically set forth in writing and executed on behalf of HEAL by a duly authorized officer. No other employee, servant, agent or representatives of HEAL has any authority whatsoever to add to, delete, alter or vary any of these Terms and Conditions in any manner, or to give any consent, approval or waiver, and HEAL shall not be bound by any such purported addition, deletion, alteration, variation, consent, approval or waiver.

7.2 No waiver by HEAL of any provision, term or condition hereof or of any breach by or obligation of the Customer hereunder shall constitute a waiver of such provision, term or condition on any other occasion or a waiver of any other breach by or obligation of the Customer.

8. SAMPLE STORAGE

8.1 Bulk samples will be retained for thirty (30) days after the analytical report has been issued unless alternate arrangements have been made in advance. Storage of samples or extracts for longer periods is by request only. Sample storage charges depend upon storage requirements and duration. Nominally, a sample storage fee of $5.00 per sample, per month will be billed monthly unless other arrangements are made. If requested, unused sample material may be returned at the client's expense. Materials, which are identified as hazardous, will be returned to the client or disposed of as hazardous waste and billed at the rate of $25.00 per sample. HEAL reserves the right to return all dibenzodioxins/dibenzofurans to the client.

9. SECTION HEADING

9.1 The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way These Terms and Conditions or their interpretations.

10. GOVERNING LAW

10.1 These Terms and Conditions, and transaction or agreement, to which they apply, shall be governed both as to interpretation and performance by the laws of the State of New Mexico.

CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other: _____

Client:

Address:

Phone #:

Fax #:

Project Name:

Project #:

Project Manager:

Sampler:

Sample Temperature:

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative			HEAL No.
					$HgCl_2$	HNO_3		

Date: Time: Relinquished By: (Signature) Received By: (Signature)

Date: Time: Relinquished By: (Signature) Received By: (Signature)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles or Headspace (Y or N)

Remarks:

1. DEFINITIONS

1.1 "Acceptance of a sample" means the determination of HEAL to proceed with work following receipt and inspection of such sample.

1.2 "Customer" means the individual or entity who may request laboratory services and his or its heirs, successors, assigns, and representatives

1.3 HEAL means Hall Environmental Analysis Laboratory its employees, servants, agents, and representative.

1.4 "Price schedule" means HEAL'S standard price schedule, as such, document may be amended from time to time by HEAL.

1.5 "Results" mean data generated by HEAL from the analysis of one or more samples.

1.6 "Terms and Conditions" mean these Terms and Conditions of sale, including the Price Schedule, and any additions or amendments hereto which are agreed to in writing by HEAL as provided in Section 7.1

2. ORDERS

2.1 The customer may order services by submitting a written purchase order to HEAL, by placing a telephone order, which will be subsequently confirmed in writing, or by negotiated contract. Any such order constitutes a) an acceptance by the Customer of HEAL'S offer to do business with the Customer under these Terms and Conditions, and b) an agreement to be bound by these Terms and Conditions. The Customer's delivery of samples to HEAL constitutes the Customer's express assent to be governed by these Terms and Conditions. HEAL reserves the right to refuse to proceed with work at any time based upon an unfavorable customer credit report.

2.2 Any order placed by the Customer under Section 2.1 is subject to a minimum cancellation charge of $250.

3. PAYMENT TERMS

3.1 Services performed by HEAL will be in accordance with prices quoted and later confirmed in writing or as stated on the Price Schedule, which prices are subject to change periodically without notice. The Customer should confirm with HEAL the current price prior to placing an order for work.

3.2 Payment terms are net 30 days from the date of invoice by HEAL. All overdue payments are subject to an additional interest and service charge of one and one-half percent (1.5%) per month or portion thereof from the due date until the date of payment. All payments shall be made in United State currency.

3.3 The prices stated on the Price Schedule do not include any sales, use or other taxes unless specifically stated. Such taxes will be added to invoice prices when required.

4. RECEIPT OF SAMPLES AND DELIVERY OF SERVICES

4.1 Prior to HEAL'S Acceptance of any sample (or after any revocation of Acceptance), the entire risk of loss or damage to such sample will remain with the Customer. In no event will HEAL have any responsibility or liability for the action or inaction of HEAL'S carrier shipping or delivering any sample to or from HEAL'S premises.

4.2 HEAL reserves the absolute right, exercisable at any time to refuse delivery of, refuse to accept, or revoke Acceptance of, any sample which in the sole judgement of HEAL a) is of unsuitable volume, b) unsuitable containers as required for the requested analysis, or c) may be or become unsuitable for, or may pose a risk in, handling, transport or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to HEAL by the Customer.

4.3 Where applicable, HEAL will use analytical methodologies which are in substantial conformity with U.S. Environmental Protection Agency (EPA), state agency, American Society for Testing and Materials (ASTM), Association of Official Analytical Chemist (AOAC), Standard Methods for the examination of Water and Wastewater, or other recognized methodologies. HEAL reserves the right to deviate from these methodologies, if necessary or appropriate due to the nature of composition of the sample or otherwise based on the reasonable judgement of HEAL, which deviation, if any will be made on a basis consistent with recognized standards of industry and/ or HEAL'S Standard Operating Procedures.

4.4 Upon timely delivery of samples, HEAL will use its best efforts to comply with storage, processing and analytical holding time limits as set forth in applicable EPA or state guidelines or otherwise requested by the Customer or set forth on the Price Schedule. However, unless specifically made part of a written agreement between HEAL and the Customer, such time limits cannot be guaranteed. Unless specifically indicated on the Price Schedule or expressly made part of a written agreement between HEAL and the Customer, analytical turnaround times are not guaranteed.

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NAVAJO REFINING COMPANY

FAX
(505) 746-5283 DIV. ORDERS
(505) 746-5481 TRUCKING
(505) 746-5458 PERSONNEL

501 EAST MAIN STREET ◦ P. O. BOX 159
ARTESIA, NEW MEXICO 88211-0159
TELEPHONE (505) 748-3311

FAX
(505) 746-5419 ACCOUNTING
(505) 746-5451 EXECUTIVE
(505) 746-5421 ENGINEERING
(505) 746-5480 P / L

November 21, 2001

Mr. Wayne Price
New Mexico Oil Conservation Division
Environmental Bureau
1220 S. St. Francis Dr.
Santa Fe, NM 87505-5472

RE: Discharge Plan Inspection – Old API Separator

Dear Wayne,

Navajo Refining Company requests approval to remove this concrete basin and dispose as non-hazardous waste at Controlled Recovery, Inc.'s landfill. Navajo removed all potentially hazardous wastes several years ago under NMED approval by sandblasting the cement down to clean concrete.

Once the basin has been removed, Navajo will investigate under the sump for WQCC contaminants and send a closure report to both NMED and OCD. Unless something unexpected is found, this investigation will constitute a sampling of soil just beneath the basin. The concrete of the basin shows no sign of cracks so a leak from the basin is unlikely. Also, as has been reported, Navajo had a gasoline leak from TK 106 5 years ago. This tank is directly up-gradient from this separator. We know the shallow groundwater in this area is contaminated from this leak. This leak is the reason the recovery trenches were installed on Tool Pushers Yard. Therefore, to get water samples under this separator would be pointless.

If there are any questions concerning this submission, please call me at 505-748-3311. Thank you for your attention to this matter.

Sincerely,
NAVAJO REFINING COMPANY

Darrell Moore
Environmental Manager for Water and Waste

Cc: Dave Cobrain, NMED

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

October 22, 2001

Lori Wrotenbery
Director
Oil Conservation Division

CERTIFIED MAIL
RETURN RECEIPT NO. 5357 7461

COPY

Mr. Darrell Moore
Environmental Manager for Water and Waste
Navajo Refining Company
P.O. Box 159
Artesia, New Mexico 88211-0159

Re: Discharge Plan Inspection GW-028 for Artesia Refinery

Dear Mr. Moore:

The New Mexico Oil Conservation Division (OCD) conducted a Discharge Plan inspection on October 15 through 17, 2001. Enclosed is a copy of the inspection report with photos for your records. As a result of the inspection the OCD requires Navajo Refining Company to address the following action items:

1. The Warehouse 5 chemical drum storage pad drainage sump was full: Please remove liquids.

2. The out-of-service water draw sumps for tanks 437 and 439 (see pictures #2 and #7) should be closed: Provide for OCD approval a closure plan.

3. Chemical Tote tanks in the crude oil pump area need proper containment. (see picture #3). No action required as Navajo corrected during inspection.

4. Crude oil pipeline pump area sump overflowed during inspection. (see picture #4). Navajo shall clean up spill and investigate extent of contamination. Results shall be reported on an OCD C-141 form.

5. Crude "LACT" unloading area (see picture #5) and Crude oil pump transfer pump area near tank 437 (see picture #6) oil is being discharge to ground. Please address this issue.

6. Gas-Oil Transfer pumps sump (see picture #8) bottom needs to be repaired. Please address.

7. Steam condensate is being discharge to ground (see picture 9&9a). Please address this issue.

8. Old API Separator (see picture #10) has standing fluids. OCD records indicate that Navajo removed the hazardous constituents, cleaned and rendered the concrete as non-hazardous. (see letter to NMED 1997) . OCD hereby approves of Navajo's verbal request to remove the concrete basin for proper disposal. Navajo shall investigate under the sump for any WQCC water contaminant and provide OCD a closure report by October 15, 2002.

9. South plant tank farm (see picture #11) tank # 419 (diesel) was recently repaired and was noted to have been leaking. Navajo's representatives indicated the most visually contaminated soils were removed. Navajo shall investigate the extent of the contamination and report it's findings to OCD.

10. Slurry Oil Treatment Area (see picture #12). Oil is reaching ground surface. Area needs containment. Please address.

11. Small leak or drip in one of the Carbon Black Oil (CBO) lines (see picture #13 & #14). Please address.

12. API separators (see picture # 15 typical) shall be cleaned out and inspected annually or have secondary containment with leak detection. Please address this issue.

13. Chemical Tote tanks (AST's) at API North Separator (see picture #16) need containment. Please address.

14. New Gas-Oil Hydro-Treater plant wastewater lines (see picture #17 & #18) under construction. Navajo shall submit a detail addendum to the recently submitted discharge plan renewal application to include this project for OCD approval.

15. OCD recommends that Navajo place labels on all groundwater recovery well tanks.

16. North Plant Gasoline Pipeline Pump area where sump overflowed. Navajo shall investigate the extent of the contamination and report its findings to OCD.

17. Waste Streams: Navajo indicated that all non-hazardous waste in the refinery is currently being disposed of at Controlled Recovery Inc. (CRI) an OCD permitted facility. The exception is office trash, which goes to the local landfill. Two waste streams were noted during the inspection that needs to be included in the discharge plan; (1) Plant Wastewater (slip stream) going to the City of Artesia POTW; and (2) The wastewater treatment by-product called "DAF" solids going to CRI. Navajo shall submit an addendum to the recently submitted discharge plan renewal application detailing all waste streams generated in the refinery. OCD recommends a waste flow diagram to simplify this process.

18. Mechanical Integrity of Wastewater Lines and Single Wall Sumps: Navajo shall submit an addendum to the recently submitted discharge plan renewal application to include an up-dated detail utility drawing with legers showing all old and new underground wastewater lines, sumps, below grade tanks, etc. A cross-reference sheet shall be provided to indicate when last test was performed and pass-fail results.

19. Stormwater Plan: Navajo shall submit an addendum to the recently submitted discharge plan renewal application to include a stormwater plan for the refinery. Navajo is building a new stormwater dyke (see pictures #9 & #10 taken October 15, 2001).

20. Groundwater Recovery Systems and Hazardous Waste Solid Waste Management Units (SMUs): In order to prevent redundant work required from two different agencies OCD recommends that Navajo, OCD and New Mexico Environment Department coordinate these activities jointly. As discussed during the exit interview OCD will set up a meeting to start this process.

In order for OCD to continue processing the discharge plan renewal application the above action items shall be completed and submitted to OCD by December 15, 2001. If you have any questions please do not hesitate to contact me at 505-476-3487 or E-mail WPRICE@state.nm.us.

Sincerely,

Wayne Price-Environmental Engineer

cc: Artesia Office
Dave Cobrain- NMED

Attachments-1

OCD ENVIRONMENTAL BUREAU

SITE INSPECTION SHEET

DATE: 10/15/01 Time: 1:30pm
10/16/01
10/17/01

Type of Facility: Refinery ☑ Gas Plant ☐ Compressor St. ☐ Brine St. ☐ Oilfield Service Co. ☐
Surface Waste Mgt. Facility ☐ E&P Site ☐ Crude Oil Pump Station ☐
Other ☐_____

Discharge Plan No ☐ Yes ☑ GW# 028

FACILITY NAME: ARTESIA REFINERY (≈ 60-70 K BBL/DAY)

PHYSICAL LOCATION: _____

Legal: QTR___QTR___ Sec___ TS___ R___ County EDDY

OWNER/OPERATOR (NAME) NAVAJO ~~REFINING~~ REFINING CO.

Contact Person: ~~DARRELL~~ MOORE - Tele:# 505-748-3311

MAILING ADDRESS: _____ State___ ZIP___

Owner/Operator Rep's:
DARRELL MOORE, ~~CHAS~~ CHARLIE PLYMALE

OCD INSPECTORS: W PRICE, M STUBBLEFIELD

1. Drum Storage: All drums containing materials other than fresh water must be stored on an impermeable pad with curbing. All empty drums will be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets will also be stored on an impermeable pad and curb type containment.
DRUMS IN OLD WASTEWATER TREATMENT AREA. ~~NOT STORED PROPERLY.~~ OK LM
These DRUMS HAVE BEEN TRIPLED RINSE.

2. Process Areas: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.
WAREHOUSE FIVE CHEMICAL PAD SUMP - SUMP STANDING FULL
PIC #2 - 437 WATER DRAW SUMP - @ PIC #7 439 WATER DRAW SUMP - REQUIRES CLOSURE
PIC #3 - PIPELINE PUMP AREA - TOTE TANK NEED'S CONTAINMENT
PIC #4 - " " " - SUMP OVERFLOW - REQUIRES ACTION
PIC #5 - CRUDE OIL LACT UNLOADING AREA - NEED'S CONTAINMENT
PIC #6 - 437 TK AREA CRUDE PUMP TRANSFER PUMPS NEED'S CONTAINMENT
PIC #8 - GAS-OIL TRANSFER PUMPS - SUMPS LOST INTEGRITY
PIC #13 - LEAK N PLT N TK FARM - REQUIRES ACTION
14

3. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new tanks or existing tanks that undergo a major modification, as determined by the Division, must be placed within an impermeable bermed enclosure.

PIC #16- A&T TOTE'S (CHEMICAL) NEED CONTAINMENT

PIC #(9), 9A STEAM CONDENSATE TRAPS DISCHARGING AROUND VARIOUS TANKS

TK 419- (DIESEL)- REQUIRES CLOSURE REPORT FROM RECENT SPILL (LEAK IN TK)

PIC #M- SOUTH PLANT N. TK FARM- 416, 417 419 REPAIR UNDER WAY

NAVAJO SHALL REPORT TO OCD ANY TANK THAT'S LOST INTEGRITY.

4. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable pad and curb type containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.

5. Labeling: All tanks, drums and containers will be clearly labeled to identify their contents and other emergency notification information.

RECOMMEND LABELING GROUNDWATER RECOVERY WELL TANKS

6. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps, or other OCD approved methods. The OCD will be notified at least 72 hours prior to all testing.

PIC# 1- MAIN BLENDER TK FARM SUMP- SINGLE WALL *

PIC # 10- OLD API NEAR ASPHALT TANKS - REQUIRES CLOSURE

PIC # 12- NORTH PLANT SURRY PITS - VISUAL CONTAMINATION ON GROUND!

PIC # 15- MAIN API SEPARATOR- SINGLE WALL (NORTH PLANT)

* ALL SINGLE WALL SUMPS REQUIRES INSPECTION

7. Underground Process/Wastewater Lines: All underground process/wastewater pipelines must be tested to demonstrate their mechanical integrity at present and then every 5 years thereafter, or prior to discharge plan renewal. The permittee may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD. The OCD will be notified at least 72 hours prior to all testing.

PIC # 17, 18- NEW WASTEWATER LINES FOR NEW ~~DIESEL~~ GAS-OIL HYDRO-TREATER

NAVAJO SHALL AMEND THE NEW D.P. APPLICATION TO INCLUDE HYDRO-TREATER PROJECT.

8. Onsite/Offsite Waste Disposal and Storage Practices: Are all wastes properly characterized and disposed of correctly?

Does the facility have an EPA hazardous waste number? _____ Yes _____ No

ARE ALL WASTE CHARACTERIZED AND DISPOSED OF PROPERLY? YES (NO) IF NO DETAIL BELOW.

"WASTEWATER NON-HAZARDOUS"

≈5K GAL/DAY GOES TO CITY OF ARTESIA – POTW – NAVAJO TO INCLUDE ON DISCHARGE PLAN

• NEED TO ADD DAF TO O.P. WASTE STREAM AS NON-HAZARDOUS ⇒ CRI

NAVAJO SENDS ALL NON-HAZ WASTE TO CRI

ONLY OFFICE TRASH GOES TO MUNICIPAL LANDFILL.

9. Class V Wells: Leach fields and other wastewater disposal systems at OCD regulated facilities which inject non-hazardous fluid into or above an underground source of drinking water are considered Class V injection wells under the EPA UIC program. All Class V wells that inject non-hazardous industrial wastes or a mixture of industrial wastes and domestic wastes will be closed unless it can be demonstrated that groundwater will not be impacted in the reasonably foreseeable future. Closure of Class V wells must be in accordance with a plan approved by the Division's Santa Fe Office. The OCD allows industry to submit closure plans which are protective of human health, the environment and groundwater as defined by the WQCC, and are cost effective. Class V wells that inject domestic waste only must be permitted by the New Mexico Environment Department.

ANY CLASS V WELLS NO ☑ YES ☐ IF YES DESCRIBE BELOW ! Undetermined ☐

10. Housekeeping: All systems designed for spill collection/prevention will be inspected weekly and after each storm event to ensure proper operation and to prevent overtopping or system failure. A record of inspections will be retained on site for a period of five years.

[redacted] GOOD

11. Spill Reporting: All spills/releases will be reported pursuant to OCD Rule 116 and WQCC 1203 to the proper OCD District Office.

REPORT ANY TANK THAT HAS LOST INTEGRITY.

NEED CLOSURE REPORT FOR TK 419 AREA & PIPELINE PUMP AREA (CRUDE) AND GASOLINE PIPELINE AREA.

12. **Does the facility have any other potential environmental concerns/issues?**

ON-GOING GROUNDWATER REMEDIATION
#20 RECOVERY SYSTEMS OPERATING
16 IN-PLANT ≈ # - OUT-PLANT
12 5

13. **Does the facility have any other environmental permits - i.e. SPCC, Stormwater Plan, etc.?**

SPCC - YES / STORMWATER - NOI TO OPT OUT of FEDERAL PLAN
NAVAJO TO SUBMIT STORMWATER PLAN AMENDMENT TO O.P. - (AMENDUM)

14. **ANY WATER WELLS ON SITE?** NO ☐ YES ☑ **IF YES, HOW IS IT BEING USED ?**

3 - FRESH WATER WELLS 10,000 BBL/DAY SAN AMBRES

15. **Documents reviewed:**

Miscellaneous Comments: WASTEWATER PONDS & 3 mi DITCH

10/15/01

PIC #1 - OUTFALL - LOOKING EAST
PIC #2 - " " IRRIGATION DRAINAGE
PIC # 3 - OLD WASTE WATER DITCH & (EAGLE ~~DRAW~~ - LOOKING WEST
#4 - " " " " LOOKING SE
#5 - EAGLE DRAW LOOKING EAST
6, - EAGLE DRAW & DITCH LOOKING WEST, 7- EAGLE DRAW - NE - 8.?
PIC #9 - NEW STORMWATER DIKE PREPREATION - PIC # 10 - LOOKING EAST, # 11 - WEST

Photos taken: _____

Documents Reviewed/Collected: _____

OLD WASTE WATER POND DRAWING

MEETING AGENDA

- TAKE PICTURES GAS P.L. AREA & WASTE WATER DRUM STORAGE
- DISCUSS INTERVIEW
- PIPELINE - & DITCH
- API
- JOINT MEET

Pic #1- Main blender tank farm sump- single wall.

Pic #2- Tank 437 water draw sump. Out of service. Requires closure.

Pic #3 - Pipeline pump area. Chemical tote tanks need containment.

Pic #4- Crude oil pipeline pump area spill. Sump over flowed oil.- Requires action.

Pic #5- Crude oil Lact unloading area needs containment.

Pic #6- 437 Crude oil tank transfer pumps. Needs containment.

Pic #7- 439 water draw sump. Out of service. Requires closures.

Pic #8- Gas-Oil transfer pumps sump. Bottom of sump has lost integrity.

Pic #9- Water discharged from steam condensate around asphalt tanks.

Pic #9a- Same as 9.

Pic #10- Old API separator located near the south side asphalt tank farm. Requires closure. Standing fluids.

Pic #11- South Plant Tank Farm. Tanks 417, 418, and 419.Area. 418 & 419 Tanks are being repaired. Tank above is receiving new floor and top. One tank 419 (Diesel) in this area was recently repaired and noted to have been leaking. This area requires an investigation to determine contamination extent.

Pic #12- Slurry oil treatment area. Oil is reaching ground surface. Area needs containment. Slurry pits schedule for inspection early December 2001.

Pic # 13- Active leak in CBO line North Plant N Tank Farm. Near LCO and CBO Tanks. Requires action.

Pic #14- Same as Above.

Pic #15- North Plant API Separator. ABT tanks shown in background. This separator is single wall and will be scheduled for inspected.

Pic # 16- AST's chemical tote tanks located next to Main API Separator needs containment.

Pic #17- New wastewater system for new north side Gas-Oil Hydro-treater.

Pic #18- Same as above. Navajo needs to submit design information for OCD approval and include in Discharge Plan.

Navajo-Artesia Refinery GW-028 Discharge Plan Inspection

Pic #1- Old wastewater pond area located 3 miles east of refinery. The picture shows the last outfall area. Picture looking east shows pond 2 & 3.

Pic #2- Same as Above. This is the last outfall area located between ponds #1 and ponds 2 and 3.

Pic #3- Area NW of wastewater ponds. Per Darrell Moore the 3 mile ditch was located on the left of the berm. The irrigation/drainage ditch on the right has not been identified but is connected to farm property to the west for drainage.

Pic#4- Picture looking SE. Shows old 3 mile refinery wastewater ditch and possible pipeline.

Pic #5- This picture shows the un-identified irrigation drainage ditch transgressing to the Pecos river.

Pic #6- Area where 3 mile ditch starts to parallel Eagle Draw. Picture looking NE. The 3 mile wastewater ditch is now on the north side of the Irrigation/drainage ditch.

Pic #7-Wastewater ditch. Eagle Draw is located to the right. Berm on left is divider between refinery (OLD) wastewater ditch and farm irrigation/drainage ditch. This is same irrigation/drainage ditch that is un-identified in previous pictures. Picture looking west.

Pic #8- Standing on irrigation/drainage ditch berm looking west.

Pic #9- SE corner of south plant farm area. Picture looking north. Area being prepared for new stormwater berm.

Pic # 10- North side of south plant farm area. Picture looking east at new stormwater berm being built.

Pic # 11- Same area as above looking west.

Summary: 10/15/01

Inspected old wastewater ponds located 3 miles east of refinery. All ponds are dry.

Drove the entire path where the old 3 mile wastewater ditch and pipeline was located. Crossed Haldeman and Bolton roads.

Inspected product recovery wells east of the refinery located on Bolton Road.

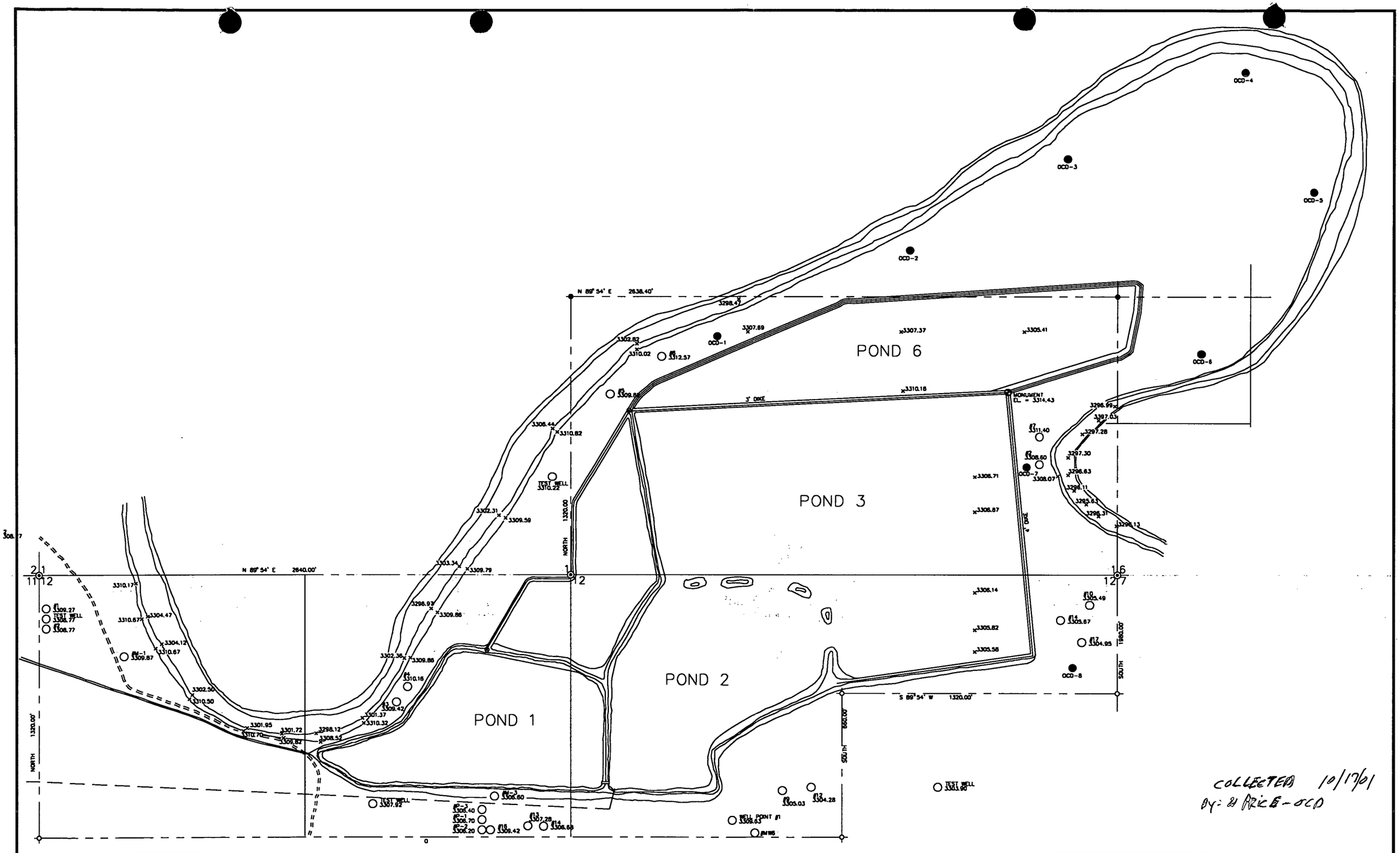
Inspected the north and south irrigation farms where the RO water is discharged.

Inspected the new storm water berm area located on the south plant farm.

Inspected plant storm water sheet flow areas.

Inspected the groundwater contamination area located just east of the south plant area.

Drove perimeter of entire plant, inspected the rail spur area. Reviewed the plants up-gradient monitor wells.



COLLECTED 10/17/01
BY: B. PRICE - OCD

NOTES
WINDMILL

REFERENCE DRAWINGS

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

NO.	REVISIONS	BY	CHK.	DATE	APPR.	APPR.

DRAWING TITLE

NAVAJO REFINING CO.
ENGINEERING DEPARTMENT
P.O. DRAWER 159
ARTESIA, NEW MEXICO

DRAWN BY	CHK'D BY	SCALE	PRINT DATE
		1"=200'-0"	6-26-03
DATE	APPR BY	DRAWING NUMBER	REV.

TELEPHONE
(505) 748-3311

EASYLINK
62905278

REFINING COMPANY

FAX
(505) 746-6410 ACCTG
(505) 746-6155 EXEC
(505) 748-9077 ENGR
(505) 746-4438 P / L

501 EAST MAIN STREET ◦ P. O. BOX 159
ARTESIA, NEW MEXICO 88211-0159

September 25, 1996

Mr. Mark Ashley
Geologist - Environmental Bureau
N.M. Oil Conservation Division
2040 S. Pacheco St.
Santa Fe, NM 87505

Re: Response to NMOCD Inspection Report of September 6, 1996

Dear Mr. Ashley:

Your inspection report letter of September 6, 1996 required Navajo to provide responses to some concerns identified during the inspection by September 30, 1996. The two areas your concerns centered around were sumps and possible lead contamination adjacent to two tanks that were at one time in leaded gasoline service.

SUMPS

Shown in the pictures you sent were several existing sumps in various services that are obviously single wall sumps without secondary containment. There are a number of these types of sumps around the refinery as they were a standard installation until NMOCD began requiring secondary containment on these types of structures. Navajo has currently compiled a list of these sumps (see attached list) and is in the process of leak testing each one. As discussed with you previously, Navajo is using a testing method of plugging all outlets from the sump and diverting or shutting off all influx to the sump. The sump is then filled to a fixed level above its typical operating level and monitored for any loss in level indicating a leak. The leak testing is scheduled to be completed by December 31, 1996.

Navajo is also evaluating the possibility of retrofitting existing sumps with secondary containment. This would most likely consist of inserting another box or lines into the existing sump boxes where practical. Some sumps may be replaced completely, with the replacement having secondary containment per OCD policy. As you saw at our Lovington Refinery, Navajo is testing and evaluating many different secondary containment. We expect to find that certain methods and materials are more appropriate for a particular type of sump than others. We should also learn which types are not suitable to a particular installation.

The particular sump shown in photo 1-1 is a truck fueling island under construction at our Trucking Division. When construction is complete there will be an insert inside the concrete sump box as shown. The concrete box will then serve as secondary containment. Provisions will be made to be able to monitor the space between the insert and the concrete outer box to detect failure of the insert.

The sumps shown in photos 1-6, 1-8, 1-10, and 1-14 are on the leak testing list attached. These sumps and others on the list are being considered for retrofit/replacement.

The concrete enclosures shown in the photo 1-21 is completely out of service. There are no live lines entering or leaving the enclosure. Though Navajo may agree that the site is not visually appealing, its completely out of service status and low apparent risk leaves it well down on our priorities to address. We will take the site into consideration for future scheduled demolition.

Photo 1-13 is of our former API separator for the South Division sewer system. It has been isolated from the active sewer system for several decades. The last use Navajo made of the site was for heavy oils recovery. Navajo cleaned out the unit, thoroughly inspected it and modified it to receive waste heavy oils such as spilled asphalt, gas oils and other heavy oil products as needed. Navajo fabricated a steam heating coil that could be inserted into the basin to melt the heavy oil thus allowing solids to settle out and clean oil to be recovered. The need for the facility was very sporadic such that it would be used for a recovery job and then sit idle for long periods of time. During your inspection, the facility was being cleaned out in preparation for demolition. Navajo has determined there is no further need for this facility.

LEAD CONTAMINATION SIGNS

The other area you had questions about was the old Lead Contamination Signs adjacent to Tanks 417 and 418. The signs have been there perhaps 50 years, no one can recall the exact date(s). Senior and retired employees recall that the signs mark the location of old tank clean out sumps. Leaded gasoline is now banned, and Navajo stopped producing it in September 1995. These particular tanks were at one time, many years ago, in leaded gasoline service. Similar tank cleaning practices are carried out today except heavy steel boxes are now inserted into the sumps dug next to a tank to be cleaned. In the case of the old practice, the dug-out sump itself served to receive any sediment washed out of the tanks with water. A pump was placed in the sump and the wash water was pumped into the process sewer system. Once the tank was clean and all the water pumped out to the sewer, any significant remaining sediment was backhoed out of the sump for disposal. The sump was then backfilled and a sign erected to mark its former location thus warning future excavators of the possible presence of some residual lead residue in the soil.

At this time, Navajo has no direct information on the presence of any remaining lead contamination. Given the age of the old sumps, these typically small size (6 ft long x 4 ft deep), the generally immobile nature of lead and the fact that finished gasoline tanks contain very little residue when cleaned, these particular sites don't appear to constitute any significant threat to human health or the environment. Navajo proposes at this time to take no further action at these sites. Should future needs require excavation in this area, Navajo will take appropriate safety precautions and will investigate the nature of materials excavated to determine if lead or other hazardous materials are present at concentrations meriting further action. Meanwhile, we plan to leave the signs in place as a visual reminder.

Finally, Navajo's analytical results of the sampling done during your inspection are enclosed as you requested.

If you have any questions or need additional information, please call me at (505) 748-3311.

Sincerely,

David G. Griffin
Manager of Environmental
Affairs for Water & Waste

DGG/sb

ANNUAL INSPECTION LIST - SUMPS

(To be completed by 12-31-96)

1. Water draw @ Tank 835
2. Slinger Sludge Sumps
3. Water draw sump Tks 838 & 834
4. Secondary Containment Sumps N.D. Rail Loading Rack
5. Sump under FCC U-bends
6. Sump @ N.D. Bundle Cleaning Station
7. Sump @ S.D. Bundle Cleaning Station
8. Sewer box Lift Station @ Tk 401
9. Spill Retention Sumps @ Gasoline Loading Rack Sewer boxes along Texas St.
10. Merichem Treater Area
11. Caustic Unloading Sump
12. Sewer Boxes in Tk 132 area
13. Asphalt Loading Rack Sump
14. Maintenance Shop Sump
15. W-27 Sump
16. Asphalt Tank Farm Sump near Tk 406
17. Sump on N. side of Tk 110
18. Sumps in Pump manifold in Blender

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

September 6, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. P-288-258-846

Mr. Phillip Youngblood
Navajo Refining Company
P. O. Drawer 159
Artesia, New Mexico 88211-0159

Re: Inspection Report
Artesia and Lovington Refineries

Dear Mr. Youngblood:

The New Mexico Oil Conservation Division (OCD) would like to thank you and your staff for your cooperation during the July 29, 1996 to August 1, 1996 inspections of the Artesia and Lovington refineries. Comments from the inspections conducted are as follows:

1. Drum Storage: All drums that contain materials other than fresh water must be stored on an impermeable pad with curbing. All Empty drums should be stored on their sides with the bungs in and lined up on a horizontal plane. Chemicals in other containers such as sacks or buckets should also be stored on an impermeable pad with curbing.

   Artesia Refinery
   Numerous empty drums, and drums containing fluids were located throughout the refinery that were not properly stored (see pictures 1-15, 1-16,1-20, 2-4, 2-5 and 2-6).

2. Process Area: All process and maintenance areas which show evidence that leaks and spills are reaching the ground surface must be either paved and curbed or have some type of spill collection device incorporated into the design.

   Artesia Refinery
   Pump 104 show evidence of hydrocarbons reaching the ground surface (see picture 1-23).

   Wastes generated at the steam cleaner area are not being completely contained within the existing pad and curb containment (see picture 2-2).

Lovington Refinery
The crude off-loading area shows evidence that leaks and spills are reaching the ground surface (see picture 2-22).

3. Above Ground Tanks: All above ground tanks which contain fluids other than fresh water must be bermed to contain a volume of one-third more than the total volume of the largest tank or of all interconnected tanks. All new facilities or modifications to existing facilities must place the tank on an impermeable type pad within the berm.

Artesia Refinery
The diesel storage tank in picture 1-2 does not appear to have the required containment.

Lovington Refinery
The waste water skimmer tank does not appear to proper berming and containment (see picture 2-24).

4. Above Ground Saddle Tanks: Above ground saddle tanks must have impermeable type pad and curb containment unless they contain fresh water or fluids that are gases at atmospheric temperature and pressure.

Artesia Refinery
The above ground saddle tanks located in pictures 1-10, 1-16, 1-22 and 2-15 do not appear to have proper pad and curb containment.

Lovington Refinery
The above ground saddle tank located in picture 2-23 does not appear to have proper pad and curb containment.

5. Labeling: All drums, tanks and containers should be clearly labeled to identify their contents and other emergency information necessary if they were to rupture, spill, or ignite.

Artesia Refinery
Numerous containers were located throughout the refinery do not appear to be properly labeled (see pictures 1-3, 1-11, 1-15, 1-20, 1-22 and 2-15).

Lovington Refinery
Containers located in pictures 2-23 and 2-24 do not appear to be properly labeled.

6. Below Grade Tanks/Sumps: All below grade tanks, sumps, and pits must be approved by the OCD prior to installation or upon modification and must incorporate secondary containment and leak-detection into the design. All pre-existing sumps and below-grade

tanks must demonstrate integrity on an annual basis. Integrity tests include pressure testing to 3 pounds per square inch above normal operating pressure and/or visual inspection of cleaned out tanks and/or sumps.

Artesia Refinery
Sumps in pictures 1-1, 1-6, 1-8, 1-10 and 1-14 do not appear to have secondary containment. What is Navajo's schedule for inspection of sumps. Please respond to the OCD by September 30, 1996.

What is the status of the pit/sump in picture 1-21? Is it going to be closed? Please respond to the OCD by September 30, 1996.

What is the status of the asphalt API separator in picture 1-13? Please respond to the OCD by September 30, 1996.

Lovington Refinery
The pipeline terminal sump does not appear to have secondary containment (see picture 2-19).

7. Underground Process/Wastewater Lines: All underground process/wastewater lines must be tested to demonstrate their mechanical integrity at present and then every 5 years there after. Permittees may propose various methods for testing such as pressure testing to 3 pounds per square inch above normal operating pressure or other means acceptable to the OCD.

   Navajo is in the process of testing and repairing/replacing all below grade lines at both refineries.

8. Housekeeping: All systems designed for spill collection/prevention should be inspected frequently to ensure proper operation and to prevent overtopping or system failure.

9. Spill Reporting: All spills/releases shall be reported pursuant to OCD Rule 116 and WQCC 1203 to the appropriate OCD District Office.

10. Lead Contamination: At the Artesia refinery, signs indicating lead contamination are present between tanks 417 and 418. What is the purpose of these signs? Is lead contamination present beneath these signs? Please respond to the OCD by September 30, 1996.

Sample results from OCD sampling of both refineries is enclosed for your review. Please submit Navajo's sample results to the OCD by September 30, 1996.

Once again, thank you for your time during our recent visit to Navajo's refineries. If you have any questions, please call me at (505) 827-7155.

Sincerely,

Mark Ashley
Geologist

xc: OCD Artesia Office

Navajo Lavington.

Final EFFLUENT

(1) Metals - 6010
96010830

(2) General Chem.
96010830

(3) 610
96010832

(4) 601/602
96010835

Cooling Tower

(1) Metals - 6010
96010845

(2) General chem.
96010845

DATE: 8/1/96 TIME: 8:30 AM

Navajo - Lavington

Rail Loading Area
- only handles asphalt.

Loading Rack - Truck Tanker.

Walk Through S. Tank Area.

No RFI on the facility yet.

- Minor House keeping points
- Need Tank Containments.

Close out - Talk
- go over housekeeping.

R.O. unit

(1) Metals 6010
9631 1433

(2) Gen. chem.
9631 1435

Trickler. outfall

(1) Metals 6010
9631 1440

(2) Gen. chem
9631 1442

(3) 610
9631 1444

(4) 601/602
9631 1446

DATE: 7/31/96 TIME: 1500

- Close out Mtg.

Overview d.p. purpose -

- Non-Hazardous waste - offsite disposal very slow process - 2 month process.

- Inspection for sumps - don't have double containment w/ Leak detection.

Continue w/ N. Plant.

N. Plant - Lots of cement & curbing.
- Not any real problems

Wastewater Area -
- Minor leaks and spills.

API Separater - Needs to be cleaned & inspected annually. (No curbing w/ leak detection.)

✓ WASTE water Flow. Tanks Need Berming.

Barrels on pallets.
Need to be on imper. containment.

DATE: 7/31/96 TIME: 7:30 AM

SAMPLES:

① POND No. 6

1. Metals - 6010
   9631400

2. General chem.
   9631402

3. 610
   9631404

4. 601/602
   9631406

② South cooling tower

1. Metals - 6010
   9631425

2. Gen. Chem.
   9631427

DATE: 7/29/99 TIME: 1310AM

ASPHALT LOADING RACK

- Sump does not have 2 valves/1 outlet.

South PLANT AREA.

(OIL) Cooling Towers.

Continue w/ Plant inspection Team.

Stop at 4:30 PM.

DATE: 7/30/96 TIME: 7:30AM

Continue w/ South Plant.

EMPTY DRUMS - stored in one area - Drums go to CRI. Crushed. Triple Rinse - RCRA Empty.

Welding Shop

Insulators Shop

* North plant - Water Containments

Lab - All Liquid Lab wastes goes to the South API.

- A comprehensive list of Lab chemicals in the discharge plan.

* North Plant has its own.

- Good Pollution Preventers throughout the N. Plant.

7/29/96

DATE: ~~7/29/96~~ TIME: 7:35 AM

Phone: Dial 9 - Local.

Navajo Refining Artesia
Discharge Plan Renewal.

Trucking Division -

RCRA D - goes to
City of Artesia - goes
to Carlsbad - municipal.
Not sure if city or County.

Wash bay - only exterior
of trucks. Interior cleaned
out as part of wastewater
system.

Wash water goes through
3 filters - discharge to
POTW. Cleaned Annually.

USED oil goes back to
refinery.

Oil filters - goes to Ed Vedder.

USED Batteries go back
to the vendor.

Solvents - Handled by
Safety clean. (Stoddard).

Rail Loading Facility.

Sumps / Tanks Below
grade - Need annual
Inspection.

Crude Oil pump Station.

Saddle Tank w/ Petrolite
corrosion inhibitor - No Pad
and Curb.

TELEPHONE
(505) 748-3311

EASYLINK
62905278

Navajo REFINING COMPANY

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

October 19, 1995

Mr. Richard Powell
New Mexico Environment Department
Surface Water Quality Bureau
1190 St. Francis Dr.
P.O. Box 26110
Santa Fe, NM 87502

RE: NPDES STORM WATER RECONNAISSANCE INSPECTION, #NMR00A159

Dear Mr. Powell,

We are in receipt of your letter of October 3, 1995 in which you reported on the inspection you conducted at our Artesia, NM refinery on July 25, 1995. While we benefited from some very helpful suggestions you made during the inspection, we have some concerns about the report itself. We do not feel the tone of the narrative portion of the report is in keeping with either the positive tone of your visit or the generally satisfactory findings on the inspection forms. In the fourth paragraph you mention that our SWPPP "is only partially complete". We do not agree with this characterization. The SWPPP for Navajo Refining was **substantially** complete and we would like to take this opportunity to address each problem that you pointed out in the narrative portion of your report.

Certifications: Of the four required certifications, two were signed at the time of the inspection. Due to an administrative oversight, the General Operator and Non-Storm water statements were not signed. All certifications are now signed.

Controls: We are unsure as to what structural controls you are referring to that are not shown. The Retention Basin, Drainage Ditch and Grating on Freeman Street are all shown on the Drainage Area Map. Also, we are in the dark on the meaning of the term non-structural controls and how you show something non-structural on a map. As you know, when the inspection took place, the Retention Basin and the Drainage Basin were under construction. Both have now been completed and the SWPPP updated to reflect the change. Finally, the sampling procedure and protocol have been redone to show these changes.

Employee Training Records: As stated at the time of the inspection, employee training records are kept by the Safety Department along with their employee records. We would have been glad to show them to

you had your time permitted. For clarity, since your visit, we have inserted a sheet in the SWPPP to that effect per your suggestion.

Potential Soil Erosion: Our understanding of the SWPPP requirements is that erosion must be addressed only if we have areas with high potential for significant soil erosion. Due to the topography in this area, we don't believe this is happening. Therefore, we have not addressed erosion in the SWPPP. Please advise us if you saw any areas you consider to be high soil erosion areas.

Review and Update of SWPPP: We acknowledge that our SWPPP was lacking in formal updating. Please be advised, however, that prior to your visit, our practice was to keep track of all changes and summarize them annually in Section 6 of the SWPPP. Since your visit, we have changed these procedures so that we update each affected section of the SWPPP by making appropriate notations as each change becomes effective. The SWPPP is updated accordingly as of this writing. We will follow this notation process during the 3 year cycle between each P. E. certification when a completely revised edition of the SWPPP will be prepared. Our next P.E. recertification is due in April 1996.

Sampling: The tone of your report seems to imply that we did not take your previous communication seriously regarding our sampling and reporting methodology. For the record, we want it to be clear that we took it very seriously. We obtained outside consultation on the matter which supported our practices. We forwarded a copy of our consultant's report by our letter dated March 2, 1995 (Copy attached). Regarding the USEPA, we informed them of this matter via a copy of our March 2, 1995 letter and consultant's report. We assume that they would have notified us if they had any concerns. The point is moot at this time anyway. With the construction of the Retention Basin and Drainage Ditch, the only times that storm water will enter Eagle Draw would be during storms capable of causing the Retention Basin to overflow. In such events, captured storm water will be sampled within 24 hours.

Spill of June 29, 1995: Frankly, we're puzzled as to why this event was inserted into Section D #3 of the NPDES Compliance Inspection Report. It was never mentioned in the text of the report. Just to re-emphasize a few points: 1) This event was more than a 100 year flood event. No system is designed to withstand that much water. 2) Once the spill occurred, we responded per our OPA 90 Plan. We notified and/or worked with many agencies including EPA, NRC, OCD, NMED-Haz Waste, NMED-Surface Water, NM Game and Fish , and Carlsbad Irrigation District. We provided all of these agencies with a copy of our incident report, which, among other things, stated our intent to let the cleanup material biodegrade in place if the residue tested RCRA non-hazardous. It in fact did test RCRA non hazardous. We have heard no negative responses from any of the agencies on our remediation efforts. In fact, Ray Smith and Brian Arrant with the OCD-Artesia office did a visual inspection of Eagle Draw from the refinery to the Pecos River on July 5, 1995 and deemed the clean-up complete. 3) You mention in one of the captions under a photo that you found "oil contaminated materials (orange colored residue) downstream of the refinery in Eagle Creek". Of course, ours is a copy with no color, but we are at a loss to remember seeing anything orange on your visit. This reference of orange residue is not consistent with the spill. The material spilled was slop oil, which is black, and we remediated with peat moss, which is brown.

Inspection Checklist: An additional issue not mentioned in your letter is the inspection checklist item under "Annual Site Compliance Evaluation Report" entitled "Certification of Compliance or a List of Non-Compliance". You checked "U" on the form when, in point of fact, this item is part of our SWPPP and was in the plan on the date of your visit. A copy is attached for your reference.

In closing, I would like to restate that we feel that the SWPPP at Navajo Refining was a substantially complete document at the time of your visit. You made some very helpful suggestions on improving our SWPPP and we have implemented those items. With the implementation of your suggestions and the upgrading of our acknowledged deficiencies we have improved the document and look forward to your

next inspection. Thank you for your time in this matter. If there are any questions, please call me at 505-748-3311.

Sincerely,
NAVAJO REFINING COMPANY

Phillip L. Youngblood
Director of Environmental Affairs

Encl.

cc:Cecilia Kernodle, USEPA (6EN-WT)
Taylor Sharpe, USEPA (6EN-WT)
NMED, Disrict IV, Roswell
NMOCD, Mark Ashley
Matt Clifton, Sr. Vice President, Navajo Refining
Virgil Langford, Refinery Manager, Navajo Refining

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-0187

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

Certified Mail - Return Receipt Requested

October 3, 1995

Mr. Mathew P. Clifton
Navajo Refining Company
501 East Main Street
Artesia, New Mexico 88210

RE: NPDES storm water Reconnaissance Inspection, #NMR00A159

Dear Mr. Clifton:

Enclosed, please find a copy of the Reconnaissance Inspection that Ann Young and I conducted at your facility on July 25, 1995. This inspection report will be sent to the U.S. Environmental Protection Agency (USEPA) in Dallas, for their review. These inspections are used to determine compliance with the National Pollutant Discharge Elimination System (NPDES) permit issued in accordance with the federal Clean Water Act.

The problems noted during the inspection are discussed in the Further Explanations section of the inspection report. You are encouraged to review the inspection report, correct any problems noted during the inspection, and to modify your operational procedures and/or Storm Water Pollution Prevention Plan (SWPPP), as appropriate.

My thanks to Mr. Phillip Youngblood and Mr. Darrell Moore of your staff for their help and cooperation during this inspection. If you have any questions, please contact me at the above address or by telephone at (505) 827-2798.

Sincerely,

Richard E. Powell
Environmental Scientist
Point Source Regulation Section

xc: USEPA, Dallas (2 copies)
Cecilia Kernodle, USEPA (6EN-WT)
Taylor Sharpe, USEPA (6EN-WT)
NMED, District IV, Roswell
NMOCD, Mark Ashley

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

NPDES Compliance Inspection Report

Form Approved
OMB No. 2040-0003
Approval Expires 7-31-85

Section A: National Data System Coding

1	2	3	11	12	17	18	19	20
Transaction Code		NPDES		yr/mo/day		Inspec. Type	Inspector	Fac Type
N	5	NMR00A159		950725		R	S	2

Remarks: EPCRA SECTION 313 FACILITY

67	69	70	71	72	73	74	75	80
Reserved		Facility Evaluation Rating	BI	QA	Reserved			
		2						

Section B: Facility Data

Name and Location of Facility Inspected:	Entry Time [ ] AM [X] PM	Permit Effective Date
Navajo Refining Company 2 blocks east of US285 on US82 - Office on North, 502 East Main Street, Artesia, Eddy Co., NM 88211	1:04	9-9-92
	Exit Time/Date: 1533 hours 7-25-95	Permit Expiration Date: 9-9-97

Name(s) of On-Site Representative(s)	Title(s)	Phone No(s)
Darrell Moore* Phillip Youngblood*	Environmental Specialist Director of Environmental Affairs	(505) 748-3311

Name, Address of Responsible Official	Title: Sr. Vice President	
Mathew P. Clifton Navajo Refining Company 501 E. Main Artesia, NM 88210	Phone No.: (505) 748-3311	Contacted: * Yes [ ] No

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S	Permit	N	Flow Measurement	N	Pollution Prevention	N	Operation and Maintenance
N	Records/Reports	N	Laboratory	N	Compliance Schedule	N	Sludge Disposal
N	Facility Site Review	N	Effluent/Receiving Waters	N	Self-Monitoring Program	N	Other: Storm Water

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

1. Permittee has not reviewed, and revised and updated SWPPP since its preparation to include personnel and operational changes at the facility.

2. Facility is sampling storm water after it enters Eagle Creek (a water of the U.S.) rather than prior to entering these waters.

3. This facility had a spill of mixed storm water and hydrocarbon product from one of its waste water separators on June 29, 1995 resulting in a discharge to Eagle Creek.

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Telephone	Date
Richard E. Powell	NMED/SWQB (505) 827-2798	10-4-95
Signiture Of Reviewer	Agency/Office	Date

Regulatory Office Use Only

Action Taken	Date	Compliance Status
		[ ] Noncompliance [ ] Compliance

NPDES Reconnaissance Inspection
Navajo Refining Company
Further Explanations

Introduction

On July 25, 1995, a Reconnaissance Inspection was conducted at the Navajo Refining Company refinery located at Artesia, New Mexico by Richard E. Powell and Ann M. Young of the State of New Mexico Environment Department (NMED). This inspection was conducted to evaluate the permittee's compliance with the NPDES baseline general storm water permit.

Storm water discharges from this facility are to Eagle Creek which is an ephemeral tributary to the Pecos River in Segment 2206 of the Pecos River Basin.

This report is based on review of files maintained by both the permittee and NMED, on-site observation by NMED personnel and verbal information provided by the permittee's representatives. An entrance interview was conducted with Messrs. Phillip Youngblood, Director of Environmental Affairs and Darrell Moore, Environmental Specialist, at the Navajo Refinery office at approximately 1304 hours on July 25, 1995. The inspectors made introductions, presented their credentials and discussed the purpose of the inspection.

Storm Water Status

The permittee has a Storm Water Pollution Prevention Plan (SWPPP) on-site which is dated March 29, 1993 and is only partially complete. Various required certifications are unsigned, some structural and all non-structural controls are not shown on the site map, employee training records are not included (although the permittee's representatives stated that these records are included with safety training records), areas with a high potential for significant soil erosion are not addressed, etc. In addition, the SWPPP has apparently not been reviewed for completeness and accuracy since it was initially prepared, nor has it been updated to include personnel and operational changes.

This facility is required to conduct semi-annual storm water sampling, due to its classification as an EPCRA Section 313 facility subject to reporting requirements for water priority chemicals. According to the permittee, Eagle Creek (which is a water of the U.S.) and another small drainage enter the west side of the refinery site, merge within the facility boundary and the combined channel exits the east side of the site. Eagle Creek then continues east, entering the Pecos River in Segment 2206 of the Pecos River Basin.

For purposes of sampling and reporting on the Discharge Monitoring Reports (DMRs) (last submittal - January 30, 1995), the permittee samples each drainage where it enters the refinery site (upstream), samples the combined offsite drainage and industrial storm water runoff where it leaves the refinery site (downstream) and subtracts the analysis results and flows at the upstream sites from the results at the downstream sampling site. The net results are then reported on the DMRs as outfall 002. Even though these are all in-stream samples, the permittee designates the upstream samples as outfall 007 & 009, and the downstream sample as outfall 002.

During previous communication with the permittee (telephone - February 3, 1995, written - February 13, 1995) from NMED, and again during this inspection, the permittee was encouraged to contact USEPA, Region 6 regarding the propriety of this sampling and reporting scheme.

Although direct discharges to Eagle Creek continue to occur, the permittee is in the process of constructing a storm water containment lagoon to capture a majority of the storm water runoff from this site. It is unclear what treatment (other than settling) the permittee expects to provide with this lagoon, but it will serve, at the very least to provide a sampling location for storm water discharges, prior to entering Eagle Creek. According to the permittee's representatives, once completed (projected 8-31-95), this lagoon will have a constructed spillway through which the lagoon will discharge to Eagle Creek and form the only storm water outfall at this facility. This will replace those outfalls currently located within Eagle Creek itself.

An exit interview to discuss the findings of this inspection was conducted at approximately 1510 hours on July 25, 1995 with Mr. Youngblood and Mr. Moore, at the refinery office. Please see the attached photographs and their descriptions for additional information.

Storm Water Industrial General Permit
Pollution Prevention Plan

CHECKLIST

Navajo Refining Company	DATE: 7-25-95	PERMIT NO NMR 00A159

POLLUTION PREVENTION TEAM

MEETS PERMIT REQUIREMENTS. S☐ M☒ U☐ N/A☐ (FURTHER EXPLANATION ATTACHED Yes)
DETAILS:

1. IDENTIFY SPECIFIC INDIVIDUALS. **no cert sig, no sigs of non-storm, etc.** Y☒ N☐ N/A☐

2. OUTLINE INDIVIDUALS RESPONSIBILITIES. **need to add Phil Youngblood** Y☒ N☐ N/A☐

DESCRIPTION OF POTENTIAL POLLUTANT SOURCES

MEETS PERMIT REQUIREMENTS. S☐ M☒ U☐ N/A☐ (FURTHER EXPLANATION ATTACHED Yes)
DETAILS:

1. SITE MAP INDICATING. S☐ M☒ U☐ N/A☐

a) DRAINAGE AREAS Y☒ N☐ N/A☐

b) DRAINAGE PATTERNS AND OUTFALLS Y☒ N☐ N/A☐

c) STRUCTURAL AND NON-STRUCTURAL CONTROLS **some structural no non-structural** Y☐ N☒ N/A☐

d) SURFACE WATERS Y☒ N☐ N/A☐

e) SIGNIFICANT MATERIALS EXPOSED TO PRECIPITATION **On Facility Map** Y☒ N☐ N/A☐

f) LOCATION OF LEAKS/SPILLS WHICH HAVE OCCURED IN THE LAST 3 YEARS **Not 6-29-95 spill** Y☐ N☒ N/A☐

g) LOCATION OF INDUSTRIAL ACTIVITIES EXPOSED TO PRECIPITATION **Area Map - only drainage area** Y☒ N☐ N/A☐

FUELING STATIONS Y☐ N☐ N/A☒

MAINTENANCE OR CLEANING AREAS **Facility Map** Y☒ N☐ N/A☐

LOADING/UNLOADING AREAS **Facility Map** Y☒ N☐ N/A☐

WASTE TREATMENT,STORAGE OR DISPOSAL AREAS **Facility Map** Y☒ N☐ N/A☐

LIQUID STORAGE TANKS **Facility Map** Y☒ N☐ N/A☐

PROCESSING AREAS **Facility Map** Y☒ N☐ N/A☐

STORAGE AREAS **Facility Map** Y☒ N☐ N/A☐

2. LIST OF POLLUTANTS LIKELY TO BE PRESENT IN DISCHARGES. S☒ M☐ U☐ N/A☐

3. DESCRIPTION OF SIGNIFICANT MATERIALS HANDLED, TREATED, STORED OR DISPOSED OF SUCH THAT EXPOSURE TO STORM WATER OCCURED IN THE LAST 3 YEARS. S☒ M☐ U☐ N/A☐

a) DESCRIPTION OF THE METHOD AND LOCATION OF STORAGE OR DISPOSAL Y☒ N☐ N/A☐

b) DESCRIPTION OF ALL MATERIAL MANAGEMENT PRACTICES Y☒ N☐ N/A☐

c) DESCRIPTION AND LOCATION OF EXISTING STRUCTURAL AND NON-STRUCTURAL CONTROLS Y☒ N☐ N/A☐

4. SUMMARY OF EXISTING STORM WATER SAMPLING DATA S☒ M☐ U☐ N/A☐

5. DESCRIPTION OF AREAS WITH A HIGH POTENTIAL FOR SIGNIFICANT SOIL EROSION S☐ M☐ U☒ N/A☐

6. A NARRATIVE SUMMARIZING POTENTIAL POLLUTANT SOURCES S☒ M☐ U☐ N/A☐

Storm Water Industrial General Permit
Pollution Prevention Plan

CHECKLIST

Navajo Refining Company	DATE: 7-25-95	PERMIT NO. NMR0OA159

DESCRIPTION OF APPROPRIATE MEASURES AND CONTROLS

MEETS PERMIT REQUIREMENTS. S☒ M☐ U☐ N/A☐ (*FURTHER EXPLANATION ATTACHED* No)
DETAILS:

1. GOOD HOUSEKEEPING PROCEDURES.	S☒ M☐ U☐ N/A☐
2. PREVENTIVE MAINTENANCE PROCEDURES.	S☒ M☐ U☐ N/A☐
3. SPILL PREVENTION AND RESPONSE PROCEDURES.	S☒ M☐ U☐ N/A☐
4. INSPECTION PROCEDURES.	S☒ M☐ U☐ N/A☐
5. EMPLOYEE TRAINING PROGRAM. Part of safety records - not in SWPPD	S☒ M☐ U☐ N/A☐
6. RECORDKEEPING AND INTERNAL REPORTING PROCEDURES	S☒ M☐ U☐ N/A☐
7. NON-STORM WATER DISCHARGE CERTIFICATION. not signed	S☐ M☒ U☐ N/A☐
a) IDENTIFY AUTHORIZED NON-STORM WATER DISCHARGES AND APPROPRIATE CONTROLS not signed	Y☒ N☐ N/A☐
8. EROSION AND SEDIMENT CONTROLS FOR AREAS WITH HIGH EROSION POTENTIAL.	S☒ M☐ U☐ N/A☐
9. A NARRATIVE CONSIDERATION OF TRADITIONAL STORM WATER MANAGEMENT PRACTICES.	S☒ M☐ U☐ N/A☐
10. PLANS FOR IMPLEMENTATION AND MAINTENANCE OF TRADITIONAL MEASURES APPROPRIATE.	S☐ M☒ U☐ N/A☐

ANNUAL SITE COMPLIANCE EVALUATION REPORTS

MEETS PERMIT REQUIREMENTS. S☐ M☒ U☐ N/A☐ (*FURTHER EXPLANATION ATTACHED* No)
DETAILS: last 10-10-14-94 by Darrell Moore

1. SUMMARY OF THE SCOPE OF THE INSPECTION.	S☒ M☐ U☐ N/A☐
2. PERSONNEL MAKING THE INSPECTION.	S☒ M☐ U☐ N/A☐
3. MAJOR OBSERVATIONS.	S☒ M☐ U☐ N/A☐
4. ACTIONS TAKEN TO REVISE THE POLLUTION PREVENTION PLAN.	S☒ M☐ U☒ N/A☐
5. CERTIFICATION OF COMPLIANCE OR A LIST OF INCIDENTS OF NON-COMPLIANCE.	S☐ M☐ U☒ N/A☐

COMPLIANCE WITH MUNICIPAL STORM WATER MANAGEMENT REQUIREMENTS

MEETS PERMIT REQUIREMENTS. S☐ M☐ U☐ N/A☒ (*FURTHER EXPLANATION ATTACHED* No)
DETAILS:

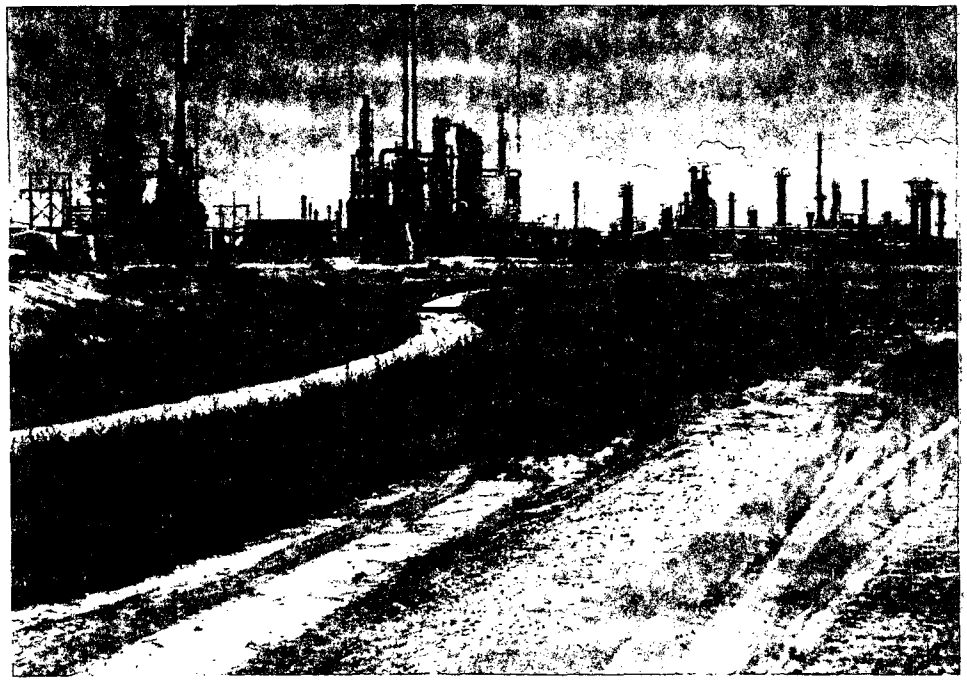
CONSISTENCY OF POLLUTION PREVENTION PLAN WITH OTHER PLANS

MEETS PERMIT REQUIREMENTS. SPCC S☒ M☐ U☐ N/A☐ (*FURTHER EXPLANATION ATTACHED* No)
DETAILS:

SALT STORAGE PILES ONSITE COVERED OR ENCLOSED

MEETS PERMIT REQUIREMENTS. S☐ M☐ U☐ N/A☒ (*FURTHER EXPLANATION ATTACHED* No)
DETAILS:

Navajo Refining Company
Reconnaissance Inspection, July 25, 1995
Photographs by Rich Powell, NMED



Eagle Creek runs from west to east through the refinery site. This photo was taken from the east side of the plant site looking downstream (west).

Oil contaminated materials (orange colored residue) downstream of the refinery in Eagle Creek. This is from a combined storm water/hydrocarbon product discharge on June 29, 1995. Hydrocarbon contaminated absorbent materials have not yet been removed from the creek.

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-1557
Fax (505) 827-1544

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

NAVAJO REFINING COMPANY
INSPECTION REPORT

Date of Report:	October 2, 1995
Date of Inspection:	August 29-30, 1995
Facility:	Navajo Refining Company
EPA ID Number:	NMD 048918817
Ownership:	Corporation
Location:	501 East Main, Artesia, NM.
Mailing Address:	P.O. Box 159 Artesia, NM. 88211-0159
Phone:	(505) 748-3311
Facility Contact:	Phillip L. Youngblood, Director of Environmental Affairs
Enforcement Letter To:	Jack Reid, President
Notification Status:	Generator/TSD Land Disposal Facility
Current Operating Status:	Generator
Type of Inspection:	Compliance Evaluation Inspection
Participants:	NMED: Frank Sanchez Michael Le Scouarnec Navajo: David Griffin Phillip Youngblood
Weather:	Clear, mid 80's
Time of Entry: Time of Exit:	1:00 p.m. 8/29/95 2:30 p.m. 8/30/95

INTRODUCTION

This inspection was conducted as a Compliance Evaluation Inspection (CEI) to fulfill the FY 95 grant agreement. The last inspection of this facility was conducted on October 9-10, 1991 in which several violations were noted. These violations included failure to conduct an adequate hazardous waste determination for wastewater being discharged into the evaporation ponds, failure to keep records of hazardous waste determinations for solid wastes being disposed of at the truck-by-pass landfarm, failure to keep inspection logs for the North Colony Landfarm, failure to mark accumulation start date on container, failure to label container, and failure to provide hazardous waste management training for employees. The following checklists were completed for this inspection: general facilities, less than 90 day, LDR, closure and post-closure, ground water monitoring, surface impoundments, tanks and containers.

HISTORY AND NATURE OF BUSINESS

The refinery, located in Artesia, NM., was built by Malco in the early 1930's, and bought later by Continental Oil Co., which became CONOCO. In 1969, CONOCO sold the refinery to the Holly Corporation, the current parent company of Navajo Refining Company. Currently, all oil refined at Navajo is New Mexico derived and refined at a rate of 60,000 barrels/day. In addition to oil sales, Navajo produces approximately 40 tons of sulfur/day which is also marketed.

The permitted and now out of service land treatment unit began operation in 1981, prior to which the TEL weathering area, a surface impoundment, was used for disposal of refinery K-wastes. The TEL area was formerly closed in April 1989, and is currently undergoing post-closure care. The OCD permitted North Colony Landfarm has been inactive since 1991 and was shut down in 1993 and petroleum contaminated wastes are now shipped to CRI, Inc., a landfarm, between Carlsbad and Hobbs.

The evaporation ponds (photos 6-10) will formally be closed by December 1996 as a result of a settlement reached over a Department of Justice lawsuit for discharging treated wastewater containing benzene concentrations above regulatory limits. Currently, the Department of Justice, EPA, and NMED are reviewing the Closure Plan. Where the treated wastewater will be discharged remains at large. The most likely possibility will be in an injection well capable of handling 700 barrels/day (one barrel = 42 gallons).

HAZARDOUS WASTE MANAGEMENT AREAS AND WASTE STREAMS MANAGED

The main hazardous wastes generated at the facility are API separator sludge (K051) and dissolved air flotation (DAF) float (K048). Less frequently generated wastes are slop oil emulsion solids (K049) and heat exchanger bundle cleaning sludge (K050). Leaded tank bottoms (K052) have not been generated in 17 years. Wastewater sumps are employed at the facility, and sludges generated at these sumps meet the F037 listing. At the wastewater treatment plant (WWTP), sludges generated at the equalization, DAF, and flocculation tanks meet the F038 listing. Petroleum naphtha degreasing solvent (D002) is generated in small quantities and is sent to the API separators. In December, 1994, nineteen drums of mercury contaminated soil (D009) were shipped to ENSCO in El Dorado, Arkansas.

In April 1991 Navajo installed a trickling filter at the last treatment unit in its WWTP prior to discharging refinery wastewater into its evaporation ponds. Any sludges generated from treatment units that follow aggressive biological (i.e. secondary) treatment are not included in the listings. Consequently, Navajo installed the trickling filter to avoid the sludges in downstream units, namely the evaporation ponds, from being considered F038 hazardous waste. However, the exemption from the listing does not negate the waste in the ponds from being hazardous waste if it exhibits a characteristic.

Sampling results on the evaporation ponds during EPA's 1991 inspection revealed benzene (D018) levels above TC limits of 0.5 mg/L. This led to the U.S. Department of Justice involvement in which a lawsuit ensued and the evaporation ponds will eventually be closed. Benzene excursions were experienced and reported during the period between November 1994 and July 1995. Navajo believes these excursions were caused by addition to the wastewater system of water "draws" from the refinery's crude oil tanks after receipt of crude oil containing excessively high levels of water. Such crude tank draws are naturally high in benzene from contact with the crude.

The refinery has three API separators, four slop oil tanks, and one wastewater treatment plant. The API separators discharge into an equalization basin, from which effluent flows to a flocculation tank, and then to a DAF tank. Two decanter tanks are used to decant water off the DAF float. Wastewater is then piped to the trickling filter to provide biological, secondary treatment. The wastewater effluent is then piped to offsite evaporation ponds near the banks of the Pecos River a few miles away. These ponds are regulated under an Oil Conservation Division (OCD) discharge plan.

Three heat exchanger bundle cleaning areas for cleaning bundles with either naphtha or a non-hazardous solvent exist at the refinery, although only two are currently being used (photos 11,12). Each area consists of a concrete surface pad with a sump to collect cleaning sludge which is connected to the WWTP via an API exchanger.

Non-hazardous waste generated include crude oil tank bottoms and catalyst slurry sludge (sent back to manufacture for recovery - photos 13,14), WWTP effluent (sent to evaporation ponds), lab chemicals (sent to API separators), asbestos (shipped to an offsite landfill), domestic sewage (sent to POTW), and general trash (sent to city landfill). The truck-by-pass landfarm is no longer receiving crude oil tank bottoms and oily material, however, the landfarm is covered under the facility's RCRA Facility Investigation, which began in the summer of 1990. The contact at EPA Region VI concerning the RFI is Rich Mayer.

RESULTS OF INSPECTION

The inspection consisted of an inbrief conference, a tour of the facility, a review of records and required documentation, completion of checklists, and an outbrief conference. The following areas of the facility were observed: some of the process/refining units, the north (photo 15), south, and WWTF API separators, the wastewater treatment plant (photos 17,18), the K-waste processing area, the heat exchanger bundle cleaning areas, the North Colony Landfarm (photo 16), the truck-by-pass landfarm, the TEL weathering area (which is closed and capped), the ninety day accumulation container storage area (photos 19,20,21), and the evaporation ponds which receive WWTP effluent (photos 6-10).

Currently, K and F listed wastes are "BDAT" processed centrifugally where the wastewater collected is returned to the WWTP, and the concentrated sludge is then thermally dried or "coked" before containerized and stored in the ninety day accumulation area. The filter press processing system, used during the 1991 inspection, is no longer being utilized.

Scaltech, Inc. has recently been contracted to recycle various K and F listed wastes. The Scaltech unit is designed to operate as an integral part of the refinery's wastewater treatment system and can process a variety of oily waste, wastewater, and wastewater sludges (see attachment 1). The unit accepts various oily wastes from the refinery (including but not limited to K048-K052, F037 and

F038) and separates them into three basic materials: wastewater, oil, and solids slurry. The wastewater is returned to the WWTP for treatment, the oil is mixed with refinery feedstock upstream of the cat cracker or crude distillation unit, and the solids slurry, which consists principally of solids in waste oil, can be shipped offsite for use as kiln fuel (as Scalfuel products, a suspension of solids in waste oil). The Scaltech system will play an integral part of Navajo's waste minimization program.

In a letter to Navajo Refining Company from NMED dated August 14, 1995 (see attachment 2), NMED is allowing the Scaltech process to be exempt from permitting requirements provided the oily waste to be treated by the Scaltech process is stored less than ninety days, as per 20 NMAC 4.1 Subpart III, 40 CFR § 262.34. The Scalfuel products (solids slurry) from the slurry dryer must also be stored less than ninety days, under the same conditions and requirements as the oily waste. Several other conditions, as stated in the letter, must also be met.

The following violations were noted:

1. Navajo has failed to mark four (4) 21,000 gallon tanks located in the K-waste processing and ninety day accumulation area with the words "Hazardous Waste". This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR § 262.34(a)(3). (See photo 1 and 2)

2. Navajo has failed to provide a written assessment reviewed and certified by an independent, qualified, registered professional engineer attesting to the structural integrity of the four tanks located in the K-waste processing and ninety day accumulation area. This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR §262.34(a)(1)(ii).

3. Navajo has failed to provide a secondary containment system for the these four tanks prior to their being put into service. This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR §262.34(a)(1)(ii) which refers more specifically to 40 CFR §265.193(a)(1).

4. Navajo has failed to provide a secondary containment system capable of detecting and collecting releases and accumulated liquids until such collected material can be removed for - the tanks located in the K-waste processing area. This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR §262.34(a)(1)(ii) which refers more specifically to 40 CFR §265.193(b)(2).

5. Navajo has failed to close two (2) - 55 gallon drums and one (1) - 400-500 gallon metal bin (approximately 25% full) of dry K-listed sludge. These containers were located in the ninety day accumulation area. This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR § 262.34(a)(1)(i). (See photos 4 and 5)

6. Navajo has failed to mark the containers noted in violation (5) with the words "Hazardous Waste". This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR §262.34(a)(3).

7. Navajo has failed to mark the containers noted in violation (5) with accumulation start dates. This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR §262.34(a)(2).

8. Navajo failed to show a legible accumulation start date on one wrangler bag containing K-listed hazardous waste located in the ninety day accumulation area. This is a violation of 20 NMAC 4.1.301, which incorporates federal regulation 40 CFR § 262.34(a)(2). (See photo 22)

9. Navajo has failed to retain copy of LDR notices accompanying manifest numbers 00264717 and 00264718. This is a violation of 20 NMAC 4.1.801, which incorporates federal regulation 40 CFR § 268.7(a)(7).

RECOMMENDED ACTION

Due to the repetitive nature of the of the violations noted as a result of the inspection, Navajo Refining Company is deemed a High Priority, and must be sent a Compliance Order with penalties.

FJS