

3R - 94

REPORTS

DATE:

Sept 16, 1996

PIT ASSESSMENT Phase I
Documentation

EXPOSURE SUMMARY

Phase II

ASSESSMENT "WESTERN TECH"

RECEIVED

SEP 16 1996

Environmental Bureau
Oil Conservation Division

4

BORING logs for wells
219-19-47-130-126

5

Groundwater Samples

6

TOPO

7

RBCA TIER 1/2 Evaluation

8

RBCA Scenario for 200'

9

RBCA Scenario for 100'

10

^{DIMENICO}
FATE Transport Scenario
for free phase vs. SEP. MEDIA

11

BioScreen Model

12

LOCATION: SAN JUAN 23-7 # 212

RCRA EXEMPT

PIT TYPE:

BDP / BP RELIEF

WASTES:

Yes ☒ No ☐S-20, T-28N, R-7W, Unit N

DATE FLOW TO PIT STOPPED: _____

TYPE REPLACEMENT PIT:

☐ NONE☐ BACKFILLED - BELOW GROUND☐ ABOVE GROUND

ACREAGE

TYPE:

☒ FEDERAL☐ JICARILLA☐ NAVAHO☐ STATE☐ FEE

SITE ASSESSMENT

Ranking Score

1) Groundwater Depth: ESTIMATE ± 50Basis: ELEVATION FROM WASH20

2) Wellhead Protection Area:

Distance To

Water Sources: <1000' Private Domestic Water Sources: >200'Basis: CERAZA WASH DOMESTIC USE ± 750'203) Distance To Surface Body of Water: 200 - 1000'Basis: CERAZA WASH ACTUAL ± 750' EAST10

Total Score:

50

Soil Characteristic

☐ Highly Contaminated/Saturated☒ Unsaturated Contaminated

RANKING CRITERIA

GUIDELINE REMEDIATION LEVELS

Depth to Groundwater	Wellhead Protection Area	Distance to Surface Water Body	Score	Rank
	<1000' from water source or < 200' from private domestic water source			
<50 ft	yes	<200' horiz	20	20
<50 - 99	no	200 - 1000' horiz	10	10
>100 ft		>1000' horiz	0	0

Total Ranking Score			
	>19	10-19	0-9
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
Field Headspaces			
Method for BTEX	100	100	100
TPH (ppm) **	100	1,000	5,000

** Concentration above background

DEFINITION OF CONTAMINATION

Date: _____

Depth Excavated: _____

Full Excavation: ☐

Maximum Extent Practicable _____

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLE RESULTS NOTES" FORM

Groundwater Encountered:

Yes ☒No ☐

If yes, approximate depth:

5.5' ± 0.5'

Groundwater Sampling?

☒

Yes

☐

No

Where was gw sample taken?

~ 4' on down gradient side of pit

Attach GW Sample Results

NOTES: Draft + Copy of Auger drilling soil profile data is attached

REMEDIATION PROFILE

Soil Treated Onsite ☐

Date Remediation Started: _____

☐ In Situ Bio☐ w/vapor venting☐ Landfarmed☐ Composted

	Date: _____		Date: _____	
	Description	Amount/Rate	Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

	Date: _____		Date: _____	
	Description	Amount/Rate	Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLING RESULTS NOTES" FORM

SOIL TREATED/HANDLED OFFSITE

TO SITE(ATTACH MANIFEST)

Where Treated: _____

Type of Land (Fed/Nav/Jic/State/Fee): _____

Quantity Moved: _____

Quantity Disposed At Envirotech: _____

FROM SITE (ATTACH MANIFEST)

To This Location From: _____

Type of Land (Fed/Nav/Jic/State/Fee): _____

Quantity Moved: _____

FINAL CLOSURE

BTEX: _____ ppm (From Headspace Analysis)

TPH: _____ ppm (From Lab Results)

Revegetated:

yes ☐no ☐

Active Well or Facility Pad:

yes ☐no ☐

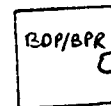
NOTES: 7/27/95 Shut off flow into pit. Hollow Stem Auger began drilling

PIT LOCATION AND COMPOSITE SAMPLE PROFILE MAP #2

WELL LOCATION: San Juan 28-7 #219 S 20 T 28N R 7W UNIT N

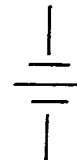
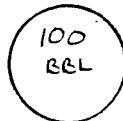
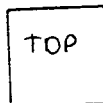
DATE STARTED: _____ DATE COMPLETED: _____

REMEDICATION/Excavation DATA



OMW

Auger Bore



- o SOIL SAMPLE LOCATION
- Δ BACKGROUND SAMPLE LOCATION

LOCATION:

SA-25-23-7 & 47

RCRA EXEMPT
WASTES:Yes ☒

PIT TYPE:

BPR

(ACTIVE)

S-20, T-28N, R-7W, Unit-A

WASTE FLOW TO PIT STOPPED:

TYPE REPLACEMENT PIT:

☐

NONE

☐

BACKFILLED - BELOW GROUND

☐

ABOVE GROUND

ACREAGE

TYPE:

☒

FEDERAL

☐

JICARILLA

☐

NAVAHO

☐

STATE

☐

FEE

SITE ASSESSMENT

1) Groundwater Depth: ESTIMATE 50-99'

Ranking Score

Basis: ELEVATION FROM A-TIDE WASH10

2) Wellhead Protection Area:

Distance To

Water Sources: > 1000' Private Domestic Water Sources: > 1000'Basis: NO PRIVATE OR DOMESTIC WTL SOURCES IN VICINITY03) Distance To Surface Body of Water: > 1000'Basis: NO SURFACE WTL IN VICINITY0

Total Score:

10

Soil Characteristic

☐

Highly Contaminated/Saturated

☒

Unsaturated Contaminated

RANKING CRITERIA

Depth to Groundwater	Wellhead Protection Area	Distance to Surface Water Body
	<1000' from water source or < 200' from private domestic water source	
Score	Score	Rank
<50 ft	yes	20
<50 - 99	no	10
>100 ft		0
	<200' horiz	20
	200 - 1000' horiz	10
	>1000' horiz	0

GUIDELINE REMEDIATION LEVELS

Total Ranking Score			
	>19	10-19	0-9
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
Field Headspace			
Method for BTEX	100	100	100
TPH (ppm)**	100	1,000	5,000

** Concentration above background

DEFINITION OF CONTAMINATION

Date:

Depth Excavated:

Full Excavation: ☐

Maximum Extent Practicable

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLE RESULTS NOTES" FORM

Groundwater Encountered:

Yes ☒No ☐

If yes, approximate depth:

70' BGS

Groundwater Sampling?

☒

Yes

☐

No

Where was gw sample taken?

Monitor Well Set in Center of Pit

Attach GW Sample Results

NOTES:

REMEDIATION PROFILESoil Treated Onsite ☐

Date Remediation Started: _____

☐ In Situ Bio☐ w/vapor venting☐ Landfarmed☐ Composted

	Date: _____		Date: _____	
	Description	Amount/Rate	Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

	Date: _____		Date: _____	
	Description	Amount/Rate	Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLING RESULTS NOTES" FORM

SOIL TREATED/HANDLED OFFSITE**TO SITE (ATTACH MANIFEST)**

Where Treated: _____

Type of Land (Fed/Nav/Jic/State/Fee): _____

Quantity Moved: _____

Quantity Disposed At Envirotech: _____

FROM SITE (ATTACH MANIFEST)

To This Location From: _____

Type of Land (Fed/Nav/Jic/State/Fee): _____

Quantity Moved: _____

FINAL CLOSURE

BTEX: _____ ppm (From Headspace Analysis)

TPH: _____ ppm (From Lab Results)

Revegetated:

yes ☐no ☒

Active Well or Facility Pad:

yes ☒no ☐

NOTES: 7/28/95 Backfilled, stopped flow & prepared pit for Auger Drilling

set to begin 7/28/95

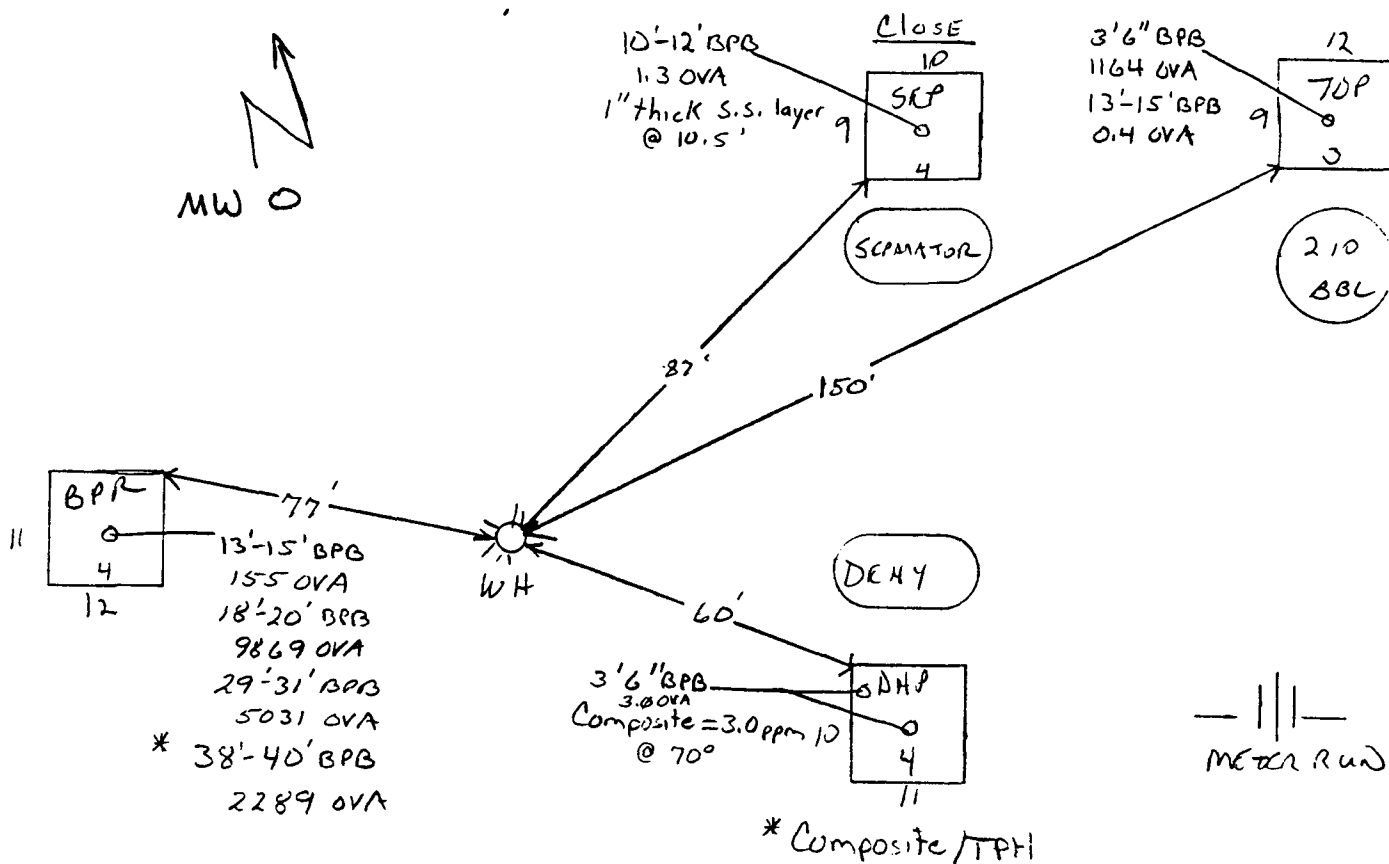
PIT LOCATION AND COMPOSITE SAMPLE PROFILE MAP #1

WELL LOCATION: SAN JUAN 29-7 #47 S20 T28N R74W UNIT A

DATE STARTED: 6/15/95

DATE COMPLETED: _____

Conoco Inc



o SOIL SAMPLE LOCATION

A BACKGROUND SAMPLE LOCATION

LOCATION: SAN JUAN 23-7 # 19

RCRA EXEMPT

WASTES:

Yes ☐ No ☒PIT TYPE: BGP (ACTIVE) S-25, T-28N R-7W, UG 4 G

TE FLOW TO PIT STOPPED: _____

TYPE REPLACEMENT PIT: ☐ NONE ☐ BACKFILLED - BELOW GROUND ☐ ABOVE GROUND

ACREAGE

TYPE: ☐ FEDERAL ☐ JICARILLA ☐ NAVAHO ☐ STATE ☐ FEE

SITE ASSESSMENT

- 1) Groundwater Depth: ESTIMATE 50-99' Ranking Score _____
Basis: ELEVATION FROM ACTIVE WASTE _____ 10
- 2) Wellhead Protection Area: _____
Distance To _____
Water Sources: > 1000' Private Domestic Water Sources: > 200'
Basis: NO PRIVATE OR DOMESTIC WATER SOURCES IN IMMEDIATE VICINITY _____ 0
- 3) Distance To Surface Body of Water: > 1000' _____
Basis: NO SURFACE WATER IN VICINITY (LOCATION SETS IN ADJACENT CANYON - CRY) _____ 0
- Total Score: 10

Soil Characteristic

☐ Highly Contaminated/Saturated☒ Unsaturated Contaminated

RANKING CRITERIA

Depth to Groundwater	Wellhead Protection Area	Distance to Surface Water Body
	<1000' from water source or < 200' from private domestic water source	
Score	Score	Rank
<50 ft 20	yes 20	<200' horiz 20
<50 - 99 10	no 0	200 - 1000' horiz 10
>100 ft 0		>1000' horiz 0

GUIDELINE REMEDIATION LEVELS

	Total Ranking Score		
	>19	10-19	0-9
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
Field Headspace			
Method for BTEX	100	100	100
TPH (ppm) **	100	1,000	5,000

** Concentration above background

DEFINITION OF CONTAMINATION

Date: _____

Depth Excavated: _____

Full Excavation: ☐ Maximum Extent Practicable _____

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLE RESULTS NOTES" FORM

Groundwater Encountered: Yes ☒ No ☐If yes, approximate depth: 81' BGSGroundwater Sampling? ☒ Yes ☐ NoWhere was gw sample taken? Monitor well set in center of pit

Attach GW Sample Results

NOTES:

LOCATION:

SAN JUAN 23-7 # 19

RCRA EXEMPT

WASTES:

Yes ☐ No ☐

PIT TYPE:

BDP (ACTIVE) S-25, T-28N, R-7W, U-4 G

TE FLOW TO PIT STOPPED: _____

TYPE REPLACEMENT PIT:

☐ NONE☐ BACKFILLED - BELOW GROUND☐ ABOVE GROUND

ACREAGE

TYPE:

☐ FEDERAL☐ JICARILLA☐ NAVAHO☐ STATE☐ FEE

SITE ASSESSMENT

Ranking Score

1) Groundwater Depth: ESTIMATE 50-99'

Basis: ELEVATION FROM ACTIVE WASTE

10

2) Wellhead Protection Area:

Distance To

Water Sources: > 1000' Private Domestic Water Sources: > 200'

Basis: NO PRIVATE OR DOMESTIC WTR SOURCES IN IMMEDIATE VICINITY

0

3) Distance To Surface Body of Water: > 1000'

Basis: NO SURFACE WTR IN VICINITY (LOCATION SETS IN ADAMS CANYON - SEE)

0

Total Score:

10

Soil Characteristic

☐ Highly Contaminated/Saturated☒ Unsaturated Contaminated

RANKING CRITERIA

GUIDELINE REMEDIATION LEVELS

Depth to Groundwater	Wellhead Protection Area	Distance to Surface Water Body
	<1000' from water source or < 200' from private domestic water sources	
Score	Score	Rank
<50 ft 20	yes 20	<200' horiz 20
<50 - 99 10	no 0	200 - 1000' horiz 10
>100 ft 0		>1000' horiz 0

	Total Ranking Score		
	>19	10-19	0-9
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
Field Headspace			
Method for BTEX	100	100	100
TPH (ppm) **	100	1,000	5,000

** Concentration above background

DEFINITION OF CONTAMINATION

Date: _____

Depth Excavated: _____

Full Excavation: ☐ Maximum Extent Practicable _____

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLE RESULTS NOTES" FORM

Groundwater Encountered:

Yes ☒No ☐

If yes, approximate depth:

81' BGS

Groundwater Sampling?

☒

Yes

☐

No

Where was gw sample taken?

Monitor well set in center of pit

Attach GW Sample Results

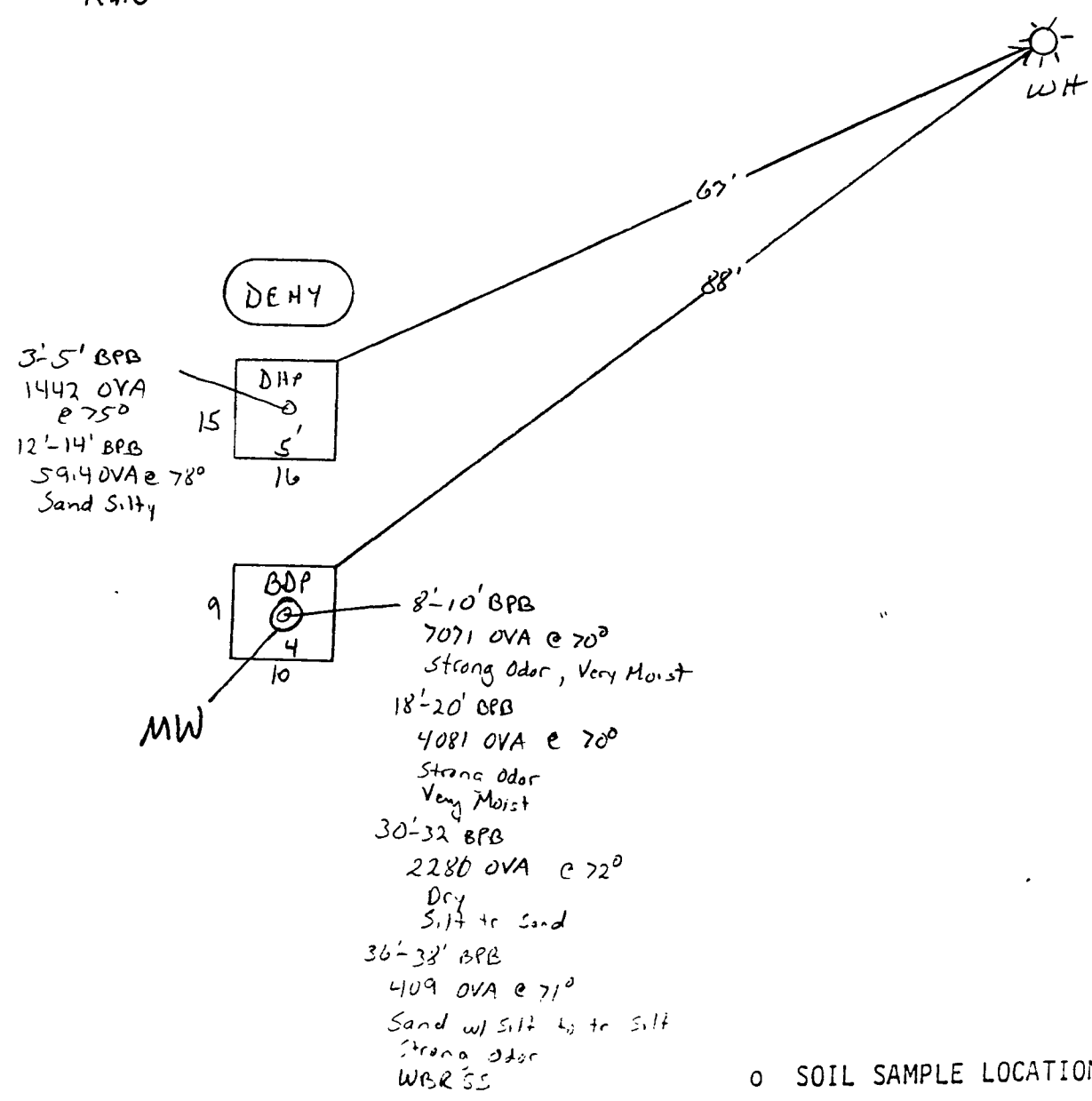
NOTES:

PIT LOCATION AND COMPOSITE SAMPLE PROFILE MAP #1

WELL LOCATION: SAN JUAN 28-7 # 19 S 25 T 28N R 7W UNIT.

DATE STARTED: 7/5/95 DATE COMPLETED: _____

Conoco Inc



- SOIL SAMPLE LOCATION
- △ BACKGROUND SAMPLE LOCATION

LOCATION: SAN JUAN 23-7 #122

RCRA EXEMPT

PIT TYPE:

WASTES:

Yes ☒ No ☐DIP (FPM) (NOT ACTIVE) S-1, F27N, R-7W, Unit M

DATE FLOW TO PIT STOPPED: _____

TYPE REPLACEMENT PIT:

☐ NONE☐ BACKFILLED - BELOW GROUND☐ ABOVE GROUND

ACREAGE

TYPE:

☐ FEDERAL☐ JICARILLA☐ NAVAHO☐ STATE☐ FEESITE ASSESSMENT

Ranking Score

1) Groundwater Depth: ESTIMATE 50-99Basis: FLUORINATION FILLS - ACTIVE WASH

2) Wellhead Protection Area:

Distance To

Water Sources: > 1000' Private Domestic Water Sources: > 200'Basis: NO PRIVATE OR DOMESTIC WATER SOURCES IN VICINITY3) Distance To Surface Body of Water: > 1000'Basis: NO SURFACE WATER IN VICINITY (CANYON 'MOUNTAIN' ONLY)

Total Score:

10

Soil Characteristic

☐ Highly Contaminated/Saturated☒ Unsaturated ContaminatedRANKING CRITERIAGUIDELINE REMEDIATION LEVELS

Depth to Groundwater	Wellhead Protection Area	Distance to Surface Water Body
	<1000' from water source or < 200' from private domestic water source	
Score	Score	Rank
<50 ft 20	yes 20	<200' horiz 20
<50 - 99 10	no 0	200 - 1000' horiz 10
>100 ft 0		>1000' horiz 0

Total Ranking Score			
	>19	10-19	0-9
Benzene (ppm)	10	10	10
BTEX (ppm)	50	50	50
Field Headspace			
Method for BTEX	100	100	100
TPH (ppm) **	100	1,000	5,000

** Concentration above background

DEFINITION OF CONTAMINATION

Date: _____

Depth Excavated: _____

Full Excavation: ☐ Maximum Extent Practicable _____

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLE RESULTS NOTES" FORM

Groundwater Encountered:

Yes ☒No ☐

If yes, approximate depth:

80' BGS

Groundwater Sampling?

☒

Yes

☐

No

Where was gw sample taken?

Monitor Well set in center of pit

Attach GW Sample Results

NOTES:

REMEDIATION PROFILESoil Treated Onsite ☐

Date Remediation Started: _____

☐ In Situ Bio☐ w/vapor venting☐ Landfarmed☐ Composted

	Date: _____		Date: _____	
	Description	Amount/Rate	Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

	Date: _____		Date: _____	
	Description	Amount/Rate	Description	Amount/Rate
Tilled				
Nutrients				
Moisture				
Bulking Agent				
Organic Material				

ALL SAMPLE RESULTS ARE SHOWN ON "SAMPLING RESULTS NOTES" FORM

SOIL TREATED/HANDLED OFFSITE**TO SITE(ATTACH MANIFEST)**

Where Treated: _____

Type of Land (Fed/Nav/Jic/State/Fee): _____

Quantity Moved: _____

Quantity Disposed At Envirotech: _____

FROM SITE (ATTACH MANIFEST)

To This Location From: _____

Type of Land (Fed/Nav/Jic/State/Fee): _____

Quantity Moved: _____

FINAL CLOSURE

BTEX: _____ ppm (From Headspace Analysis)

TPH: _____ ppm (From Lab Results)

Revegetated:

yes ☐no ☐

Active Well or Facility Pad:

yes ☐no ☐

NOTES: 8/1/95 Backfilled & Prepared for Auger drilling

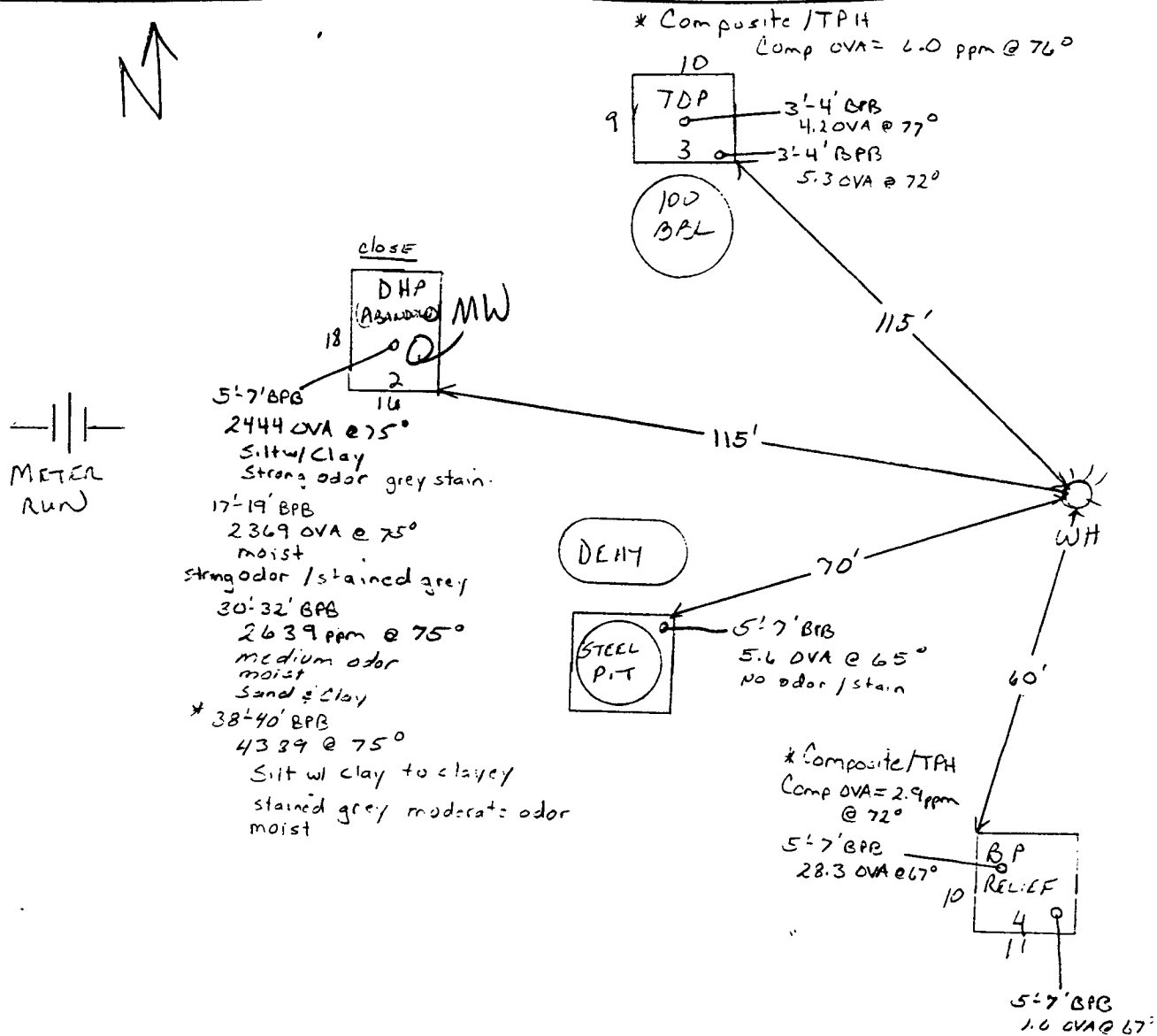
PIT LOCATION AND COMPOSITE SAMPLE PROFILE MAP #1

WELL LOCATION: SAN JUAN 28.7 #126 S 1 T 27N R 7W UNIT M

DATE STARTED: 7/7/95

DATE COMPLETED: _____

Conoco Inc.



Estimated
D.G.

o SOIL SAMPLE LOCATION

Δ BACKGROUND SAMPLE LOCATION

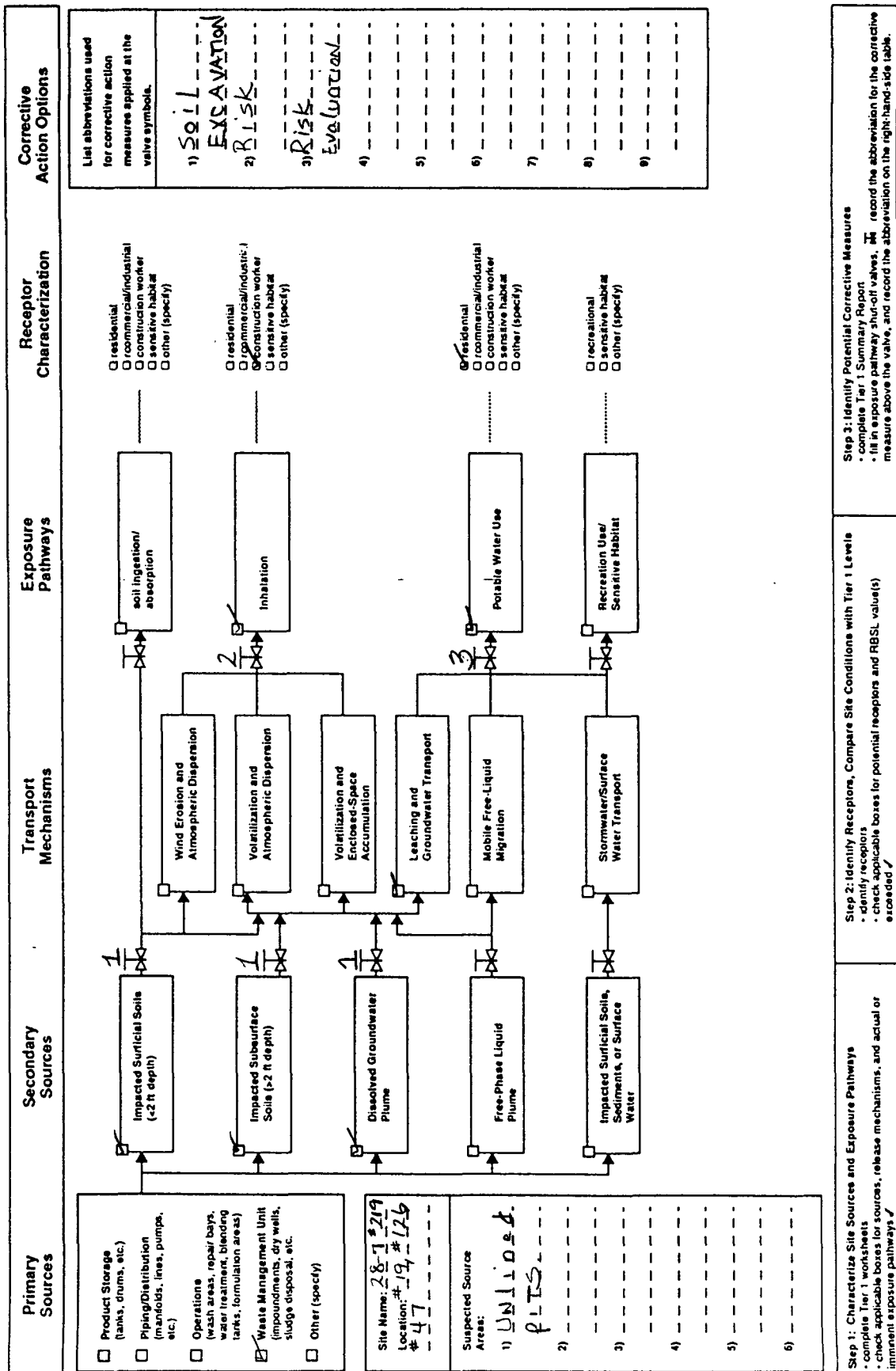


FIG. 2 Exposure Scenario Evaluation Flowchart

RISK BASED CORRECTIVE ACTION**WORKSHEET 5****POTENTIAL EXPOSURE POPULATIONS SUMMARY****CURRENT**

Potential Exposure Populations	Receptor Selected?	Explanation
<i>Off-site Resident</i>	N	No residential areas are located in the site vicinity.
<i>On-site Resident</i>	N	No residences are located on the site.
<i>On-site Worker</i>	Y	The site is an active well site.
<i>Construction Worker</i>	N	There are no construction activities at the site currently.
<i>Off-site Worker</i>	N	Commercial businesses are located on properties near the site.
<i>Site Visitor</i>	N	The site is visited less than 1 hr per month.

FUTURE

Potential Exposure Populations	Receptor Selected?	Explanation
<i>Off-site Resident</i>	N	Area is within BLM lands. No residential areas anticipated.
<i>On-site Resident</i>	N	The site is expected to remain an active producing well site with no on-site residents.
<i>On-site Worker</i>	Y	The site is expected to remain an active producing well with no on-site residents.
<i>Construction Worker</i>	N	The potential will be removed after approved soil remediation is performed.
<i>Off-site Worker</i>	N	No commercial businesses are expected to remain adjacent to the site.
<i>Site Visitor</i>	N	The site is not expected to be an active service station with no on-site residents.

RISK BASED CORRECTIVE ACTION**WORKSHEET 6****POTENTIAL EXPOSURE PATHWAYS SUMMARY****CURRENT - OFF-SITE RESIDENT (ADULT/CHILD)**

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
Ground Water	ingestion	N	Ground water is not currently used as a drinking water source.
	dermal absorption during showering	N	The ground water is not currently used for showering.
Soil	ingestion	N	Contact with soil not applicable for off-site receptors.
	dermal absorption	N	Contact with soil not applicable for off-site receptors.
Air	inhalation	N	Volatiles are far to remote for inhalation.

CURRENT - OFF-SITE WORKER

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
Ground Water	ingestion	N	Ground water is not currently used as a drinking water source.
	dermal absorption during showering	N	The ground water is not currently used for showering.
Soil	ingestion	N	Contact with soil not applicable for off-site receptors.
	dermal absorption	N	Contact with soil not applicable for off-site receptors.
Air	inhalation	N	Volatiles from the soil are to remote for inhalation.

RISK BASED CORRECTIVE ACTION**WORKSHEET 6****POTENTIAL EXPOSURE PATHWAYS SUMMARY****CURRENT - SITE VISITOR**

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
Ground Water	ingestion	N	The ground water is not currently used as a drinking water source.
	dermal absorption during showering	N	Showering is not applicable for this receptor.
Soil	ingestion	N	The area of affected soils is paved and will not be contacted by site visitors.
	dermal absorption	N	The area of affected soils is paved and not be contacted by site visitors.
Air	inhalation	N	Volatiles from the soil may be inhaled.

CURRENT - ON-SITE WORKER

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
Ground Water	ingestion	N	The ground water is not currently used as a drinking water source.
	dermal absorption during showering	N	Showering is not applicable for this receptor.
Soil	ingestion	N	The area of affected soils is paved and will not be contacted by site visitors.
	dermal absorption	N	The area of affected soils is paved and will not be contacted by site visitors.
Air	inhalation	N	Volatiles from the soil are remote for inhalation.

RISK BASED CORRECTIVE ACTION**WORKSHEET 6****POTENTIAL EXPOSURE PATHWAYS SUMMARY****FUTURE - OFF-SITE ADULT/CHILD**

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	
			<i>Explanation</i>
<i>Ground Water</i>	ingestion	Y	The ground water theroretically could be used as a source .
	dermal absorption during showering	Y	The ground water theortically could be used as a drinking water source.
<i>Soil</i>	ingestion	N	Contact with soil not applicable for off-site receptors.
	dermal absorption	N	Contact with soil not applicable for off-site receptors.
<i>Air</i>	inhalation	N	Volatiles will be remediated in the near future.

FUTURE - OFF-SITE WORKER

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	
			<i>Explanation</i>
<i>Ground Water</i>	ingestion	N	The ground water has no foreseeable use as a drinking water source.
	dermal absorption during showering	N	Showering is not applicable for this receptor.
<i>Soil</i>	ingestion	N	Contact with soil not applicable for off-site receptors.
	dermal absorption	N	Contact with soil not applicable for off-site receptors.
<i>Air</i>	inhalation	N	Volatiles will be removed by active remediation.

RISK BASED CORRECTIVE ACTION**WORKSHEET 6****POTENTIAL EXPOSURE PATHWAYS SUMMARY****FUTURE - SITE VISITOR**

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
Ground Water	ingestion	N	Ingestion of on-site ground water is not applicable for this receptor.
	dermal absorption during showering	N	Showering is not applicable for this receptor.
Soil	ingestion	N	The site is expected to be developed and covered by pavement.
	dermal absorption	N	The site is expected to be developed and covered by pavement.
Air	inhalation	N	Volatiles will be remediated.

FUTURE - ON-SITE WORKER

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
Ground Water	ingestion	N	Ingestion of on-site ground water is not applicable for this receptor.
	dermal absorption during showering	N	Showering is not applicable for this receptor.
Soil	ingestion	N	The site is expected to be developed and covered by pavement.
	dermal absorption	N	The site is expected to be developed and covered by pavement.
Air	inhalation	N	Volatiles will be remediated.

RISK BASED CORRECTIVE ACTION**WORKSHEET 6****POTENTIAL EXPOSURE PATHWAYS SUMMARY*****FUTURE - CONSTRUCTION WORKER***

<i>Potential Exposure Media</i>	<i>Potential Exposure Pathways</i>	<i>Complete Exposure Pathway</i>	<i>Explanation</i>
<i>Ground Water</i>	ingestion	N	Ingestion of on-site ground water is not applicable for this receptor.
	dermal absorption during excavation	N	Depth to ground water is below 50 feet.
<i>Soil</i>	ingestion	Y	There is potential for incidental ingestion during excavation/construction activities.
	dermal absorption	Y	There is potential for dermal contact during excavation/construction activities.
<i>Air</i>	inhalation	Y	Particulates from the soil may be inhaled.



**Western
Technologies
Inc.**

The Quality People
Since 1955

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

August 29, 1995

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

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

**Re: Phase II Results
Conoco Unit 28-7
San Juan Basin, New Mexico.**

WT Ref. No. 3185JC120.

Dear Mr. Coy:

Western Technologies Inc. (WT) is pleased to provide this letter report which documents a limited soil and groundwater investigation conducted at five specific unlined surface impoundments (pits) associated with natural gas production wells within Conoco Inc.'s (Conoco's) Unit 28-7. The subject Unit is located in New Mexico's San Juan Basin. Work was conducted in general accordance with the Scope of Work authorized in WT's proposal number 3185PC100, dated July 12, 1995.

Summary of Work

Envirodrill Inc. of Albuquerque, New Mexico drilled a:

- o 61.5-foot-deep boring (completed as a well) at well site #219 blow-down pit (BDP)/back-pressure relief (BPR) pit. Groundwater was encountered at 55.5 feet below ground surface (bgs);
- o 76.5-foot-deep boring (completed as a well) at well site #47 BPR pit. Groundwater was encountered at 70 feet bgs;
- o 85-foot-deep boring (completed as a well) at well site #19 BDP pit. Groundwater was encountered at 80 feet bgs;
- o 85-foot-deep boring (completed as a well) at well site #126 dehydrator pit (DHP). Groundwater was encountered at 80 feet bgs; and a
- o 61.5-foot-deep boring at well site #130 DHP.

A CME-75 diesel-powered drilling rig equipped with 7.75-inch outside diameter hollow-stem-augers was used to drill the borings/wells.

The subject pits were previously assessed by WT and were found to contain impacted soil (based on "heated headspace" readings) to a depth of 40 feet bgs. Two-inch diameter casing was installed in the groundwater monitoring wells in accordance with New Mexico Oil Conservation Division (OCD)/U.S. Bureau of Land Management (BLM) guidelines for groundwater sampling. As per the OCD/BLM guidelines, one monitoring well was installed adjacent to and hydrologically down-gradient to each of the subject pits. The monitoring wells were constructed according to industry standard using PVC material. A minimum of five feet of well screen was placed above the static water level to allow for seasonal fluctuations in the water table, as described in the attached boring logs (Appendix A).

Soils were collected from the borings using a 1.5-foot split-spoon sampler. This method can measure the resistance of sampler penetration ("blow counts"). Each boring was logged for lithologic and engineering characteristics, and to determine the degree of contamination in the field, using the "heated headspace" method. Soil samples were collected at five-foot intervals beginning at 40 feet bgs (please refer to Appendix A).

Before initiating any field work, WT prepared a Site Safety & Health Plan (SSHP). The SSHP was in accordance with WT's corporate Health & Safety Program, and Conoco's Exploration and Production North America Safety and Occupational Health Manual (1991 edition). Adequate planning is needed prior to performing work to minimize the risk of employee injury or illness. The 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 conducted.

WT properly purged the four wells and sampled the fresh aquifer recharge water. Water samples were appropriately preserved in adequate containers, and labeled with the project name and job number, date, well number and depth of collection, and company name. The samples were placed on ice in an insulated cooler and shipped to Westech Laboratories Inc. (Westech) in El Paso, Texas via overnight courier. Westech analyzed the water samples according to:

- EPA Method 8020 for benzene, toluene, ethylbenzene, and total xylenes (BTEX; #219, #47, #19); and,
- Total Dissolved Solids (TDS; #47).

In addition, soil samples collected from immediately above the water table of borings at well sites #47, #19, and #126 were analyzed by Westech for total petroleum hydrocarbons (TPH) by EPA Method 418.1.



Analytical Results

Laboratory analytical results (provided by Westech) indicated that BTEX levels according to EPA Method 8020 exceeded New Mexico Water Quality Control Commission (WQCC) guidelines for benzene (10 ug/L) at #219 BDP/BPR (83 ug/L), #47 BPR (130 ug/L), #19 BDP (47 ug/L), and #126 DHP (270 ug/L). WQCC guidelines for toluene (750 ug/L) were exceeded at #47 BPR (760 ug/L) and #126 DHP (3,700 ug/L), and for total xylenes (620 ug/L) at #126 DHP (4,300 ug/L). The OCD/BLM action-level for TPH in soil (1,000 mg/kg) was also exceeded at #130 DHP (3,100 mg/kg). None of the other samples collected and analyzed exceeded WQCC or OCD/BLM guidelines (please refer to Appendix B for laboratory and quality control reports, and chain-of-custody documentation).

Recommendations

WT recommends submitting the enclosed data to the appropriate regulatory agencies and negotiating a passive remedial approach for those aforementioned areas exceeding guidelines.

This report concludes WT's services on this project. If you have any questions or if we may be of further assistance, please call us at (505) 327-4966.

Sincerely,
WESTERN TECHNOLOGIES INC.
Environmental Services



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

Copies to: Addressee (2)
File (1)

**APPENDIX A
BORING LOGS**

DATE DRILLED: 07-28-1995

BORING NUMBER:

LOCATION: Well # 219; BDP/BPR

ELEVATION: Not Determined

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
96.0	21	N		MODERATE	45	SP		SAND; with silt, brown, moderately dense, dry to slightly moist, moderate hydrocarbon odor, no staining.
73.8	18	N		MODERATE	50			
18.5	11	N		SLIGHT	55	SM		SAND AND SILT; brown, loose, very moist, slight hydrocarbon odor, no staining.
						SP		groundwater encountered at 55.5 feet BGS SAND; with silt, brown, wet, no hydrocarbon staining or odor.
15	11	N		NONE	60			
					61.5			
					65			
					70			
					75			
					80			

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: 140

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7

Boring Log

NOTES:

screen 60'-50'; sand 61'-47'; grout 47'-45';
native w/ 3% bentonite 45'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.

Job No: 3185JC120

Plate: 1



DATE DRILLED: 07-31-1995

BORING NUMBER:

LOCATION: Well # 47; BPR

ELEVATION: Not Determined

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP		SAND; trace silt, brown, moderately dense to dense, dry to slightly moist, strong hydrocarbon odor, no staining.
100	23	N		STRONG	45			
200	26	N		STRONG	50			
12	50/1"	N		MODERATE	55	BRSS		SANDSTONE; with interbedded SILTSTONE; pale brown to light grey with occasional olive tones, hard to very hard, dry to wet, moderate to slight hydrocarbon odor, no staining except slight staining at water table.
42	50/1"	N		MODERATE	60			
9	72/7"	N		SLIGHT	65			
14	50/3"	N		SLIGHT	70			groundwater encountered at 70 feet BGS
37	50/1"	N		SLIGHT	75			
								76.5
					80			

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: 140

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7

Boring Log

NOTES:

screen 75'-65'; sand 76'-63'; grout 63'-60';
native w/ 3% bentonite 60'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.

Job No: 3185JC120

Plate: 2

DATE DRILLED: 08-04-1995

BORING NUMBER:

LOCATION: Well # 19 BDP

ELEVATION: Not Determined

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
100	23	N		STRONG	45	SP		SAND; trace silt, light brown, moderately dense, slightly moist, slight hydrocarbon odor, no staining.
200	26	N		STRONG	50	SM		SILTY SAND; to SAND WITH SILT; brown, moderately dense, dry to moist, slight to moderate hydrocarbon odor, no staining.
12	50/1"	N		MODERATE	55			
42	50/1"	N		MODERATE	60			
9	72/7"	N		SLIGHT	65			
14	50/3"	N		SLIGHT	70	ML		SANDY SILT; brown, very stiff, moist to wet, slight to moderate hydrocarbon odor, no staining.
37	50/1"	N		SLIGHT	75			
					80	WBRMS		WEATHERED SILTSTONE; sandy, olive-grey, medium hard, wet, with convoluted interbedding, slight hydrocarbon odor, no staining.
(this soil will be continued on the next page)								

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: 140

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7

Boring Log

NOTES:

screen 85'-75'; sand 85'-73'; grout 73'-70';
native w/ 3% bentonite 70'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.

Job No: 3185JC120

Plate: 3



DATE DRILLED: **08-04-1995**
LOCATION: **Well # 19 BDP**

BORING NUMBER:
ELEVATION: **Not Determined**

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						WBRMS		groundwater encountered at 80 feet BGS
					85	BRSS		SANDSTONE; grey, very hard, moist to wet, slight hydrocarbon odor, no staining.
					85			85
					90			
					95			
					100			
					105			
					110			
					115			
					120			

ND - "None detected"
N - Split-spoon sampler
G - Grab (scoop)

Driving weight: **140**

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7

Boring Log

NOTES:

screen 85'-75'; sand 85'-73'; grout 73'-70';
native w/ 3% bentonite 70'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.

Job No: **3185JC120**

Plate: **3**

APPENDIX B
LABORATORY REPORTS



**Westtech
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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. : 6503230
INVOICE NO.: 3185W058
REPORT DATE: 08-17-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #219 BDP/BPR
SAMPLE TYPE: Water
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: Well Conoco 28-7
ANALYST: 5. Skornia

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
EXTRACTION DATE: --
ANALYSIS DATE ..: 08-16-95

Method 8020 - Aromatic Volatiles

D A T A T A B L E			
Parameter	Result	Unit	Detection Limit
Benzene	83	ug/L	1.0
Toluene	180	ug/L	1.0
Ethylbenzene	8.2	ug/L	1.0
Total Xylenes	40	ug/L	0.3

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CLIENT WESTERN TECHNOLOGIES, INC.
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FARMINGTON, NM 87401

SAMPLE NO. : 6503231
INVOICE NO.: 3185W058
REPORT DATE: 08-10-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #47 BPR
SAMPLE TYPE: Soil
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: @70' BGS Conoco 28-7

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
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.	08-09-95

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CLIENT WESTERN TECHNOLOGIES, INC.
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SAMPLE NO. : 6503232
INVOICE NO.: 3185W058
REPORT DATE: 08-17-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #47 BPR
SAMPLE TYPE: Water
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: Well Conoco 28-7
ANALYST: 5. Skornia

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
EXTRACTION DATE: --
ANALYSIS DATE ..: 08-16-95

Method 8020 - Aromatic Volatiles

D A T A T A B L E			
Parameter	Result	Unit	Detection Limit
Benzene	130	ug/L	1.0
Toluene	760	ug/L	1.0
Ethylbenzene	14	ug/L	1.0
Total Xylenes	64	ug/L	0.3

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SAMPLE NO. : 6503233
INVOICE NO.: 3185W058
REPORT DATE: 08-16-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #47 BPR
SAMPLE TYPE: Water
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: Well Conoco 28-7

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
EXTRACTION DATE: --

Inorganic Non-Metals

D A T A				T A B L E	
Parameter	Result	Unit	Detection Limit	Analysis Date	Test Method
Total Dissolved Solids	940	mg/L	5.0	08-15-95	STD METH 2540-C
					F. Armendariz

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SAMPLE NO. : 6503234
INVOICE NO.: 3185W058
REPORT DATE: 08-10-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #19 BDP
SAMPLE TYPE: Soil
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: @ 80' BGS Conoco 28-7

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
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	16	mg/kg	10.	08-09-95

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CLIENT WESTERN TECHNOLOGIES, INC.
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SAMPLE NO. : 6503235
INVOICE NO.: 3185W058
REPORT DATE: 08-17-95
REVIEWED BY:
PAGE : 1 OF 1

CLIENT SAMPLE ID : #19 BDP
SAMPLE TYPE: Water
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: Well Conoco 28-7
ANALYST: 5. Skornia

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
EXTRACTION DATE: --
ANALYSIS DATE ..: 01-01-95

Method 8020 - Aromatic Volatiles

D A T A T A B L E			
Parameter	Result	Unit	Detection Limit
Benzene	47	ug/L	1.0
Toluene	710	ug/L	1.0
Ethylbenzene	34	ug/L	1.0
Total Xylenes	460	ug/L	0.3

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SAMPLE NO. : 6503354
INVOICE NO.: 3185WO66
REPORT DATE: 08-21-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #130 DHP 60-60.5 BGS
SAMPLE TYPE: Soil
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: Cononco 28-7

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-07-95
SUBMITTAL DATE : 08-16-95
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	3100	mg/kg	10.	08-18-95

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SAMPLE NO. : 6503236
INVOICE NO.: 3185W058
REPORT DATE: 08-10-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #126 DHP
SAMPLE TYPE: Soil
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: @ 80' BGS Conoco 28-7

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-04-95
SUBMITTAL DATE : 08-07-95
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.	08-09-95

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CLIENT WESTERN TECHNOLOGIES, INC.
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FARMINGTON, NM 87401

SAMPLE NO. : 6503355
INVOICE NO.: 3185W066
REPORT DATE: 08-22-95
REVIEWED BY: *[Signature]*
PAGE : 1 OF 1

CLIENT SAMPLE ID : #126 BPR Well
SAMPLE TYPE: Water
SAMPLED BY: B. Andersen
SUBMITTED BY: B. Andersen
SAMPLE SOURCE: Cononco 28-7
ANALYST: A. Skornia

AUTHORIZED BY : D. Cesark
CLIENT P.O. : --
SAMPLE DATE ...: 08-07-95
SUBMITTAL DATE : 08-16-95
EXTRACTION DATE: --
ANALYSIS DATE ..: 08-18-95

Method 8020 - Aromatic Volatiles

D A T A T A B L E			
Parameter	Result	Unit	Detection Limit
Benzene	270	ug/L	1.0
Toluene	3700	ug/L	1.0
Ethylbenzene	580	ug/L	1.0
Total Xylenes	4300	ug/L	0.3

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QUALITY CONTROL REPORT

QC IDENTIFIER: 34-080995-1
REFERENCE NOTEBOOK : TPH-7
REFERENCE PAGE: 34

INSTRUMENT : IR-TPH
ANALYZED BY : D.Guzman
ANALYZED ON : 08-09-95

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

SAMPLES IN THIS RUN: 6503231 6503234 6503236 6503240

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Total Petroleum Hydrocarbons	mg/kg	200.	190	95.0
Total Petroleum Hydrocarbons	mg/kg	200.	194	97.0

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6503231	Total Petroleum Hydrocarbons	mg/kg	<10.	<10	NC
6503240	Total Petroleum Hydrocarbons	mg/kg	85000	85000	0.0

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6503231	Total Petroleum Hydrocarbons	mg/kg	<10.	100	96	96.0
6503240	Total Petroleum Hydrocarbons	mg/kg	85000	100	85000	NP

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Total Petroleum Hydrocarbons	mg/kg	<10



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QUALITY CONTROL REPORT

QC IDENTIFIER: 34-080995-1
REFERENCE NOTEBOOK : TPH-7
REFERENCE PAGE: 34

INSTRUMENT : IR-TPH
ANALYZED BY : D.Guzman
ANALYZED ON : 08-09-95

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:

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

- 4) Relative Percent Difference (RPD) is:

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

WESTECH
LABORATORIES, INC.
QUALITY ASSURANCE OFFICER

DATE 8-21-95



**Westtech
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: 31-081695-1
REFERENCE NOTEBOOK :
REFERENCE PAGE:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-16-95

TEST DESCRIPTION ...: Method 8020 - Aromatic Volatiles
TEST METHOD: 8020

SAMPLES IN THIS RUN: 6503230 6503232 6503235 6503303 6503304 6503314 6503315
6503316 6503321 6503322 6503323 6503324 6503325 6503326
6503327 6503328 6503329 6503330 6503331 6503332 6503333
6503334 6503335

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
1,2 Dibromoethane(EDB)	ug/L	10	9.4	94.0
1,2-Dichloroethane	ug/L	10	9.1	91.0
Ethylbenzene	ug/L	10.	8.6	86.0
Toluene	ug/L	10.	8.6	86.0
Total Xylenes	ug/L	30.	27	90.0
Benzene	ug/L	10.	8.5	85.0
Methyl Tert-Butyl Ether	ug/L	10	9.8	98.0
1,2 Dibromoethane(EDB)	ug/L	10	8.6	86.0
1,2-Dichloroethane	ug/L	10	8.7	87.0
Ethylbenzene	ug/L	10.	8.6	86.0
Toluene	ug/L	10.	8.6	86.0
Total Xylenes	ug/L	30.	27	90.0
Benzene	ug/L	10.	8.5	85.0
Methyl Tert-Butyl Ether	ug/L	10	9.7	97.0
Ethylbenzene	ug/L	10.	8.5	85.0
Toluene	ug/L	10.	8.6	86.0
Total Xylenes	ug/L	30.	27	90.0
Benzene	ug/L	10.	8.4	84.0
Ethylbenzene	ug/L	10.	8.4	84.0
Toluene	ug/L	10.	8.2	82.0
Total Xylenes	ug/L	30.	26	86.7
Benzene	ug/L	10.	8.3	83.0

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6503322	Ethylbenzene	ug/L	<1.0	<1.0	NC
6503322	Toluene	ug/L	<1.0	<1.0	NC
6503322	Benzene	ug/L	<1.0	<1.0	NC
6503322	Total Xylenes	ug/L	1.2	0.9	NC



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QUALITY CONTROL REPORT

QC IDENTIFIER 31-081695-1
REFERENCE NOTEBOOK :
REFERENCE PAGE

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-16-95

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6503330	Ethylbenzene	ug/L	<1.0	<1.0	NC
6503330	Toluene	ug/L	<1.0	<1.0	NC
6503330	Benzene	ug/L	<1.0	<1.0	NC
6503330	Total Xylenes	ug/L	1.8	<0.3	NC
6503334	Ethylbenzene	ug/L	<1.0	<1.0	NC
6503334	Toluene	ug/L	<1.0	<1.0	NC
6503334	Benzene	ug/L	<1.0	<1.0	NC
6503334	Total Xylenes	ug/L	<0.3	<0.3	NC

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6503323	Ethylbenzene	ug/L	<1.0	20	20	100.0
6503323	Toluene	ug/L	<1.0	20	19	95.0
6503323	Benzene	ug/L	<1.0	20	20	100.0
6503323	Total Xylenes	ug/L	<0.3	60	62	103.3
6503331	Ethylbenzene	ug/L	<1.0	20	18	90.0
6503331	Toluene	ug/L	<1.0	20	18	90.0
6503331	Benzene	ug/L	<1.0	20	19	95.0
6503331	Total Xylenes	ug/L	<0.3	60	59	98.3
6503335	Ethylbenzene	ug/L	<1.0	20	16	80.0
6503335	Toluene	ug/L	<1.0	20	16	80.0
6503335	Benzene	ug/L	<1.0	20	18	90.0
6503335	Total Xylenes	ug/L	<0.3	60	55	91.7

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Benzene	ug/L	<1.0
Toluene	ug/L	<1.0
Ethylbenzene	ug/L	<1.0



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QUALITY CONTROL REPORT

QC IDENTIFIER: 31-081695-1
REFERENCE NOTEBOOK :
REFERENCE PAGE:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-16-95

METHOD BLANKS -

<u>PARAMETER</u>	<u>UNIT</u>	<u>RESULT</u>
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:

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

- 4) Relative Percent Difference (RPD) is:

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

WESTECH
LABORATORIES, INC.
QUALITY ASSURANCE OFFICER

DATE 8-21-95



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CHAIN OF CUSTODY RECORD

Page of

CLIENT	WT Farmington	ADDRESS	400 S Corcoran Ave
CONTACT PERSON	Dale Cessick	PROJECT	Farmington NM
TELEPHONE	505 327 4966	CONTRACT NO.	87401-5943
FAX	505 327 5293	WESTECH QUOTE / CONTRACT NO.	31855JC120

• SEE FEE SCHEDULE •

SAMPLER (SIGNATURE) (PRINT NAME)	DATE	TIME	SAMPLE TYPE CODES			NO. CONTAINERS	COMPOSITE	GRAB	SAMPLE TYPE	CONTAINERS (FOR LAB USE ONLY)				REQUESTED ANALYSES	LABORATORY IDENTIFICATION	SAMPLE/COOLER TEMPERATURE:
			A - WATER	S - SOIL	G - SLUDGE					D - DRINKING WATER	W - WASTEWATER	T - TRAVEL BLANK	X - OTHER (SPECIFY)			
<i>Brian Anderson</i> BRIAN ANDERSON	7/31	8:45														
#219 BOP/BPR	7/31	10:40														
#47 BPR	7/31	14:45														
#47 BPR	7/31	14:45														
#19 BDP	8/4	10:30														
#19 BDP	8/4	13:30														
#19 BDP	8/4	13:30														
#126 DHP	8/1	16:45														

RELINQUISHED BY (SIGNATURE)	PRINT NAME	RECEIVED BY (SIGNATURE)	PRINT NAME	DATE / TIME	REMARKS
<i>Brian Anderson</i>	Brian Anderson	<i>[Signature]</i>		8/7/95 09:00	
<i>WPS</i>		<i>[Signature]</i>		10:00 8-8-95	

☐ Fax Results ☐ Special Detection Limits / Requirements
SAMPLE PROCESS TURNAROUND TIME: 5 day UST
☐ Standard ☒ Other (specify)



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El Paso • 10737 Gateway West, No. 100 • TX 79935 • (915) 592-3591

CHAIN OF CUSTODY RECORD

Page ____ of ____

CLIENT	WT	ADDRESS	400 S Lorena Ave
CONTACT PERSON	David Cesak	PROJECT	Farmington Dam 87401
TELEPHONE	505 3274966	JOB / P.O. NO.	3485JC120
FAX	505 3275293	WESTECH QUOTE / CONTRACT NO.	

• SEE FEE SCHEDULE •

[illegible]

623 694 WT1 White – Laboratory; Yellow – Work File; Pink – Client



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QUALITY CONTROL REPORT

QC IDENTIFIER: 34-081895-3
REFERENCE NOTEBOOK : TPH-7
REFERENCE PAGE: 41-43

INSTRUMENT : IR-TPH
ANALYZED BY : D.Guzman
ANALYZED ON : 08-18-95

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

SAMPLES IN THIS RUN: 6503354 6503357 6503358 6503359 6503360 6503361 6503362
6503363 6503364 6503370 6503371 6503372 6503373 6503374
6503375 6503376 6503377 6503378 6503380 6503381 6503402
6503403 6503404 6503408 6503409 6503410

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Total Petroleum Hydrocarbons	mg/kg	200.	194	97.0
Total Petroleum Hydrocarbons	mg/kg	200.	192	96.0
Total Petroleum Hydrocarbons	mg/kg	200.	201	100.5
Total Petroleum Hydrocarbons	mg/kg	200.	192	96.0

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6503363	Total Petroleum Hydrocarbons	mg/Kg	29	100	124	95.0
6503375	Total Petroleum Hydrocarbons	mg/Kg	13	100	130	117.0
6503380	Total Petroleum Hydrocarbons	mg/Kg	<10.	100	102	102.0

METHOD BLANKS -

PARAMETER	UNIT	RESULT
Total Petroleum Hydrocarbons	mg/kg	<10



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QUALITY CONTROL REPORT

QC IDENTIFIER: 34-081895-3
REFERENCE NOTEBOOK : TPH-7
REFERENCE PAGE: 41-43

INSTRUMENT : IR-TPH
ANALYZED BY : D.Guzman
ANALYZED ON : 08-18-95

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:

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

- 4) Relative Percent Difference (RPD) is:

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

WESTECH
LABORATORIES, INC.
QUALITY ASSURANCE OFFICER


DATE 8-23-95



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QUALITY CONTROL REPORT

QC IDENTIFIER: 31-081895-1
REFERENCE NOTEBOOK :
REFERENCE PAGE:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-18-95

TEST DESCRIPTION ...: Method 8020 - Aromatic Volatiles
TEST METHOD: 8020

SAMPLES IN THIS RUN: 6503344 6503345 6503346 6503347 6503348 6503349 6503350
6503355 6503356 6503380 6503381 6503382 6503383 6503384
6503385 6503386 6503387 6503388 6503389 6503390 6503391
6503392 6503393 6503394 6503395 6503396 6503397 6503398
6503402 6503403 6503404 6503405 6503406 6503407

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
1,2 Dibromoethane(EDB)	ug/L	10	9.0	90.0
1,2-Dichloroethane	ug/L	10	8.4	84.0
Ethylbenzene	ug/L	10.	9.6	96.0
Toluene	ug/L	10.	9.7	97.0
Total Xylenes	ug/L	30.	31	103.3
Benzene	ug/L	10.	9.9	99.0
Methyl Tert-Butyl Ether	ug/L	10	9.2	92.0
1,2 Dibromoethane(EDB)	ug/L	10	9.1	91.0
1,2-Dichloroethane	ug/L	10	8.3	83.0
Ethylbenzene	ug/L	10.	9.5	95.0
Toluene	ug/L	10.	9.5	95.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	9.7	97.0
Methyl Tert-Butyl Ether	ug/L	10	8.9	89.0
1,2 Dibromoethane(EDB)	ug/L	10	8.5	85.0
1,2-Dichloroethane	ug/L	10	8.7	87.0
Ethylbenzene	ug/L	10.	9.9	99.0
Toluene	ug/L	10.	9.7	97.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	11	110.0
Methyl Tert-Butyl Ether	ug/L	10	9.2	92.0
1,2 Dibromoethane(EDB)	ug/L	10	10	100.0
1,2-Dichloroethane	ug/L	10	9.1	91.0
Ethylbenzene	ug/L	10.	9.4	94.0
Toluene	ug/L	10.	9.6	96.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	9.9	99.0
Methyl Tert-Butyl Ether	ug/L	10	10	100.0
1,2 Dibromoethane(EDB)	ug/L	10	9.4	94.0
1,2-Dichloroethane	ug/L	10	9.4	94.0
Ethylbenzene	ug/L	10.	9.5	95.0
Toluene	ug/L	10.	9.7	97.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	10	100.0



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QUALITY CONTROL REPORT

QC IDENTIFIER: 31-081895-1
REFERENCE NOTEBOOK :
REFERENCE PAGE:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-18-95

CALIBRATION CHECK -

PARAMETER	UNIT	TRUE VALUE	FOUND VALUE	%RECOVERY
Methyl Tert-Butyl Ether	ug/L	10	9.8	98.0
1,2 Dibromoethane(EDB)	ug/L	10	8.6	86.0
1,2-Dichloroethane	ug/L	10	9.5	95.0
Ethylbenzene	ug/L	10.	9.2	92.0
Toluene	ug/L	10.	9.4	94.0
Total Xylenes	ug/L	30.	30	100.0
Benzene	ug/L	10.	9.8	98.0
Methyl Tert-Butyl Ether	ug/L	10	9.7	97.0
1,2 Dibromoethane(EDB)	ug/L	10	9.1	91.0
1,2-Dichloroethane	ug/L	10	8.8	88.0
Ethylbenzene	ug/L	10.	9.3	93.0
Toluene	ug/L	10.	9.4	94.0
Total Xylenes	ug/L	30.	29	96.7
Benzene	ug/L	10.	9.6	96.0
Methyl Tert-Butyl Ether	ug/L	10	9.3	93.0

REPLICATES -

SAMPLE NUMBER	PARAMETER	UNIT	RESULT	REPLICATE	RPD%
6503402	Ethylbenzene	ug/Kg	<10.	<10.	NC
6503402	Toluene	ug/Kg	<10.	<10.	NC
6503402	Benzene	ug/Kg	<10.	<10.	NC
6503402	Total Xylenes	ug/Kg	<3.0	<3.0	NC
6503402	Methyl Tert-Butyl Ether	ug/Kg	<20.	<20.	NC
6503344	Ethylbenzene	ug/L	<1.0	<1.0	NC
6503344	Toluene	ug/L	<1.0	<1.0	NC
6503344	Total Xylenes	ug/L	0.9	0.7	NC
6503344	Benzene	ug/L	1.6	1.1	NC
6503344	Methyl Tert-Butyl Ether	ug/L	<2.0	<2.0	NC
6503384	Total Xylenes	ug/L	0.7	0.4	NC
6503394	Ethylbenzene	ug/L	<1.0	<1.0	NC
6503394	Toluene	ug/L	<1.0	<1.0	NC
6503394	Total Xylenes	ug/L	1.5	1.4	NC
6503394	Benzene	ug/L	<1.0	<1.0	NC
6503394	Methyl Tert-Butyl Ether	ug/L	540	540	0.0



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QUALITY CONTROL REPORT

QC IDENTIFIER: 31-081895-1
REFERENCE NOTEBOOK :
REFERENCE PAGE:

INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-18-95

SPIKES -

SAMPLE NUMBER	PARAMETER	UNIT	SAMPLE RESULT	SPIKE AMOUNT	SAMPLE+SPIKE RESULT	%RECOVERY
6503402	Ethylbenzene	ug/Kg	<10.	500	550	110.0
6503402	Toluene	ug/Kg	<10.	500	550	110.0
6503402	Benzene	ug/Kg	<10.	500	560	112.0
6503402	Total Xylenes	ug/Kg	<3.0	1500	1700	113.3
6503402	Methyl Tert-Butyl Ether	ug/Kg	<20.	500	520	104.0
6503346	Ethylbenzene	ug/L	<1.0	20	21	105.0
6503346	Toluene	ug/L	<1.0	20	21	105.0
6503346	Total Xylenes	ug/L	1.7	60	66	107.2
6503346	Benzene	ug/L	<1.0	20	21	105.0
6503346	Methyl Tert-Butyl Ether	ug/L	<2.0	20	21	105.0
6503385	Ethylbenzene	ug/L	<1.0	20	19	95.0
6503385	Toluene	ug/L	<1.0	20	19	95.0
6503385	Benzene	ug/L	<1.0	20	20	100.0
6503385	Total Xylenes	ug/L	0.4	60	61	101.0
6503395	Ethylbenzene	ug/L	2.8	20	20	86.0
6503395	Toluene	ug/L	57	500	490	86.6
6503395	Total Xylenes	ug/L	90	1500	1400	87.3
6503395	Benzene	ug/L	200	500	650	90.0
6503395	Methyl Tert-Butyl Ether	ug/L	830	500	1300	94.0

METHOD BLANKS -

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

QUALITY CONTROL REPORT

QC IDENTIFIER: 31-081895-1
REFERENCE NOTEBOOK :
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INSTRUMENT : HEWLETT PACKARD GC5890 PID/ELCD
ANALYZED BY : A. Skornia
ANALYZED ON : 08-18-95

NOTE -

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

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

- 4) Relative Percent Difference (RPD) is:

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

**WESTECH
LABORATORIES, INC.
QUALITY ASSURANCE OFFICER**

DATE 8-23-95

DATE DRILLED: 08-07-1995

BORING NUMBER:

LOCATION: Well # 130 DHP

ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
800	23	N		STRONG	45	WBRMS		WEATHERED SILTSTONE AND SANDSTONE; brown, medium hard, moist, calcareous, strong hydrocarbon odor, stained grey.
130	50/4"	N		SLIGHT	50	BRSS		SANDSTONE WITH INTERBEDDED SILTSTONE; pale olive-brown to light brown, very hard, moist, strong to slight hydrocarbon odor, no staining.
220	50/3"	N		MODERATE	55			
75	50/2"	N		SLIGHT	60			
					61.5			Groundwater Not Encountered
					65			
					70			
					75			
					80			
ND - "None detected" N - Split-spoon sampler G - Grab (scoop) Headspace by New Mexico USTR, Chapter XII Appendix C.						CONOCO UNIT 28-7		
Driving weight: 140 NOTES: Backfilled with native soils mixed with 3% bentonite						Boring Log		
						WESTERN TECHNOLOGIES INC.		
						Job No: 3185JC120		Plate: 5

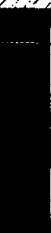


DATE DRILLED: 08-04-1995

BORING NUMBER:

LOCATION: Well # 126 DHP

ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
1700	11	N		STRONG	45	ML		SANDY SILT; with clay, stained grey, stiff to very stiff, moist, strong hydrocarbon odor, heavy staining.
> 2000	17	N		STRONG	50			
400	15	N		STRONG	55	SM		SILTY SAND; with occasional SAND; with silt, and SANDY SILT; intervals. Brown, moderately dense to very stiff, slightly moist to dry, strong to slight hydrocarbon odor, heavy to slight staining.
700	22	N		SLIGHT	60			
350	30	N		SLIGHT	65			
130	20	N		STRONG	70	WBRMS BRSS		WEATHERED SILTSTONE; sandy, grey, medium hard, wet. SANDSTONE WITH INTERBEDDED SILTSTONE; pale olive-brown to light brown, very hard, moist to wet, strong to slight hydrocarbon odor, no staining.
250	50/4"	N		SLIGHT	75			
					80			(this soil will be continued on the next page)
ND - "None detected" N - Split-spoon sampler G - Grab (scoop) Headspace by New Mexico USTR, Chapter XII Appendix C.						CONOCO UNIT 28-7		
Driving weight: 140 NOTES: screen 85'-75'; sand 85'-73'; grout 73'-70'; native w/ 3% bentonite 70'-5', concrete 5'-0'						Boring Log		
						WESTERN TECHNOLOGIES INC.		
						Job No: 3185JC120		Plate: 4

DATE DRILLED: 08-04-1995

BORING NUMBER:

LOCATION: Well # 126 DHP

ELEVATION: Not Determined

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
320	50/2"	N		SLIGHT		BRSS		 groundwater encountered at 80 feet BGS
					85			85
					90			
					95			
					100			
					105			
					110			
					115			
					120			

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Headspace by New Mexico USTR, Chapter XII Appendix C.

Driving weight: 140

CONOCO UNIT 28-7

Boring Log

NOTES:
screen 85'-75'; sand 85'-73'; grout 73'-70';
native w/ 3% bentonite 70'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.

Job No: 3185JC120

Plate: 4

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: **07-28-1995**

BORING NUMBER:

LOCATION: **Well # 219; BDP/BPR**ELEVATION: **Not Determined**

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
96.0	21	N		MODERATE	45	SP		SAND; with silt, brown, moderately dense, dry to slightly moist, moderate hydrocarbon odor, no staining.
73.8	18	N		MODERATE	50			
18.5	11	N		SLIGHT	55	SM		SAND AND SILT; brown, loose, very moist, slight hydrocarbon odor, no staining.
								groundwater encountered at 55.5 feet BGS
						SP		SAND; with silt, brown, wet, no hydrocarbon staining or odor.
15	11	N		NONE	60			
								61.5
					65			
					70			
					75			
					80			

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: **140**

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7

Boring Log

NOTES:

screen 60'-50'; sand 61'-47'; grout 47'-45';

native w/ 3% bentonite 45'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.Job No: **3185JC120**Plate: **1**

DATE DRILLED: **07-31-1995**

BORING NUMBER:

LOCATION: **Well # 47; BPR**ELEVATION: **Not Determined**

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						SP		SAND; trace silt, brown, moderately dense to dense, dry to slightly moist, strong hydrocarbon odor, no staining.
100	23	N		STRONG	45			
200	26	N		STRONG	50			
12	50/1"	N		MODERATE	55	BRSS		SANDSTONE; with interbedded SILTSTONE; pale brown to light grey with occasional olive tones, hard to very hard, dry to wet, moderate to slight hydrocarbon odor, no staining except slight staining at water table.
42	50/1"	N		MODERATE	60			
9	72/7"	N		SLIGHT	65			
14	50/3"	N		SLIGHT	70			groundwater encountered at 70 feet BGS
37	50/1"	N		SLIGHT	75			
								76.5
					80			

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: **140**

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7**Boring Log**

NOTES:

screen 75'-65'; sand 76'-63'; grout 63'-60';

native w/ 3% bentonite 60'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.Job No: **3185JC120**Plate: **2**

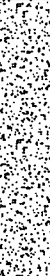
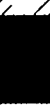
DATE DRILLED: 08-04-1995

BORING NUMBER:

LOCATION: Well # 19 BDP

ELEVATION: Not Determined

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
100	23	N		STRONG	45	SP		SAND; trace silt, light brown, moderately dense, slightly moist, slight hydrocarbon odor, no staining.
200	26	N		STRONG	50	SM		SILTY SAND; to SAND WITH SILT; brown, moderately dense, dry to moist, slight to moderate hydrocarbon odor, no staining.
12	50/1"	N		MODERATE	55			
42	50/1"	N		MODERATE	60			
9	72/7"	N		SLIGHT	65			
14	50/3"	N		SLIGHT	70	ML		SANDY SILT; brown, very stiff, moist to wet, slight to moderate hydrocarbon odor, no staining.
37	50/1"	N		SLIGHT	75			
					80	WBRMS		WEATHERED SILTSTONE; sandy, olive-grey, medium hard, wet, with convoluted interbedding, slight hydrocarbon odor, no staining.
(this soil will be continued on the next page)								

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: 140

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7

Boring Log

NOTES:

screen 85'-75'; sand 85'-73'; grout 73'-70';

native w/ 3% bentonite 70'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.

Job No: 3185JC120

Plate: 3

DATE DRILLED: **08-04-1995**

BORING NUMBER:

LOCATION: **Well # 19 BDP**ELEVATION: **Not Determined**

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.

HEADSPACE READING	BLOWS per FOOT	SAMPLE TYPE	SAMPLE	PETRO. ODOR	DEPTH	USCS	GRAPHIC	SOIL DESCRIPTION
						WBRMS		groundwater encountered at 80 feet BGS
					85	BRSS		SANDSTONE; grey, very hard, moist to wet, slight hydrocarbon odor, no staining.
					85			
					90			
					95			
					100			
					105			
					110			
					115			
					120			

ND - "None detected"

N - Split-spoon sampler

G - Grab (scoop)

Driving weight: **140**

Headspace by New Mexico USTR, Chapter XII Appendix C.

CONOCO UNIT 28-7**Boring Log**

NOTES:

screen 85'-75'; sand 85'-73'; grout 73'-70';

native w/ 3% bentonite 70'-5', concrete 5'-0'

WESTERN TECHNOLOGIES INC.Job No: **3185JC120**Plate: **3**

CURRENT GROUND WATER DATA

WELL	DATE	BENZENE		TOLUENE		ETHYLBENZENE		XYLENES		TPH	
		Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value

Detection Limit: 0.001

219	08/16/95	0.08	0.08	0.18	0.18	0.01	0.01	0.04	0.04		
	08/16/95	0.17	0.17	0.99	0.99	ND	ND	0.22	0.22		
	03/20/96	0.02	0.02	0.03	0.03	ND	ND	ND	0.00		
	07/18/96	ND	0.00	0.01	0.01	ND	ND	ND	0.00		
47	08/16/95	0.13	0.13	0.76	0.76	0.01	0.01	0.06	0.06		
	08/16/95	0.01	0.01	0.19	0.19	ND	ND	0.03	0.03		
	03/25/96	0.09	0.09	0.90	0.90	ND	ND	0.18	0.18		
	07/18/96	0.11	0.11	0.59	0.59	0.01	0.01	0.06	0.06		
19	08/16/95	0.05	0.05	0.71	0.71	0.03	0.03	0.46	0.46		
	08/15/95	0.07	0.07	0.97	0.97	0.03	0.03	0.41	0.41		
	03/20/96	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.08		
	07/18/96	ND	0.00	ND	0.00	ND	ND	ND	0.00		
126	08/04/95	0.27	0.27	3.70	3.70	0.58	0.58	4.30	4.30		
	08/15/95	0.24	0.24	3.19	3.19	0.16	0.16	1.94	1.94		
	03/20/96	ND	0.00	0.02	0.02	0.01	0.01	0.20	0.20		
	07/18/96	ND	0.00	ND	0.00	ND	ND	ND	0.00		

Summary Statistics(mg/l)

Benzene		Toluene		Ethylbenzene		Xylenes		TPH	
12.00 Detects		14.00 Detects		9.00 Detects		12.00 Detects		0.00 Detects	
max	0.27	max	3.70	max	0.58	max	4.30	max	0.00
min	0.00	min	0.00	min	0.00	min	0.00	min	0.00
mean	0.08	mean	0.77	mean	0.05	mean	0.50	mean	#DIV/0!
stdev	0.09	stdev	1.12	stdev	0.15	stdev	1.12	stdev	#DIV/0!
N	16.00	N	16.00	N	16.00	N	16.00	N	0.00
tstat	1.75	tstat	1.75	tstat	1.75	tstat	1.75	tstat	#VALUE!
95th UCL	0.12	95th UCL	1.26	95th UCL	0.12	95th UCL	0.99	95th UCL	#DIV/0!

ND Not detected
NS Groundwater Sample was not obtained

CURRENT GROUND WATER DATA

Detection Limit: 0.001 BENZENE 0.001 TOLUENE 0.001 ETHYLBENZENE 0.001 XYLENES 0.001 TPH 1.000

WELL	DATE	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value	Concentration (mg/L)	Calculated Value
219	08/16/95	0.13	0.13	0.76	0.76	0.01	0.01	0.06	0.06	0.06	0.06
	08/16/95	0.01	0.01	0.19	0.19	ND	0.00	0.03	0.03	0.03	0.03
	03/20/96	0.09	0.09	0.90	0.90	ND	0.00	0.18	0.18	0.18	0.18
	07/18/96	0.11	0.11	0.59	0.59	0.01	0.01	0.06	0.06	0.06	0.06
47	08/16/95	0.13	0.13	0.76	0.76	0.01	0.01	0.06	0.06	0.06	0.06
	08/16/95	0.01	0.01	0.19	0.19	ND	0.00	0.03	0.03	0.03	0.03
	03/25/96	0.09	0.09	0.90	0.90	ND	0.00	0.18	0.18	0.18	0.18
	07/18/96	0.11	0.11	0.59	0.59	0.01	0.01	0.06	0.06	0.06	0.06
19	08/16/95										
	08/15/95										
	03/20/96										
	07/18/96										
126	08/04/95										
	08/15/95										
	03/20/96										
	07/18/96										

Summary Statistics(mg/l)

Benzene					Toluene					Ethylbenzene					Xylenes					TPH				
4.00 Detects					4.00 Detects					2.00 Detects					4.00 Detects					0.00 Detects				
max	0.13				max	0.90				max	0.01				max	0.18				max	0.00			
min	0.01				min	0.19				min	0.00				min	0.03				min	0.00			
mean	0.08				mean	0.61				mean	0.01				mean	0.08				mean	#DIV/0!			
stdev	0.05				stdev	0.31				stdev	0.01				stdev	0.06				stdev	#DIV/0!			
N	4.00				N	4.00				N	4.00				N	4.00				N	0.00			
tstat	2.35				tstat	2.35				tstat	2.35				tstat	2.35				tstat	#VALUE!			
95th UCL	0.14				95th UCL	0.97				95th UCL	0.01				95th UCL	0.16				95th UCL	#DIV/0!			

ND Not detected
NS Groundwater Sample was not obtained

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID: Not Given
Sample ID: MW #1 SJ28-7 #219
Lab ID: 0396G01343
Sample Matrix: Water
Condition: Cool/Intact

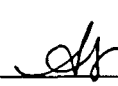
Report Date: 07/25/96
Date Sampled: 07/15/96
Date Received: 07/15/96
Date Extracted: NA
Date Analyzed: 07/18-25/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	5.6	1.0
Toluene	10.1	1.0
Ethylbenzene	ND	1.0
m,p-Xylenes	1.2	1.0
o-Xylene	2.3	1.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	99.7%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review



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AROMATIC VOLATILE ORGANICS

Client:	CONOCO	Report Date:	03/20/96
Project Name:	NA	Date Sampled:	03/12/96
Sample ID:	SJ 28-7 #219	Date Received:	03/20/96
Sample Number:	039600350 / 0696G00467	Date Extracted:	03/20/96
Sample Matrix:	Water	Date Analyzed:	03/20/96
Preservative:	Cool, HCl	Time Analyzed:	11:24 AM
Condition:	Intact, pH < 2		

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Benzene	0.019	0.01
Toluene	0.027	0.01
Ethylbenzene	ND	0.01
p,m-xylene	ND	0.01
o-xylene	ND	0.01

ND - Analyte not detected at stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene	103%	75 - 125%
Bromofluorobenzene	103%	70 - 120%

Reference:

Method 5030A, Purge and Trap.
Method 8020A, Aromatic Volatile Organics.
SW-846, Test Methods for Evaluating Solid Waste, United States
Environmental Protection Agency, Final Update II, September 1994.

Comments:

Elevated detection limits due to high levels of other compounds.

Note 7 mpph
Analyst

Ramona R. Nunez
Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Bailer	Report Date:	08/16/95
Sample ID:	SJ 28-7 #219 BDP/BPR-MW	Date Sampled:	08/11/95
Lab ID:	G01375	Date Received:	08/11/95
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	08/16/95

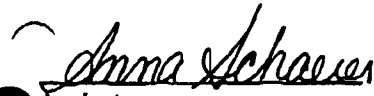
Compound Name	Concentration (ppb)	Detection Limit (ppb)
Benzene	170	10.0
Toluene	993	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	165	10.0
o-Xylene	54.1	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	116.5	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


Analyst
Review

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID: Not Given
Sample ID: 28-7 #47 MW1
Lab ID: 0396G01347
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/26/96
Date Sampled: 07/17/96
Date Received: 07/17/96
Date Extracted: NA
Date Analyzed: 7/18-25/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	108	20.0
Toluene	589	20.0
Ethylbenzene	ND	20.0
m,p-Xylenes	51.8	20.0
o-Xylene	25.8	20.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	106.0%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

df
Analyst

SB
Review

VOLATILE AROMATIC HYDROCARBONS

Conoco

Project ID: Water-BTEX
Sample ID: #1 SJ 28-7 #47
Lab ID: 0396G00321
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 03/29/96
Date Sampled: 03/22/96
Date Received: 03/22/96
Date Extracted: NA
Date Analyzed: 03/25/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	86.8	10.0
Toluene	896	10.0
Ethylbenzene	ND	10.0
m,p-Xylenes	140	10.0
o-Xylene	37.8	10.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	100.2	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


Analyst


Review

InterMountain Laboratories, Inc.

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VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Monitor Well/Bailer and Hand	Report Date:	08/16/95
Sample ID:	SJ 28-7 #47 BPR-MW	Date Sampled:	08/15/95
Lab ID:	G01392	Date Received:	08/15/95
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	08/16/95

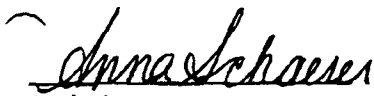
Benzene	12.2	4.0
Toluene	186	4.0
Ethylbenzene	ND	4.0
m,p-Xylenes	27.7	4.0
o-Xylene	7.0	4.0

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	114.1	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


Analyst
Review

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID: Not Given
Sample ID: 28-7 #19 MW1
Lab ID: 0396G01348
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/26/96
Date Sampled: 07/17/96
Date Received: 07/17/96
Date Extracted: NA
Date Analyzed: 7/18-25/96

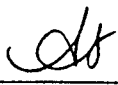
Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	0.4	0.2
Toluene	0.3	0.2
Ethylbenzene	0.7	0.2
m,p-Xylenes	0.8	0.2
o-Xylene	ND	0.2

ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	93.4%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:



Analyst



Review



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Phone (409) 774-4999 Fax (409) 696-096

AROMATIC VOLATILE ORGANICS

Client:	CONOCO	Report Date:	03/20/96
Project Name:	NA	Date Sampled:	03/12/96
Sample ID:	SJ 28-7 #19	Date Received:	03/20/96
Sample Number:	039600352 / 0696G00468	Date Extracted:	03/20/96
Sample Matrix:	Water	Date Analyzed:	03/20/96
Preservative:	Cool, HCl	Time Analyzed:	12:44 PM
Condition:	Intact, pH < 2		

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Benzene	0.014	0.01
Toluene	0.012	0.01
Ethylbenzene	0.011	0.01
p,m-xylene	0.078	0.01
o-xylene	ND	0.01

ND - Analyte not detected at stated detection limit.

Quality Control:

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene	106%	75 - 125%
Bromofluorobenzene	103%	70 - 120%

Reference:

Method 5030A, Purge and Trap.
Method 8020A, Aromatic Volatile Organics.
SW-846, Test Methods for Evaluating Solid Waste, United States
Environmental Protection Agency, Final Update II, September 1994.

Comments:

Elevated detection limits due to high levels of other compounds.

Not 7 mpp
Analyst

Ramona R. Wende
Review

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VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Bailer	Report Date:	08/16/95
Sample ID:	SJ 28-7 #19 BDP-MW	Date Sampled:	08/11/95
Lab ID:	G01373	Date Received:	08/11/95
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	08/15/95

Compound	Concentration (ppm)	Detection Limit (ppm)
Benzene	65.2	10.0
Toluene	973	10.0
Ethylbenzene	33.5	10.0
m,p-Xylenes	315	10.0
o-Xylene	93.0	10.0

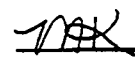
ND - Analyte not detected at the stated detection limit.

Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	117.5	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:


Analyst


Review

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID: Not Given
Sample ID: 28-7 #126 MW1
Lab ID: 0396G01349
Sample Matrix: Water
Condition: Cool/Intact

Report Date: 07/26/96
Date Sampled: 07/17/96
Date Received: 07/17/96
Date Extracted: NA
Date Analyzed: 07/18/96

Target Analyte	Concentration (ppb)	Detection Limit (ppb)
Benzene	ND	5.0
Toluene	10.7	5.0
Ethylbenzene	7.4	5.0
m,p-Xylenes	24.5	5.0
o-Xylene	ND	5.0

ND - Analyte not detected at the stated detection limit.

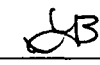
Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	90.0%	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:



Analyst



Review



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Phone (409) 774-4999 Fax (409) 696-096

AROMATIC VOLATILE ORGANICS

Client:	CONOCO	Report Date:	03/20/96
Project Name:	NA	Date Sampled:	03/12/96
Sample ID:	SJ 28-7 #126	Date Received:	03/20/96
Sample Number:	039600353 / 0696G00469	Date Extracted:	03/20/96
Sample Matrix:	Water	Date Analyzed:	03/20/96
Preservative:	Cool, HCl	Time Analyzed:	1:38 PM
Condition:	Intact, pH < 2		

Analyte	Concentration (mg/L)	Detection Limit (mg/L)
Benzene	ND	0.01
Toluene	0.019	0.01
Ethylbenzene	0.013	0.01
p,m-xylene	0.19	0.01
o-xylene	0.011	0.01

ND - Analyte not detected at stated detection limit.

Quality Control:

<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene	107%	75 - 125%
Bromofluorobenzene	102%	70 - 120%

Reference:

Method 5030A, Purge and Trap.
Method 8020A, Aromatic Volatile Organics.
SW-846, Test Methods for Evaluating Solid Waste, United States
Environmental Protection Agency, Final Update II, September 1994.

Comments:

Elevated detection limits due to high levels of other compounds.

Not a mfg
Analyst

Ramona R. Williams
Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

VOLATILE AROMATIC HYDROCARBONS

Conoco, Inc.

Project ID:	Bailer	Report Date:	08/16/95
Sample ID:	SJ 28-7 #126 DHP-MW	Date Sampled:	08/11/95
Lab ID:	G01374	Date Received:	08/11/95
Sample Matrix:	Water	Date Extracted:	NA
Condition:	Cool/Intact	Date Analyzed:	08/15/95

Compound	Concentration (ppm)	Detection Limit (ppm)
Benzene	238	10.0
Toluene	3,190	10.0
Ethylbenzene	164	10.0
m,p-Xylenes	1,520	10.0
o-Xylene	421	10.0

ND - Analyte not detected at the stated detection limit.

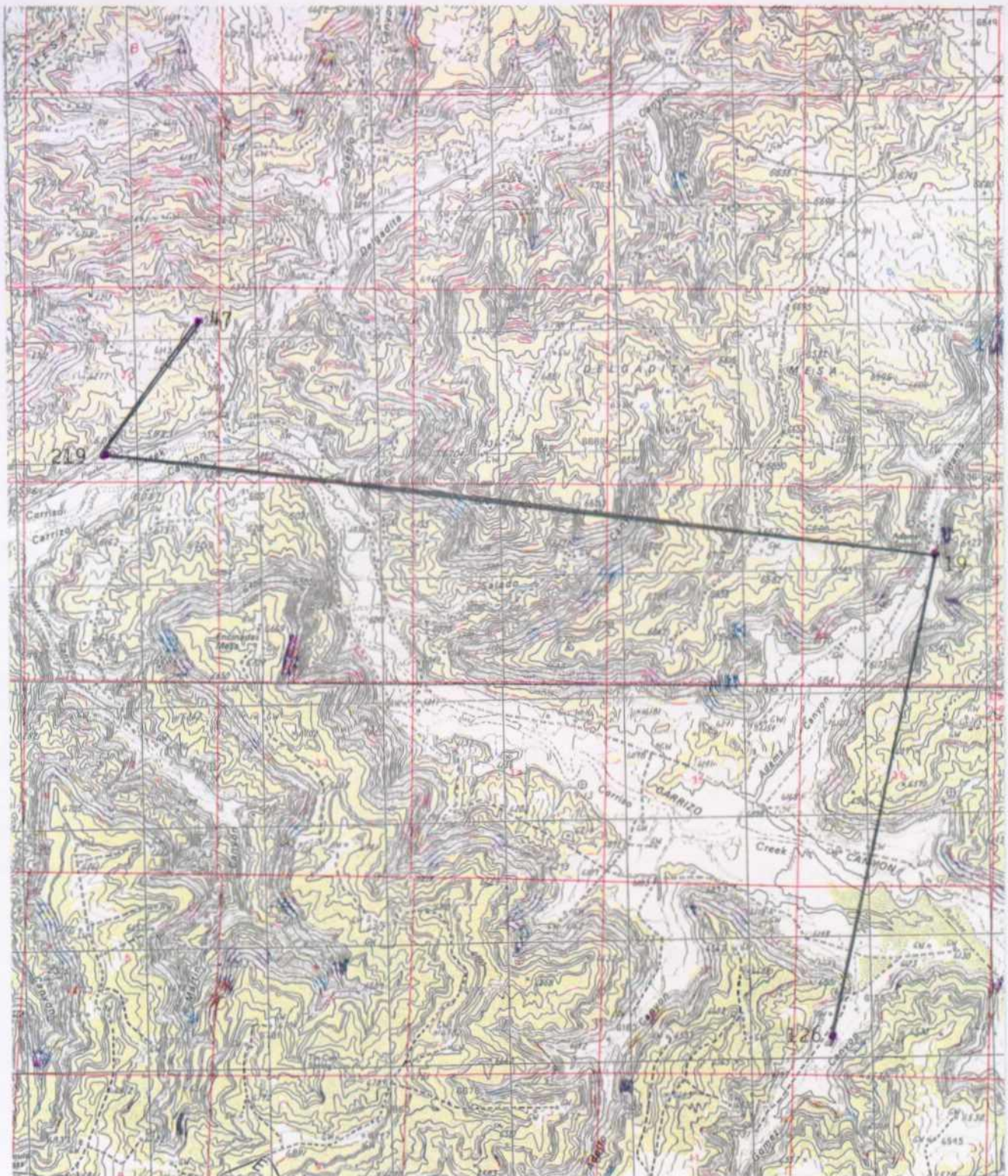
Quality Control:	<u>Surrogate</u>	<u>Percent Recovery</u>	<u>Acceptance Limits</u>
	Bromofluorobenzene	114.2	75 -125%

Reference: Method 5030, Purge and Trap; Method 8020, Aromatic Volatile Organics; Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, September 1986.

Comments:

Analyst

Review



CONTOUR INTERVAL 20 FEET

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: San Juan 28-7 Lease
 Site Location: San Juan Basin, New Mexico Date Completed: 8/9/96
 Completed By: Steve H. Danbom

Software: GSI RBCA Spreadsheet
 Version: v 1.0

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

DEFAULT PARAMETERS

Exposure Parameter	Definition (Units)	Adult	Residential (1-6yrs)	Chronic	Commercial/Industrial
ATc	Averaging time for carcinogens (yr)	70			
ATn	Averaging time for non-carcinogens (yr)	30	6	25	1
BW	Body Weight (kg)	70	15	70	70
ED	Exposure Duration (yr)	30	6	25	1
EF	Exposure Frequency (days/yr)	350	350	250	180
EFd	Exposure Frequency for dermal exposure	350	350	250	180
IRgw	Ingestion Rate of Water (l/day)	2	200	1	100
IRs	Ingestion Rate of Soil (mg/day)	100		50	50
IRadj	Adjusted soil ing. rate (mg/yr/kg-d)	1.1E+02		9.4E+01	
IRa.in	Inhalation rate indoor (m ³ /3day)	15		20	
IRa.out	Inhalation rate outdoor (m ³ /3day)	20		2.0E+03	5.8E+03
SA	Skin surface area (dermal) (cm ²)	5.8E+03		1.7E+03	
SAadj	Adjusted dermal area (cm ² -yr/kg)	2.1E+03			
M	Soil to Skin adherence factor	1		FALSE	FALSE
AAFs	Age adjustment on soil ingestion	FALSE		FALSE	FALSE
AAFd	Age adjustment on skin surface area	FALSE		FALSE	FALSE
tox	Use EPA tox data for air (or PEL based)	TRUE		TRUE	TRUE
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE		FALSE	FALSE

Matrix of Exposed Persons to Complete Exposure Pathways	Residential	Commercial/Industrial
Groundwater Pathways:		
GW.i	TRUE	FALSE
GW.v	FALSE	FALSE
GW.b	FALSE	FALSE
Soil Pathways		
S.v	FALSE	FALSE
SS.v	TRUE	FALSE
SS.d	FALSE	TRUE
S.i	FALSE	FALSE
S.b	FALSE	FALSE

Matrix of Receptor Distance and Location on- or off-site	Residential	Commercial/Industrial
	Distance	Distance
GW	6.1E+04	6.1E+04
S	FALSE	FALSE

Matrix of Target Risks	Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-05
TRc	Target Risk (class C carcinogens)	1.0E-05
THQ	Target Hazard Quotient	1.0E+00
Opt	Calculation Option (1, 2, or 3)	2
Tier	RBCA Tier	2

Surface Parameters	Definition (Units)	Residential	Chronic	Commercial/Industrial
t	Exposure duration (yr)	30	25	1
A	Contaminated soil area (cm ²)	9.3E+05	9.3E+05	9.3E+05
W	Length of affected soil parallel to wind (cm)	9.1E+02	9.1E+02	9.1E+02
W.gw	Length of affected soil parallel to groundwater (cm)	9.1E+02	9.1E+02	9.1E+02
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	2.3E+02	2.3E+02
delta	Air mixing zone height (cm)	2.0E+02	2.0E+02	2.0E+02
Lss	Definition of surficial soils (cm)	1.0E+02	1.0E+02	1.0E+02
Pe	Particulate area emission rate (g/cm ² /s)	2.2E-10	2.2E-10	2.2E-10
Groundwater Definition (Units)	Value			
delta.gw	Groundwater mixing zone depth (cm)	2.7E+02	2.7E+02	2.7E+02
I	Groundwater infiltration rate (cm/yr)	2.4E+02	2.4E+02	2.4E+02
Ugw	Groundwater Darcy velocity (cm/yr)	4.0E+01	4.0E+01	4.0E+01
Ugw.tr	Groundwater Transport velocity (cm/yr)	1.2E+02	1.2E+02	1.2E+02
Ks	Saturated Hydraulic Conductivity (cm/s)			
grad	Groundwater Gradient (cm/cm)			
Sw	Width of groundwater source zone (cm)	3.0E+03	3.0E+03	3.0E+03
Sd	Depth of groundwater source zone (cm)	2.7E+02	2.7E+02	2.7E+02
BC	Biodegradation Capacity (mg/L)			
BI07	Is Bioattenuation Considered	FALSE	FALSE	FALSE
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01	3.8E-01	3.8E-01
loc.sat	Fraction organic carbon in water-bearing unit	2.0E-03	2.0E-03	2.0E-03
Soil Definition (Units)	Value			
hc	Capillary zone thickness (cm)	5.0E+00	5.0E+00	5.0E+00
hv	Vadose zone thickness (cm)	2.1E+03	2.1E+03	2.1E+03
rho	Soil density (g/cm ³)	1.7	1.7	1.7
foc	Fraction of organic carbon in vadose zone	0.002	0.002	0.002
phi	Soil porosity in vadose zone	0.38	0.38	0.38
Lgw	Depth to groundwater (cm)	2.1E+03	2.1E+03	2.1E+03
Ls	Depth to top of affected soil (cm)	1.0E+02	1.0E+02	1.0E+02
Lsubs	Thickness of affected subsurface soils (cm)	2.0E+02	2.0E+02	2.0E+02
pH	Soil/groundwater pH	6.5	6.5	6.5
phi.w	Volumetric water content	0.342	0.342	0.342
phi.a	Volumetric air content	0.038	0.038	0.038
Building Definition (Units)	Residential	Commercial		
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02	3.0E+02
ER	Building air exchange rate (s ⁻¹)	1.4E-04	2.3E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	1.5E+01	1.5E+01
ela	Foundation crack fraction	0.01	0.01	0.01
Dispersive Transport Parameters Definition (Units)	Residential	Commercial		
ax	Longitudinal dispersion coefficient (cm)	6.1E+03	6.1E+03	6.1E+03
ay	Transverse dispersion coefficient (cm)	2.0E+03	2.0E+03	2.0E+03
az	Vertical dispersion coefficient (cm)	3.0E+02	3.0E+02	3.0E+02
doy	Transverse dispersion coefficient (cm)			
dcz	Vertical dispersion coefficient (cm)			

RBCA CHEMICAL DATABASE

Physical Property Data

Vapor																	
CAS		Molecular Weight		Diffusion Coefficients		log (Koc) or log(Kd)		Henry's Law Constant		Pressure		Solubility					
Number	Constituent	type	MW	ref	In air (cm2/s)	In water (cm2/s)	@ 20 - 25 C (l/kg)	@ 20 - 25 C (unitless)	(atm-m3)	(mm Hg)	Pure	Component	ref	(mg/l) Pure	Component	ref	
					Dair	Dwat	re	re	mol	re	re	ref			ref		
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5

Site Name: San Juan 28-7 Leas Site Location: San Juan Basin, Ne Completed By: Steve H. Danborn Date Completed: 8/9/1996

Software version: v 1.0

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RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose		Inhalation		re	Oral		Slope Factors 1/(mg/kg/day)		Inhalation		ref	EPA Weight of Evidence		Is Constituent Carcinogenic ?
		RfD_oral	(mg/kg/day)	RfD_inhal	(mg/kg/day)		SF_oral	(mg/kg/day)	SF_inhal	(mg/kg/day)	SF_inhal	(mg/kg/day)				
71-43-2	Benzene	-		R	1.70E-03	R	2.90E-02	A	2.90E-02	A	2.90E-02	A	A			TRUE
100-41-4	Ethylbenzene	1.00E-01		A	2.86E-01	A	-	R	-	R	-	R	D			FALSE
108-88-3	Toluene	2.00E-01		A,R	1.14E-01	,	-	R	-	R	-	R	D			FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00		A,R	2.00E+00	A	-	R	-	R	-	R	D			FALSE

Site Name: San Juan 28-7 Site Location: San Juan Basin, New Completed By: Steve H. Danborn Date Completed: 8/9/1996

Software version: v 1.0

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RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	MCL (mg/L)	Maximum Contaminant Level reference	Permissible Exposure Limit (mg/m3)	Relative Absorption Factors	Detection Limits	Half Life (First-Order Decay) (days)
				Oral	Dermal	Groundwater (mg/L)	Saturated
						ref	Unsaturated
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA 1	0.002	720
100-41-4	Ethylbenzene	7.00E-01	6 FR 3526 (30 Jan 91)	4.34E+02	ACGIH 1	0.002	228
108-88-3	Toluene	1.00E+00	6 FR 3526 (30 Jan 91)	1.47E+02	ACGIH 1	0.002	28
1330-20-7	Xylene (mixed isomers)	1.00E+01	6 FR 3526 (30 Jan 91)	4.34E+02	ACGIH 1	0.005	360
						C	720
						C	228
						C	28
						C	360
						C	720
						C	228
						C	28
						C	360

Site Name: San Juan 28-7 Site Location: San Juan Basin, New Mexico Completed By: Steve H. Danbo Date Completed: 8/9/1996

Software version: v 1.0

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REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	alue (mg/kg)	note
Benzene	1.4E-1		1.4E+0			
Ethylbenzene	1.3E-2		1.3E-1			
Toluene	9.7E-1		9.7E+0			
Xylene (mixed isomers)	1.6E-1		1.6E+0			

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexico

Completed By: Steve H. Danborn

Date Completed: 8/9/1996

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene	
Ethylbenzene	
Toluene	
Xylene (mixed isomers)	

Site Name: San Juan 28-7 Lease Completed By: Steve H. Danborn
Site Location: San Juan Basin, New Me Date Completed: 8/9/1996

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

Dilution Attenuation Factor
(DAF) in Groundwater

CONSTITUENT	Residential		Comm./Ind.
	Receptor	Receptor	
Benzene	7.2E+2		1.0E+0
Ethylbenzene	7.2E+2		1.0E+0
Toluene	7.2E+2		1.0E+0
Xylene (mixed isomers)	7.2E+2		1.0E+0

Site Name: San Juan 28-7 Lease

Completed By: Steve H. Danbom

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

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CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene	
Ethylbenzene	
Toluene	
Xylene (mixed isomers)	

Site Name: San Juan 28-7 Lease

Completed By: Steve H. Danbom

Site Location: San Juan Basin, New Mexi Date Completed: 8/9/1996

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RBCA SITE ASSESSMENT

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m ³)
Benzene		
Ethylbenzene		
Toluene		
Xylene (mixed isomers)		

Site Name: San Juan 28-7 Lease

Completed By: Steve H. Danbom

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

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RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexico

Completed By: Steve H. Danborn

Date Completed: 8/9/1996

1 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

AIR EXPOSURE PATHWAYS

SURFACE SOILS - VAPOR AND
DUST INHALATION

(CHECKED IF PATHWAY IS ACTIVE)

Constituents of Concern	1) Source Medium		2) NAE Value (mg/m ³ /kg) Receptor		3) Exposure Medium Air: POE Conc. (mg/m ³) (1) / (2)		4) Exposure Multiplier (IR*ET*EF*ED)/(BW*AT) (m ³ /kg-day)		5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	
	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential	On-Site Residential
Benzene	1.4E+0	2.7E+5	5.2E-6	1.2E-1	6.1E-7	1.3E-7	9.7E-6	1.6E-6		
Ethylbenzene	1.3E-1	2.7E+5	4.8E-7	2.7E-1	5.8E-6	2.7E-1	1.3E-7	9.7E-6		
Toluene	9.7E+0	2.7E+5	3.5E-5	2.7E-1	5.8E-6	2.7E-1	1.3E-7	9.7E-6		
Xylene (mixed isomers)	1.6E+0	2.7E+5	5.8E-6	2.7E-1	5.8E-6	2.7E-1	1.3E-7	9.7E-6		

NOTE: ABS = Dermal absorption factor (dim)
AF = Adherence factor
AT = Averaging time (days)

BW = Body Weight (kg)
CF = Units conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
ET = Exposure time (hr/day)
IR = Intake rate (L/day or mg/day)

POE = Point of exposure
SA = Skin surface area (cm²)

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Serial: G-271-DHX-538

Software: GSI RBGA Spreadsheet
Version: v1.0

RECA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexico Completed By: Steve H. Danbom

Date Completed: 8/9/1996

2 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

AIR EXPOSURE PATHWAYS

☒ CHECKED IF PATHWAY IS ACTIVE

Exposure Concentration

SUBSURFACE SOLS: VAPOR

INSULATION

1) Source Medium

2) NAF Value (m³/kg)

Receptor

3) Exposure Medium

4) Exposure Multiplier

5) Average Daily Intake Rate

TOTAL PATHWAY INTAKE (mg/kg-day)

(Sum intake values from surface & subsurface routes.)

On-Site Residential

6.1E-7

1.3E-7

9.7E-6

1.6E-6

Constituents of Concern

Benzene

Ethylbenzene

Toluene

Xylene (mixed isomers)

Subsurface Soil

Conc. (mg/kg)

0.0E+0

0.0E+0

0.0E+0

NOTE: ABS = Dermal absorption factor (dlm)

AF = Adherence factor

AT = Averaging time (days)

BW = Body Weight (kg)

CF = Units conversion factor

ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)

ET = Exposure time (hr/day)

IR = Intake rate (L/day or mg/day)

POE = Point of exposure

SA = Skin surface area (cm²)

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Serial: G-271-DHX-538

Software: GSI RECA Spreadsheet
Version: v 1.0

RECA SITE ASSESSMENT

Tier 2 Worksheet 8.2

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mex Completed By: Steve H. Danbom

Date Completed: 8/9/1996

1 OF 3

TIER 2 PATHWAY RISK CALCULATION

AIR EXPOSURE PATHWAYS

■ CHECKED IF PATHWAYS ARE ACTIVE

CARCINOGENIC RISK

Constituents of Concern	Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Inhalation Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
		On-Site	Residential		On-Site	Residential	On-Site	Residential		On-Site	Residential
Benzene	A	6.1E-7		2.9E-2	1.8E-8		1.4E-6		1.7E-3	8.4E-4	
Ethylbenzene	D						1.3E-7		2.9E-1	4.6E-7	
Toluene	D						9.7E-6		1.1E-1	8.5E-5	
Xylene (mixed isomers)	D						1.6E-6		2.0E+0	8.0E-7	

Total Pathway Carcinogenic Risk = 1.8E-8 0.0E+0

Total Pathway Hazard Index = 9.3E-4 0.0E+0

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexi

Completed By: Steve H. Danborn

Date Completed: 8/9/1996

3 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS

SURFACE SOILS OR SEDIMENTS:
DERMAL CONTACT

Exposure Concentration

Constituents of Concern	1) Source Medium Surface Soil Conc. (mg/kg)	4) Exposure Multiplier (SA _{soil} × ABS × CF × ED) / (BW × AT) (1/day)		5) Average Daily Intake Rate (mg/kg-day)	
		On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Benzene	1.4E+0		1.0E-5		1.4E-5
Ethylbenzene	1.3E-1		2.8E-5		3.7E-4
Toluene	8.7E+0		2.8E-5		2.8E-4
Xylene (mixed isomers)	1.8E+0		2.8E-5		4.5E-5

NOTE:

ABS = Dermal absorption factor (dm)
AF = Adherence factor
AT = Averaging time (days)

BW = Body Weight (kg)
CF = Units conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (L/day or mg/day)

POE = Point of exposure
SA = Skin surface area (cm²)

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Serial: G-371-DHX-538

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Version: v1.0

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease Site Location: San Juan Basin, New Mexico Completed By: Steve H. Danborn Date Completed: 8/9/1996 4 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS:
INGESTION

Exposure Concentration

Constituents of Concern	1) Source Medium Surface Soil Conc. (mg/kg)	4) Exposure Multiplier (R _{UC} EF _{ED})/(BW _{AT}) (1/day)		5) Average Daily Intake Rate (mg/kg-day)	
		On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Benzene	1.4E+0		1.7E-7		2.5E-7
Ethylbenzene	1.3E-1		4.8E-7		6.4E-8
Toluene	9.7E+0		4.8E-7		4.8E-8
Xylene (mixed isomers)	1.8E+0		4.8E-7		7.8E-7

TOTAL PATHWAY INTAKE (mg/kg-day)

(Sum Intake values from
dermal & ingestion routes.)

On-Site Residential	On-Site Commercial
1.5E-5	1.5E-5
3.8E-4	3.8E-4
2.8E-4	2.8E-4
4.8E-5	4.8E-5

NOTE:

ABS = Dermal absorption factor (dim)
AF = Adherence factor
AT = Averaging time (days)

BW = Body Weight (kg)
CF = Units conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (L/day or mg/day)

POE = Point of exposure
SA = Skin surface area (cm²)

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Serial: G-371-DHX-538

Software: GSI RBGA Spreadsheet
Version: v 1.0

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.2

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexico Completed By: Steve H. Danborn

Date Completed: 8/9/1996

2 OF 3

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAYS

☐ CHECKED IF PATHWAYS ARE ACTIVE

CARCINOGENIC RISK

Constituents of Concern	(1) EPA Carcinogen Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Oral Slope Factor mg/kg-day ⁻¹	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
		On-Site Residential	On-Site Commercial		n-Site Resident	n-Site Commercial	On-Site Resident	n-Site Commercial		On-Site Resident	On-Site Commercial
Benzene	A		1.5E-5	2.9E-2		4.3E-7					
Ethylbenzene	D							3.8E-6	1.0E-1		3.8E-5
Toluene	D							2.8E-4	2.0E-1		1.4E-3
Xylene (mixed isomers)	D							4.6E-5	2.0E+0		2.3E-5

Total Pathway Carcinogenic Risk =

0.0E+0

4.3E-7

Total Pathway Hazard Index =

0.0E+0

1.6E-3

et

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Serial: G-271-DRX-83

Software: GSI RBCA Spreadsheet
Version: v 1.0

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

5 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

SOIL: LEACHING TO GROUNDWATER/

INGESTION

☒ (CHECKED IF PATHWAY IS ACTIVE)

Exposure Concentration

Constituents of Concern	1) Source Medium		2) MAP Value (L/kg) Receptor		3) Exposure Medium Groundwater: POE Conc. (mg/L) (1/2)		4) Exposure Multiplier (ROEF x ED) (mg/kg-day)		5) Average Daily Intake Rate (mg/kg-day)	
	Soil Concentration (mg/kg)									
Benzene	1.1E+00									
Ethylbenzene	1.2E+01									
Toluene	8.7E+00									
Xylene (mixed isomers)	1.8E+00									

NOTE: AT = Averaging time (days)

BW = Body Weight (kg)

CF = Units conversion factor

ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)

IR = Intake rate (L/day)

POE = Point of exposure

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Serial: G-271-CHK-038

Software: GSI RBCA Spreadsheet
Version: v1.0

RECA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

6 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

GROUNDWATER: INGESTION

■ (CHECKED IF PATHWAY IS ACTIVE)

Exposure Concentration

MAX. PATHWAY INTAKE (mg/kg-day)
(Maximum Intake of active pathways
soil leaching & groundwater routes.)

Constituents of Concern	1) Source Medium Concentration (mg/L)	2) MUF Value (dm) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (UK2)	4) Exposure Mapplier (USEPA/ED/BNWAT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day)	Off-Site Residential	
						Off-Site Residential	Off-Site Residential
Benzene	14E-1	7.2E+2	2.0E-4	1.2E-2		2.3E-4	2.3E-4
Ethylbenzene	1.2E-2	7.2E+2	1.8E-5	2.7E-2		5.0E-7	5.0E-7
Toluene	9.7E-1	7.2E+2	1.4E-3	2.7E-2		3.7E-5	3.7E-5
Xylenes (mixed isomers)	1.8E-1	7.2E+2	2.2E-4	2.7E-2		6.1E-6	6.1E-6

NOTE: AT = Averaging time (days)

BW = Body Weight (kg)
CF = Unit conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
IR = Intake rate (L/day or mg/day)

POE = Point of exposure

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Serial: G-271-CHK-538

Software: GSI RECA Spreadsheet
Version: v1.0

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.2

Site Name: San Juan 28-7 Le-ase

Site Location: San Juan Basin, New Mex Completed By: Steve H. Danborn

Date Completed: 8/9/1996

3 OF 3

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

■ CHECKED IF PATHWAYS ARE ACTIVE

CARCINOGENIC RISK

TOXIC EFFECTS

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
		On-Site Residential	Off-Site Residential		On-Site Residential	Off-Site Residential			On-Site Residential	Off-Site Residential
Benzene	A	2.3E-6		2.9E-2		6.8E-8				
Ethylbenzene	D							1.0E-1		5.0E-6
Toluene	D							2.0E-1		1.9E-4
Xylene (mixed isomers)	D							2.0E+0		3.0E-6

Total Pathway Carcinogenic Risk =

0.0E+0

6.8E-8

Total Pathway Hazard Index =

0.0E+0

1.9E-4

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.3

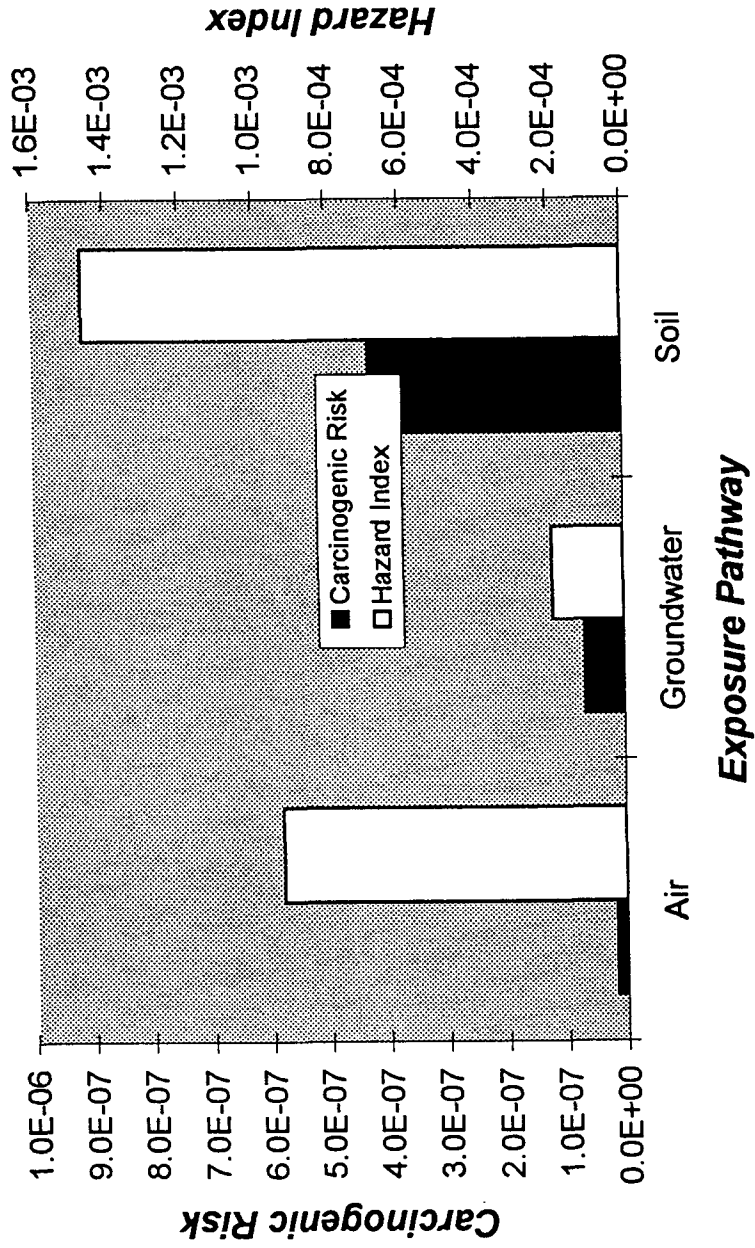
Site Name: San Juan 28-7 Lease
 Site Location: San Juan Basin, New Mexico
 Completed By: Steve H. Danbom
 Date Completed: 8/9/1996

1 of 1

TIER 2 BASELINE RISK SUMMARY TABLE

BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS					
EXPOSURE PATHWAY	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
AIR EXPOSURE PATHWAYS										
Complete:	1.8E-8	1.0E-5	1.8E-8	N/A	o	8.4E-4	1.0E+0	9.3E-4	N/A	o
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	6.8E-8	1.0E-5	6.8E-8	N/A	o	1.9E-4	1.0E+0	1.9E-4	N/A	o
SOIL EXPOSURE PATHWAYS										
Complete:	4.3E-7	1.0E-5	4.3E-7	N/A	o	1.4E-3	1.0E+0	1.5E-3	N/A	o
CRITICAL EXPOSURE PATHWAY (Select Maximum Values from Complete Pathways)										
	4.3E-7	1.0E-5	4.3E-7	N/A	o	1.4E-3	1.0E+0	1.5E-3	N/A	o

Total Risk for Each Pathway



RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: San Juan 28-7 Lease

Completed By: Steve H. Danborn

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

1 OF 1

SURFACE SOIL SSTL VALUES
(< 3 FT BGS)

Calculation Option: 2

☐ MCL exposure limit?
☐ PEL exposure limit?

Target Risk (Class A & B) 1.0E-5
 Target Risk (Class C) 1.0E-5
 Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("X" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Ingestion, Inhalation and Dermal Contact	Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
			Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)			
CAS No.	Name	(mg/kg)						(mg/kg)		Only if "yes" left
71-43-2	Benzene	1.4E+0	NA	NA	NA	>Res	>Res	3.3E+1	☐	<1
100-41-4	Ethylbenzene	1.3E-1	NA	NA	NA	>Res	>Res	>Res	☐	<1
108-88-3	Toluene	9.7E+0	NA	NA	NA	>Res	>Res	>Res	☐	<1
1330-20-7	Xylene (mixed isomers)	1.6E+0	NA	NA	NA	>Res	>Res	>Res	☐	<1

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: San Juan 28-7 Lease

Completed By: Steve H. Danbom

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

1 OF 1

SUBSURFACE SOIL SSTL VALUES (> 3 FT BGS)		Calculation Option: 2	
Target Risk (Class A & B) 1.0E-5 Target Risk (Class C) 1.0E-5 Target Hazard Quotient 1.0E+0		☐ MCL exposure limit? ☐ PEL exposure limit?	

CONSTITUENTS OF CONCERN		SSTL Results For Complete Exposure Pathways ("x" If Complete)									
CAS No.	Name	Representative Concentration (mg/kg)	Soil Leaching to Groundwater		Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL (mg/kg)	SSTL Exceeded ?	Required CRF
			Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Commercial: (on-site)			
71-43-2	Benzene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐ if yes	Only if "Yes" left <1
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1
108-88-3	Toluene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1

RBCA SITE ASSESSMENT

Site Name: San Juan 28-7 Lease

Completed By: Steve H. Danborn

1 OF 1

Site Location: San Juan Basin, New Mexico

Date Completed: 8/9/1996

GROUNDWATER SSTL VALUES

Calculation Option: 2

☐ MCL exposure limit?☐ PEL exposure limit?

Target Risk (Class A & B) 1.0E-5

Target Risk (Class C) 1.0E-5

Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("X" If Complete)

CAS No.	Name	Representative Concentration (mg/L)	X	Groundwater Ingestion		Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL (mg/L)	SSTL Exceeded?	Required CRF
				Residential: 2000 feet	Commercial: (on-site)	Regulatory(MCL): 2000 feet	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)		
71-43-2	Benzene	1.4E-1		2.1E+1	NA	NA	NA	NA	NA	2.1E+1	☐ If yes	Only if "yes" left <1
100-41-4	Ethylbenzene	1.3E-2		>Sol	NA	NA	NA	NA	NA	>Sol	☐	<1
108-88-3	Toluene	9.7E-1		>Sol	NA	NA	NA	NA	NA	>Sol	☐	<1
1330-20-7	Xylene (mixed isomers)	1.6E-1		>Sol	NA	NA	NA	NA	NA	>Sol	☐	<1

Serial: 0

Software: GSI RBCA Spreadsheet

Version: v 1.0

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RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: San Juan 28-7 Lease Well #43 Job Identification: sanjuan.xls
 Site Location: San Juan Basin, New Mexico Date Completed: 8/16/96
 Completed By: Steve H. Danborn

Software: GSI RBCA Spreadsheet
 Version: v 1.0

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

DEFAULT PARAMETERS

Exposure Parameter	Definition (Units)	Adult	Residential (1-6yrs)	Commercial/Industrial (1-16 yrs)	Chronic	Construction
ATc	Averaging time for carcinogens (yr)	70	6	16	25	1
ATn	Averaging time for non-carcinogens (yr)	30	15	35	70	1
BW	Body Weight (kg)	70	6	16	25	1
ED	Exposure Duration (yr)	30	6	16	25	180
EF	Exposure Frequency (days/yr)	350			250	
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (l/day)	2	200		1	100
IRs	Ingestion Rate of Soil (mg/day)	100			50	
IRad	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m ³ /day)	15			20	
IRa.out	Inhalation rate outdoor (m ³ /day)	20			20	
SA	Skin surface area (dermal) (cm ²)	5.8E+03			5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² -yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1			FALSE	
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)	TRUE			FALSE	
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE			FALSE	

Matrix of Exposed Persons to Complete Exposure Pathways

Pathway	Residential	Commercial/Industrial
Groundwater Ingestion	TRUE	FALSE
Volatilization to Outdoor Air	FALSE	FALSE
Vapor Intrusion to Buildings	FALSE	FALSE
Soil Pathways		
Volatiles from Subsurface Soils	FALSE	FALSE
Volatiles and Particulate Inhalation	TRUE	TRUE
Direct Ingestion and Dermal Contact	FALSE	TRUE
Leaching to Groundwater from all Soils	FALSE	FALSE
Intrusion to Buildings - Subsurface Soils	FALSE	FALSE

Matrix of Receptor Distance and Location on- or off-site

Receptor	Distance	On-Site	Commercial/Industrial
GW	6.1E+03	FALSE	FALSE
S	6.1E+03	TRUE	FALSE

Matrix of Target Risks

Target Risk	Individual	Cumulative
TRab	1.0E-05	1.0E-05
TRc	1.0E-05	1.0E-05
THQ	1.0E+00	1.0E+00
Opt	2	2
Tier	RBCA Tier	

Surface Parameters	Definition (Units)	Residential	Commercial/Industrial
t	Exposure duration (yr)	30	25
A	Contaminated soil area (cm ²)	9.3E+05	9.3E+05
W	Length of affected soil parallel to wind (cm)	9.1E+02	9.1E+02
W.gw	Length of affected soil parallel to groundwater (cm)	9.1E+02	9.1E+02
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	2.3E+02
delta	Air mixing zone height (cm)	2.0E+02	2.0E+02
Lss	Definition of surficial soils (cm)	1.0E+02	1.0E+02
Pe	Particulate areal emission rate (g/cm ² /s)	2.2E-10	2.2E-10
Groundwater	Definition (Units)	Value	
delta.gw	Groundwater mixing zone depth (cm)	2.7E+02	
i	Groundwater infiltration rate (cm/yr)	2.4E+00	
Ugw	Groundwater Darcy velocity (cm/yr)	4.6E+01	
Ugw.tr	Groundwater Transport velocity (cm/yr)	1.2E+02	
Ks	Saturated Hydraulic Conductivity (cm/s)		
grad	Groundwater Gradient (cm/cm)		
Sw	Width of groundwater source zone (cm)	3.0E+03	
Sd	Depth of groundwater source zone (cm)	2.7E+02	
BC	Biodegradation Capacity (mg/L)	FALSE	
BIO?	Is Biodegradation Considered	FALSE	
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01	
foc.sat	Fraction organic carbon in water-bearing unit	2.0E-03	
Soil	Definition (Units)	Value	
hc	Capillary zone thickness (cm)	5.0E+00	
hv	Vadose zone thickness (cm)	2.1E+03	
rho	Soil density (g/cm ³)	1.7	
foc	Fraction of organic carbon in vadose zone	0.002	
phi	Soil porosity in vadose zone	0.38	
Lgw	Depth to groundwater (cm)	2.1E+03	
Ls	Depth to top of affected soil (cm)	1.0E+02	
Leubs	Thickness of affected subsurface soils (cm)	2.0E+02	
pH	Soil/groundwater pH	6.5	
phi.w	Volumetric water content	capillary	vadose
phi.a	Volumetric air content	0.342	0.12
		0.038	0.26
Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s ⁻¹)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	
Dispersive Transport	Definition (Units)	Residential	Commercial
ax	Longitudinal dispersion coefficient (cm)	6.1E+02	
ay	Transverse dispersion coefficient (cm)	2.0E+02	
az	Vertical dispersion coefficient (cm)	3.0E+01	
Vapor	Transverse dispersion coefficient (cm)		
doy	Vertical dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Leasa Well #47

Site Location: San Juan Basin, New Mexico Completed By: Steve H. Danborn

Date Completed: 8/16/1996

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TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

SOIL LEACHING TO GROUNDWATER/
INGESTION

☒ CHECKED IF PATHWAY IS ACTIVE

Constituents of Concern	Exposure Concentration		2) NAF Value (L/kg) Receptor	Groundwater Concentration (mg/L) (1)/(2)	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day)
	1) Source Medium	Soil Concentration (mg/kg)				
Benzene		1.4E+0				
Ethylbenzene		1.3E-1				
Toluene		9.7E+0				
Xylene (mixed isomers)		1.6E+0				

NOTE: AT = Averaging time (days)

BW = Body Weight (kg)
CF = Units conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
IR = Intake rate (L/day)

POE = Point of exposure

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Serial: G-271-DHX-538

Software: GSI RBGA Spreadsheet
Version: v 1.0

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease Well #47

Site Location: San Juan Basin, New Mexico

Completed By: Steve H. Danbom

Date Completed: 8/16/1996

6 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

GROUNDWATER: INGESTION

Exposure Concentration

■ (CHECKED IF PATHWAY IS ACTIVE)

MAX. PATHWAY INTAKE (mg/kg-day)
(Maximum intake of active pathways
not including & groundwater routes.)

Constituents of Concern	1) Source Medium Groundwater Concentration (mg/L)	2) NAE Value (dlm) Receptor Off-Site Residential	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2) Off-Site Residential	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (L/kg-day) Off-Site Residential	5) Average Daily Intake Rate (mg/kg-day) Off-Site Residential	MAX. PATHWAY INTAKE (mg/kg-day) (Maximum intake of active pathways not including & groundwater routes.) Off-Site Residential
Benzene	1.4E-1	8.4E+0	1.7E-2	1.2E-2	2.0E-4	2.0E-4
Ethylbenzene	1.3E-2	8.4E+0	1.5E-3	2.7E-2	4.2E-5	4.2E-5
Toluene	9.7E-1	8.4E+0	1.2E-1	2.7E-2	3.2E-3	3.2E-3
Xylene (mixed isomers)	1.6E-1	8.4E+0	1.9E-2	2.7E-2	5.2E-4	5.2E-4

NOTE: AT = Averaging time (days)

BW = Body Weight (kg)
CF = Units conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
IR = Intake rate (L/day or mg/day)

POE = Point of exposure

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Serial: G-271-DHX-538

Software: GSI RBGA Spreadsheet
Version: v 1.0

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.2

Site Name: San Juan 28-7 Lease Well #47

Site Location: San Juan Basin, New Mex Completed By: Steve H. Danborn

Date Completed: 8/16/1996

3 OF 3

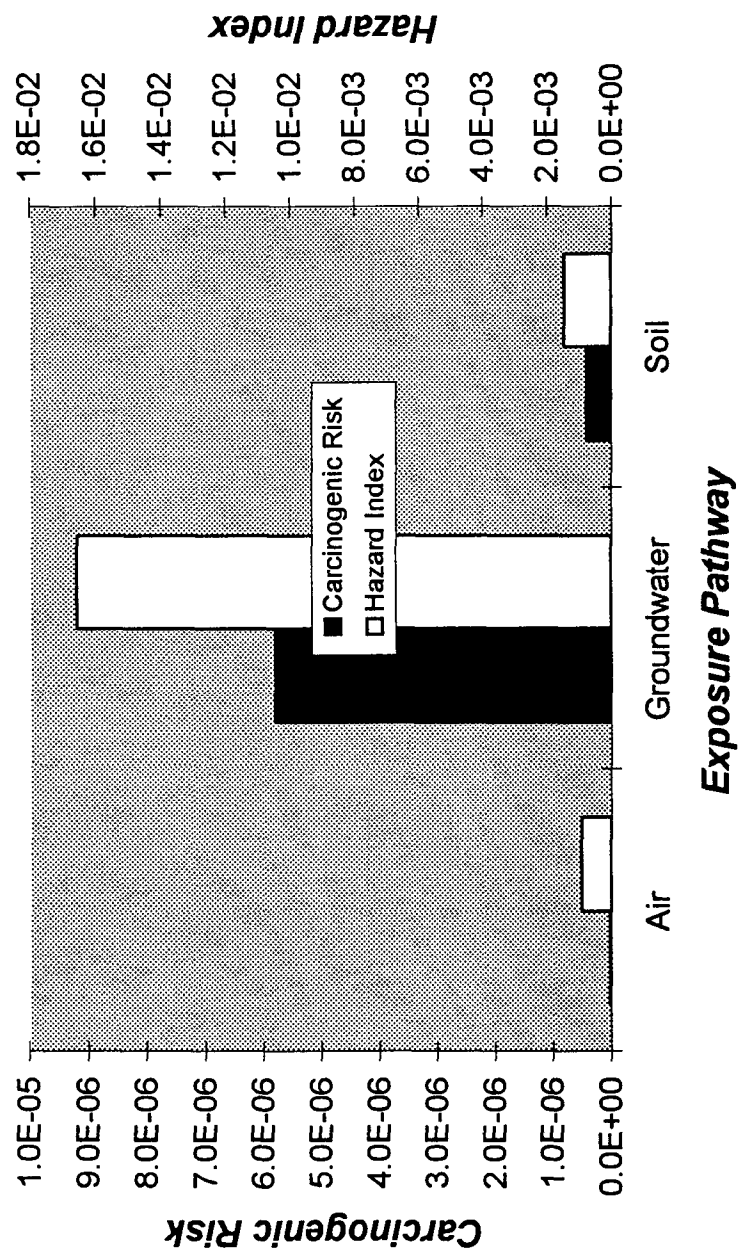
TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

■ [CHECKED IF PATHWAYS ARE ACTIVE]

CARCINOGENIC RISK			TOXIC EFFECTS			
(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)	(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual COC Risk (2) x (3)	(5) Total Toxicant Intake Rate (mg/kg/day)	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)
	Off-Site Residential		Off-Site Residential	Off-Site Residential		Off-Site Residential
Constituents of Concern						
Benzene	2.0E-4	2.9E-2	5.8E-6	4.2E-5	1.0E-1	4.2E-4
Ethylbenzene				3.2E-3	2.0E-1	1.6E-2
Toluene				5.2E-4	2.0E+0	2.6E-4
Xylene (mixed isomers)						
Total Pathway Carcinogenic Risk =			0.0E+0	5.8E-6	Total Pathway Hazard Index =	
					0.0E+0	
					1.7E-2	

Total Risk for Each Pathway



RECA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: San Juan 28-7 Lease Well #47
Site Location: San Juan Basin, New Mexico

Completed By: Steve H. Danborn
Date Completed: 8/16/1996

1 OF 1

GROUNDWATER SSTL VALUES

Calculation Option: 2

☐ MCL exposure limit?

☐ PEL exposure limit?

Target Risk (Class A & B) 1.0E-5
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("X" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X	Groundwater Ingestion		Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded?	Required CRF
CAS No.	Name	(mg/L)		Residential: 200 feet	Commercial: (on-site)	Regulatory(MCL): 200 feet	Residential: (on-site)	Commercial: (on-site)	Commercial: (on-site)	(mg/L)	■* If yes	Only if "yes" left
71-43-2	Benzene	1.4E-1		2.5E-1	NA	NA	NA	NA	NA	2.5E-1	☐	<1
100-41-4	Ethylbenzene	1.3E-2		3.1E+1	NA	NA	NA	NA	NA	3.1E+1	☐	<1
108-88-3	Toluene	9.7E-1		6.1E+1	NA	NA	NA	NA	NA	6.1E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	1.6E-1		>Sol	NA	NA	NA	NA	NA	>Sol	☐	<1

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: San Juan 28-7 Lease Well #42 Job Identification: sanjuan.xls
 Site Location: San Juan Basin, New Mexico Date Completed: 8/16/98
 Completed By: Steve H. Danborn

Software: GSI RBCA Spreadsheet
 Version: v 1.0

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

DEFAULT PARAMETERS

Exposure Parameter	Definition (Units)	Adult	Residential (1-5yrs)	Commercial/Industrial (1-16 yrs)	Chronic	Construction
ATc	Averaging time for carcinogens (yr)	70	6	16	25	1
ATn	Averaging time for non-carcinogens (yr)	30	15	35	70	1
BW	Body Weight (kg)	70	6	16	25	1
ED	Exposure Duration (yr)	30	6	16	25	180
EF	Exposure Frequency (days/yr)	350			250	
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRg	Ingestion Rate of Soil (mg/day)	2			1	
IRs	Ingestion Rate of Soil (mg/kg-d)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m ³ /day)	15			20	
IRa.out	Inhalation rate outdoor (m ³ /day)	20			20	
SA	Skin surface area (dermal) (cm ²)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² -yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1			FALSE	
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)	TRUE			FALSE	
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE			FALSE	

Matrix of Exposed Persons to Complete Exposure Pathways

Groundwater Pathways:	Residential	Commercial/Industrial
GW.i	TRUE	FALSE
GW.v	FALSE	FALSE
GW.b	FALSE	FALSE
Soil Pathways		
S.v	FALSE	FALSE
SS.v	TRUE	TRUE
SS.d	FALSE	TRUE
S.l	FALSE	FALSE
S.b	FALSE	FALSE

Matrix of Receptor Distance and Location on- or off-site

GW	Residential Distance	Commercial/Industrial Distance
S	3.0E+03	3.0E+03

Matrix of Target Risks

Target Risk	Individual	Cumulative
TRab	1.0E-05	1.0E-05
TRc	1.0E-05	1.0E-05
THQ	1.0E+00	1.0E+00
Opt	2	2
Tier	RBCA Tier	

Surface Parameters	Definition (Units)	Residential	Commercial/Industrial
t	Exposure duration (yr)	30	25
A	Contaminated soil area (cm ²)	9.3E+05	9.3E+05
W	Length of affected soil parallel to wind (cm)	9.1E+02	9.1E+02
W.gw	Length of affected soil parallel to groundwater (cm)	9.1E+02	9.1E+02
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	2.3E+02
delta	Air mixing zone height (cm)	2.0E+02	2.0E+02
Lss	Definition of surficial soils (cm)	1.0E+02	1.0E+02
Pe	Particulate areal emission rate (g/cm ² /s)	2.2E-10	2.2E-10
Groundwater Definition (Units)			
delta.gw	Groundwater mixing zone depth (cm)	2.7E+02	2.7E+02
I	Groundwater infiltration rate (cm/yr)	2.4E+00	2.4E+00
Ugw	Groundwater Darcy velocity (cm/yr)	4.6E+01	4.6E+01
Ugw.tr	Groundwater Transport velocity (cm/yr)	1.2E+02	1.2E+02
Ks	Saturated Hydraulic Conductivity (cm/s)		
grad	Groundwater Gradient (cm/cm)		
Sw	Width of groundwater source zone (cm)	3.0E+03	3.0E+03
Sd	Depth of groundwater source zone (cm)	2.7E+02	2.7E+02
BC	Biodegradation Capacity (mg/L)	FALSE	FALSE
Is	Is Bioattenuation Considered	FALSE	FALSE
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	2.0E-03	2.0E-03
Soil Definition (Units)			
hc	Capillary zone thickness (cm)	5.0E+00	5.0E+00
hv	Vadose zone thickness (cm)	2.1E+03	2.1E+03
rho	Soil density (g/cm ³)	1.7	1.7
foc	Fraction of organic carbon in vadose zone	0.002	0.002
phi	Soil porosity in vadose zone	0.38	0.38
Lgw	Depth to groundwater (cm)	2.1E+03	2.1E+03
Ls	Depth to top of affected soil (cm)	1.0E+02	1.0E+02
Lsub	Thickness of affected subsurface soils (cm)	2.0E+02	2.0E+02
pH	Soil/groundwater pH	6.5	6.5
phi.w	Volumetric water content	capillary	vadose
phi.a	Volumetric air content	0.342	0.12
		0.038	0.26
Building Definition (Units)			
Lb	Building volume/area ratio (cm)	Residential	Commercial
ER	Building air exchange rate (s ⁻¹)	2.0E+02	3.0E+02
Lcrk	Foundation crack thickness (cm)	1.4E-04	2.3E-04
eta	Foundation crack fraction	1.5E-01	0.01
Dispersive Transport Parameters			
ax	Longitudinal dispersion coefficient (cm)	Residential	Commercial
ay	Transverse dispersion coefficient (cm)	3.0E+02	1.0E+02
az	Vertical dispersion coefficient (cm)	1.0E+02	1.5E+01
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.2

Site Name: San Juan 28-7 Lease Well #47

Site Location: San Juan Basin, New Mex Completed By: Steve H. Danbom

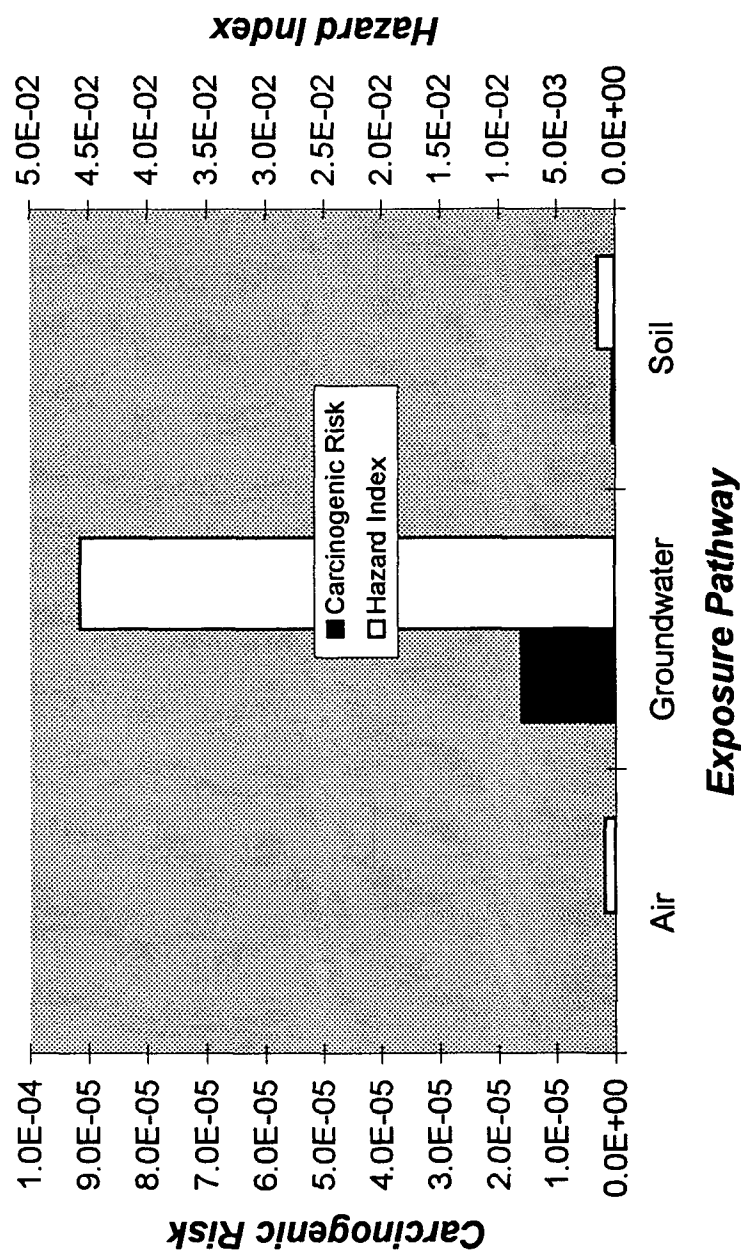
Date Completed: 8/16/1996

3 OF 3

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS		■ CHECKED IF PATHWAYS ARE ACTIVE				TOXIC EFFECTS		
		CARCINOGENIC RISK						
(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)	(3) Oral Slope Factor (mg/kg-day) ⁻¹	(4) Individual Risk (2) x (3)	(5) Total Toxicant Intake Rate (mg/kg/day)	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)		
Constituents of Concern	Off-Site Residential		Off-Site Residential	Off-Site Residential		Off-Site Residential		
Benzene	5.5E-4	2.9E-2	1.6E-5	1.2E-4	1.0E-1	1.2E-3		
Ethylbenzene				8.8E-3	2.0E-1	4.4E-2		
Toluene				1.4E-3	2.0E+0	7.2E-4		
Xylene (mixed isomers)								
		Total Pathway Carcinogenic Risk =		0.0E+0	1.6E-5	Total Pathway Hazard Index =		0.0E+0 4.6E-2

Total Risk for Each Pathway



RBGA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: San Juan 28-7 Lease Well #47
 Site Location: San Juan Basin, New Mexico
 Completed By: Steve H. Danbom
 Date Completed: 8/16/1996

1 OF 1

GROUNDWATER SSTL VALUES

Calculation Option: 2

☐ MCL exposure limit?
☐ PEL exposure limit?

Target Risk (Class A & B) 1.0E-5
 Target Risk (Class C) 1.0E-5
 Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CAS No.	Name	Representative Concentration (mg/L)	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL (mg/L)	SSTL Exceeded?	Required CRF
			Residential: 100 feet	Commercial: (on-site)	Regulatory(MCL): 100 feet	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)			
71-43-2	Benzene	1.4E-1	8.9E-2	NA	NA	NA	NA	NA	NA	8.9E-2	■	Only if "yes" left 2.0E+00
100-41-4	Ethylbenzene	1.3E-2	1.1E+1	NA	NA	NA	NA	NA	NA	1.1E+1	□	<1
108-88-3	Toluene	9.7E-1	2.2E+1	NA	NA	NA	NA	NA	NA	2.2E+1	□	<1
1330-20-7	Xylene (mixed isomers)	1.6E-1	>Sol	NA	NA	NA	NA	NA	NA	>Sol	□	<1

RBGA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease Well #47

Site Location: San Juan Basin, New Mexico

Completed By: Steve H. Danborn

Date Completed: 8/16/1996

5 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

SOIL: LEACHING TO GROUNDWATER/

INGESTION

☒ (CHECKED IF PATHWAY IS ACTIVE)

Exposure Concentration

1) Source Medium	2) NAE Value (L/kg) Receptor	3) Exposure Medium (mg/L) (1)/(2)	4) Exposure Multiplier (IR*EF*ED)/(BW*AT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day)
Soil Concentration (mg/kg)				
Benzene				
Ethylbenzene				
Toluene				
Xylene (mixed isomers)				

NOTE: AT = Averaging time (days)

BW = Body Weight (kg)

CF = Units conversion factor

ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)

IR = Intake rate (L/day)

POE = Point of exposure

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Serial: G-271-DHX-538

Software: GSI RBGA Spreadsheet
Version: v 1.0

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.1

Site Name: San Juan 28-7 Lease Well #47

Site Location: San Juan Basin, New Mexico

Date Completed: 8/16/1996

6 OF 6

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS		CHECKED IF PATHWAY IS ACTIVE		MAX. PATHWAY INTAKE (mg/kg-day)	
GROUNDWATER: INGESTION				(Maximum intake of active pathways soil leaching & groundwater routes.)	
Constituents of Concern	1) Source Medium	2) NAF Value (dim) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (Y12)	4) Exposure Multiplier (IR*EF*ED)(BW*AT) (L/kg-day)	5) Average Daily Intake Rate (mg/kg-day)
	Groundwater Concentration (mg/L)	Off-Site Residential	Off-Site Residential	Off-Site Residential	Off-Site Residential
Benzene	1.4E-1	3.0E+0	4.7E-2	1.2E-2	5.5E-4
Ethylbenzene	1.3E-2	3.0E+0	4.3E-3	2.7E-2	1.2E-4
Toluene	9.7E-1	3.0E+0	3.2E-1	2.7E-2	8.8E-3
Xylene (mixed isomers)	1.8E-1	3.0E+0	5.2E-2	2.7E-2	1.4E-3

NOTE: AT = Averaging time (days)

BW = Body Weight (kg)
CF = Units conversion factor
ED = Exp. duration (yrs)

EF = Exposure frequency (days/yr)
IR = Intake rate (L/day or mg/day)

POE = Point of exposure

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Serial: G-271-DHX-538

Software: GSI RBCA Spreadsheet
Version: v 1.0

Prioritizing Petroleum UST Sites Based on Environmental Liability

Problems to Solve:

Calculate maximum distance of plume migration.

Calculate minimum time of travel to maximum distance.

Assumptions:

Benzene is most mobile and toxic chemical of concern.

Use off-site residential exposure scenario for ground-water ingestion.

Use reasonable maximum exposure parameters.

Use Domenico dissolved ground-water transport model.

Use ASTM standard default parameters except where noted.

Source width (ft)	50							
Source depth (ft)	5							
Pure chemical solubility, S (mg/L)	1750							
Mole fraction in gasoline, Xi (dimensionless)	0.03							
Maximum chemical concentration in water, C = S(Xi) (mg/L)	52.5							
Degradation half life (days) (i.e., avg/min of 7 values in ASTM std.)		409	409	409	730	730	730	none
Organic Carbon Coefficient, Koc (L/kg)	38							
Organic carbon content of soil, f _{oc} (dimensionless)	0.01							
Sorption Coefficient, K _s = Koc x f _{oc}	0.38							
Soil bulk density, d (g/cm ³)	1.7							
Saturated porosity, p (dimensionless)*	0.3							
Retardation Factor, R _c = 1 + (K _s)/p (dimensionless)	3.15							
Hydraulic gradient, i (dimensionless)	0.005							
Hydraulic conductivity, K _s (cm/s)		1.00E-02	1.00E-03	1.00E-04	1.00E-02	1.00E-03	1.00E-04	Indep.
Contaminant velocity, U _d , max = (K _s)(i) / (p)(R _c) x 1034646 (ft/yr)		54.69	5.47	0.55	54.69	5.47	0.55	
Soil Type		Clean Sand	Silty Sand	Clayey Sand	Clean Sand	Silty Sand	Clayey Sand	

* Differs from default value in ASTM std.

Domenico Results:								
Degradation half life (days) (i.e., avg/min of 7 values in ASTM std.)		409	409	409	730	730	730	none
Hydraulic conductivity, K _s (cm/s)		1.00E-02	1.00E-03	1.00E-04	1.00E-02	1.00E-03	1.00E-04	Indep.
Contaminant velocity, U _d , max = (K _s)(i) / (p)(R _c) x 1034646 (ft/yr)		54.69	5.47	0.55	54.69	5.47	0.55	
Soil Type		Clean Sand	Silty Sand	Clayey Sand	Clean Sand	Silty Sand	Clayey Sand	
Chemical Concentration at Distance from Source	Dist. (ft)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)	Conc. (mg/L)
	0	5.25E+01	5.25E+01	4.27E+01	5.25E+01	5.25E+01	5.25E+01	5.25E+01
	25	2.70E+01	3.60E+00	1.10E-04	3.10E+01	8.90E+00	6.40E-03	
	50	1.10E+01	3.40E-01		1.40E+01	1.50E+00	2.30E-05	1.90E+01
	75	5.00E+00	4.50E-02		7.00E+00	3.30E-01		
	100	2.50E+00	8.00E-03		3.80E+00	8.40E-02		6.90E+00
	125	1.30E+00	1.70E-03		2.20E+00	2.50E-02		
	150	7.70E-01			1.40E+00	8.60E-03		
	200	2.90E-01			6.20E-01	1.30E-03		2.00E+00
	300	6.10E-02			1.70E-01			8.90E-01
	400	1.70E-02			6.20E-02			5.00E-01
	500	5.70E-03			2.60E-02			3.20E-01
	600	2.20E-03			1.20E-02			2.20E-01
	700				5.90E-03			
	800				3.10E-03			1.30E-01
	1000							8.10E-02
	2000							2.00E-02
	3000							9.00E-03
	4000							5.10E-03
	5000							3.30E-03

FATE AND TRANSPORT OF FUEL RELEASES

Page 2 of 2

Domenico Results:

Degradation half life (days) (i.e., avg/min of 7 values in ASTM std.)

Hydraulic conductivity, Ks (cm/s)

Contaminant velocity, Ud, max = (Ks)(i) / (p)(Rc) x 1034646 (ft/yr)

Soil Type

Risk at Distance from Source

	409	409	409	730	730	730	none
	1.00E-02	1.00E-03	1.00E-04	1.00E-02	1.00E-03	1.00E-04	Indep.
	54.69	5.47	0.55	54.69	5.47	0.55	
	Clean Sand	Silty Sand	Clayey Sand	Clean Sand	Silty Sand	Clayey Sand	
Dist. (ft)	Cancer Risk	Cancer Risk	Cancer Risk	Cancer Risk	Cancer Risk	Cancer Risk	Cancer Risk
0	1.80E-02	1.80E-02	1.45E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02
25	9.30E-03	1.20E-03	3.90E-08	1.00E-02	3.00E-03	2.20E-06	
50	3.80E-03	1.10E-04		4.80E-03	5.10E-04	7.90E-09	6.50E-03
75	1.70E-03	1.30E-05		2.40E-03	1.10E-04		
100	8.50E-04	2.70E-06		1.30E-03	2.90E-05		2.40E-03
125	4.50E-04	5.80E-07		7.60E-04	8.60E-06		
150	2.60E-04			4.80E-04	2.90E-06		
200	9.90E-05			2.10E-04	4.30E-07		6.60E-04
300	2.10E-05			5.90E-05			3.00E-04
400	5.80E-06			2.10E-05			1.70E-04
500	1.90E-06			8.80E-06			1.10E-04
600	7.40E-07			4.00E-06			7.70E-05
700				2.00E-06			
800				1.10E-06			4.30E-05
1000							2.80E-05
2000							6.90E-06
3000							3.10E-06
4000							1.70E-06
5000							1.10E-06

Contaminant Travel Time:

Hydraulic conductivity, Ks (cm/s)

Contaminant velocity, Ud, max = (Ks)(i) / (p)(Rc) x 1034646 (ft/yr)

Type

Contaminant Travel Time at Distance from Source

	1.00E-02	1.00E-03	1.00E-04				
	54.69	5.47	0.55				
	Clean Sand	Silty Sand	Clayey Sand				
Dist. (ft)	Time (yr)	Time (yr)	Time (yr)				
0	0.0	0.0	0.0				
25	0.5	4.6	45.7				
50	0.9	9.1	91.4				
75	1.4	13.7	137.1				
100	1.8	18.3					
125	2.3	22.9					
150	2.7	27.4					
200	3.7	36.6					
300	5.5	54.9					
400	7.3	73.1					
500	9.1	91.4					
600	11.0	109.7					
700	12.8						
800	14.6						
1000	18.3						
2000	36.6						
3000	54.9						
4000	73.1						
5000	91.4						

FIGURE 1

Benzene Concentration at Distance from Source
Half-Life = 409 days

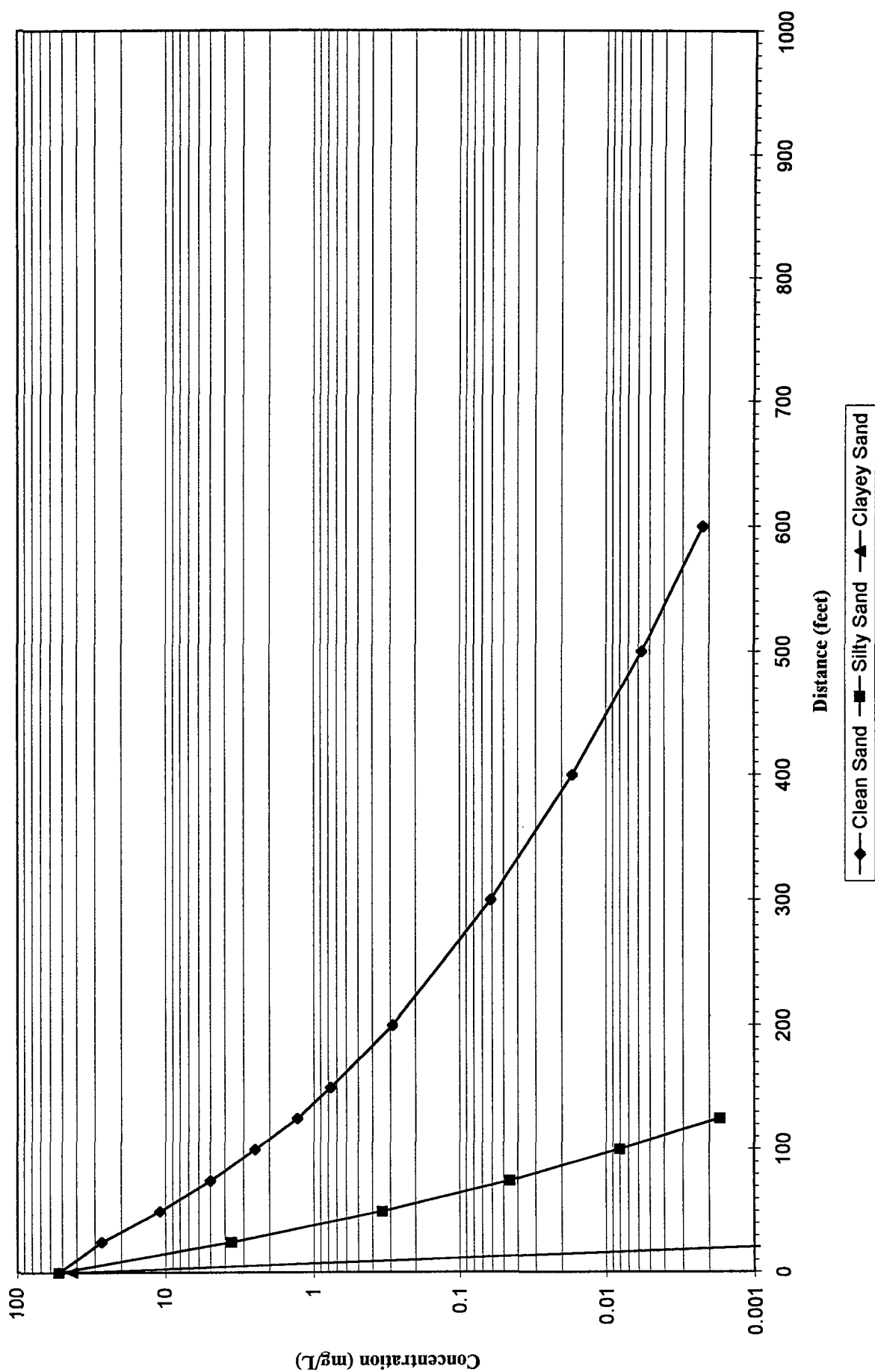


FIGURE 2

Benzene Concentration at Distance from Source
Half-Life = 730 days

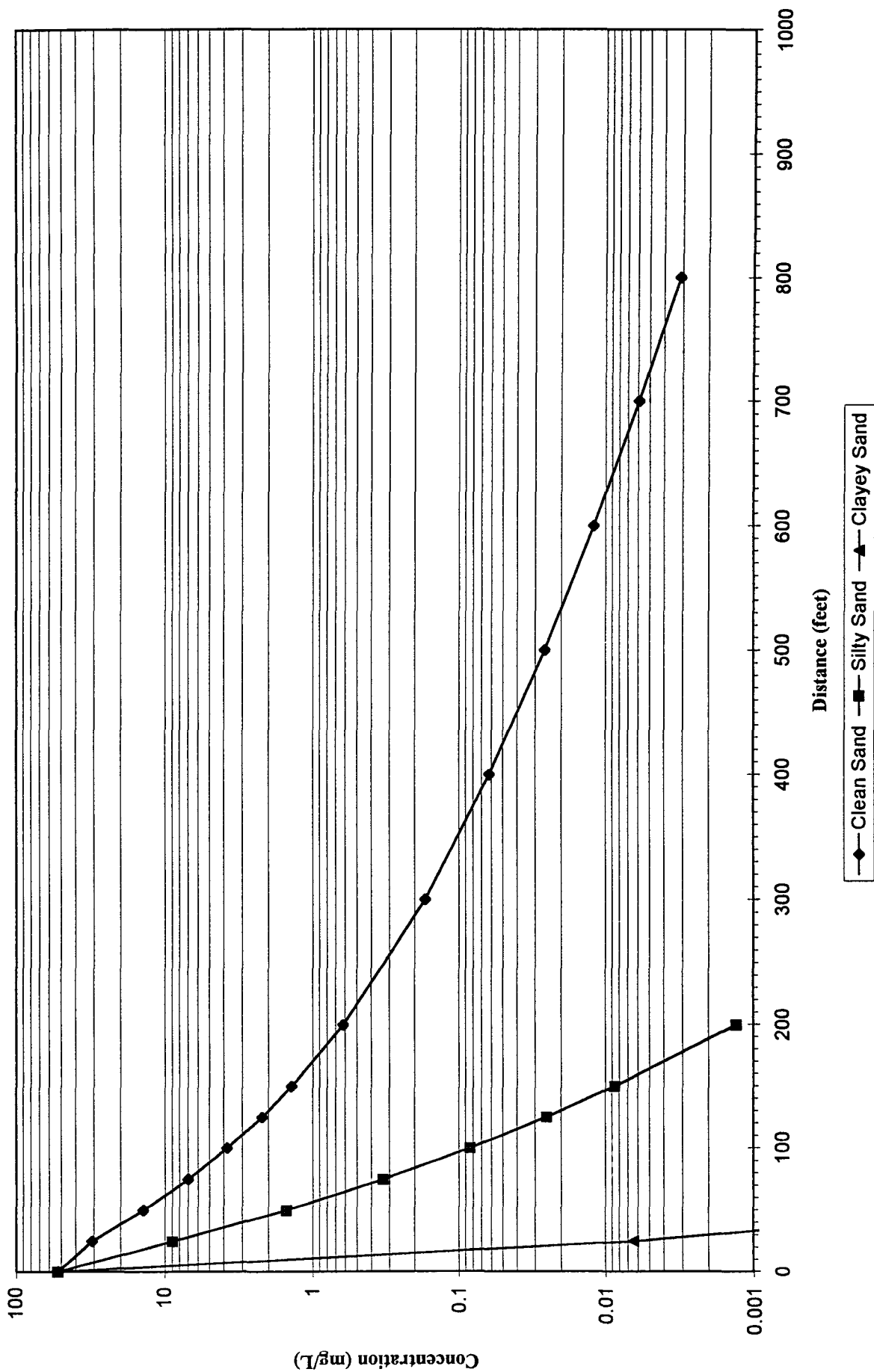


FIGURE 3

Cancer Risk at Distance from Source
Half-Life = 409 days

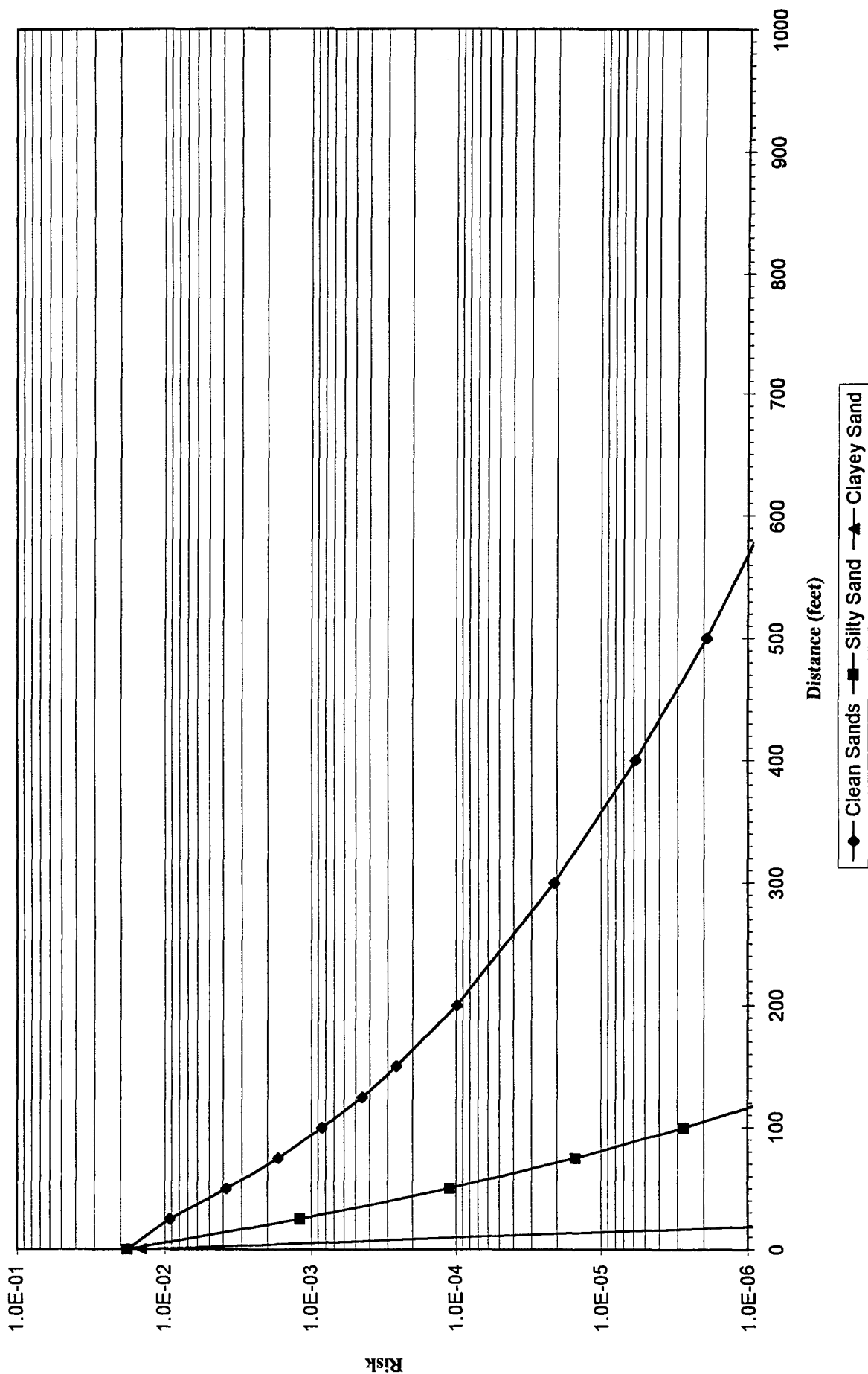


FIGURE 4

Cancer Risk at Distance from Source
Half-Life = 730 days

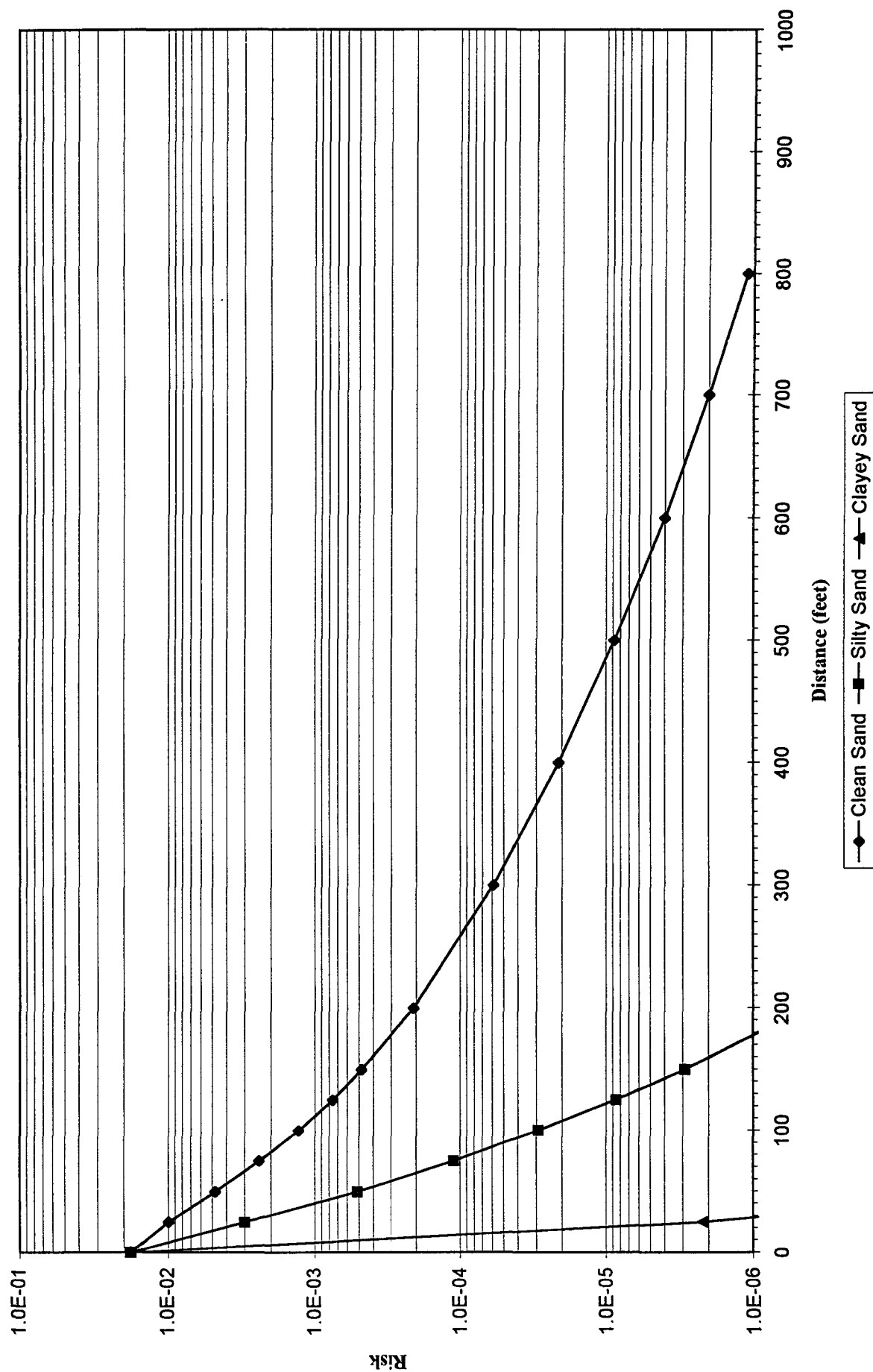
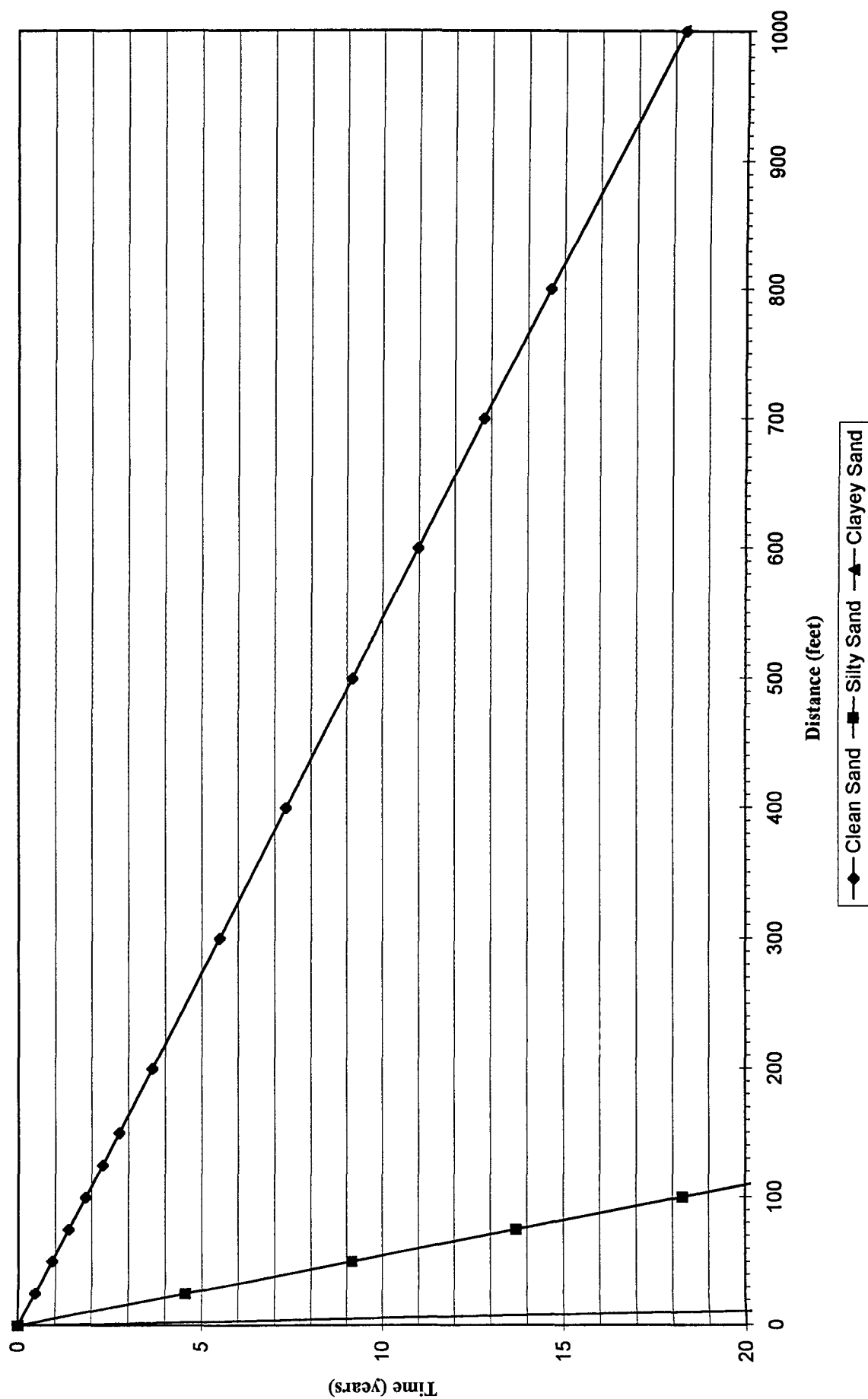


FIGURE 5

Benzene Travel Time at Distance from Source



BIOSCREEN Natural Attenuation Spreadsheet Model

Version 1.0
Prepared by the Environmental Sciences Division, U.S. Environmental Protection Agency

1. HYDROGEOLOGY

Seepage Velocity (ft/yr)
 Hydraulic Conductivity (cm/sec)
 Hydraulic Gradient (ft/ft)
 Porosity (-)

2. DISPERSION

Longitudinal Dispersion* (-)
 Transverse Dispersion* (-)
 Vertical Dispersion* (-)
 Estimated Plume Length (ft)

3. ADSORPTION

Retardation Factor* (-)
 or
 Soil Bulk Density* (g/L)
 Partition Coef*field* (L/kg)
 Fraction Organic Carbon* (-)

4. BIODEGRADATION

1st Order Decay Coeff.* (per yr)
 or Solute Half-Life* (year)

5. GENERAL

Model Area Length (ft)
 Model Area Width (ft)
 Simulation Time* (yr)

6. SOURCE

Source Width (ft)	Avg. Concentration (mg/L)	Source Zone
100	0.001	1
300	0.014	2
200	0.14	3
100	0.14	4
100	0.001	5

Source Thickness (ft)
 Source Half-life (yr)
 Total Mass* (kg)

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)
 Dist. from Source (ft)

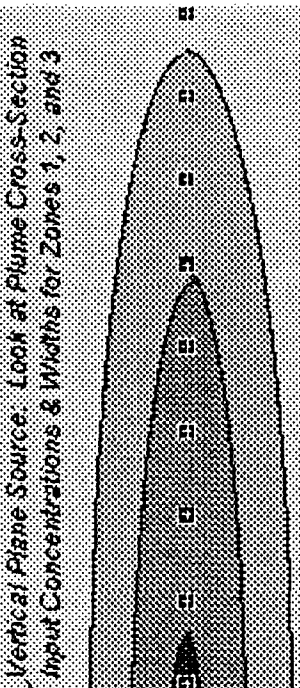
8. CHOOSE TYPE OF OUTPUT TO SEE:

☐ **RUN CENTERLINE** ☐ **View Output**

☐ **RUN ARRAY** ☐ **View Output**

☐ **Help** ☐ **Reset All** ☐ **Print**

☐ **Reset Default Formulas**



Vertical Plane Source. Look at Plume Cross-Section Input Concentrations & Widths for Zones 1, 2, and 3

View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
 If No Data Leave Blank or Enter '0'

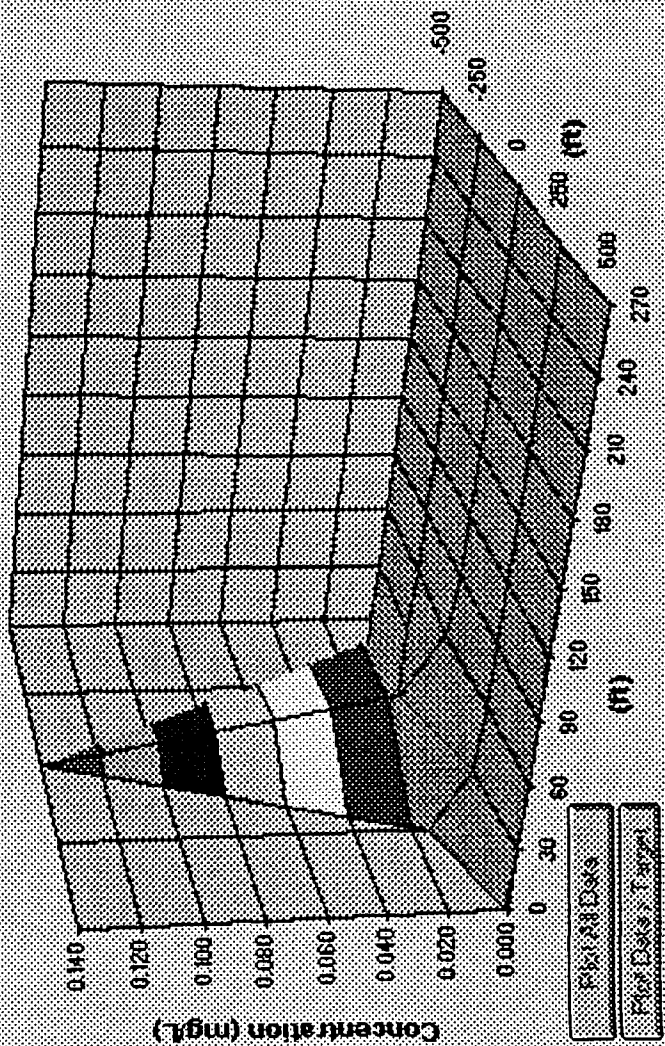
[illegible]

44	Time:	50 Years	Target Level	0.050 mg/L	Displayed Model	1st Order Decay	Instantaneous Reaction Model
45							

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	3.2	(Kg)
Actual Plume Mass	0.3	(Kg)
= Plume Mass Removed by Biodeg	2.9	(Kg)
	91%	

Original Mass in Source	2000.0	(Kg)
Mass in Source Now	1996.8	(Kg)
Time = 50 Years		

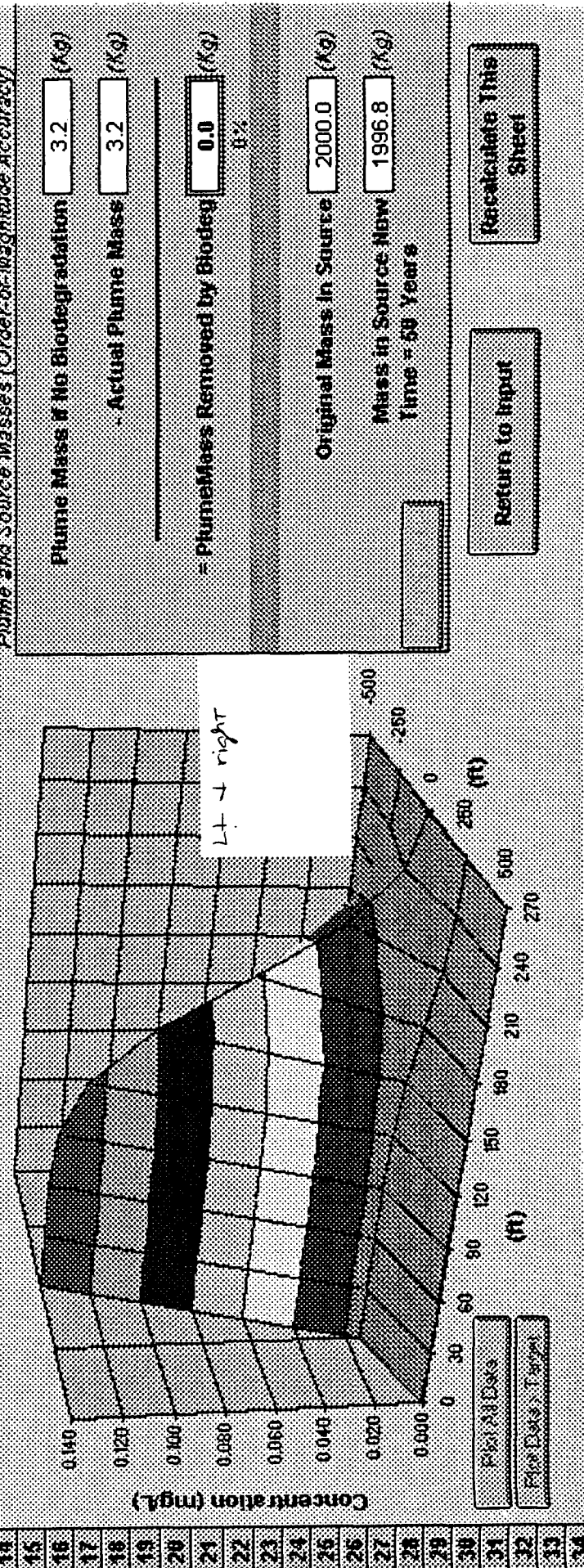


Recalculate This Sheet

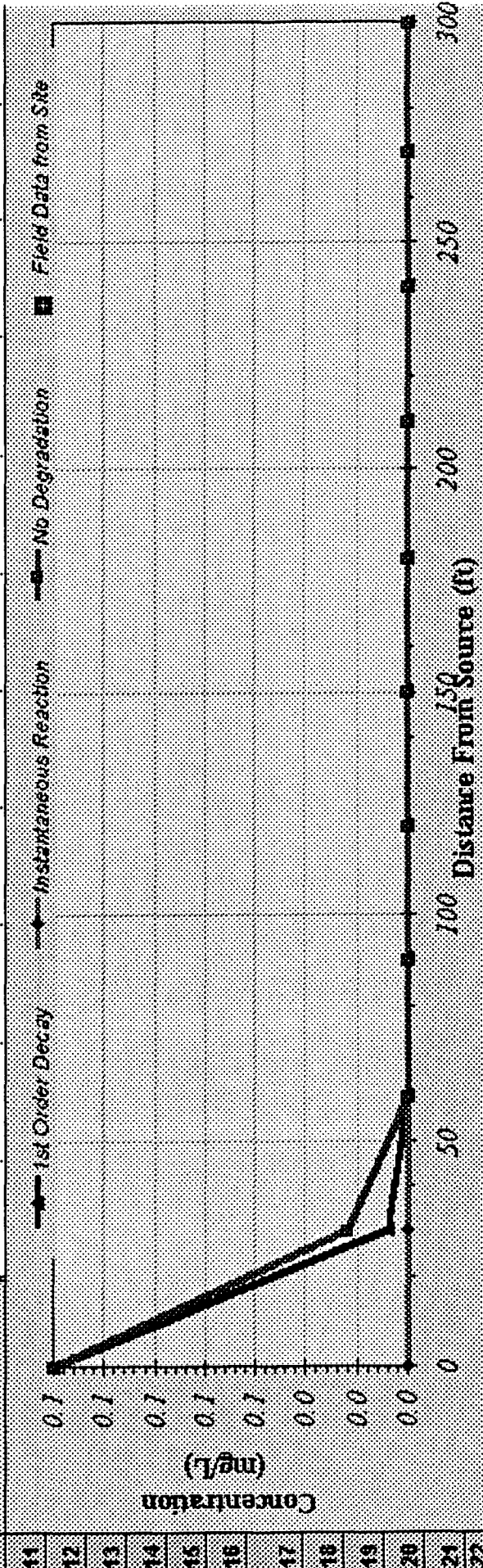
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2	DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at 2-θ)													
3	Transverse													
4	Distance (ft)													
5	1	0	30	60	90	120	150	180	210	240	270	300	Model to Display	
6	500	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No Degradation Model	
7	250	0.014	0.014	0.014	0.014	0.013	0.010	0.006	0.003	0.001	0.000	0.000	1st Order Decay Model	
8	0	0.140	0.140	0.139	0.137	0.127	0.101	0.063	0.028	0.008	0.002	0.000	Instantaneous Reaction Model	
9	-250	0.014	0.014	0.014	0.014	0.013	0.010	0.006	0.003	0.001	0.000	0.000	Displayed Model	
10	-500	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	No Degradation	

Time: 50 Years

Target Level: 0.050 mg/L



A	B	C	D	E	F	G	H	I	J	K	L
DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)											
6	Distance from Source (ft)										
7	0	30	60	90	120	150	180	210	240	270	300
8	0.140	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	0.140	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	Field Data from Site										

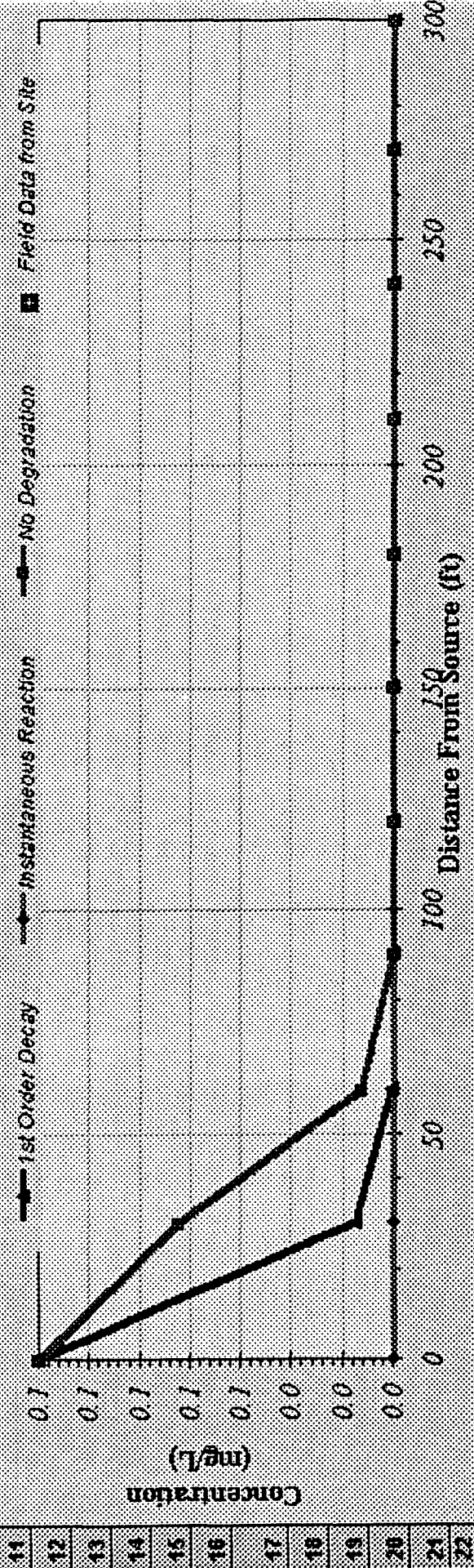


Time: 5 Years

Next Time Step
 Pure Advection

Replay Animation
 Return to Input
 Recalculate This Sheet

	A	B	C	D	E	F	G	H	I	J	K	L
2	DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)											
3												
4												
5												
6	TYPE OF MODEL	0	30	60	90	120	150	180	210	240	270	300
7	No Degradation	0.140	0.084	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	1st Order Decay	0.140	0.015	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Field Data from Site											



Replay Animation

Next Timestep

Prev Timestep

10 Years

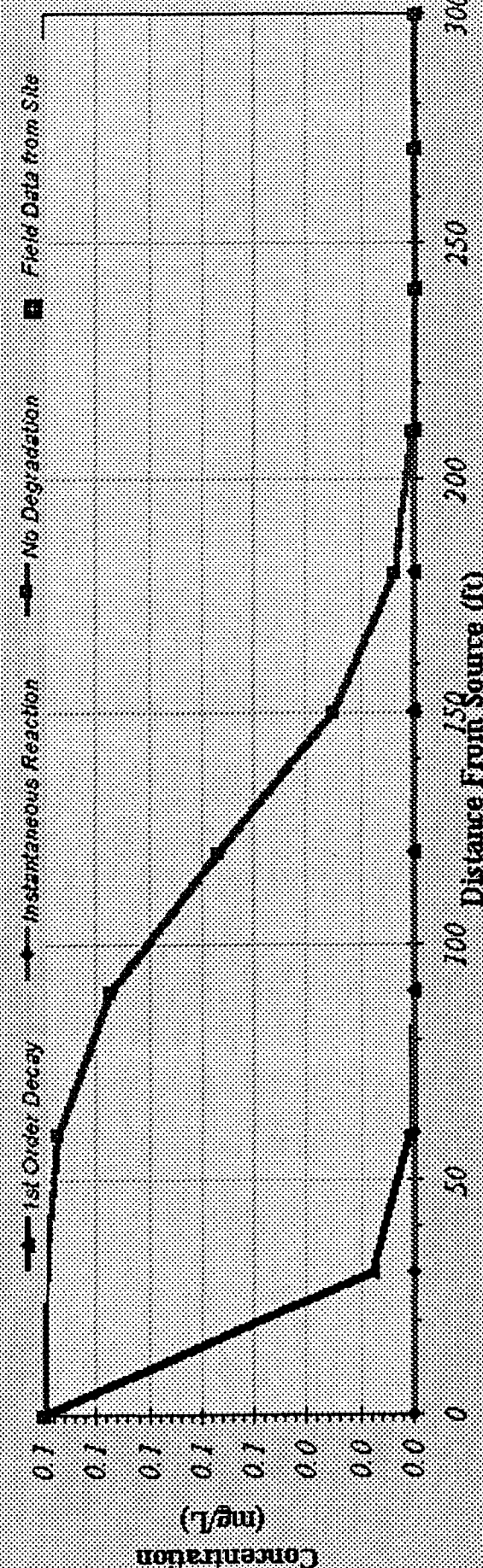
Timer

Return to Input

Recalculate This Sheet

PlumeCenter

	A	B	C	D	E	F	G	H	I	J	K	L
2	DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at 2=0)											
5	Distance from Source (ft)											
6	TYPE OF MODEL	0	30	60	90	120	150	180	210	240	270	300
7	No Degradation	0.140	0.139	0.135	0.115	0.073	0.030	0.007	0.001	0.000	0.000	0.000
8	1st Order Decay	0.140	0.016	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Field Data from Site											



Time:

35 Years

Next TimeStep

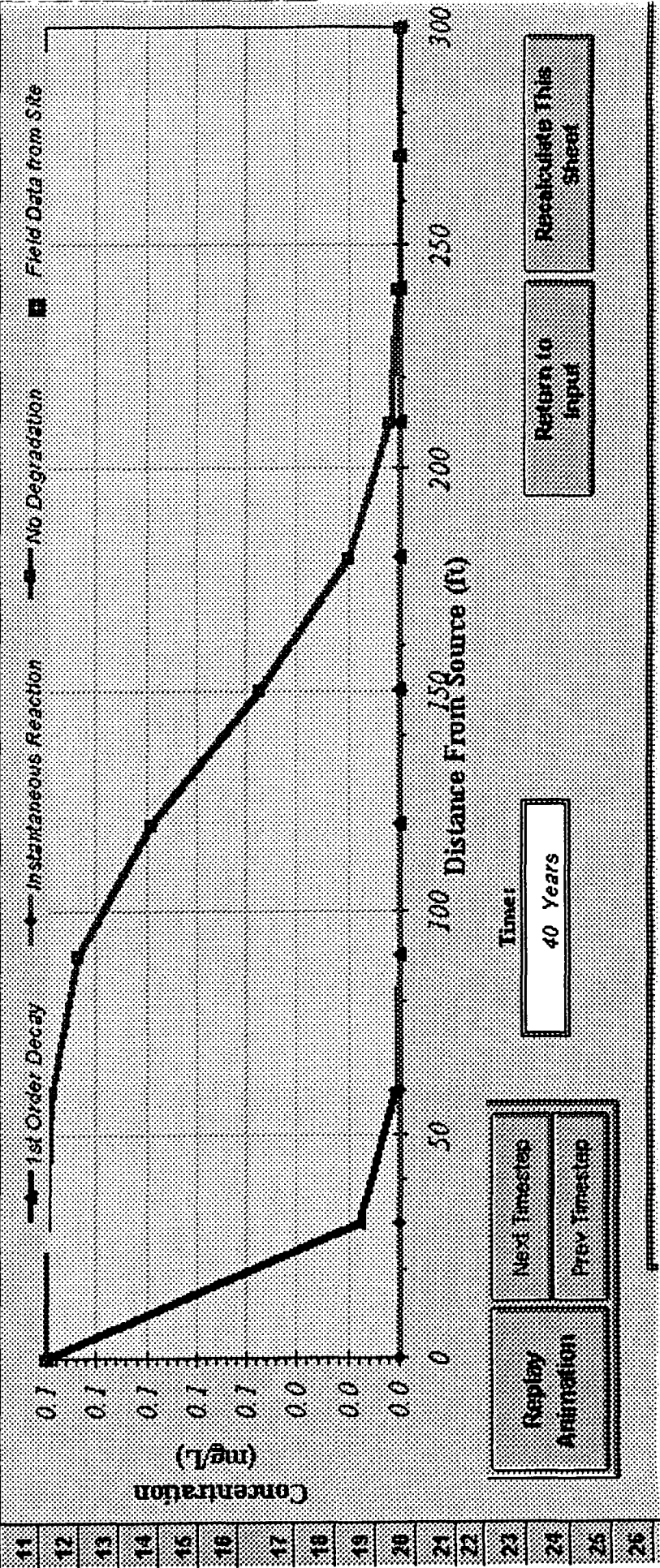
Prev TimeStep

Replay Animation

Return to Input

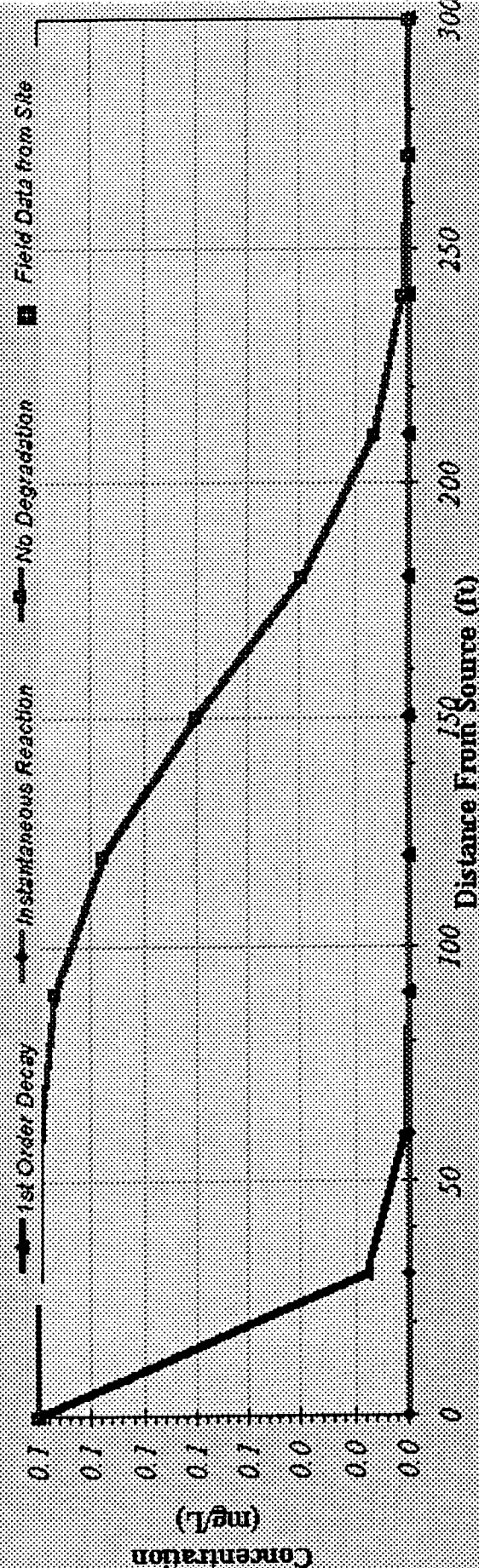
Recalculate This Sheet

	A	B	C	D	E	F	G	H	I	J	K	L
2	DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)											
5	Distance from Source (ft)											
6	TYPE OF MODEL	0	30	60	90	120	150	180	210	240	270	300
7	No Degradation	0.140	0.140	0.138	0.127	0.098	0.055	0.020	0.004	0.001	0.000	0.000
8	1st Order Decay	0.140	0.016	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Field Data from Site											



PlumeCenter

Table 3												
A	B	C	D	E	F	G	H	I	J	K	L	
DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)												
5	Distance from Source (ft)											
6	TYPE OF MODEL	0	30	60	90	120	150	180	210	240	270	300
7	No Degradation	0.140	0.140	0.139	0.134	0.115	0.080	0.039	0.013	0.003	0.000	0.000
8	1st Order Decay	0.140	0.016	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Field Data from Site											



Timer
45 Years

Replay Animation

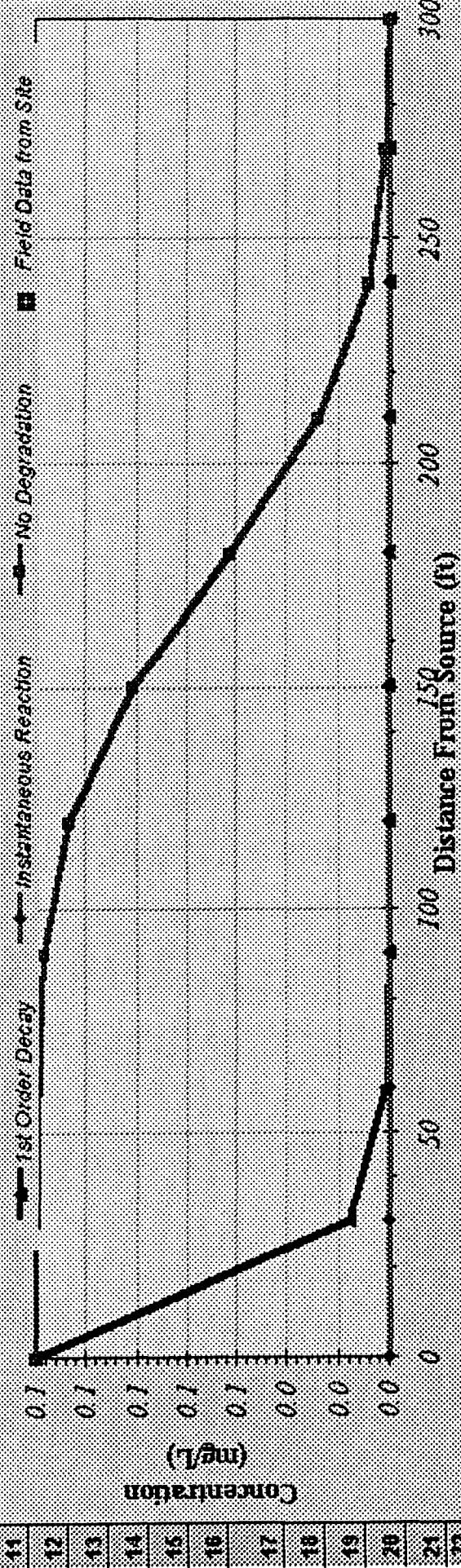
Next Timestep

Prev Timestep

Return to Input

Recalculate This Sheet

	A	B	C	D	E	F	G	H	I	J	K	L
2	DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)											
3												
4												
5												
6	TYPE OF MODEL	0	30	60	90	120	150	180	210	240	270	300
7	No Degr adation	0.140	0.140	0.159	0.137	0.127	0.101	0.063	0.026	0.008	0.002	0.000
8	1st Order Decay	0.140	0.016	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Inet. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	Field Data from Site											



Replay
Animation

Next TimeStep
Prev TimeStep

Timer
50 Years

Return to Input Recalculate This Sheet

On Site Technologies, LTD.

Date: 25-Mar-98

CLIENT: Conoco, Inc.
 Work Order: 9803029
 Project: 2-1359

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS WATER	Batch ID: GC-1_980310	Test Code: SW8020A	Units: µg/L	Analysis Date: 3/10/98	Prep Date:
Client ID: 9803029	Run ID: GC-1_980310A	PQL	SPK value	SeqNo: 112	
Analyte	Result	PQL	SPK value	LowLimit	HighLimit
Benzene	41.09	0.5	40	39	150
Ethylbenzene	41.79	0.5	40	32	160
m,p-Xylene	79.54	1	80	35	145
o-Xylene	40.75	0.5	40	35	145
Toluene	40.67	0.5	40	46	148
				%REC	RPD Ref Val
				102.6%	
				104.5%	
				99.4%	
				101.9%	
				101.4%	
				%RPD	RPDLimit
					Qual

Qualifiers:

ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 25-Mar-98

CLIENT: Conoco, Inc.

Work Order: 9803029

Project: 2-1359

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 QC0529/30		Batch ID: GC-1_980310		Test Code: SW8020A		Units: µg/L		Analysis Date: 3/10/98		Prep Date:	
Client ID:		9803029		Run ID:		GC-1_980310A		SeqNo:		110	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.63	0.5	20	0	108.2%	85	115				
Ethylbenzene	22.22	0.5	20	0	111.1%	85	115				
m,p-Xylene	42.23	1	40	0	105.6%	85	115				
o-Xylene	21.68	0.5	20	0	108.4%	85	115				
Toluene	21.48	0.5	20	0	107.4%	85	115				
1,4-Difluorobenzene	94.35	0	100	0	94.3%	70	130				
4-Bromochlorobenzene	91.54	0	100	0	91.5%	70	130				
Fluorobenzene	93.42	0	100	0	93.4%	70	130				

Sample ID: CCV2 QC0529/30		Batch ID: GC-1_980310		Test Code: SW8020A		Units: µg/L		Analysis Date: 3/10/98		Prep Date:	
Client ID:		9803029		Run ID:		GC-1_980310A		SeqNo:		111	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.55	0.5	20	0	102.8%	85	115				
Ethylbenzene	21.05	0.5	20	0	105.3%	85	115				
m,p-Xylene	39.89	1	40	0	99.7%	85	115				
o-Xylene	20.53	0.5	20	0	102.6%	85	115				
Toluene	20.39	0.5	20	0	102.0%	85	115				
1,4-Difluorobenzene	94.12	0	100	0	94.1%	70	130				
4-Bromochlorobenzene	92.35	0	100	0	92.3%	70	130				
Fluorobenzene	93.48	0	100	0	93.5%	70	130				

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

ON SITE

CHAIN OF CUSTODY RECORD

6899

TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

Date: 3/9/98

Page 1 of 1

Purchase Order No.:		Job No. 2-1359	
Name Larry Trujillo		Title	
Company Conoco		Company Conoco	
Address		Mailing Address	
City, State, Zip		City, State, Zip	
Telephone No.		Telefax No.	
Sampling Location: San Juan 28-7-47		ANALYSIS REQUESTED	
Sampler: Larry Trujillo		Containers	
SAMPLE IDENTIFICATION		LAB ID	
Sample #1 28-7-47		9803029-01A	
DATE TIME		DATE TIME	
3/9/98 1207		3/9/98 1556	
MATRIX		PRES.	
H2O		HCl	
Date/Time 3/9/98 1556		Date/Time 3/9/98 1556	
Date/Time		Date/Time	
Date/Time		Date/Time	
Relinquished by: [Signature]		Received by: [Signature]	
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Method of Shipment:		Rush	
Authorized by:		10 Working Days	
(Client Signature Must Accompany Request)		24-48 Hours	
Distribution: White - On Site Yellow - LAB Pink - Sampler Goldenrod - Client		Special Instructions:	

6989

Page 1 of 1

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LAB: (505) 325-5667 • FAX: (505) 325-6256

Distribution:	White – On Site	Yellow – LAB	Pink – Sampler	Goldenrod – Client
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ON SITE

Page _____ of _____

Date:

TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

[illegible]

OFF: (505) 325-5667



LAB: (505) 325-1556

June 16, 1998

Larry Trujillo
On Site Technologies, Limited Partnership
612 E. Murray Drive
P.O. Box 2606
Farmington, NM 87499
TEL: (505) 325-5667
FAX (505) 327-1496

RE: 2-1359; Conoco

Order No.: 9806033

Dear Larry Trujillo,

On Site Technologies, LTD. received 1 sample on 6/10/98 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
BTEX (SW8020A)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read 'David Cox'.

David Cox

OFF: (505) 325-5667



LAB: (505) 325-1556

On Site Technologies, LTD.

Date: 16-Jun-98

CLIENT: On Site Technologies, Limited Partnership

Project: 2-1359; Conoco

Lab Order: 9806033

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 16-Jun-98

Client:	On Site Technologies, Limited Partnership	Client Sample Info:	San Juan 28-7-47
Work Order:	9806033	Client Sample ID:	#1
Lab ID:	9806033-01A	Matrix:	AQUEOUS
Project:	2-1359; Conoco	Collection Date:	6/9/98 9:21:00 AM
		COC Record:	5135

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
BTEX		SW8020A		Analyst: DC		
Benzene	ND	0.5		µg/L	1	6/14/98
Toluene	ND	0.5		µg/L	1	6/14/98
Ethylbenzene	ND	0.5		µg/L	1	6/14/98
m,p-Xylene	ND	1		µg/L	1	6/14/98
o-Xylene	ND	0.5		µg/L	1	6/14/98

Qualifiers:	PQL - Practical Quantitation Limit	S - Spike Recovery outside accepted recovery limits
	ND - Not Detected at Practical Quantitation Limit	R - RPD outside accepted recovery limits
	J - Analyte detected below Practical Quantitation Limit	E - Value above quantitation range
	B - Analyte detected in the associated Method Blank	Surr: - Surrogate

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

On Site Technologies, LTD.

Date: 16-Jun-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9806033

Project: 2-1359; Conoco

QC SUMMARY REPORT

Method Blank

Sample ID: MB1	Batch ID: GC-1_980614	Test Code: SW8020A	Units: µg/L	Analysis Date: 6/14/98	Prep Date:
Client ID:	9806033	Run ID: GC-1_980614B		SeqNo: 2996	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Benzene	.0426	0.5			J
Ethylbenzene	.0628	0.5			J
m,p-Xylene	.1828	1			J
o-Xylene	.0816	0.5			J
Toluene	.1025	0.5			J

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9806033
Project: 2-1359; Conoco

Date: 16-Jun-98

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 9806014-02AMS		Batch ID: GC-1_980614		Test Code: SW8020A		Units: µg/L		Analysis Date: 6/14/98		Prep Date:	
Client ID:		9806033		Run ID: GC-1_980614B				SeqNo: 2997			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	813	10	800	4.052	101.1%	56	128				
Ethylbenzene	812.9	10	800	4.38	101.1%	78	107				
m,p-Xylene	1577	20	1600	17.67	97.5%	67	118				
o-Xylene	806.4	10	800	2.606	100.5%	78	107				
Toluene	806.6	10	800	3.922	100.3%	74	116				

Sample ID: 9806014-02AMSD		Batch ID: GC-1_980614		Test Code: SW8020A		Units: µg/L		Analysis Date: 6/14/98		Prep Date:	
Client ID:		9806033		Run ID: GC-1_980614B				SeqNo: 2998			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	788.5	10	800	4.052	98.1%	56	128	813	3.1%	12	
Ethylbenzene	811.3	10	800	4.38	100.9%	78	107	812.9	0.2%	11	
m,p-Xylene	1559	20	1600	17.67	96.3%	67	118	1577	1.2%	10	
o-Xylene	791.3	10	800	2.606	98.6%	78	107	806.4	1.9%	14	
Toluene	783.7	10	800	3.922	97.5%	74	116	806.6	2.9%	14	

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 16-Jun-98

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9806033
Project: 2-1359; Conoco

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS	Batch ID: GC-1_980614	Test Code: SW8020A	Units: µg/L	Analysis Date: 6/14/98	Prep Date:
Client ID: 9806033	Run ID: GC-1_980614B	PQL	SPK value	SeqNo: 2995	
Analyte	Result	PQL	SPK value	LowLimit	HighLimit
Benzene	40.87	0.5	40	56	128
Ethylbenzene	40.4	0.5	40	78	107
m,p-Xylene	78.11	1	80	67	118
o-Xylene	40.26	0.5	40	78	107
Toluene	40.14	0.5	40	74	116
		%REC		RPD Limit	RPD Limit
		102.1%			
		100.8%			
		97.4%			
		100.5%			
		100.1%			

Qualifiers:

ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 16-Jun-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9806033

Project: 2-1359; Conoco

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 QC0529/30		Batch ID: GC-1_980614		Test Code: SW8020A		Units: µg/L		Analysis Date: 6/14/98		Prep Date:	
Client ID: 9806033		Run ID: GC-1_980614B		PQL		SPK value		SeqNo: 2992			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.32	0.5	20	0	106.6%	85	115				
Ethylbenzene	21.51	0.5	20	0	107.6%	85	115				
m,p-Xylene	41.34	1	40	0	103.3%	85	115				
o-Xylene	21.34	0.5	20	0	106.7%	85	115				
Toluene	21.1	0.5	20	0	105.5%	85	115				
1,4-Difluorobenzene	92.58	0	100	0	92.6%	70	130				
4-Bromochlorobenzene	80.52	0	100	0	80.5%	70	130				
Fluorobenzene	93.34	0	100	0	93.3%	70	130				

Sample ID: CCV2 QC0529/30		Batch ID: GC-1_980614		Test Code: SW8020A		Units: µg/L		Analysis Date: 6/14/98		Prep Date:	
Client ID: 9806033		Run ID: GC-1_980614B		PQL		SPK value		SeqNo: 2993			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.83	0.5	20	0	104.1%	85	115				
Ethylbenzene	22.1	0.5	20	0	110.5%	85	115				
m,p-Xylene	43.85	1	40	0	109.6%	85	115				
o-Xylene	21.84	0.5	20	0	109.2%	85	115				
Toluene	21.56	0.5	20	0	107.8%	85	115				
1,4-Difluorobenzene	92.73	0	100	0	92.7%	70	130				
4-Bromochlorobenzene	79.29	0	100	0	79.3%	70	130				
Fluorobenzene	92.28	0	100	0	92.3%	70	130				

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

CLIENT: On Site Technologies, Limited Partnership
 Work Order: 9806033
 Project: 2-1359; Conoco

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV3 QC0529/30		Batch ID: GC-1_980614		Test Code: SW8020A		Units: µg/L		Analysis Date: 6/14/98				Prep Date:	
Client ID: 9806033		Run ID: GC-1_980614B		PQL		SPK value		SPK Ref Val		%REC		SeqNo: 2994	
Analyte	Result			PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	42.1			0.5	40	0	105.3%	85	115				
Ethylbenzene	42.85			0.5	40	0	107.1%	85	115				
m,p-Xylene	81.5			1	80	0	101.9%	85	115				
o-Xylene	41.48			0.5	40	0	103.7%	85	115				
Toluene	41.48			0.5	40	0	103.7%	85	115				
1,4-Difluorobenzene	92.78			0	100	0	92.8%	70	130				
4-Bromochlorobenzene	80.77			0	100	0	80.8%	70	130				
Fluorobenzene	92.47			0	100	0	92.5%	70	130				

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 16-Jun-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9806033

Project: 2-1359; Conoco

Test No: SW8020A

QC SUMMARY REPORT SURROGATE RECOVERIES

BTEX

Sample ID	14FBZ	4BCBZ	FLBZ
9806014-01A	92.3	79.7	93.4
9806014-02AMS	92.4	75.1	92.7
9806014-02AMSD	92.8	80.4	92.5
9806019-01A	93.8	78.8	93.3
9806019-02A	93	77.9	93.3
9806030-02A	93.6	79.3	93
9806030-03A	93.8	85.6	93.1
9806031-01A	90.9	85.3	91.5
9806031-02A	90.1	85.3	90.6
9806032-01A	93.1	86.7	93.6
9806033-01A	93.4	84.7	93.2
9806034-01A	90.7	83.9	91.5
CCV1 QC0529/30	92.6	80.5	93.3
CCV2 QC0529/30	92.7	79.3	92.3
CCV3 QC0529/30	92.8	80.8	92.5
LCS	92.4	79.8	92.9
MB1	93	80.9	93.4

Acronym	Surrogate	QC Limits
14FBZ	= 1,4-Difluorobenzene	70-130
4BCBZ	= 4-Bromochlorobenzene	70-130
FLBZ	= Fluorobenzene	70-130

* Surrogate recovery outside acceptance limits

TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

[illegible]

Distribution:	White – On Site	Yellow – LAB	Pink – Sampler	Goldenrod – Client
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TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

[illegible]

Distribution:	White – On Site	Yellow – LAB	Pink – Sampler	Goldenrod – Client
---------------	-----------------	--------------	----------------	--------------------

[illegible]

OFF: (505) 325-5667



LAB: (505) 325-1556

September 25, 1998

Larry Trujillo
On Site Technologies, Limited Partnership
612 E. Murray Drive
P.O. Box 2606
Farmington, NM 87499
TEL: (505) 325-5667
FAX (505) 327-1496

RE: 2-1359; Conoco

Order No.: 9809029

Dear Larry Trujillo,

On Site Technologies, LTD. received 1 sample on 9/14/98 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
BTEX (SW8020A)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in cursive script, appearing to read 'David Cox'.

David Cox

OFF: (505) 325-5667



LAB: (505) 325-1556

On Site Technologies, LTD.

Date: 25-Sep-98

CLIENT: On Site Technologies, Limited Partnership

Project: 2-1359; Conoco

Lab Order: 9809029

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 25-Sep-98

Client:	On Site Technologies, Limited Partnership	Client Sample Info:	San Juan 28-7-47
Work Order:	9809029	Client Sample ID:	Sample #1
Lab ID:	9809029-01A	Matrix:	AQUEOUS
Project:	2-1359; Conoco	Collection Date:	9/14/98 9:44:00 AM
		COC Record:	5552

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
BTEX	SW8020A					Analyst: DC
Benzene	30	1		µg/L	1	9/21/98
Toluene	19	1		µg/L	1	9/21/98
Ethylbenzene	6.1	1		µg/L	1	9/21/98
m,p-Xylene	3.1	2		µg/L	1	9/21/98
o-Xylene	6.4	1		µg/L	1	9/21/98

Qualifiers:	PQL - Practical Quantitation Limit	S - Spike Recovery outside accepted recovery limits
	ND - Not Detected at Practical Quantitation Limit	R - RPD outside accepted recovery limits
	J - Analyte detected below Practical Quantitation Limit	E - Value above quantitation range
	B - Analyte detected in the associated Method Blank	Surr: - Surrogate

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

On Site Technologies, LTD.

Date: 25-Sep-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9809029

Project: 2-1359; Conoco

QC SUMMARY REPORT

Method Blank

Sample ID: MB1	Batch ID: GC-1_980921	Test Code: SW8020A	Units: µg/L	Analysis Date 9/21/98	Prep Date:
Client ID:	9809029	Run ID: GC-1_980921A		SeqNo: 6730	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
Benzene	.0421	1			J
Ethylbenzene	.0623	1			J
m,p-Xylene	.1705	2			J
o-Xylene	.1247	1			J
Toluene	.1509	1			J

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 25-Sep-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9809029

Project: 2-1359; Conoco

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 9809031-02AMS		Batch ID: GC-1_980921	Test Code: SW8020A	Units: µg/L	Analysis Date 9/21/98		Prep Date:				
Client ID:		9809029	Run ID: GC-1_980921A		SeqNo: 6731						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	191.1	5	200	0.4255	95.3%	56	128				
Ethylbenzene	211.5	5	200	0.4985	105.5%	78	107				
m,p-Xylene	414.5	10	400	2.556	103.0%	67	118				
o-Xylene	201.8	5	200	0.3315	100.8%	78	107				
Toluene	204.9	5	200	1.194	101.8%	74	116				

Sample ID: 9809031-02AMSD		Batch ID: GC-1_980921	Test Code: SW8020A	Units: µg/L	Analysis Date 9/21/98		Prep Date:				
Client ID:		9809029	Run ID: GC-1_980921A		SeqNo: 6732						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	184.1	5	200	0.4255	91.8%	56	128	191.1	3.7%	12	
Ethylbenzene	206.4	5	200	0.4985	103.0%	78	107	211.5	2.4%	11	
m,p-Xylene	404.8	10	400	2.556	100.6%	67	118	414.5	2.4%	10	
o-Xylene	196.7	5	200	0.3315	98.2%	78	107	201.8	2.6%	14	
Toluene	199.3	5	200	1.194	99.1%	74	116	204.9	2.7%	14	

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 25-Sep-98

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9809029
Project: 2-1359; Conoco

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS WATER		Batch ID: GC-1_980921	Test Code: SW8020A	Units: µg/L	Analysis Date 9/21/98	Prep Date:					
Client ID:		9809029	Run ID: GC-1_980921A		SeqNo: 6729						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.51	1	40	0.0421	98.7%	56	128				SV 10/9/95/98
Ethylbenzene	43.12	1	40	0.0623	107.6%	78	107				
m,p-Xylene	85.18	2	80	0.1705	106.3%	67	118				
o-Xylene	42.33	1	40	0.1247	105.5%	78	107				
Toluene	41.78	1	40	0.1509	104.1%	74	116				

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 25-Sep-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9809029

Project: 2-1359, Conoco

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 QC0606/07		Batch ID: GC-1_980921	Test Code: SW8020A	Units: µg/L	Analysis Date 9/21/98		Prep Date:
Client ID: 9809029		Run ID: GC-1_980921A	PQL	SPK value	SPK Ref Val	SeqNo: 6726	
Analyte	Result					LowLimit	HighLimit
Benzene	20.22	1	20	0	101.1%	85	115
Ethylbenzene	22.23	1	20	0	111.2%	85	115
m,p-Xylene	43.6	2	40	0	109.0%	85	115
o-Xylene	21.64	1	20	0	108.2%	85	115
Toluene	21.52	1	20	0	107.6%	85	115
1,4-Difluorobenzene	88.91	0	100	0	88.9%	70	130
4-Bromochlorobenzene	79.55	0	100	0	79.5%	70	130
Fluorobenzene	85.36	0	100	0	85.4%	70	130

Sample ID: CCV2 QC0606/07		Batch ID: GC-1_980921	Test Code: SW8020A	Units: µg/L	Analysis Date 9/21/98		Prep Date:
Client ID: 9809029		Run ID: GC-1_980921A	PQL	SPK value	SPK Ref Val	SeqNo: 6727	
Analyte	Result					LowLimit	HighLimit
Benzene	19.84	1	20	0	99.2%	85	115
Ethylbenzene	21.74	1	20	0	108.7%	85	115
m,p-Xylene	42.67	2	40	0	106.7%	85	115
o-Xylene	20.81	1	20	0	104.1%	85	115
Toluene	20.98	1	20	0	104.9%	85	115
1,4-Difluorobenzene	88.7	0	100	0	88.7%	70	130
4-Bromochlorobenzene	69.55	0	100	0	69.6%	70	130
Fluorobenzene	85.39	0	100	0	85.4%	70	130

S

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9809029

Project: 2-1359; Conoco

QC SUMMARY REPORT
Continuing Calibration Verification Standard

Sample ID: CCV3 QC0606/07		Batch ID: GC-1_980921		Test Code: SW8020A		Units: µg/L		Analysis Date 9/21/98		Prep Date:	
Client ID:		9809029		Run ID: GC-1_980921A				SeqNo: 6728			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Limit	%RPD	RPD Limit	Qual
Benzene	37.58	1	40	0	93.9%	85	115				
Ethylbenzene	41.94	1	40	0	104.8%	85	115				
m,p-Xylene	82.28	2	80	0	102.9%	85	115				
o-Xylene	40.08	1	40	0	100.2%	85	115				
Toluene	40.64	1	40	0	101.6%	85	115				
1,4-Difluorobenzene	87.81	0	100	0	87.8%	70	130				
4-Bromochlorobenzene	63.38	0	100	0	63.4%	70	130				S
Fluorobenzene	84.05	0	100	0	84.0%	70	130				

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 25-Sep-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9809029

Project: 2-1359; Conoco

Test No: SW8020A

QC SUMMARY REPORT SURROGATE RECOVERIES

BTEX

Sample ID	14FBZ	4BCBZ	FLBZ
9809027-01A	88.5	71	85
9809027-02A	86	58.3 *	82.6
9809027-03A	87.8	58.5 *	84.3
9809027-05A	87.2	67.7 *	84.1
9809028-01A	79	39.9 *	75.7
9809029-01A	86.3	58 *	83.2
9809030-01A	88.8	64 *	84.6
9809031-01A	86.8	55.5 *	80
9809031-02A	89.3	70.7	85.1
9809031-02AMS	88.3	66.9 *	84.2
9809031-02AMSD	87.7	63.8 *	83.8
9809031-03A	82.7	40.8 *	78
9809033-01A	83.4	44.6 *	79.4
9809034-01A	89.9	71	85.8
9809034-02A	83.8	61.4 *	82.2
9809034-03A	89.3	76	85.4
9809034-04A	89.3	69.8 *	85.3
9809034-05A	87.6	55.7 *	83.1
9809035-01A	78.8	36.9 *	74.3
9809035-02A	87.3	53.2 *	82.7
CCV1 QC0606/07	88.9	79.5	85.4
CCV2 QC0606/07	88.7	69.6 *	85.4
CCV3 QC0606/07	87.8	63.4 *	84
LCS WATER	89.3	81.8	85.5
MB1	88.3	74.6	84.8

Acronym	Surrogate	QC Limits
14FBZ	= 1,4-Difluorobenzene	70-130
4BCBZ	= 4-Bromochlorobenzene	70-130
FLBZ	= Fluorobenzene	70-130

* Surrogate recovery outside acceptance limits

[illegible]

Date:

TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

[illegible]

OFF: (505) 325-5667



LAB: (505) 325-1556

December 15, 1998

Larry Trujillo
On Site Technologies, Limited Partnership
612 E. Murray Drive
P.O. Box 2606
Farmington, NM 87499
TEL: (505) 325-5667
FAX (505) 327-1496

RE: 2-1359; Conoco

Order No.: 9812022

Dear Larry Trujillo,

On Site Technologies, LTD. received 1 sample on 12/10/98 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

BTEX (SW8020A)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in dark ink, appearing to read "David Cox", is written over a horizontal line.

David Cox

OFF: (505) 325-5667



LAB: (505) 325-1556

On Site Technologies, LTD.

Date: 15-Dec-98

CLIENT: On Site Technologies, Limited Partnership

Project: 2-1359; Conoco

Lab Order: 9812022

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 15-Dec-98

Client:	On Site Technologies, Limited Partnership	Client Sample Info:	San Juan 28-7-47
Work Order:	9812022	Client Sample ID:	Sample 1
Lab ID:	9812022-01A	Matrix:	AQUEOUS
Project:	2-1359; Conoco	Collection Date:	12/9/98 12:55:00 PM
		COC Record:	5623

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
BTEX		SW8020A				Analyst: HR
Benzene	17	1		µg/L	1	12/10/98
Toluene	33	1		µg/L	1	12/10/98
Ethylbenzene	2.4	1		µg/L	1	12/10/98
m,p-Xylene	4.9	2		µg/L	1	12/10/98
o-Xylene	6.5	1		µg/L	1	12/10/98

Qualifiers:

PQL - Practical Quantitation Limit

ND - Not Detected at Practical Quantitation Limit

J - Analyte detected below Practical Quantitation Limit

B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Surr: - Surrogate

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

On Site Technologies, LTD.

Date: 15-Dec-98

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9812022
Project: 2-1359; Conoco

QC SUMMARY REPORT
Method Blank

Sample ID: MB1	Batch ID: GC-1_981210	Test Code: SW8020A	Units: µg/L	Analysis Date 12/10/98	Prep Date:						
Client ID:	9812022	Run ID: GC-1_981210A		SeqNo: 9432							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	.0828	1									J
Ethylbenzene	.1496	1									J
m,p-Xylene	.2857	2									J
o-Xylene	.1375	1									J
Toluene	.1456	1									J

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Dec-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9812022

Project: 2-1359; Conoco

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 9812007-01AMS		Batch ID: GC-1_981210	Test Code: SW8020A	Units: µg/L	Analysis Date 12/10/98		Prep Date:				
Client ID:		9812022	Run ID: GC-1_981210A		SeqNo: 9437						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	177.9	5	200	0	89.0%	56	128				
Ethylbenzene	524.3	5	200	343.4	90.4%	78	107				
m,p-Xylene	880	10	400	522.1	89.5%	67	118				
o-Xylene	258.5	5	200	75.14	91.7%	78	107				
Toluene	218.9	5	200	0	109.5%	74	116				

Sample ID: 9812007-01AMSD		Batch ID: GC-1_981210	Test Code: SW8020A	Units: µg/L	Analysis Date 12/10/98		Prep Date:				
Client ID:		9812022	Run ID: GC-1_981210A		SeqNo: 9439						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	177.8	5	200	0	88.9%	56	128	177.9	0.1%	12	
Ethylbenzene	523.6	5	200	343.4	90.1%	78	107	524.3	0.1%	11	
m,p-Xylene	880.5	10	400	522.1	89.6%	67	118	880	0.1%	10	
o-Xylene	255.6	5	200	75.14	90.2%	78	107	258.5	1.1%	14	
Toluene	219.3	5	200	0	109.7%	74	116	218.9	0.2%	14	

Sample ID: 9812021-02AMS		Batch ID: GC-1_981210	Test Code: SW8020A	Units: µg/L	Analysis Date 12/10/98		Prep Date:				
Client ID:		9812022	Run ID: GC-1_981210A		SeqNo: 9438						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	1963	50	2000	110.6	92.6%	56	128				
Ethylbenzene	2410	50	2000	573.1	91.8%	78	107				
m,p-Xylene	7339	100	4000	3782	88.9%	67	118				
o-Xylene	2537	50	2000	675.1	93.1%	78	107				
Toluene	2267	50	2000	374.8	94.6%	74	116				

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9812022
Project: 2-1359; Conoco

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID: 9812021-02AMSD		Batch ID: GC-1_981210		Test Code: SW8020A		Units: µg/L		Analysis Date 12/10/98		Prep Date:	
Client ID:		9812022		Run ID: GC-1_981210A				SeqNo: 9440			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	1984	50	2000	110.6	93.7%	56	128	1963	1.1%	12	
Ethylbenzene	2434	50	2000	573.1	93.1%	78	107	2410	1.0%	11	
m,p-Xylene	7417	100	4000	3782	90.9%	67	118	7339	1.1%	10	
o-Xylene	2574	50	2000	675.1	95.0%	78	107	2537	1.5%	14	
Toluene	2292	50	2000	374.8	95.9%	74	116	2267	1.1%	14	

Qualifiers: NID - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Dec-98

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9812022
Project: 2-1359; Conoco

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS WATER		Batch ID: GC-1_981210	Test Code: SW8020A	Units: µg/L	Analysis Date 12/10/98				Prep Date:		
Client ID:		9812022	Run ID: GC-1_981210A		SeqNo: 9436						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	37.64	1	40	0.0828	93.9%	56	128				
Ethylbenzene	37.95	1	40	0.1496	94.5%	78	107				
m,p-Xylene	74.54	2	80	0.2857	92.8%	67	118				
o-Xylene	38.56	1	40	0.1375	96.0%	78	107				
Toluene	37.79	1	40	0.1456	94.1%	74	116				

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

CLIENT: On Site Technologies, Limited Partnership
Work Order: 9812022
Project: 2-1359; Conoco

Date: 15-Dec-98

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 QC0606/07		Batch ID: GC-1_981210		Test Code: SW8020A		Units: µg/L		Analysis Date 12/10/98		Prep Date:	
Client ID:		9812022		Run ID: GC-1_981210A				SeqNo: 9433			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.57	1	20	0	97.9%	85	115				
Ethylbenzene	19.86	1	20	0	99.3%	85	115				
m,p-Xylene	38.68	2	40	0	96.7%	85	115				
o-Xylene	20.19	1	20	0	100.9%	85	115				
Toluene	19.7	1	20	0	98.5%	85	115				
1,4-Difluorobenzene	90.06	0	100	0	90.1%	70	130				
4-Bromochlorobenzene	96.84	0	100	0	96.8%	70	130				
Fluorobenzene	88.7	0	100	0	88.7%	70	130				

Sample ID: CCV2 QC0606/07		Batch ID: GC-1_981210		Test Code: SW8020A		Units: µg/L		Analysis Date 12/10/98		Prep Date:	
Client ID:		9812022		Run ID: GC-1_981210A				SeqNo: 9434			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.58	1	20	0	97.9%	85	115				
Ethylbenzene	19.78	1	20	0	98.9%	85	115				
m,p-Xylene	38.52	2	40	0	96.3%	85	115				
o-Xylene	20.04	1	20	0	100.2%	85	115				
Toluene	19.63	1	20	0	98.2%	85	115				
1,4-Difluorobenzene	90.13	0	100	0	90.1%	70	130				
4-Bromochlorobenzene	95.97	0	100	0	96.0%	70	130				
Fluorobenzene	89.03	0	100	0	89.0%	70	130				

Qualifiers:

ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9812022

Project: 2-1359; Conoco

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV3 QC0606/07		Batch ID: GC-1_981210		Test Code: SW8020A		Units: µg/L		Analysis Date 12/10/98		Prep Date:	
Client ID:		9812022		Run ID: GC-1_981210A				SeqNo: 9435			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.69	1	40	0	96.7%	85	115				
Ethylbenzene	39.06	1	40	0	97.6%	85	115				
m,p-Xylene	76.76	2	80	0	95.9%	85	115				
o-Xylene	39.63	1	40	0	99.1%	85	115				
Toluene	39.05	1	40	0	97.6%	85	115				
1,4-Difluorobenzene	90.34	0	100	0	90.3%	70	130				
4-Bromochlorobenzene	97.62	0	100	0	97.6%	70	130				
Fluorobenzene	89.28	0	100	0	89.3%	70	130				

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

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

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Dec-98

CLIENT: On Site Technologies, Limited Partnership

Work Order: 9812022

Project: 2-1359; Conoco

Test No: SW8020A

QC SUMMARY REPORT SURROGATE RECOVERIES

BTEX

Sample ID	14FBZ	4BCBZ	FLBZ
9812007-01A	87.6	92.4	90.6
9812007-01AMS	83.9	92.9	84.5
9812007-01AMSD	83.9	93.2	84.8
9812008-01A	89.7	96.8	88.6
9812008-02A	90.9	97	90.1
9812008-03A	89.2	95.3	88.2
9812009-01A	88	97	88
9812009-02A	93.9	89.8	87.4
9812020-01A	90.2	97.4	89.2
9812020-02A	90.2	95.7	185 *
9812021-02AMS	89.8	96.7	89.2
9812021-02AMSD	90.2	96.6	89.1
9812021-03A	93.4	98	93.3
9812021-04A	89.2	97.2	88.7
9812021-05A	89.9	96.2	89
9812022-01A	89.4	95.6	88
9812023-01A	89.2	97	88.6
CCV1 QC0606/07	90.1	96.8	88.7
CCV2 QC0606/07	90.1	96	89
CCV3 QC0606/07	90.3	97.6	89.3
LCS WATER	89.7	96.8	88.7
MB1	90.4	95.9	89.1

Acronym	Surrogate	QC Limits
14FBZ	= 1,4-Difluorobenzene	70-130
4BCBZ	= 4-Bromochlorobenzene	70-130
FLBZ	= Fluorobenzene	70-130

* Surrogate recovery outside acceptance limits

ON SITE

CHAIN OF CUSTODY RECORD

5623

TECHNOLOGIES, LTD.

657 W. Maple • P. O. Box 2606 • Farmington NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

Page _____ of _____

Date: 12/10/98

Purchase Order No.:		Job No. <u>2-1357</u>		Name <u>Larry Trujillo</u>		Title	
SEND INVOICE TO		Name <u>Larry Trujillo</u>		Company <u>Conoco</u>		City, State, Zip	
Name		Company		Mailing Address		Telephone No.	
Address		Dept.		City, State, Zip		Telefax No.	
City, State, Zip		Sampling Location: <u>San Juan 28-7-47</u>		ANALYSIS REQUESTED			
Sampler: <u>Larry Trujillo</u>		Number of Containers		LAB ID			
SAMPLE IDENTIFICATION		SAMPLE DATE		MATRIX		PRES.	
Sample 1		12/10/98		H2O		H21	
Relinquished by: <u>Jay S. [Signature]</u>		Date/Time <u>12/10/98</u>		Received by: <u>[Signature]</u>		Date/Time <u>12/10/98</u>	
Relinquished by:		Date/Time		Received by:		Date/Time	
Relinquished by:		Date/Time		Received by:		Date/Time	
Method of Shipment:		Rush		24-48 Hours		10 Working Days	
Authorized by: _____		Date _____		Special Instructions:			
(Client Signature <u>Must</u> Accompany Request)		Date					

Distribution: White - On Site Yellow - LAB Pink - Sampler Goldenrod - Client

[illegible]