3R - 82

REPORTS

DATE:

7/31/1995

Site Delineation
for
Erin Stays Com 1E

CONOCO INC.
Midland Division
Farmington, New Mexico

RECEIVED
AUG 3 1 1995
Environmental Bureau
Oil Conservation Division

Designed
by

Western Technologies INC.

July 31, 1995

(505) 327-4966
(505) 327-5293 FAX

Table of Contents

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conoco

Midland Division
Exploration Production

Conoco Inc.
10 Desta Drive, Suite 100W
Midland, TX 79705-4500
(915) 686-5400

5488

August 26, 1995

Mr. William C. Olson
Environmental Bureau
New Mexico Oil Conservation Division
Post Office Box 3088
Santa Fe, NM 87504

Dear Mr. Olson:

GROUNDWATER ASSESSMENT AT ERIN STAYS COM 1E SEC. 2, T 25N, R 11W.

Upon initial site assessment from local company and contract employees, the determination was made to investigate potential groundwater contamination within the facility site. Enclosed is the delineation report of the site soil/groundwater plume.

In summary, the area is extremely isolated from residence or area recharge of a source aquifer for domestic or livestock use. Local recharge from the reserve pit could explain the sole existence of the discontinuous water table identified as the plume. Please review our findings and advise as to the actions required by Conoco.

Yours very truly

R.N. Goates
Environmental Specialist

cc: Mr. Denny Foust
NM Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

John Coy (w/o enclosure)

Western Technologies Inc.
The Quality People
Since 1955

400 South Lorena Avenue
Farmington, New Mexico 87401
(505) 327-4966 • fax 327-5293

July 31, 1995

Conoco Inc.
Midland Division
3315 Bloomfield Highway
Farmington, New Mexico 87401

Attention: Mr. C. John Coy, Field Shear Specialist

Re: Report on the assessment of a groundwater contamination plume, Erin Stays Com 1E wellsite, San Juan Basin, New Mexico. WT Ref. No. 3185JC065.

Dear Mr. Coy:

On May 18, 1995, Western Technologies Inc. (WT) submitted a proposal (WT Ref. No. 3185PC065) to Conoco Inc. (Conoco) to better delineate a known groundwater contamination plume located at the Erin Stays Com 1E wellsite, San Juan Basin, New Mexico. The subject site was a production well facility consisting of a wellhead, 300-barrel capacity aboveground storage tank (AST), and a separator, dehydrator, and their associated surface impoundments (pits), along with two existing piezometers.

1.0 RESULTS

The assessment was accomplished by utilizing a Geoprobe sampling system to manually advance eleven 12-foot deep soil borings and four 26- to 31-foot deep piezometers (the third piezometer [BW #3] required three attempts at three different locations due to weathered claystone and sandstone starting at 20 feet below ground surface [bgs]). The soil borings were installed in order to evaluate subsurface soil gas vapors with the prospect of determining soil impact, and thus infer the areal extent of impact to groundwater. The piezometers were installed to: collect groundwater "grab" samples for the purpose of physically evaluating the condition of groundwater at the subject site; and, survey the relative elevation of groundwater with the intent of assessing the magnitude of impact and the direction of groundwater flow. The boring/piezometer locations are depicted in Plate 1, Site Plan.

Before initiating any field work, WT prepared a Site Safety & Health Plan (SSHP) for use by field personnel to minimize the risk of injury or illness. Adequate planning is needed prior to performing work to minimize the risk of employee injury or illness. This SSHP provides health

and safety criteria for the protection of on-site personnel, the public, and the environment from physical, biologic/pathologic, and chemical hazards associated with the environmental assessment activities to be conducted at this site. The specific assessment activities to which this plan applies include: soil and groundwater sampling, drilling and other assessment activities described in the following subsections. The purpose of the SSHP is to provide personal protection standards, mandatory safety practices and procedures while performing environmental assessment tasks associated with this project. The SSHP was adhered to by personnel conducting field operations.

Soil samples were collected from each of the eleven borings from ten to twelve feet bgs in a two-foot-long nylon sampling sleeve. Additionally, soil samples were collected from each of the four piezometers (prior to installing casing) at various depths immediately above the water table, and often including the aquifer itself. The samples were visually examined and described for soil and engineering characteristics according to the Unified Soil Classification System (USCS), and to determine the degree of contamination in the field, using the "heated headspace" method (please refer to Appendix A, Boring Logs).

The heated headspace method was conducted on samples collected as a screening tool utilizing a Thermo Environmental Instruments Model 580A OVA photo-ionization detector (PID). The analysis was conducted according to New Mexico Oil Conservation Division/U.S. Department of the Interior - Bureau of Land Management (OCD/BLM) prescribed methodology as follows: a .5 liter capacity sample jar was filled half-way with the soil sample and the opening was sealed with non-porous plastic material; the temperature of the sample was estimated to be between 59 and 77 degrees fahrenheit (based on air temperature reports); the sample was then placed in direct sunlight for a minimum of five minutes to allow aromatic hydrocarbon vapors to develop, during this time the sample jar was shaken vigorously for a period of one minute; the seal was then pierced with the probe of the PID and the highest reading over a period of one minute was recorded; the PID was calibrated to isobutylene, therefore, a factory-issued correction factor of 0.47 was applied to the recorded readings in order to assume the required benzene response factor. A total of 21 soil samples were collected for screening purposes. The corrected heated headspace readings for the samples ranged from a high of 4,575 parts per million (ppm) at B #1, to eight recorded readings of 0 ppm (corrected for benzene; please refer to Table 1).

TABLE 1. HEATED HEADSPACE ANALYSIS RESULTS

PIEZOMETER/BORING ID	SAMPLE DEPTH	PID READING (PPM)	PID READING (PPM) (corrected for benzene)
B #1	10'-12'	9,734	4,575
B #2	10'-12'	10	5
B #3	10'-12'	71	33
B #4	10'-12'	8	4
B #5	10'-12'	1	1
B #6	10'-12'	0	0
B #7	10'-12'	0	0
B #8	10'-12'	1	1
B #9	10'-12'	1	1
B #10	10'-12'	0	0
B #11	10'-12'	0	0
BW #1	27'-29'	2,770	1,302
BW #1	29'-31'	98	46
BW #2	25'-27'	70	33
BW #2	27'-29'	22	10
BW #3	20'-22'	32	15
BW #3	23'-25'	2	1
BW #3	25'-26'	0	0
BW #4	21'-23'	0	0
BW #4	24'-26'	0	0
BW #4	26'-27'	0	0

NOTE: PID READINGS ROUNDED-OFF TO NEAREST WHOLE NUMBER

Soil samples were placed in glass containers, packed on ice in an insulated cooler, and transported via overnight carrier under proper chain-of-custody to Westech Laboratories Inc. (Westech) for analyses. The four soil samples collected from the piezometers were analyzed for Total Recoverable Petroleum Hydrocarbons (TPH) by EPA Method 418.1. In addition, one soil sample (BW #2; 27'-29') was analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX) using EPA Method 8020 because: heated headspace results indicated levels above the action level of 100 parts per million (ppm) established by the OCD/BLM; and, due to the close proximity

of the sample to groundwater. An additional soil sample was collected from the aquifer at BW #4 from 24'-26' bgs for a sieve analysis in order to determine aquifer engineering characteristics.

WT constructed the piezometers by setting .5-inch outside diameter slotted PVC pipe. The subsurface generally features clayey and silty sands within the depth of exploration. Sampling was conducted at specific two-foot intervals (not continuously). Therefore, much of the probed interval was classified as "undifferentiated". The boring logs are presented as Appendix A.

The depth to groundwater at the subject site ranged from 26 feet bgs at BW #4 in the eastern portion of the site, to 29 feet bgs measured at BW #1 in the western portion of the site. The apparent direction of groundwater movement based on the surveyed elevation of the currently existing piezometers and depth to groundwater measurements is west-southwest (refer to Plate 2 and Table 2). Please note that elevation data are arbitrary, assigning "100-feet" to a specific nut located on the southeast side of the wellhead and designated as the benchmark.

TABLE 2. GROUNDWATER ELEVATIONS 7/95

PIEZOMETER ID	ELEVATION (TOP OF WELL CASING)	DEPTH TO GROUNDWATER	ELEVATION OF GROUNDWATER
BW #1	98.62	26.77	71.85
BW #2	100.46	28.10	72.36
BW #3	NA	NA	NA
BW #4	99.11	25.16	73.95
DP #3	98.20	26.74	71.46
DP #4	NA	NA	NA

WT had difficulty obtaining groundwater samples from the piezometers due to the lack of groundwater available for sampling purposes. Fresh aquifer recharge could not be obtained because when the piezometers were purged inadequate recharge occurred. Therefore, "grab" samples were obtained. Groundwater "grab" samples were obtained by driving a 19-inch-long stainless steel screen point sampler to below the water table and using a polyethylene tubing and check-valve sampling system to collect the samples. New disposable tubing was utilized for each individual piezometer to prevent cross-contamination. Samples were collected and placed in glass containers, packed on ice in an insulated cooler, and transported via overnight carrier under proper chain-of-custody to Westech for the following analyses: purgeable aromatics using EPA Method 602, nitrate nitrogen, total phosphorous, pH, and conductivity. Appendix

B includes laboratory analytical reports which address the magnitude of aquifer contamination based on soil and groundwater analytical results. The analytical results are summarized below in Table 3. The direction of groundwater movement was determined by surveying all three newly installed piezometers (BW #3 did not contain groundwater; three attempted piezometer locations), plus the two existing piezometers, sounding the piezometers, and producing a resultant water table elevation and hydraulic gradient map (Plate 2). The lateral extent of soil and groundwater impact is presented in Plate 3.

The aquifer thickness appears to be 3 to 4 feet according to the boring logs for BW #1, BW #2, and BW #4 (please refer to Appendix B). The aquifer appears to be comprised of sand with varying amounts of clay and silt. The aquifer appears to be a discontinuous stringer sand. No groundwater was encountered in the locale of BW #3, and the aquifer at BW #4 consisted of a claystone and sandstone. According to the grain size analysis (or sieve test) performed on a sample collected from 24 to 26 feet bgs at BW #4 the aquifer contains a high percentage of fines. A total of 92.4 percent of the sample passed through the #30 sieve (please refer to Appendix B for the sieve test laboratory report).

TABLE 3. ANALYTICAL RESULTS

SAMPLE ID	SAMPLE TYPE	PH/ COND. (umhos/cm)	NITRATE NITROGEN (mg/L)	EPA 602 (BTEX) (ug/L - water; mg/kg - soil)	TOTAL PHOS. (mg/L)	EPA 418.1 (TPH) (mg/kg)	TDS (mg/l)
BW #1	WATER	NA	NA	B 6,600 E 170 T 5,300 X 1,300	NA	NA	6,600
BW #1 (27'-29")	SOIL	NA	NA	NA	NA	ND	NA
BW #2 (27'-29')	SOIL	NA	NA	B .380 E .620 T .230 X 4.800	NA	47	NA
BW #3 (25'-27')	SOIL	NA	NA	NA	NA	ND	NA
BW #4 (21'-23')	SOIL	NA	NA	NA	NA	ND	NA
DP #3/#4	WATER	5/12,000	0.54	NA	<0.05	NA	NA

NOTES: ug/L = micrograms per liter, mg/l = milligrams per liter, mg/kg = milligrams per kilogram, ND = not detected (<10 mg/kg); NA = not applicable; B = Benzene; T = Toluene, E = Ethylbenzene; X = Total Xylenes, TDS = Total Dissolved Solids.

New Mexico Water Quality Control Commission (WQCC) human health standards for groundwater have been exceeded at BW #1 for benzene (10 ug/L), toluene (750 ug/L), and total xylenes (620 ug/L), and domestic water supply standards were exceeded for pH (6 to 9) in the composite sample tested from DP #3/4 (please refer to Table 3). In order to better characterize the groundwater quality at the site, a "grab" sample was collected from BW #1 and analyzed for Total Dissolved Solids (TDS). WQCC standards for TDS (10,000 mg/l) were not exceeded at BW #1.

OCD/BLM recommended soil remediation levels for TPH (100 milligrams per kilogram [mg/kg]) and BTEX (benzene, 10 mg/kg; BTEX, 50 mg/kg) were not exceeded in any of the samples analyzed. The extent and magnitude of soil contamination are displayed in Plate 3. No free-floating product was indicated in the piezometers. The piezometers may require proper abandonment at a later date.

Water samples collected from previously existing DP #3 and DP #4 were composited and analyzed for pH/conductivity, nitrate nitrogen, and total phosphorous analyses.

2.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the subsurface soil samples collected and characterized at the subject site, the underling aquifer appears to be a discontinuous stringer sand comprised of sand with varying amounts of clay and silt. According to the grain size analysis (performed on a sample collected from 24 to 26 feet bgs at BW #4) the aquifer contains a high percentage of fines. A total of 92.4 percent of the sample passed through the #30 sieve.

Of the 21 soil samples collected and screened for volatile hydrocarbons by heated headspace analysis, only two, B #1 and BW #1, indicated levels higher than the 100 ppm action level established by the OCD/BLM. The location of both borings is immediately downgradient of the two former pits. No groundwater was indicated in three piezometers (BW #3, 3A, and 3B) installed downgradient of B #1, between B #1 and DP #4 (a known area of groundwater impact). Therefore, WT hypothesizes that the area of B #1, directly adjacent to and downgradient of the former dehydrator pit is a current source of soil (and potentially groundwater) impact, and that liquids migrated downgradient from the former pit and collected in groundwater located in a sand lens at DP #4. The groundwater in the locale of DP #4 is in an isolated, discontinuous

pocket, as indicated by the lack of groundwater immediately upgradient and downgradient (TH #7).

A smaller source of impact is situated in the locale of BW #1 directly adjacent to and downgradient of the former separator pit. This source may continue to contribute to low levels of groundwater impact downgradient at DP #3.

Although levels exceeding WQCC standards exist in groundwater samples collected and analyzed from the subject site at BW #1 (and previously, DP #4) the aquifer is hydrologically discontinuous and "tight". WT recommends eliminating the existing soil contamination (because it is a potential source of groundwater impact) located immediately downgradient of the former pits, and applying for a variance with the OCD/BLM because groundwater remediation at the subject site is impractical and unwarranted.

This concludes WT's services for this project. Please call the undersigned at (505) 327-4966, if you have any questions.

Sincerely,
WESTERN TECHNOLOGIES INC.
Environmental Services

David R. Cesark, R.G., R.E.A.
Senior Environmental Scientist

Copies to: (3) Addressee
(1) File

NOTES:

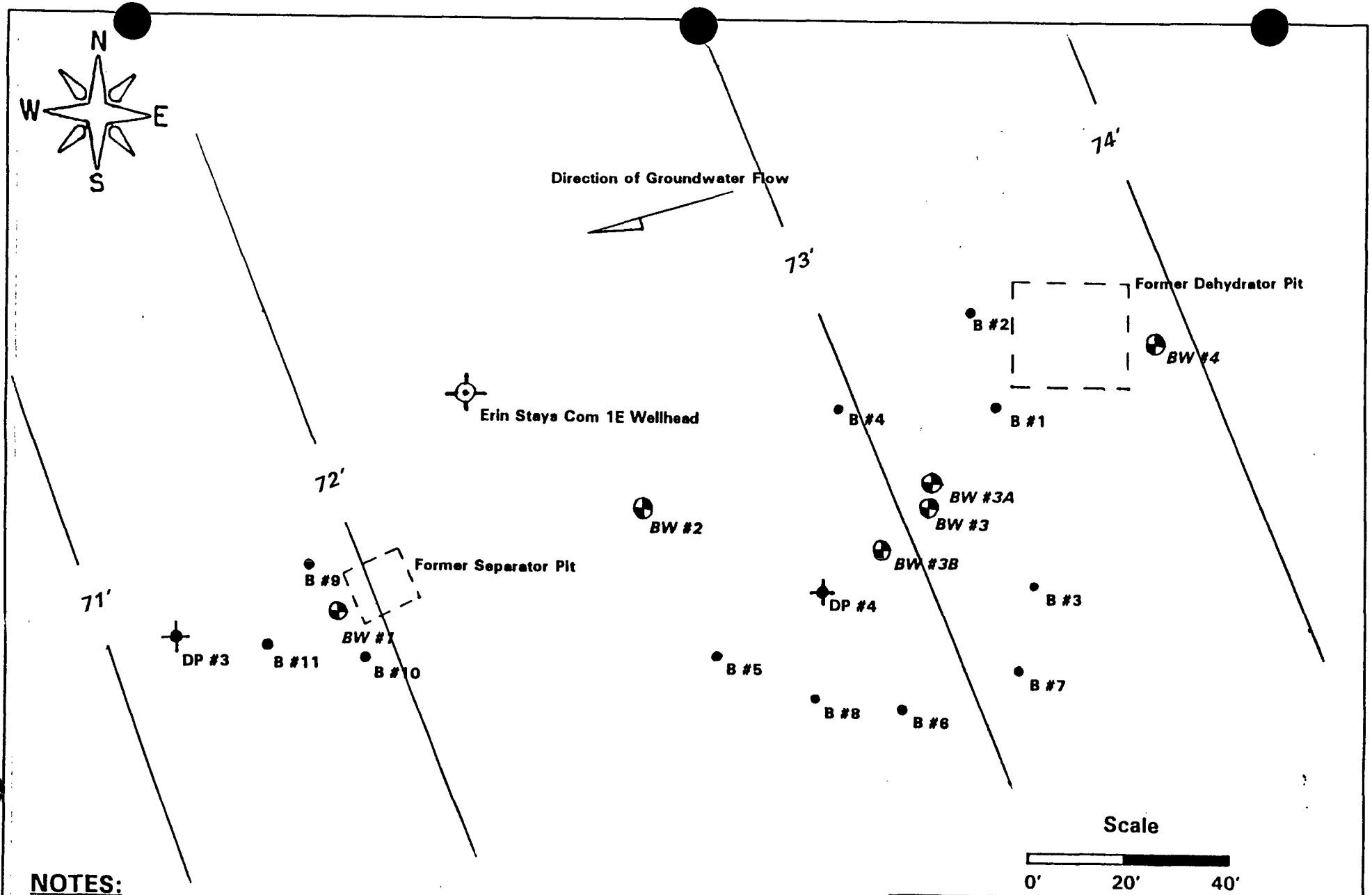
- Soil Boring Location
- Newly Installed Piezometer
- Previously Existing Piezometer

CONOCO INC. - ERIN STAYS COM 1E

SITE PLAN

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065	Plate: 1



NOTES:

- Soil Boring Location
- Newly Installed Piezometer
- Previously Existing Piezometer

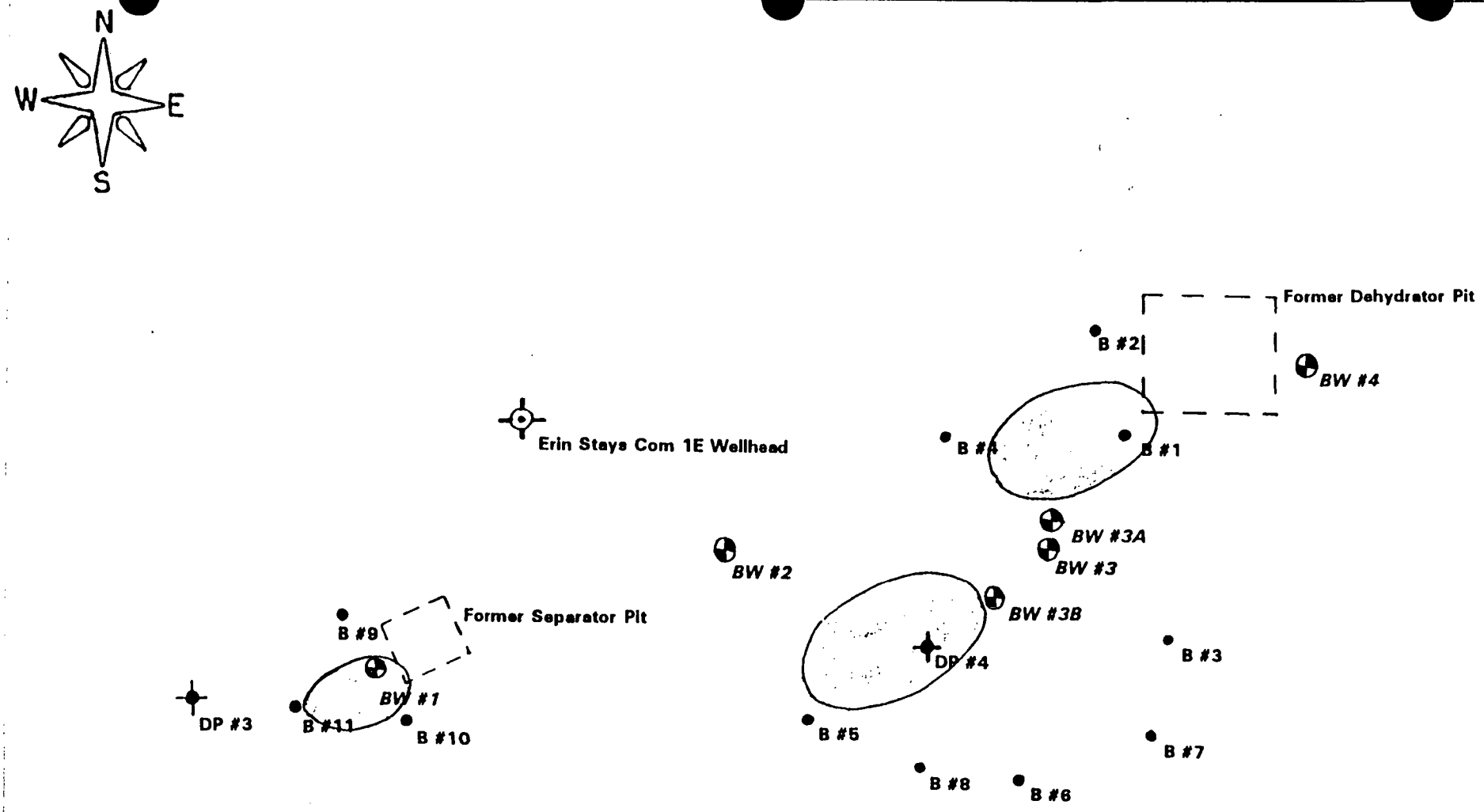
Elevation in Feet Based on Designated 100' Benchmark
Contours in 1 Foot Intervals

CONOCO INC. - ERIN STAYS COM 1E

HYDRAULIC GRADIENT

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 | Plate: 2



Scale

0' 20' 40'

NOTES:

- Soil Boring Location
- Newly Installed Piezometer
- Previously Existing Piezometer

CONOCO INC. - ERIN STAYS COM 1E

EXTENT OF IMPACT

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 | Plate: 3

APPENDIX A
Boring Logs

DATE DRILLED: 05-23-1995
LOCATION: See Site Plan (Figure 1)

BORING NUMBER: B#1
ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated
9734		G		STRONG	10	SP		SAND; with silt, light greyish-brown, moist, strong hydrocarbon odor and staining.
								12 Feet Stopped At 12 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 | Plate: 1

DATE DRILLED: 05-23-1995 BORING NUMBER: B#2

LOCATION: See Site Plan (Figure 1) ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
9.6		G		SLIGHT	10	SP/SM		SAND; with silt, to SAND; silty, light greyish-brown slight hydrocarbon odor, slight staining.
								12 Feet Stopped At 12 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop) Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 2

DATE DRILLED: 05-23-1995
LOCATION: See Site Plan (Figure 1)

BORING NUMBER: B#3
ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
70.8		G		MODERATE	10	SM		SAND; silty, with clay light brown, moist, moderate hydrocarbon odor, no staining.
								12 Feet Stopped At 12 Feet

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 3

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: 05-23-1995 BORING NUMBER: B#4

LOCATION: See Site Plan (Figure 1) ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
7.7		G		SLIGHT	10	SM/SP		SAND; silty, with clay to SAND; gravelly, silty, light brown, moist, slight hydrocarbon odor, no staining.
								12 Feet Stopped At 12 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop) Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 4

DATE DRILLED: 05-23-1995
LOCATION: See Site Plan (Figure 1)

BORING NUMBER: B#5
ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
					5			
1.3		G		NONE	10	SP		SAND; with silt, trace gravel, light brown, no hydrocarbon odor or staining.
								12 Feet Stopped At 12 Feet
					15			
					20			
					25			
					30			

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 5

DATE DRILLED: **05-23-1995**

BORING NUMBER: **B#6**

LOCATION: **See Site Plan (Figure 1)**

ELEVATION: **Not Determined**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
0.0		G		NONE	10	SP		SAND; with silt, light brown, slightly moist, no hydrocarbon odor or staining.
								12 Feet Stopped At 12 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 | Plate: 6

DATE DRILLED: 05-23-1995 BORING NUMBER: B#7

LOCATION: See Site Plan (Figure 1) ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
0.0		G		NONE	10	SM/SC		SAND; silty, with clay to clayey, light brown, slightly moist, no hydrocarbon odor or staining.
								12 Feet Stopped At 12 Feet

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop) Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 7

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: **05-23-1995**

BORING NUMBER: **B#8**

LOCATION: **See Site Plan (Figure 1)**

ELEVATION: **Not Determined**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
1.3		G		SLIGHT	10	SP/SC		SAND; with silt, trace clay to SAND; clayey, with silt, light brown to brown, moist, slight hydrocarbon odor, no staining.
								12 Feet Stopped At 12 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065

Plate: 8

DATE DRILLED: 05-23-1995 BORING NUMBER: B#9

LOCATION: See Site Plan (Figure 1) ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
1.3		G		SLIGHT	10	SP		SAND; with silt, light greyish-brown, moist, slight hydrocarbon odor, no staining.
								12 Feet Stopped At 12 Feet

5 15 20 25 30

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop) Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 9

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: **05-23-1995**

BORING NUMBER: **B#10**

LOCATION: **See Site Plan (Figure 1)**

ELEVATION: **Not Determined**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
0.4		G		NONE	10	SM		SAND; silty, with clay, light brown, moist, no hydrocarbon odor, no staining.
								12 Feet Stopped At 12 Feet

5 — 15 — 20 — 25 — 30

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 Plate: 10

DATE DRILLED: **05-23-1995**

BORING NUMBER: **B#11**

LOCATION: **See Site Plan (Figure 1)**

ELEVATION: **Not Determined**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
0.4		G		NONE	10	SM		SAND; silty, trace clay, light brown, slightly moist no hydrocarbon odor or staining.
								12 Feet Stopped At 12 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: **3185JC065**

Plate: **11**

DATE DRILLED: **05-24-1995**

LOCATION: **See Site Plan (Figure 1)**

BORING NUMBER: **BW#1**

ELEVATION: **98.62**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
					0	SP-SC		SANDS; undifferentiated
					5			
					10			
					15			
					20			
					25			
2770		G		STRONG		SM		SAND; silty, with clay, light brown, very moist strong hydrocarbon odor, stained dark grey.
								GROUNDWATER ENCOUNTERED AT 29 FEET
98-12		G		SLIGHT	30	SC/SP		SAND; interlayered silty to trace silt, light brown, very moist to wet, moderate hydrocarbon odor, slightly stained. feet. (this soil will be continued on the next page)

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.
Elevation measured from top of casing.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: **3185JC065** Plate: **12**

DATE DRILLED: **05-24-1995**

LOCATION: **See Site Plan (Figure 1)**

BORING NUMBER: **BW#1**

ELEVATION: **98.62**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
98-12		G		SLIGHT		WBRCS		WEATHERED CLAYSTONE; trace silt, dark olive grey, moist, no hydrocarbon odor or staining.
								31 Feet
								Stopped At 31 Feet

35

40

45

50

55

60

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.
Elevation measured from top of casing.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: **3185JC065** Plate: **12**

DATE DRILLED: **05-25-1995**

LOCATION: **See Site Plan (Figure 1)**

BORING NUMBER: **BW#2**

ELEVATION: **100.46**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-SC		SANDS; undifferentiated.
					5			
					10			
					15			
					20			
70		G		MODERATE	25	SM		SAND; silty, with clay to clayey, light brown, moist, moderate hydrocarbon odor, stained grey.
								GROUNDWATER ENCOUNTERED AT 27 FEET
22		G		SLIGHT		SC		SAND; clayey to silty, to SAND AND CLAY; light brown, very moist, slight hydrocarbon odor, no staining.
					30			**29 Feet** Stopped At 29 Feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.
Elevation measured from top of casing.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 | Plate: 13

DATE DRILLED: 05-31-1995
LOCATION: See Site Plan (Figure 1)

BORING NUMBER: BW#3, 3A, 3B
ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-CL		SANDS AND CLAYS; undifferentiated.
					5			
					10			
					15			
32		G		SLIGHT	20	WBRCS		WEATHERED CLAYSTONE & SANDSTONE; interbedded, silty to clayey matrix, fine to coarse grained, light brown with slight olive-tone, moist to very moist, no hydrocarbon odor or staining.
1.8		G		NONE				
0.4		G		NONE	25	BRCS		CLAYSTONE; slightly silty with fine to coarse grained sand, light olive-brown, moist, no hydrocarbon odor or staining.
								26 Feet
								Stopped At 26 Feet
					30			

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065 | Plate: 14

DATE DRILLED: **05-30-1995**

BORING NUMBER: **BW#4**

LOCATION: **See Site Plan (Figure 1)**

ELEVATION: **99.11**

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP-CL		SANDS AND CLAYS; undifferentiated.
					5			
					10			
					15			
					20			
0.4		G		NONE		WBRCS		WEATHERED CLAYSTONE; with interbedded SANDSTONE, silty to clayey, light olive-brown, moist to wet in sandy intervals, no hydrocarbon odor or staining.
0.4		G		NONE	25			
0.4		G		NONE		BRCS		CLAYSTONE; slightly silty with fine grained sand, light olive-brown, moist, no hydrocarbon odor or staining.
								27 Feet
								Stopped At 27 Feet
					30			

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)
Driving weight: 20
Headspace by New Mexico USTR, Chapter XII Appendix C.

NOTES:
Borings driven to depth using slide hammer.
Elevation measured from top of casing.

CONOCO; ERIN STAYS COM 1E

Boring Log

WESTERN TECHNOLOGIES INC.

Job No: 3185JC065

Plate: 15

APPENDIX B
Laboratory Reports

Westech Laboratories Inc.
The Quality People
Since 1955

10737 Gateway West, No. 100
El Paso, Texas 79935-4906
(915) 592-3591 • fax 592-3594

CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502334
INVOICE NO.: 3185W028
REPORT DATE: 06-09-95
REVIEWED BY:

CLIENT SAMPLE ID : BW#1 27'-29'
SAMPLE TYPE .....: Soil
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: Erin Stays Com 1E

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 05-24-95
SUBMITTAL DATE : 06-02-95
EXTRACTION DATE: --

Modified 418.1 - Total Petroleum Fuel Hydrocarbons

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Total Petroleum Hydrocarbons .....:	<10.	mg/kg	10.	06-09-95

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Managing Director

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CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502335
INVOICE NO.: 3185W028
REPORT DATE: 06-09-95
REVIEWED BY:

CLIENT SAMPLE ID : BW#2 27'-29'
SAMPLE TYPE .....: Soil
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: Erin Stays Com 1E
ANALYST .....: A. Skornia

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 05-24-95
SUBMITTAL DATE : 06-02-95
EXTRACTION DATE: 06-08-95
ANALYSIS DATE .: 06-09-95

Method: Modified 418.1 (TPH) + 8020 (BTEX)

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Total Petroleum Hydrocarbons .....:	47	mg/Kg	10.
Benzene .....:	380	ug/Kg	10.
Ethylbenzene .....:	620	ug/Kg	10.
Toluene .....:	230	ug/Kg	10.
Total Xylenes .....:	4800	ug/Kg	3.0

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CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502336
INVOICE NO.: 3185W028
REPORT DATE: 06-09-95
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : BW#3 25'-27'
SAMPLE TYPE .....: Soil
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: Erin Stays Com 1E

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 05-24-95
SUBMITTAL DATE : 06-02-95
EXTRACTION DATE: --

Modified 418.1 - Total Petroleum Fuel Hydrocarbons

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Total Petroleum Hydrocarbons .....:	<10.	mg/kg	10.	06-09-95

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CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502337
INVOICE NO.: 3185W028
REPORT DATE: 06-09-95
REVIEWED BY:

CLIENT SAMPLE ID : BW#4 21'-23'
SAMPLE TYPE .....: Soil
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: Erin Stays Com 1E

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 05-24-95
SUBMITTAL DATE : 06-02-95
EXTRACTION DATE: --

Modified 418.1 - Total Petroleum Fuel Hydrocarbons

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Total Petroleum Hydrocarbons .....:	<10.	mg/kg	10.	06-09-95

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CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502332
INVOICE NO.: 3185W028
REPORT DATE: 06-09-95
REVIEWED BY:

CLIENT SAMPLE ID : BW#1 Monitor Well
SAMPLE TYPE .....: Water
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: Erin Stays Com 1 E
ANALYST.....: A. Skornia

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 05-31-95
SUBMITTAL DATE : 06-02-95
EXTRACTION DATE: --
ANALYSIS DATE .: 06-07-95

Method 602 - Purgeable Aromatics

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Benzene	6600	ug/L	1.0
Ethylbenzene	170	ug/L	1.0
Toluene	5300	ug/L	1.0
Total Xylenes	1300	ug/L	0.3

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CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502897
INVOICE NO.: 3185WO45
REPORT DATE: 07-25-95
REVIEWED BY:

CLIENT SAMPLE ID : 3185JC065 Erin Stays
SAMPLE TYPE .....: Water
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: BWA1 Erin Stays Com 1E

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 07-09-95
SUBMITTAL DATE : 07-13-95
EXTRACTION DATE: --

Inorganic Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Total Dissolved Solids .....:	6600	mg/L	5.0	07-20-95	STD METH 2540-C	F. Armendariz

(Work File Copy)

Managing Director

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CLIENT WESTERN TECHNOLOGIES, INC.
400 LORENA AVENUE
FARMINGTON, NM 87401

SAMPLE NO. : 6502421
INVOICE NO.: 3185W028
REPORT DATE: 06-15-95
REVIEWED BY:

CLIENT SAMPLE ID : DP #3+ #4 Composite
SAMPLE TYPE .....: Water
SAMPLED BY .....: B. Andersen
SUBMITTED BY ....: B. Andersen
SAMPLE SOURCE ...: Conoco Erin Stays

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 05-31-95
SUBMITTAL DATE : 06-06-95
EXTRACTION DATE: --

Inorganic Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method	Analyst
Electrical Conductivity .....:	12000	umhos/cm		06-15-95	STD METH 2510 B	F. Armendariz
Nitrate Nitrogen .....:	0.54	mg/L	0.50	06-06-95	EPA 300.0	F. Armendariz
pH .....:	5.0	S.U.		06-06-95	STD METH 4500-H+	F. Armendariz
Total Phosphorus .....:	<0.05	mg/L	0.05	06-09-95	STD METH 4500-P E	D.Guzman

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-060995-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 06-09-95

TEST DESCRIPTION ..: Mod. 8015 - TPH (C4-9) Gas / 8020 BTEX
TEST METHOD .....: Modified 8015 / 8020

SAMPLES IN THIS RUN: 6502335 6502339 6502341 6502373 6502383 6502384 6502414 6502415 6502416 6502417 6502418 6502453 6502458 6502459 6502460 6502462

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
1,2 Dibromoethane(EDB)	ug/L	10	8.6	86.0
1,2-Dichloroethane	ug/L	10	8.5	85.0
Ethylbenzene	ug/L	10.	8.9	89.0
Toluene	ug/L	10.	8.7	87.0
Total Xylenes	ug/L	30.	27	90.0
Benzene	ug/L	10.	8.9	89.0
Methyl Tert-Butyl Ether	ug/L	10	9.1	91.0
Ethylbenzene	ug/L	10.	9.5	95.0
Toluene	ug/L	10.	9.5	95.0
Total Xylenes	ug/L	30.	29	96.7
Benzene	ug/L	10.	9.6	96.0
Ethylbenzene	ug/L	10.	9.7	97.0
Toluene	ug/L	10.	9.7	97.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	9.8	98.0
Total Petroleum Fuel Hydrocarbons	mg/L	5	5.6	112.0
Ethylbenzene	ug/L	10.	9.4	94.0
Toluene	ug/L	10.	9.5	95.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	9.6	96.0
Ethylbenzene	ug/L	10.	9.7	97.0
Toluene	ug/L	10.	9.8	98.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	9.9	99.0
Total Petroleum Fuel Hydrocarbons	mg/L	5	5.8	116.0

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6502339	Ethylbenzene	ug/Kg	370	380	2.7
6502339	Toluene	ug/Kg	46	46	NC

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-060995-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 06-09-95

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6502339	Total Xylenes	ug/Kg	260	260	0.0
6502339	Benzene	ug/Kg	<10	<10	NC
6502414	Ethylbenzene	ug/L	<1.0	<1.0	NC
6502414	Toluene	ug/L	<1.0	<1.0	NC
6502414	Total Xylenes	ug/L	0.8	<0.3	NC
6502414	Benzene	ug/L	<1.0	<1.0	NC
6502414	Total Petroleum Fuel Hydrocarbons	mg/L	<2.0	<2.0	NC
6502414	Total Petroleum Fuel Hydrocarbons	mg/L	<1.0	<1.0	NC

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6502339	Ethylbenzene	ug/Kg	370	500	850	96.0
6502339	Toluene	ug/Kg	46	500	540	98.8
6502339	Total Xylenes	ug/Kg	260	1500	1800	102.7
6502339	Benzene	ug/Kg	<10	500	520	104.0
6502416	Ethylbenzene	ug/L	<1.0	20	20	100.0
6502416	Toluene	ug/L	<1.0	20	20	100.0
6502416	Total Xylenes	ug/L	<0.3	60	61	101.7
6502416	Benzene	ug/L	<1.0	20	20	100.0
6502417	Total Petroleum Fuel Hydrocarb	mg/L	9.9	10	18	81.0

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Benzene	ug/Kg	<10.
Toluene	ug/Kg	<10.
Ethylbenzene	ug/Kg	<10.
Total Xylenes	ug/Kg	<3.0
Total Petroleum Fuel Hydrocarbons	mg/L	<1.0
Benzene	ug/L	<1.0

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-060995-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 06-09-95

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Toluene	ug/L	<1.0
Ethylbenzene	ug/L	<1.0
Total Xylenes	ug/L	<0.3

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

WESTECH
LABORATORIES, INC.
QUALITY ASSURANCE OFFICER

DATE 6-19-95

Westech Laboratories Inc.
The Quality People
Since 1955

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El Paso, Texas 79935-4906
(915) 592-3591 • fax 592-3594

QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-060795-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 06-07-95

TEST DESCRIPTION ..: 8020 BTEX
TEST METHOD .....: 8020

SAMPLES IN THIS RUN: 6502287 6502288 6502289 6502294 6502295 6502296 6502297
6502329 6502332 6502381 6502382 6502408 6502409

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
1,2 Dibromoethane(EDB)	ug/L	10	8.6	86.0
1,2-Dichloroethane	ug/L	10	8.9	89.0
Ethylbenzene	ug/L	10.	8.5	85.0
Toluene	ug/L	10.	8.7	87.0
Total Xylenes	ug/L	30.	26	86.7
Benzene	ug/L	10.	8.7	87.0
Methyl Tert-Butyl Ether	ug/L	10	9.3	93.0
1,2 Dibromoethane(EDB)	ug/L	10	8.6	86.0
1,2-Dichloroethane	ug/L	10	9.1	91.0
Ethylbenzene	ug/L	10.	8.5	85.0
Toluene	ug/L	10.	8.8	88.0
Total Xylenes	ug/L	30.	26	86.7
Benzene	ug/L	10.	8.8	88.0
Methyl Tert-Butyl Ether	ug/L	10	8.5	85.0

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6502288	Ethylbenzene	ug/L	<1.0	<1.0	NC
6502288	Toluene	ug/L	<1.0	<1.0	NC
6502288	Benzene	ug/L	1.6	1.7	NC
6502288	Total Xylenes	ug/L	2.5	2.6	3.9
6502408	1,2 Dibromoethane(EDB)	ug/L	<1.0	<1.0	NC
6502408	1,2-Dichloroethane	ug/L	<1.0	<1.0	NC
6502408	Ethylbenzene	ug/L	<1.0	<1.0	NC
6502408	Toluene	ug/L	3.671	3.6	NC
6502408	Total Xylenes	ug/L	0.6	0.6	NC
6502408	Benzene	ug/L	16	15	6.5
6502408	Methyl Tert-Butyl Ether	ug/L	<2.0	<2.0	NC

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-060795-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 06-07-95

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6502289	Ethylbenzene	ug/L	<1.0	20	18	90.0
6502289	Toluene	ug/L	<1.0	20	19	95.0
6502289	Benzene	ug/L	<1.0	20	19	95.0
6502289	Total Xylenes	ug/L	1.7	60	56	90.5
6502409	1,2 Dibromoethane(EDB)	ug/L	<5.0	20	17	85.0
6502409	1,2-Dichloroethane	ug/L	<0.5	20	19	95.0
6502409	Ethylbenzene	ug/L	<1.0	20	17	85.0
6502409	Toluene	ug/L	<1.0	20	18	90.0
6502409	Total Xylenes	ug/L	<0.3	60	54	90.0
6502409	Benzene	ug/L	1.6	20	19	87.0
6502409	Methyl Tert-Butyl Ether	ug/L	<2.0	20	17	85.0

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Benzene	ug/L	<1.0
Toluene	ug/L	<1.0
Ethylbenzene	ug/L	<1.0
Total Xylenes	ug/L	<0.3

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QUALITY CONTROL REPORT

QC IDENTIFIER .....: 31-060795-1
REFERENCE NOTEBOOK :
REFERENCE PAGE ....:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 06-07-95

NOTE -

1) NC: Not Calculable because result is < 5 times the MDL

2) NP: Not Practical because sample result is 4 times or more greater than spike added.

3) Percent Recovery is:

$$\frac{\text{Sample+Spike Result - Sample Result}}{\text{Spike Amount}} \times 100$$

4) Relative Percent Difference (RPD) is:

$$\frac{\text{Sample Result - Replicate Result}}{(\text{Sample Result + Replicate Result})/2} \times 100$$

WESTECH
LABORATORIES, INC.
QUALITY ASSURANCE OFFICER
DATE 6-20-95

Westech Laboratories Inc.
The Quality People
Since 1955

10737 Gateway West, No. 100
El Paso, Texas 79935-4906
(915) 592-3591 • fax 592-3594

QUALITY CONTROL REPORT

QC IDENTIFIER .....: 34-060995-2
REFERENCE NOTEBOOK : TPH #7
REFERENCE PAGE ....:

INSTRUMENT : IR-TPH
ANALYZED BY : W. Weigart
ANALYZED ON : 06-09-95

TEST DESCRIPTION ..: Total Petroleum Hydrocarbons
TEST METHOD .....: 418.1

SAMPLES IN THIS RUN: 6502327 6502334 6502335 6502336 6502337 6502338 6502340 6502373 6502377 6502378 6502379 6502464

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Total Petroleum Hydrocarbons	mg/kg	200.	180	90.0
Total Petroleum Hydrocarbons	mg/kg	200.	180	90.0
Total Petroleum Hydrocarbons	mg/kg	200.	190	95.0

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6502327	Total Petroleum Hydrocarbons	mg/kg	19	18	NC
6502373	Total Petroleum Hydrocarbons	mg/Kg	71	67	5.8

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6502327	Total Petroleum Hydrocarbons	mg/kg	19	100	120	101.0
6502373	Total Petroleum Hydrocarbons	mg/Kg	71	100	160	89.0

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Total Petroleum Hydrocarbons	mg/kg	<10

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Flagstaff • 2400 E. Huntington Dr. • AZ 86004 • 602-774-2312 • fax 774-6469
El Paso • 10737 Gateway West #100 • TX 79935 • 915-592-3591 • fax 592-3594

CHAIN OF CUSTODY RECORD

CLIENT	ADDRESS	
WT (F ...)	4... S Corena Ave Farmington NM 87401	
TELEPHONE (505) 327-4966	PROJECT Erin Stays Conl E	JOB/P.O. NO. x 3185W028

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

SAMPLER (SIGNATURE): [signature]

SAMPLER (PLEASE PRINT): Brian Andersen

SAMPLE TYPE CODES: S - SOIL, O - OIL, T - TRAVEL BLANK, W - WATER, G - SLUDGE, F - FIELD BLANK, X - OTHER (SPECIFY)

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE LOCATION	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	HOLD	602 BTEX	pH conductivity	Nitrate Nitrogen	total phosphorus	TPH 418.1	BTEX (8020)	COMMENTS	LABORATORY IDENTIFICATION
BW#1 monitor well	5/31	11³⁰	BW#1 monitor Well		X	W	2		X						call if can't run for 602	0502332
" "	5/31	11⁵⁰	" " "		X	W	1			X	X	X			broken	2333
"	5/24	10³⁰	BW#1 @ 27'-29'		X	S	1	X					X	*	*save for possible 8020 call first!!	2334
BW#2	5/25	14²⁰	BW#2 @ 27'-29'		X	S	1						X	X		2335
BW#3	5/30	10⁰⁵	BW#3 @ 25'-27'		X	S	1						X			2336
BW#4	5/30	11²⁰	BW#4 @ 21'-23'		X	S	1						X			2337

sample container BW#1 - liquid broken

BW#1 soil broken & transferred into another 4 oz jar.
David Cesark informed.

RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE/TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
[signature]	Brian Andersen	5/31 @ 1530 pm		
		6/3 ...	B Thompson	

REMARKS: if 602 can not be run then contact us. *Save BW#1 soil for (possible) 8020

SAMPLE / COOLER °C: rec'd on ice

SAMPLE PROCESS TURNAROUND TIME: ☐ 10 BUSINESS DAYS ☐ OTHER (SPECIFY)

623 (6/93) White - Testing Laboratory; Yellow - Department Job File; Pink - Client

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CHAIN OF CUSTODY RECORD

CLIENT	ADDRESS
WT Farm 3185JC065	400 S Loreum Ave Farmington NM 87401
TELEPHONE	PROJECT: 3185JC065 Conoco Eninstays / JOB/P.O. NO.: 3185W028

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

SAMPLER (SIGNATURE): [signature]
SAMPLER (PLEASE PRINT): Brian Anderson

SAMPLE TYPE CODES: S - SOIL; O - OIL; T - TRAVEL BLANK; W - WATER; G - SLUDGE; F - FIELD BLANK; X - OTHER (SPECIFY)

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE LOCATION	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	HOLD	REQUESTED ANALYSES: pH; Conductivity; Nitrate/Nitrogen; Total Phosphorous	COMMENTS	LABORATORY IDENTIFICATION
DP #3 3185JC065	5/31	11:50	DP #3/DP#4	X						Run in place of other sample which was broken upon arrival	502421
										Label reads MW-3b 1/24 1/2 leaked out & pH ~ 6 quality -	

RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE / TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
[signature]	Brian Anderson	6/5 @ 12:00	[signature]	
RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE / TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
RELINQUISHED BY (SIGNATURE)	PRINT NAME	DATE / TIME	RECEIVED BY (SIGNATURE)	PRINT NAME
		6/6/95 1330	[signature]	

REMARKS: Find Work order from previous delivery - Original sample Jar Broke
SAMPLE / COOLER: °C
SAMPLE PROCESS TURNAROUND TIME: ☐ 10 BUSINESS DAYS ☐ OTHER (SPECIFY)

623 (6/93) White - Testing Laboratory; Yellow - Department Job File; Pink - Client

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CHAIN OF CUSTODY RECORD

CLIENT: WT Farm.	ADDRESS: 400 S. Corona Ave
CONTACT PERSON: Dave Cegark	Farmington N.M.
TELEPHONE: 327 4966	PROJECT: Erin Stays Com 1E / JOB/P.O. NO.: 3185JC065
FAX:	WESTECH QUOTE / CONTRACT NO.:

• SEE FEE SCHEDULE •

SAMPLER (SIGNATURE):
(PRINT NAME): Brian Anderson

SAMPLE TYPE CODES: A-WATER S-SOIL O-OIL G-SLUDGE D-DRINKING WATER W-WASTEWATER T-TRAVEL BLANK F-FIELD BLANK X-OTHER (SPECIFY):

SAMPLE/COOLER TEMPERATURE: rec'd on ice

SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE LOCATION	NO. CONTAINERS	COMPOSITE	GRAB	SAMPLE TYPE	CONTAINERS (FOR LAB USE ONLY): Unpreserved	HNO_3	NaOH	H_2SO_4	HCl	HOLD (Do Not Analyze)	REQUESTED ANALYSES: Total Petroleum Hydrocarbons	COMMENTS (DWR / PWS / ETC.)	LABORATORY IDENTIFICATION
3185JC065 Erin Stays	7/3	11:10	BWA1	1		X	A	X						X		6502897

RELINQUISHED BY (SIGNATURE)	PRINT NAME	RECEIVED BY (SIGNATURE)	PRINT NAME	DATE / TIME
	Brian Anderson			
UPS		B Thompson		7/3/95 830

REMARKS

☐ Fax Results ☐ Special Detection Limits / Requirements

SAMPLE PROCESS TURNAROUND TIME:
☐ Standard ☐ Other (specify)

623 ©94 WTI White – Laboratory; Yellow – Work File; Pink – Client

SIEVE ANALYSIS

Type of Material [illegible] Job No. [illegible]

Source of Material BW-4 24-26 Lab/Invoice No. _____

Sieve No.	Weight Retained	% Retained	% Pass Accum.	Specs.
4				
3				
2				
1 1/2				
1 1/8				
1				
3/4				
1/2				
3/8				
1/4, #3				
#4				
Ret. #4		Technician Initial		
Pass #4 Wet		Wet Weight Before Wash	164.3	Sulin
Pass #4 Dry		Dry Weight Before Wash	162.1	
Total Dry		Weight After Wash	114.5	
Initial Total		Elutriation	47.6	
#8	2.7	1.7	98.3	
#10	3.0	1.9	98.1	
#16	5.5	3.4	96.6	
#30	12.3	7.6	92.4	
#40	19.4	12.0	88.0	
#50	29.3	18.1	81.9	
#100	69.6	42.9	57.1	
#200	106.0	65.4	34.6	
Finer Than 200	114.5			
Total	162.1			

Sampled By _____ Date _____

Submitted By _____ Date _____

Test/Calc. By _____ Date _____

Reviewed By _____ Date _____

Classification _____

Test Procedure

☐ Aggregate

Sieve ASTM C136-

-200 ASTM C117-

☐ Soil

Sieve ASTM D422-

-200 ASTM D1140-

☐

☐

Special Instructions _____

301 (3/92 spf)

Western Technologies Inc.

PLASTICITY INDEX
ASTM D4318-

Type of Material _____ Job No. _____

Source of Material _____ Lab/Invoice No. _____

Sampled By _____ Date _____

Submitted By _____ Date _____

Tested / Calculated By _____ Date _____

Reviewed By _____ Date _____

LIQUID LIMIT

Taps			
Container Identification			
Wet Weight + Container			
Dry Weight + Container	−		
Weight of Water	=		
Dry Weight + Container			
Weight of Container	−		
Weight of Dry Soil	=		
$\frac{\text{Weight of Water}}{\text{Weight of Dry Soil}}$ x 100 = Liquid Limit	=		
Liquid Limit at 25 Taps	=		

PLASTIC LIMIT

Container Identification			
Wet Weight + Container	−		
Dry Weight + Container	=		
Weight of Water			
Dry Weight + Container	=		
Weight of Container	−		
Weight of Dry Soil	=		
$\frac{\text{Weight of Water}}{\text{Weight of Dry Soil}}$ x 100 = Plastic Limit	=		

PLASTICITY INDEX ASTM D4318- =

344 (3/92 spf)

Western Technologies Inc.