TECHNICO
Environmental Services, Inc.
PO Box 7244, Kennewick, Washington 99336-0616 (509) 582-7447 Fax (509) 586-7363

Technico Project No. M12 Contamination

August 15, 1995

AUG 18 1995
WOO
WATER DIVISION

Mr. Robert Cutler
Underground Storage Tank Program (WD-133)
Environmental Protection Agency
1200 6th Avenue
Seattle, WA 98101

Subject: Site Characterization and Independent Cleanup Action Report for the Brand X Tank 'n' Tummy, 401 S. Elm Street, Toppenish, WA

Dear Mr. Cutler:

During the removal of underground storage tanks at the subject site, contamination was noted and notification made to you and Janine Jennings of the Yakama Indian Nation. Status reports have been made by telephone to each of you subsequent to the initial discovery of contamination. Contamination was noted in association with the underground storage tanks and an aboveground dispenser which was formerly used for diesel fuel. Figure 1 is a site map showing the pertinent information on this facility along with sampling locations and the location of groundwater monitoring wells. Concentrations of petroleum hydrocarbons in site soils are provided in Table 1. Concentrations of petroleum hydrocarbons in the groundwater at this site are provided in Table 2.

The excavation around Tanks I and II revealed the fill pipe was a source of contamination at Tank II (see Attachment 3 photos). Photo 1 shows the contamination around the fill pipe near the surface (blue color). The fuel identification tag on the tank, shown at the base of the shovel, reads "Shell Regular." Photo 2 shows the berth of the tank immediately after tank removal. This contamination moved down alongside the fill pipe, stayed very close to the perimeter of the tank, and continued below the tank. Some contamination occurred between the tanks at Location 107 but this soil was removed with all of the other contaminated soils which occurred above the groundwater table. At the end of the work, the hole was clean as evidenced by the samples taken at Locations 105, 106, and 108.

Tanks III and IV had contamination around Fill Pipe 3 with a clean hole obtained on the north and west sides of the hole as evidenced by confirming samples at J100 and 117. However, the south and east sides of the hole were contaminated in the smear zone where groundwater apparently moves up and down seasonally at the site. Soil samples collected in the smear zone along the west side of the hole had elevated soil gas vapor readings similar to those taken at Location 119, indicating the west side of the hole is also contaminated.

Near the former location of the diesel dispenser, along the fence separating the east and west half of this property, the blacktop was removed and the soil excavated down to groundwater at Location 130. This location does contain diesel fuel as indicated in Table 1.

At this point in time, there are gasoline concentrations above MTCA Cleanup Levels to the south and east of the excavated area where Tanks III and IV formerly sat. There is also diesel fuel contamination above MTCA Cleanup Levels near the former diesel dispenser at Location 130. No further excavation was attempted to the south and east of the Tank III and IV excavated area because the hole in this area was more than 20 feet deep and it was only 19 feet to the curb of State Highway 97. Any further excavation could have jeopardized offsite property from the cave-in potential.

clean up?

Groundwater monitoring wells were installed at locations MW1, MW2, and MW3 based upon reported groundwater flows and direction at the Chevron site across Fort Road. Table 3 shows top of casing elevations, static water level, and groundwater elevation measurements taken on April 27, May 2, and July 5, and August 10, 1995. Groundwater has risen about 2 feet since the introduction of irrigation water in early April. Groundwater contours and direction of flow shown on Figure 2 indicate wells MW2 and MW3 are properly placed to detect residual contamination. No diesel was detected in the groundwater..

The only known downgradient user of groundwater in this area is the City of Toppenish which has two wells (wells 6 and 8) indicated by the red star on Figure 3. The wells at this location are screened at a depth of more than 100 feet (see Attachment 1). The wells have been analyzed for BTEX compounds once every 3 years for the last 12 years. Analyses of these wells have indicated no presence of gasoline or BTEX compounds, as shown in Attachment 2.

Conclusion

The sources of the more mobile gasoline and BTEX compounds on this site have been removed to the extent practicable. Groundwater elevations will be taken every other month to track elevation changes and direction of flow. Routine monitoring will be conducted biannually at seasonally high and low water elevations to determine the concentrations of gasoline, BTEX and diesel in the groundwater. Since approximately 300 cubic yards of contaminated soil have been removed from the site, groundwater quality should improve in the future.

semi?

Should you have any questions concerning this report, please don't hesitate to call.

Sincerely,

John A. Zillich

Tables, Figures, and Attachments included with this letter report are:

Table 1 Hydrocarbon concentrations in site soils.
Table 2 Hydrocarbon concentrations in site groundwater.
Table 3 Groundwater elevations for Toppenish wells.

Figure 1 Site Map of Brand X Tank 'n' Tummy.
Figure 2 Groundwater elevations, contours and direction of flow on August 10, 1995.
Figure 3 Topographical map of Toppenish, 7.5 minute series.

Attachment 1 Well logs for Toppenish City Wells SO6 and SO8.
Attachment 2 Analytical results for Toppenish City Wells SO6 and SO8.
Attachment 3 Site photos.

Table 1 - Hydrocarbon co..entrations in site soils.

MTCA Cleanup Levels for each analyte shown in column header in mg/Kg

Bold italic results are above MTCA Method A Cleanup Levels for Soils.

Sample ID	Relative Elevation	Gasoline 100 mg/Kg	Diesel 200 mg/Kg	Waste Oil 200 mg/Kg	Benzene 0.5 mg/Kg	Toluene 40 mg/Kg	Ethylbenzene 20 mg/Kg	Total Xylenes 20 mg/Kg	Comments
1		<10	<25	<100					Possible old load-out area
2		<10	<25	<100					Side of tank opposite fill pipe
3		<10	<25	<100					Former aboveground diesel tank location
4		<10	<25	<100					Existing loadout pad
5		<10	<25	<100					End of Tank 1
6		<10	<25	<100					Fuel island
7		<10	<25	<100					Fuel island- Surface 7.0 to 8.0'
8 at 7.0' - 8.0'		<10	<25	<100					End of Tank 3 - Surface - 7.0 - 8.0'
8 at 9.5' - 10.5'		<10	<25	<100					End of Tank 3 - Surface - 9.5 - 10.5'
10		<10	<25	<100					Bulk fuel storage area
12		<10	<25	<100					Bulk fuel storage area
13		<10	<25	<100					Bulk fuel storage area
100		<10	<25	<100					Just above groundwater
102		<10	44	<100					Possible old loadout area
103		<10	<25	<100					BKG sample - RFC
104		<10	<25	<100					Possible old loadout area
105	91.94	<5			<0.005	<0.005	<0.005	<0.015	
106	91.42	<5			<0.005	<0.005	<0.005	<0.015	
107		***400***			<0.050	0.444	0.464	2.51	
108	92.68	<5			<0.005	<0.005	<0.005	<0.015	
109		<10	30	<100					From -1 to -2' below diesel tank
110		<10	<25	<100					From -1 to -2' below diesel tank
111		<10	<25	<100					From -1 to -2' below diesel tank
113		<10	<25	<100					Below dispenser
114		<10	<25	<100					Below dispenser
117	92.63	<10	<25	<100					Northwest side of Tank 3 at groundwater
119-2	83.0-86.36	<5.0			<0.005	<0.005	<0.005	<0.015	13.5 to 16.8' below surface
119-3 (835)	86.36 to GW	***14160***			<0.050	3.288	4.677	***176.9***	16.8' to groundwater
119-3 (946)		***7430***			<0.050	<0.050	<0.050	***21.2***	
120		<10	<25	<100					Imported fill dirt
122		38			<0.005	<0.005	<0.005	<0.015	Imported fill dirt with vapor reading
123		<5.0			<0.005	<0.005	<0.005	<0.015	2' below groundwater
127		<10	<25	<100					Below elbows in delivery lines
128		<10	<25	<100					Below elbows in delivery lines
130	91.1-95.1	<10	***16400***	<100					Diesel contaminated soil
134	90.7-94.9	<10	<25	<100					Surface -5.0 - 9.2' at MW1
135		<10	<25	<100					Surface -14.0' at MW2
Tank 2 Pile		***1590***			0.222	3.3	3.635	***31***	
Tank 3 Sample 1 Pile		***2740***			0.194	2.086	6.416	***45.41***	
Tank 3 Sample 2 Pile		***5550***			***1.675***	13.5	***25.56***	***126***	

Table 2 - Hydrocarbon concentrations in site groundwater.							
MTCA Method A Cleanup Levels for each analyte shown in column header in mg/L.							
Bold italic results are above MTCA Method A Cleanup Levels for Groundwater.							
Sample ID	Gasoline 1.0 mg/L	Diesel 1.0 mg/L	Waste Oil 1.0 mg/L	Benzene 0.005 mg/L	Toluene .040 mg/L	Ethylbenzene .030 mg/L	Total Xylenes .020 mg/L
M-12 T-MW-1		<1.0					
M-12 T-MW-2		<1.0					
M-12 T-MW-3		<1.0					
M12 T-MW-1	<1.0			<0.001	<0.005	<0.005	<0.015
M12 T-MW-2	<1.0			<0.001	<0.005	<0.005	<0.015
M12 T-MW-3	<1.0			***0.015***	***0.089***	***0.079***	***1.425***

Pb?

Table 3.
Groundwater Elevations for Toppenish Wells

Readings for April 27, 1995

Well	Top of Casing Elevation	Static Water Level	Groundwater Elevation
MW1	749.02'	11.85'	737.17'
MW2	749.98'	13.23'	736.75'
MW3	750.05'	13.31'	736.74'

Readings for May 2, 1995

Well	Top of Casing Elevation	Static Water Level	Groundwater Elevation
MW1	749.02'	11.38'	737.64'
MW2	749.98'	12.74'	737.24'
MW3	750.05'	12.95'	737.10'

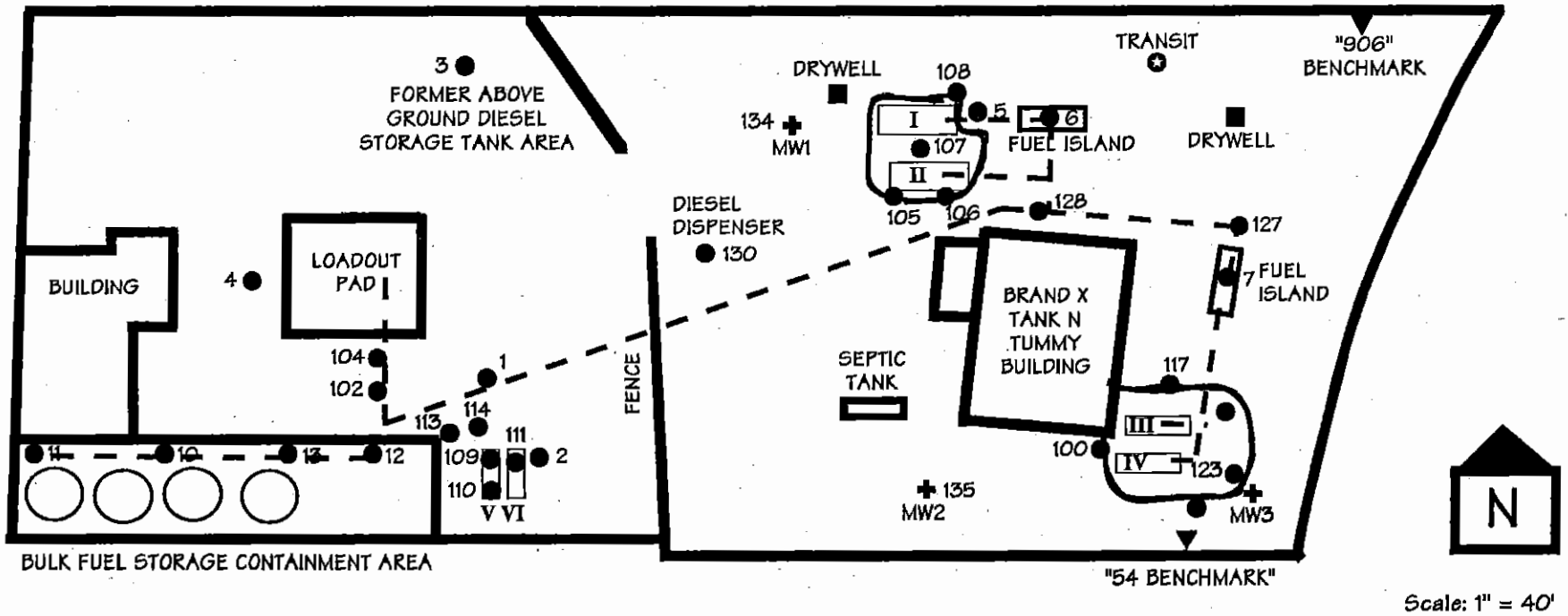
Readings for July 5, 1995

Well	Top of Casing Elevation	Static Water Level	Groundwater Elevation
MW1	749.02'	10.43'	738.59'
MW2	749.98'	11.73'	738.25'
MW3	750.05'	12.11'	737.94'

Readings for August 10, 1995

Well	Top of Casing Elevation	Static Water Level	Groundwater Elevation
MW1	749.02'	9.83'	739.19'
MW2	749.98'	11.13'	738.85'
MW3	750.05'	11.45'	738.60'

Figure 1
Site Map of the Brand X Tank 'n' Tummy in Toppenish, Washington

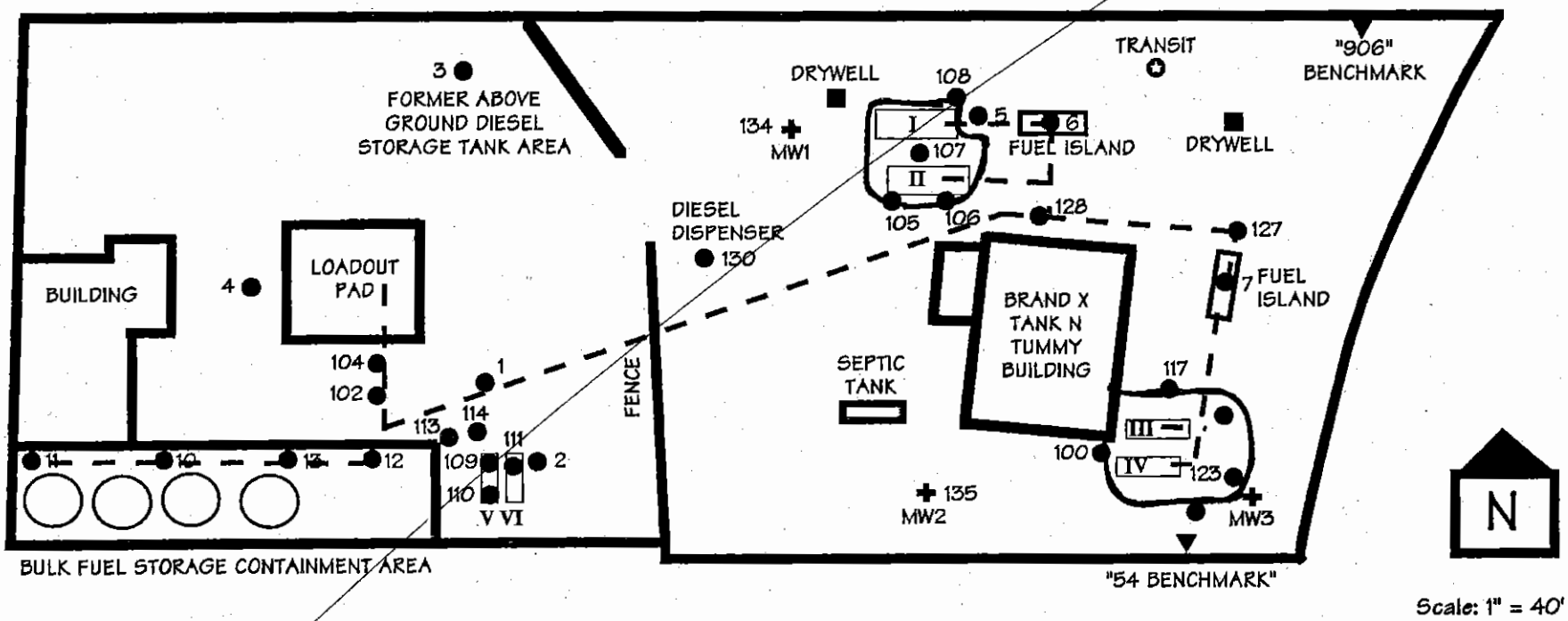


LEGEND

- ● SOIL SAMPLING LOCATION
- ■ DRYWELL
- ✪ TRANSIT
- — — FUEL LINE
- ✚ MONITORING WELL LOCATION
- ▼ BENCHMARK
- [I] FUEL STORAGE TANKS (6)

Tanks I & II are 6,500 gallons each
Tanks III & IV are 4,000 gallons each
Tanks V & VI are 1,000 gallons each

Figure 2
Site Map of Brand X Tank 'n' Tummy Site in Toppenish, WA with Groundwater Elevations, Contours, and Direction of Flow August 10, 1995

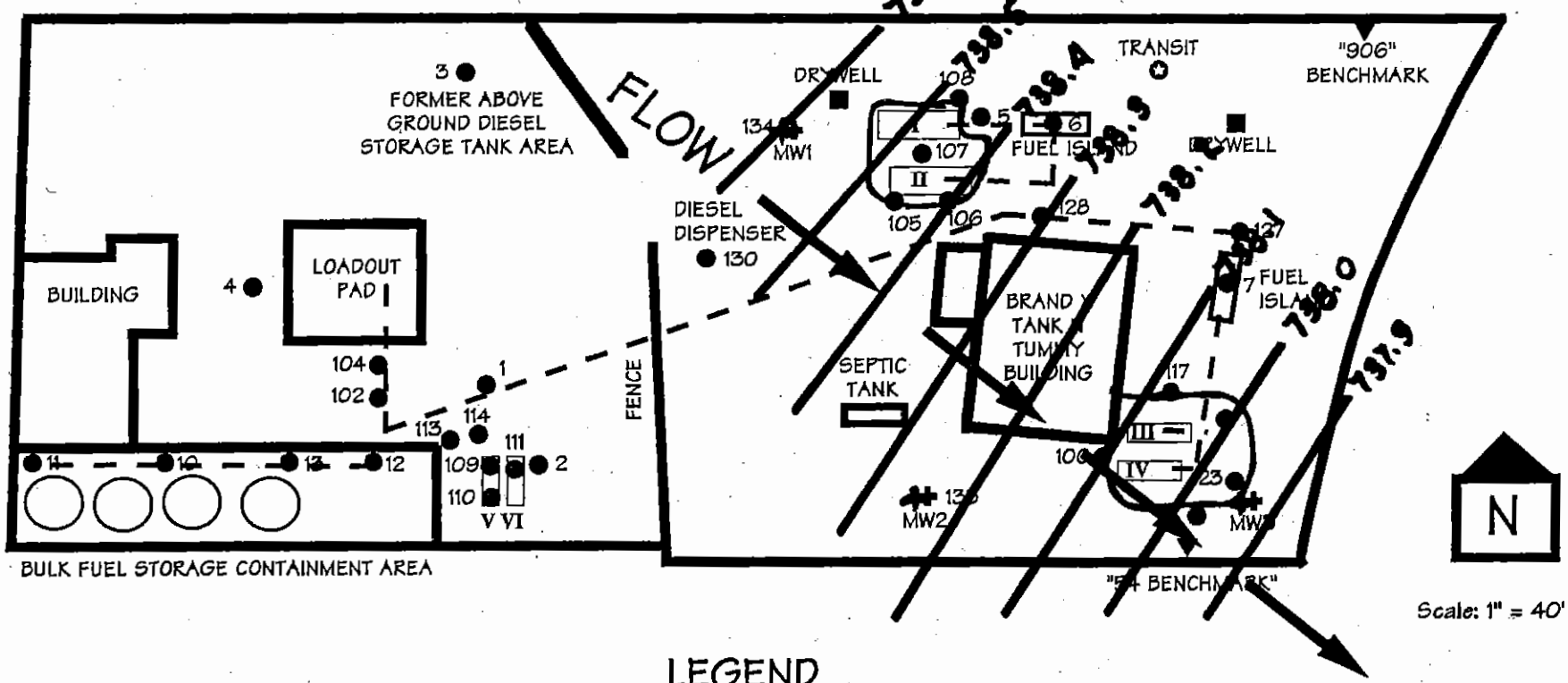


LEGEND

- ● SOIL SAMPLING LOCATION
- ■ DRYWELL
- ✪ TRANSIT
- — — FUEL LINE
- ✚ MONITORING WELL LOCATION
- ▼ BENCHMARK
- [I] FUEL STORAGE TANKS (6)

Tanks I & II are 6,500 gallons each
Tanks III & IV are 4,000 gallons each
Tanks V & VI are 1,000 gallons each

Figure 2
Site Map of Brand X Tank 'n' Tummy Site in Toppenish, WA with Groundwater Elevations, Contours, and Direction of Flow August 10, 1995



LEGEND

- ● SOIL SAMPLING LOCATION
- ■ DRYWELL
- ✪ TRANSIT
- — — FUEL LINE
- ✚ MONITORING WELL LOCATION
- ▼ BENCHMARK
- [I] FUEL STORAGE TANKS (6)

Tanks I & II are 6,500 gallons each
Tanks III & IV are 4,000 gallons each
Tanks V & VI are 1,000 gallons each

8/10/95
MW1 @ 738.59
MW2 @ 738.25
MW3 @ 737.94
RELATIVE ELEVATIONS

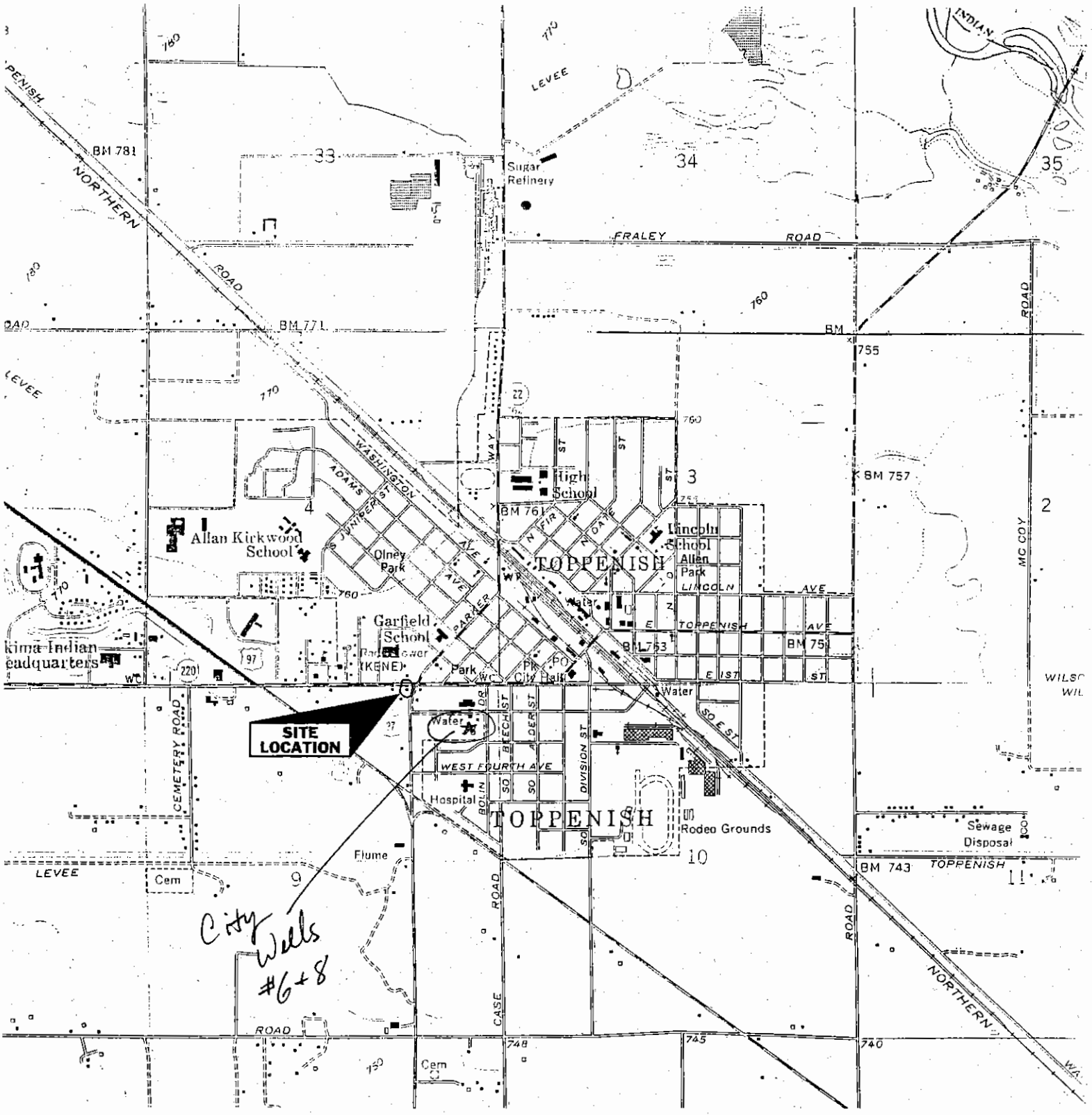
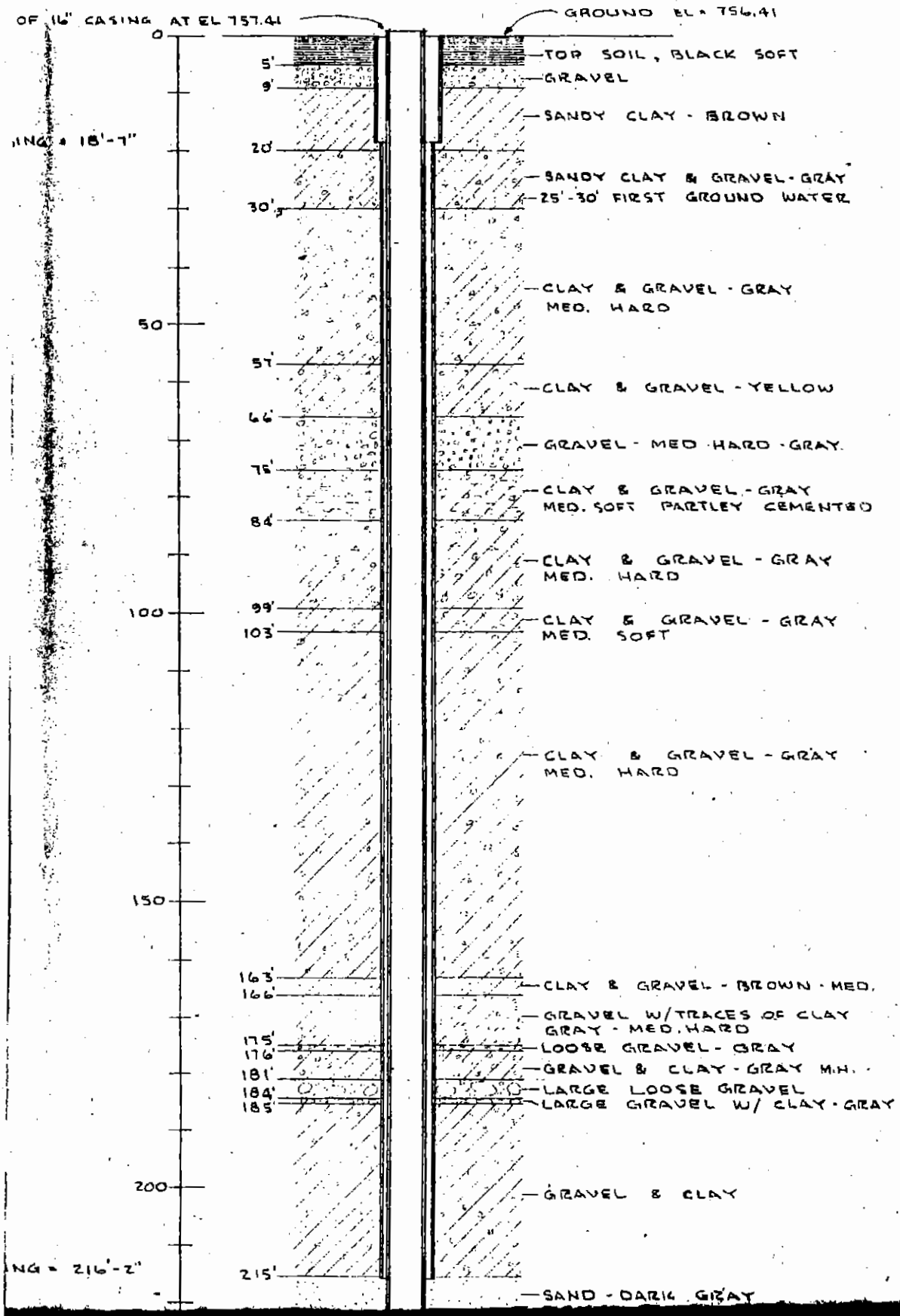
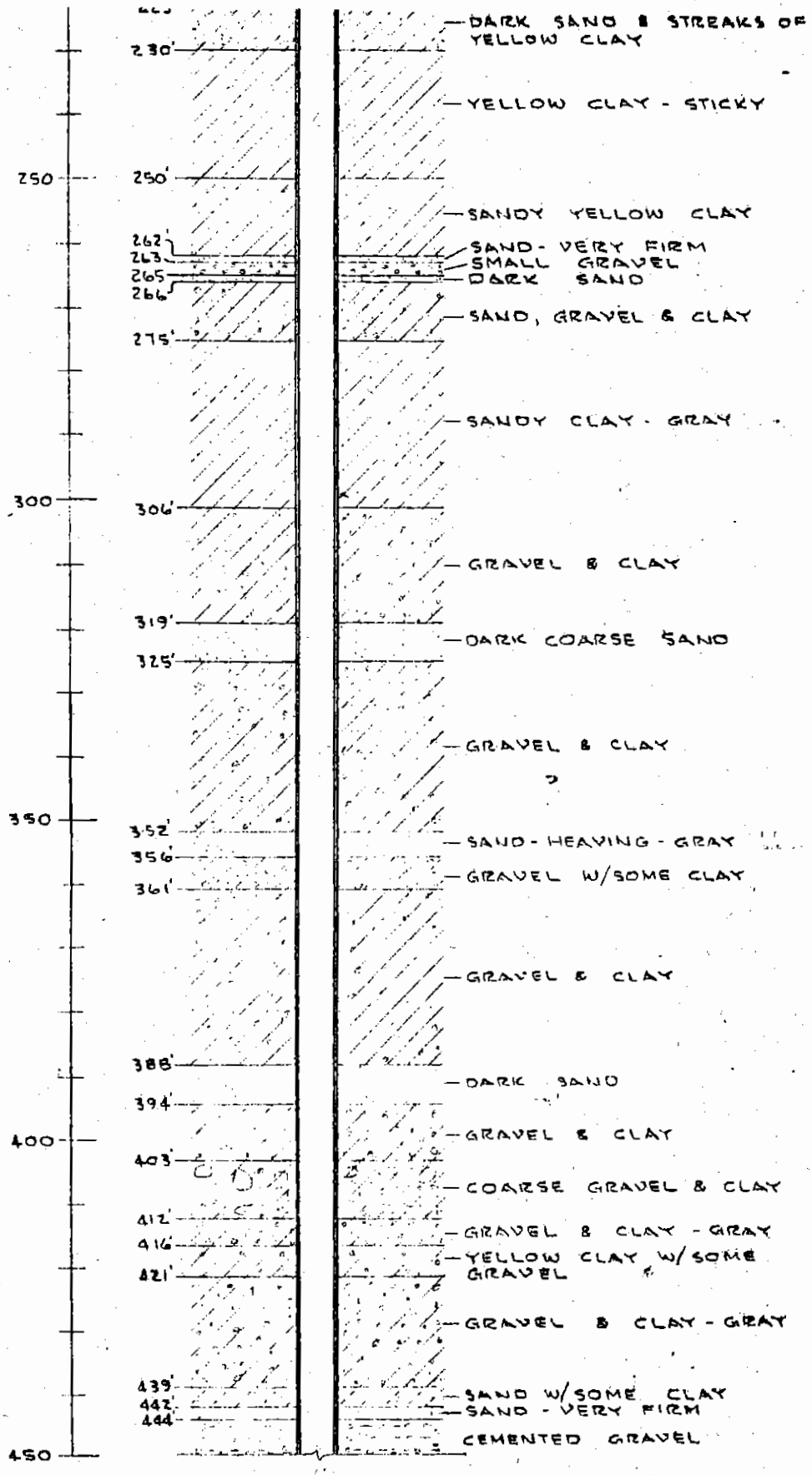


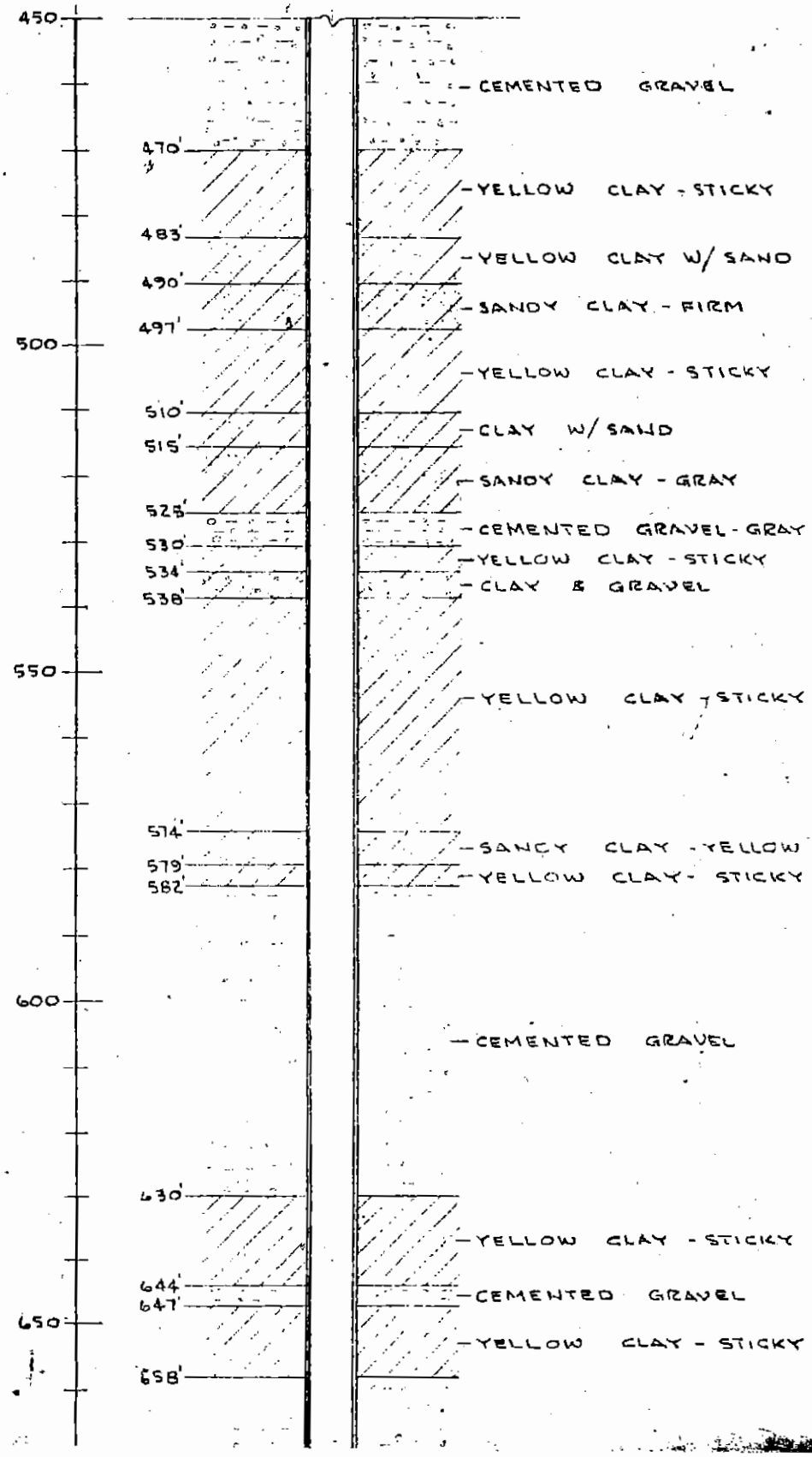
Figure 3 - Topographical Map
USGS 7.5 minute series

Toppenish Well #6 Log Page 1

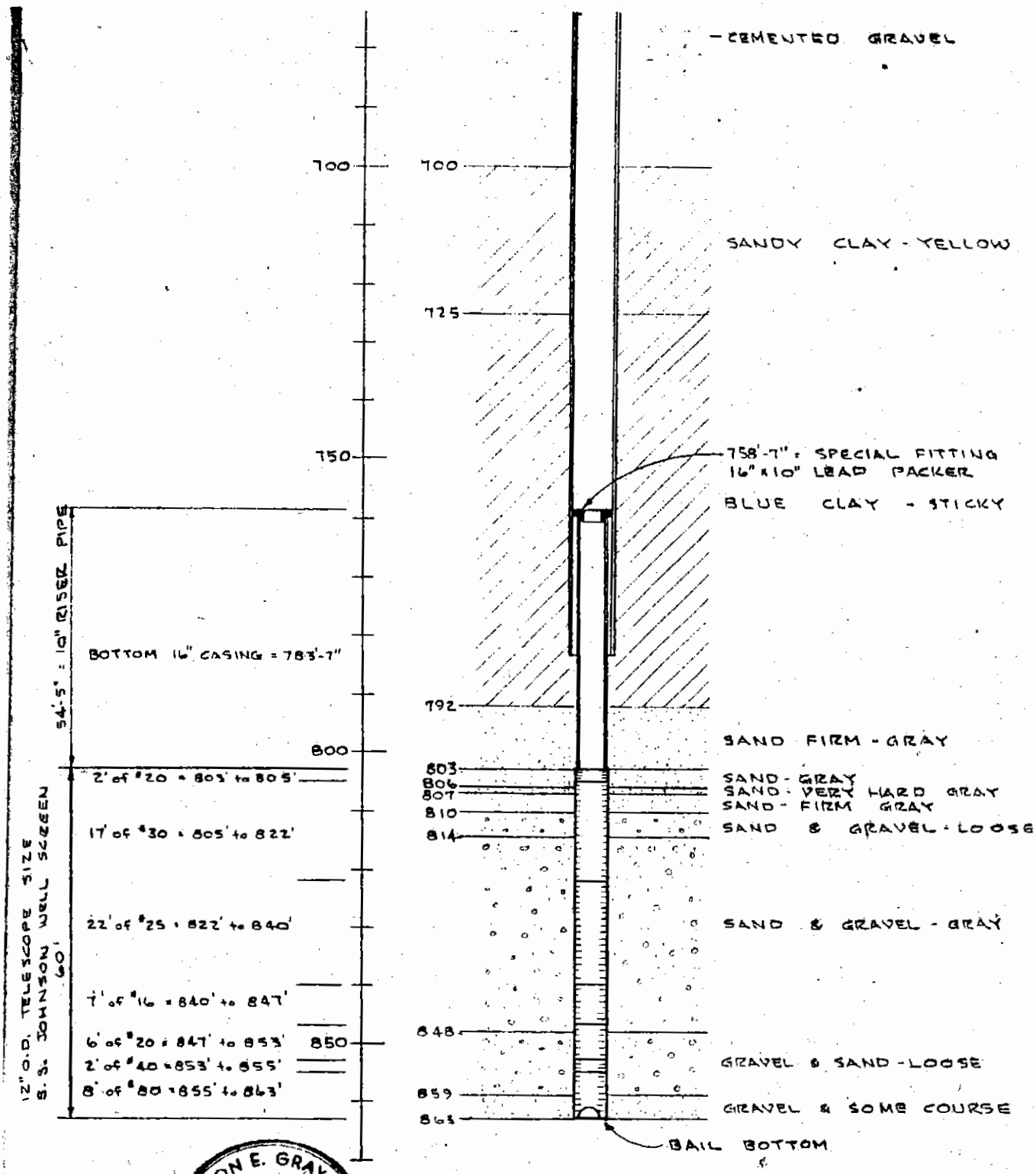


Pg 2


230'
250
250'
262'
263'
265
266'
275'
300
306'
319'
325'
350
352'
356'
361'
388'
394'
400
403'
412'
416'
421'
439'
442'
444'
450
DARK SAND & STREAKS OF YELLOW CLAY
YELLOW CLAY - STICKY
SANDY YELLOW CLAY
SAND - VERY FIRM
SMALL GRAVEL
DARK SAND
SAND, GRAVEL & CLAY
SANDY CLAY - GRAY
GRAVEL & CLAY
DARK COARSE SAND
GRAVEL & CLAY
SAND - HEAVING - GRAY
GRAVEL W/SOME CLAY
GRAVEL & CLAY
DARK SAND
GRAVEL & CLAY
COARSE GRAVEL & CLAY
GRAVEL & CLAY - GRAY
YELLOW CLAY W/SOME GRAVEL
GRAVEL & CLAY - GRAY
SAND W/SOME CLAY
SAND - VERY FIRM
CEMENTED GRAVEL
54.5' = 10" RISER PIPE
12" O.D. TELESCOPE SIZE
S. & JOHNSON WELL SCREEN
60'

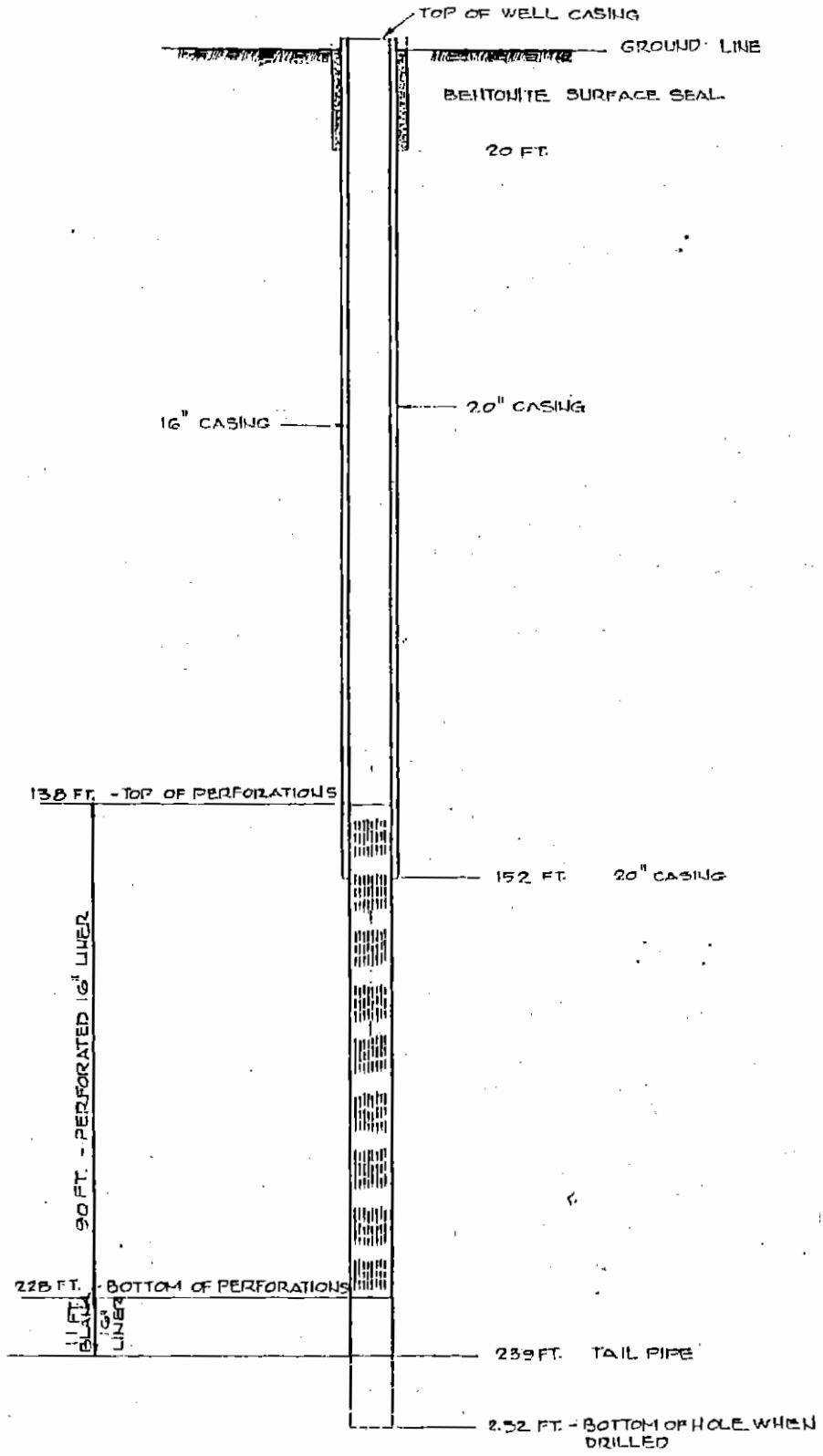

450
500
550
600
650
470'
483'
490'
497'
510'
515'
525'
530'
534'
538'
574'
579'
582'
630'
644'
647'
658'
CEMENTED GRAVEL
YELLOW CLAY - STICKY
YELLOW CLAY W/ SAND
SANDY CLAY - FIRM
YELLOW CLAY - STICKY
CLAY W/ SAND
SANDY CLAY - GRAY
CEMENTED GRAVEL - GRAY
YELLOW CLAY - STICKY
CLAY & GRAVEL
YELLOW CLAY - STICKY
SANDY CLAY - YELLOW
YELLOW CLAY - STICKY
CEMENTED GRAVEL
YELLOW CLAY - STICKY
CEMENTED GRAVEL
YELLOW CLAY - STICKY

Pg 4



DON E. GRAY
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

CITY OF TOPPENISH					
YAKIMA COUNTY					WASHINGT
WATER WORKS PROJECT					
WELL # 6 —— WELL DATA					
DATE: FEB. 1959				GRAY & OSBORNE	SCALE: NOT
DRAWN: W.W.M.				CONSULTING ENGINEERS	SHEET 1
CHECKED: DEG				YAKIMA WASHINGTON	OF 1
APPROVED: DEG					
NO.	REVISION	BY	DATE	APPD	



WELL NO.8 - RECORD DRAWING

NOTE:
ALL LEVELS ARE MEASURED FROM TOP OF WELL HEAD, WHICH IS 2 FT. ABOVE GROUND WHEN WELL WAS DRILLED.

CITY OF TOPPENISH
YAKIMA COUNTY WASHINGTON
WELL NO. 8
WELL LOG
DATE: MAY 94
DRAWN: LRH
CHKD: JCP
APPD.
Gray & Osborne, Inc.
CONSULTANTS
SEATTLE & YAKIMA
WASHINGTON
FIGURE 01

CITY OF TOPPENISH

WELL #8 LOG

DEPTH	FORMATION
0 - 3	Topsoil, brown sand gravel cobbles
3 - 7	Silty clay water
9 - 20	Cemented sand-gravel, few cobbles
20 - 23	Cemented sand - gravel, few cobbles
23 - 39	Sand, gravel, looser, little water
39 - 45	Clay bound sand, gravel, little water
45 - 57	Layer clay bound sand, gravel, looser silt bound sand, gravel (water)
57 - 62	Layer brown cemented, sand, gravel, silty bound sand gravel, little water
62 - 68	Sand gravel, water
68 - 80	Cemented sand, gravel smaller sand, gravel, water
80 - 100	Cemented sand, gravel, little water
100 - 105	Cemented sand, gravel, little water
105 - 120	Cemented sand, gravel layered, little water
120 - 140	Cemented sand, gravel layered, little water
140 - 152	Clay bound sand, gravel, few cobbles, little water
152 - 166	Clay bound sand, gravel, little water
166 - 177	Clay bound sand, gravel, little water, few cobbles

Northwest Laboratories
An Affiliate of Midwest Laboratories, Inc. • Omaha, NE
905-J Vintage Valley Parkway • Zillah, WA USA 98953 • (509) 829-3711 • FAX (509) 829-3712

Report Number
95-117-2084

REPORT OF ANALYSIS

For: (7777)

Date Reported: 04/28/95
Date Received: 04/26/95

Mail to: City of Toppenish
21 West First Avenue
Toppenish, WA 98948

TOPPENSIH, WA

VOC

Lab Number: 250632 Sample ID: W 144 WELL 6

Method: EPA 524.2 Units: µg/L Analyst: cjh Date: 04/27/95

Analysis	Level Found	Detection Limit	Analysis	Level Found	Detection Limit
Benzene	n.d.	1	1,2-Dichloropropane	n.d.	1
Bromobenzene	n.d.	1	1,3-Dichloropropane	n.d.	1
Bromochloromethane	n.d.	1	2,2-Dichloropropane	n.d.	1
Bromodichloromethane	n.d.	1	1,1-Dichloropropene	n.d.	1
Bromoform	n.d.	1	cis-1,3-Dichloropropene	n.d.	1
Bromomethane	n.d.	1	trans-1,3-Dichloropropene	n.d.	1
n-Butylbenzene	n.d.	1	Ethylbenzene	n.d.	1
sec-Butylbenzene	n.d.	1	Hexachlorobutadiene	n.d.	1
tert-Butylbenzene	n.d.	1	Isopropylbenzene	n.d.	1
Carbon tetrachloride	n.d.	1	p-Isopropyltoluene	n.d.	1
Chlorobenzene	n.d.	1	Methylene chloride	n.d.	3
Chlorodibromomethane	n.d.	1	Naphthalene	n.d.	1
Chloroethane	n.d.	1	n-Propylbenzene	n.d.	1
Chloroform	n.d.	1	Styrene	n.d.	1
Chloromethane	n.d.	1	1,1,1,2-Tetrachloroethane	n.d.	1
2-Chlorotoluene	n.d.	1	1,1,2,2-Tetrachloroethane	n.d.	1
4-Chlorotoluene	n.d.	1	Tetrachloroethene	n.d.	1
1,2-Dibromo-3-chloropropane	n.d.	1	Toluene	n.d.	1
1,2-Dibromoethane	n.d.	1	1,2,3-Trichlorobenzene	n.d.	1
Dibromomethane	n.d.	1	1,2,4-Trichlorobenzene	n.d.	1
1,2-Dichlorobenzene	n.d.	1	1,1,1-Trichloroethane	n.d.	1
1,3-Dichlorobenzene	n.d.	1	1,1,2-Trichloroethane	n.d.	1
1,4-Dichlorobenzene	n.d.	1	Trichloroethene	n.d.	1

The above analytical results apply only to the sample(s) submitted.

Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

Attachment 2

Northwest Laboratories
An Affiliate of Midwest Laboratories, Inc. • Omaha, NE
905-J Vintage Valley Parkway • Zillah, WA USA 98953 • (509) 829-3711 • FAX (509) 829-3712

Report Number
95-117-2085

REPORT OF ANALYSIS

For: (7777)

Date Reported: 04/28/95
Date Received: 04/26/95

Mail to:
City of Toppenish
21 West First Avenue
Toppenish, WA 98948

TOPPENSIH, WA

VOC

Lab Number: 250633 Sample ID: W 145 WELL 8

Method: EPA 524.2 Units: µg/L Analyst: cjh Date: 04/27/95

Analysis	Level Found	Detection Limit	Analysis	Level Found	Detection Limit
Benzene	n.d.	1	1,2-Dichloropropane	n.d.	1
Bromobenzene	n.d.	1	1,3-Dichloropropane	n.d.	1
Bromochloromethane	n.d.	1	2,2-Dichloropropane	n.d.	1
Bromodichloromethane	n.d.	1	1,1-Dichloropropene	n.d.	1
Bromoform	n.d.	1	cis-1,3-Dichloropropene	n.d.	1
Bromomethane	n.d.	1	trans-1,3-Dichloropropene	n.d.	1
n-Butylbenzene	n.d.	1	Ethylbenzene	n.d.	1
sec-Butylbenzene	n.d.	1	Hexachlorobutadiene	n.d.	1
tert-Butylbenzene	n.d.	1	Isopropylbenzene	n.d.	1
Carbon tetrachloride	n.d.	1	p-Isopropyltoluene	n.d.	1
Chlorobenzene	n.d.	1	Methylene chloride	n.d.	3
Chlorodibromomethane	n.d.	1	Naphthalene	n.d.	1
Chloroethane	n.d.	1	n-Propylbenzene	n.d.	1
Chloroform	n.d.	1	Styrene	n.d.	1
Chloromethane	n.d.	1	1,1,1,2-Tetrachloroethane	n.d.	1
2-Chlorotoluene	n.d.	1	1,1,2,2-Tetrachloroethane	n.d.	1
4-Chlorotoluene	n.d.	1	Tetrachloroethene	n.d.	1
1,2-Dibromo-3-chloropropane	n.d.	1	Toluene	n.d.	1
1,2-Dibromoethane	n.d.	1	1,2,3-Trichlorobenzene	n.d.	1
Dibromomethane	n.d.	1	1,2,4-Trichlorobenzene	n.d.	1
1,2-Dichlorobenzene	n.d.	1	1,1,1-Trichloroethane	n.d.	1
1,3-Dichlorobenzene	n.d.	1	1,1,2-Trichloroethane	n.d.	1
1,4-Dichlorobenzene	n.d.	1	Trichloroethene	n.d.	1

The above analytical results apply only to the sample(s) submitted.

Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced in whole or in part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

Little Je

Photo 1
Tank 2 Fill Pipe Contamination (blue color)

Photo 2
Tank 2 Berth

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

TCLP Lead

Client: PLSA Engineering
Lab No: 62593qc
Units: mg/L

QC Batch No. L621
Sample No. 62552-1 (Batch QC)
Date Extracted: 2-7-97
Date Analyzed: 2-10-97

METHOD BLANK

Parameter	Result	PQL
Lead	ND	0.05

ND - Not Detected
PQL - Practical Quantitation Limit

MATRIX SPIKE

Parameter	Sample Result	MS Result	MS Amount	%R	Flag
Lead	0.14	4.6	5.0	89	

MS = Matrix Spike %R = Percent Recovery

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

1525 6°C

UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PLSA
PROJECT NAME: 96390
CONTACT: Doug D'Hondt
PHONE NO: 509-575-6990

ANALYSIS REQUESTED: Specify State _____

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	[illegible]			CLOSURE DELIVERABLES
	13	1/29	1100	Soil										✓										✓			

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	D'Hondt	PLSA	1440, 1/29/97
Received By	[signature]	Dan Nguyen	[illegible]	1000 1/31/97
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:

Summary of test conditions for static acute definitive *O. mykiss* toxicity test.

Job Name: Sound Analytical Services | Date: 4 - 8 February 1997

Test Protocol:	Washington State Department of Ecology Biological Testing Methods, for Designation of Dangerous Waste, Publication # 80-12, revised August 1996.
Test Material:	14
Test Organisms/Age:	*O. mykiss* (rainbow trout); 39 days from swim up at test initiation
Source:	Mt. Lassen Trout Farm; Red Bluff, California
Loading Limit:	0.8 g (wet weight) per liter of test solution
Number/Container:	10
Volume/Container:	7 liters
Test Chambers:	20 l High-density linear polyethylene containers
Replicates:	Three
Test Concentrations:	100 mg/l
Reference Toxicant:	Potassium Chloride
Test Duration:	96 hours
Control:	Natural spring water from Gold Creek Trout Farm, Woodinville, WA
Lighting:	Fluorescent bulbs (50-100 foot candles)
Photoperiod:	16 hours light; 8 hours dark
Aeration:	None
Renewal:	None
Temperature:	12 ± 1° C
Chemical Data:	Dissolved oxygen, temperature, and pH measured at initiation of test and every 24 hours; hardness, alkalinity, and specific conductance determined at each concentration.
Effect Measured:	Mortality
Test Acceptability:	Control mortality ≤ 10%

Summary of Results:

	O. mykiss (mortality)		
Sample No.	Control (unspun)	Control (spun)	100 mg/L
14	0%	0%	0%
Reference Toxicant LC50		2.7 g/L KCl	

Parametrix, Inc.
Environmental Toxicology Laboratory

Oncorhynchus mykiss

Test Type: Static Acute Trout Hazardous Waste (80-12)
Sample Number: PLSA 62525 / 14
Test Initiation Date: 2/4/97 Time: 1200
Source of Organisms: Mt. Lassen Trout Farm
Client: SAS
Age of Organisms: 39 days from swim up

Conc.	Rep.	Number of Survivors				
		0 hours	24 hours	48 hours	72 hours	96 hours
Control (unspun)	A	10	10	10	10	10
	B	10	10	10	10	10
	C	10	10	10	10	10
Control (spun)	A	10	10	10	10	10
	B	10	10	10	10	10
	C	10	10	10	10	10
~~10 mg/L~~	A	—	—	—	—	—
	B	—	—	—	—	—
	C	—	—	—	—	—
100 mg/L	A	10	10	10	10	10
	B	10	10	10	10	10
	C	10	10	10	10	10
	Initals	[illegible]	[illegible]	[illegible]	[illegible]	PS
	Date	2/4	2/5	2/6	2/7	2/8

Test Volume: 7 L
Mean Control Fish Weight: 543 mg
Fish Length Range:
MAX: 3.6 cm
MIN: 3.0 cm

Comments:

Control fish lengths: (cm) 3.6 | 3.5 | 3.3 | 3.3 | 3.5 | 3.5 | 3.4 | 3.5 | 3.0 | 3.2 Mean= 3.4 cm

Analysis	Control (unspun)	Control (spun)	10 mg/L	100 mg/L
Hardness	88	90	—	110
Alkalinity	54	54	—	52

Rev. 3/6/96

Anna McEntire

Parametrix, Inc.
Environmental Toxicology Laboratory

Oncorhynchus mykiss

Test Type: Static Acute Trout Hazardous Waste (80-12) Client: SAS

Test Initiation Date: 2/4/97 Sample Number: PLSA 62525/14

Temperature (°C) 0 hr 12 24 hrs 11 48 hrs 11 72 hrs 11 96 hrs 11

		pH (°C)					Dissolved Oxygen (mg/l)					Specific Conductivity (µMHOS)	
		Time in Hours					Time in Hours					Time in Hours	
oncentration	Rep.	0	24	48	72	96	0	24	48	72	96	0	96
ontrol (unspun)	A	7.5	7.2	7.2	7.2	7.1	10.0	10.1	10.1	10.1	9.6	140	145
	B	7.5	7.2	7.2	7.2	7.1	10.0	10.1	10.1	9.9	9.5	140	145
	C	7.5	7.2	7.2	7.1	7.1	10.0	10.1	9.9	9.8	9.6	140	145
ontrol (spun)	A	7.5	7.2	7.2	7.2	7.1	10.0	10.2	9.9	9.8	9.6	140	145
	B	7.5	7.2	7.2	7.2	7.1	10.0	10.2	9.9	9.8	9.6	140	145
	C	7.5	7.2	7.2	7.2	7.1	10.0	10.2	9.9	9.6	9.6	140	145
~~0 mg/L~~	A												
	B												
	C												
00 mg/L	A	7.6	7.2	7.2	7.2	7.1	10.0	10.1	9.8	9.7	9.6	140	145
	B	7.6	7.1	7.2	7.2	7.1	10.0	10.1	9.6	9.6	9.6	140	145
	C	7.6	7.1	7.2	7.2	7.1	10.0	10.1	9.7	9.7	9.6	140	145
	Initals	RL	JM	JM	JM	PS	RL	JM	JM	JM	PS	RL	PS
	Date	2/4	2/5	2/6	2/7	2/8	2/4	2/5	2/6	2/7	2/8	2/4	2/8

omments:

ev. 3/6/96

PARAMETRIX, INC.
5808 Lake Washington Blvd. NE
Kirkland, Washington 98033

STATIC ACUTE TROUT TOXICITY TEST

Toxicant KCL Test Dates 2/4/97 - 2/8/97 Time 1400

Dilution Water Spring Water

Source of Organisms Mt. Larsen Trout Farm Age of Organisms 40 days from Swim up

Temp (°C) Day 0 11 Day 1 11 Day 2 11 Day 3 11 Day 4 11

Conc.	Rep	No. of Survivors 0	24	48	72	96	pH 0	24	48	72	96	Dissolved Oxygen (mg/L) 0	24	48	72	96	Specific Conductivity (µS) 0	96
Control	A	10	10	10	10	10	7.1	7.3	7.2	7.2	7.1	10.6	9.7	9.9	10.1	10.1	130	140
	B	10	10	10	10	10												
1.2 g/L	A	10	10	10	10	10	7.5	7.4	7.4	7.5	7.4	10.6	9.7	9.9	10.0	10.1	1700	1750
	B	10	10	10	10	10												
1.715 g/L	A	10	10	10	10	10	7.6	7.5	7.4	7.5	7.4	10.6	9.6	9.9	10.0	10.1	2350	2400
	B	10	10	10	10	10												
2.45 g/L	A	10	10	10	10	10	7.6	7.5	7.4	7.5	7.3	10.6	9.7	10.0	10.0	10.2	3400	3450
	B	10	8-2	7-1	7	6-1												
3.5 g/L	A	10	8-2	1-7	0-1	0	7.7	7.5	7.4	7.5	—	10.6	9.7	10.1	10.2	—	5000	5000 **
	B	10	7-3	2-5	0-2	0												
5.0 g/L	A	10	0-10	0	0	0	7.7	7.3	7.4	~~7.4~~ RP 2/11	—	10.6	9.8	~~10.5~~	—	—	~~5500~~	
	B	10	3-7	0-3	0	0								10.5 4			7000	6500 *
	A																	
	B																	
	A																	
	B																	
	A																	
	B																	
Initials		JK	JK	JK	JK	PS	JK	JK	JK	JK	PS	JK	JK	JK	JK	PS	JK	PS
Date		2/4	2/5	2/6	2/7	2/8	2/4	2/5	2/6	2/7	2/8	2/4	2/5	2/6	2/7	2/8	2/4	2/8

Comments

* TAKEN AT 48 hrs JK 2/6

** TAKEN AT 72 hrs JK 2/7

TRIMMED SPEARMAN-KARBER METHOD. MONTANA STATE UNIV

FOR REFERENCE, CITE:
HAMILTON, M.A., R.C. RUSSO, AND R.V. THURSTON, 1977.
TRIMMED SPEARMAN-KARBER METHOD FOR ESTIMATING MEDIAN
LETHAL CONCENTRATIONS IN TOXICITY BIOASSAYS.
ENVIRON. SCI. TECHNOL. 11(7): 714-719;
CORRECTION 12(4):417 (1978).

DATE: 2/4/97 TEST NUMBER: 1 DURATION: 4 DAYS
CHEMICAL: KCL SPECIES: TROUT

RAW DATA:

CONCENTRATION(G/L)	1.20	1.72	2.45	3.50	5.00
NUMBER EXPOSED:	20	20	20	20	20
MORTALITIES:	0	0	4	20	20
SPEARMAN-KARBER TRIM:		0.00%			

SPEARMAN-KARBER ESTIMATES: LC50: 2.73
95% LOWER CONFIDENCE: 2.56
95% UPPER CONFIDENCE: 2.91

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

14°C

UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PLSA
PROJECT NAME: 96390
CONTACT: Doug D'Hondt
PHONE NO: 509-575-6990

ANALYSIS REQUESTED: Specify State WA

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals (RCRA 8)	Total Halogens				CLOSURE DELIVERABLES
	1			H_2O	5			✓			✓		✓														
	2			Soil	1			✓			✓		✓														
0051-1	3			Soil	1	✓									✓	✓	✓			✓		✓					
✓ 2	4			Soil	1						✓		✓														

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	Doug D'Hondt	PLSA	1230, 10/24/96
Received By	Mary Curtiss	Mary Curtiss	SAS	10:00 10/24/96
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:
1) Please Rush Only Samples 1 & 2
2) If HCID Identifies A specific hydrocarbon, please analyze for that hydrocarbon.

Thankyou

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

160622

UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PLSA
PROJECT NAME: 96390
CONTACT: Doug D'Hondt
PHONE NO: 509-575-6590

ANALYSIS REQUESTED: Specify State WA

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens				CLOSURE DELIVERABLES
1	5	10/30	1130	Soil	1	✓				✓			✓														
2	6	10/30	1130	Soil	1	✓				✓			✓														

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	D'Hondt	PLSA	1300, 10/30
Received By	[signature]	Dan Nguyen	SAS	1000 10/31/96
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:
① Please Analyze for Hydrocarbon HCID Identities

17°C

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

1/3

UST PARAMETERS
61235 CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PLSA
PROJECT NAME: 96390
CONTACT: Doug D'Hondt
PHONE NO: 509-575-6990

ANALYSIS REQUESTED: Specify State _____

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	~~PAH's~~ CPAH	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens				CLOSURE DELIVERABLES
1	7	11/25	1200	Soil	1										✓	✓											
2	8	11/25	1200	Soil	1										✓	✓											
3	9	11/25	1200	Soil	1										✓	✓											
4	10	11/25	1200	Soil	1										✓	✓											
5	11	11/25	1200	Soil	1										✓	✓											
6	12	11/25	1200	Soil	1										✓	✓											

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	D'Hondt	PLSA	400/11/85
Received By	S Giang	Giang	[illegible]	900 am 11/27/86
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:

15°C

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PCSA

PROJECT NAME: 96390

CONTACT: Doug D'Andrea

PHONE NO: 509-375-6890

ANALYSIS REQUESTED: Specify State WA

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens				CLOSURE DELIVERABLES
61754	13	12/16	1200	H2O	3						✓																

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	D'Andrea	PCSA	12/18/96 0900
Received By	Mary Curtiss	Mary Curtiss	SAS	10:30 12/20/96
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:

Rush Rush.

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

1 P5.25 6°C

UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PLSA
PROJECT NAME: 96390
CONTACT: Doug D'Honolt
PHONE NO: 509-575-6990

ANALYSIS REQUESTED: Specify State _____

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	Fish Bioassay			CLOSURE DELIVERABLES
	14	1/29	1100	Soil										✓										✓			

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	D'Honolt	PLSA	1440 1/29/97
Received By	[signature]	[signature]	[illegible]	1000 1/31/97
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:

14°C

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: PESA
PROJECT NAME: 96335
CONTACT: Doug D'Amelt
PHONE NO: 505-575-6990

ANALYSIS REQUESTED: Specify State WA

LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HCID	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens				CLOSURE DELIVERABLES
2[illegible]A3	14	2/3	1530	Soil	1									✓													
	R																										

	Signature	Printed Name	Firm	Time / Date
Relinquished By	[signature]	D'Amelt	PESA	1540, 2/3
Received By	Mary Curtiss	Mary Curtiss	SAS	10:00 2/3/97
Relinquished By				
Received By				
Relinquished By				
Received By				

SPECIAL INSTRUCTIONS/COMMENTS:
* Lab Needed More Soil For Analysis.
∴ An Extra Sample Was Sent.