

ROZAK ENGINEERING

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November 24, 1999

Mr. Don Seagren, Environmental Specialist
Alaska Dept. of Environmental Conservation
Kenai Area Office
43335 Kalifonsky Beach Rd., Suite 11
Soldotna, AK 99669

RECEIVED**NOV 24 1999**Department of
Environmental Conservation
KDO

Subject: Underground Tank Removal and Cleanup Report
Doyle's Fuel Storage Facility, Reckey # 98-23-01-289-01
SE 1/4 B.L.M. Lot 51, S34, T6S, R11W, City of Kenai, Alaska

Dear Mr. Seagren,

This report presents the results of the underground fuel tank removal and soil cleanup performed at the subject property that was formerly occupied by Doyle's Fuel Service (maintenance shop, office, and house). Two 500-gallon gasoline tanks and two 500-gallon heating oil tanks were excavated and removed from the property. Contaminated soil from one tank pit and from a waste oil pit was thermally remediated at an off-site location. Analytical results for both the UST closure and thermal remediation are included in this report.

SUMMARY

Two 500-gallon fuel oil tanks and two 500-gallon gasoline tanks were excavated and removed from the property. Approximately 65 cubic yards of contaminated soil was excavated during removal of the heating fuel tank (Tank #3) located adjacent to the shop and in a waste oil pit located southeast of the shop.

Most of the contaminated soil was close to the fuel oil tank near the southeast corner of the shop. Because the tank did not have a hole in it and there was no sign of leaking at the fuel pipe connections, most of the fuel contamination probably resulted from the tank being over-filled. The contamination at the waste oil pit was probably due to the disposal (possibly burning) associated with equipment crank case oil, filters, oil containers, and rags.

Field screen results indicated there had not been any significant fuel releases around the other tanks. The contaminated soil removed from the Tank #3 pit and waste oil pit was temporarily stockpiled on-site, then hauled to Soil Processing Inc. and thermally remediated. Thermally remediated soils were sampled and analyzed, returned to the site, and used to backfill the excavated areas.

PROPERTY LOCATION AND HISTORY

The subject property is a triangular shaped lot, about 7/10 of an acre in size, that is bordered by the Kenai Spur Highway on the west to north diagonal, by undeveloped forested land on the south (also owned by Jim Doyle), and by the SE 1/4 B.L.M Lot 51 on the east (Figure 1). There is very little vegetation on the property. The soils consist of medium sand with gravel surfacing in traffic areas. Groundwater was about 9 feet below the surface at the time of the UST closure, but probably fluctuates seasonally.

There is a 26' by 42' house located in the middle of the property. A water well and a 500-gallon underground heating fuel oil storage tank were located near the southwest corner of the house. The well provided water for the house until July 1999 when the facility was connected to city water. There is a 40' by 80' shop, with an attached 16' by 60' office, located in the southwest portion of the property. The shop has a concrete floor and was used to service heavy equipment.

A 500-gallon fuel tank was buried near the southeast corner of the shop. The tank was located about 5 feet from the foundation of the building and was used to store heating fuel oil for the shop. There is a septic system located to the west of the shop. Two 500-gallon gasoline tanks were buried 15 to 20 feet east of the 500-gallon fuel oil tank. The two 500-gallon gasoline tanks were used for noncommercial purposes.

TANK REMOVAL AND ASSESSMENT

On 7-7-99, each tank was checked and arrangements were made for the residual fuel to be removed. A limited amount of excavation with a bobcat-type machine was done. About 10 cubic yards of contaminated soil was excavated near the surface, south of Tank #3 and west of the waste oil pit [Figure 2]. The soil was placed on a liner on the asphalt east of the shop. Gray to dark-gray color and waste oil odor was detected at many of the sample locations. Fiberglass odor was also detected at several locations.

Eight field screen samples were collected from the area and volatile hydrocarbon levels were tested using a photoionization detector (PID). PID readings ranged from 0 to 600 ppm. Five of the field screen samples were analyzed using the PetroFLAG hydrocarbon test system, which gives a more accurate measurement of the levels of diesel and residual range contamination. The PetroFLAG tests indicated that contamination in excess of 5000 ppm were present in four of the field screen samples. Due to schedule conflicts with the contractor, further excavation was delayed until 7-9-99.

Excavation resumed on 7-9-99. An area of dark stained soil that had solvent and oil odor was detected south of Tank #2. This area was determined to be a waste oil pit that had been used to dispose of used motor oils. About 10 cubic yards of soil was excavated from the pit and stockpiled on the liner. Hydrocarbon odor and gray color associated with waste oil was barely noticeable at 6 feet. After the waste oil pit was excavated, a birch tree on the east edge of the pit was removed by owner. The pit was enlarged and five more cubic yards of discolored soil under the tree was excavated and

placed in the contaminated soil pile. Some stained soil fell into the pit bottom, was removed, and placed in the contaminated soil pile. A lab sample was collected at 7 feet.

Tank #1 (gasoline tank) was excavated and removed first. Field screen samples were collected 1 foot below the bottom of the tank at the north and south ends of the tank (see Photo 1). PID measurements of the field screen samples detected volatiles at less than 1 ppm. There was a slight hydrocarbon odor in the soil at the south end of the tank, but none at the north end of the tank. **Tank #2** (gasoline) was excavated and removed next. Field screen samples were collected from 1 foot below the bottom of the tank at the north and south ends of the tank. There was no hydrocarbon odor in the field screen samples and PID measurements were less than 1 ppm. The soil excavated from around the tanks was a medium sand. All piping was connected to the top of the tanks and extended vertically to the surface, without any couplings, elbows or swing joints. Lab samples were collected under the tanks, and the tank pits were backfilled with clean gravel fill. The soil was compacted using the bucket on the backhoe.

The fuel oil tank next to the house (**Tank #4**) was excavated next. After the copper fuel lines were disconnected and drained, the tank was removed and field screen samples were collected from 1 foot below the bottom of the tank at the north and south ends. Hydrocarbon odor was not detected on the surface around the tank or in excavated soil. PID readings were less than 1 ppm in the sample from the north end of the tank and 1.8 ppm in the sample collected from the south end of the tank pit. Lab samples were not collected from Tank #4 pit because there was no sign of any fuel contamination.

Tank #3 (southeast corner of shop) was excavated and removed after noon on 7-9-99. The copper fuel lines were disconnected and drained before the tank was removed. A slight hydrocarbon odor was detected and the soil was slightly stained at the north end of the pit. PID measurements detected 330 ppm volatiles in the field screen sample collected from the north end of the pit and 58 ppm in the sample collected from the south end of the pit. Both field screen samples were collected from 1 foot below the bottom of the tank.

Contaminated soil was excavated around Tank #3 to a depth of almost 9 feet below ground surface. About 25 cubic yards of contaminated soil was excavated. Elevated PID readings were detected in the pit bottom at the north end of the tank, but excavation was halted because deeper excavation would have undermined the shop foundation.

Two laboratory analytical samples were collected from the bottom of the pit at about 9 feet bgs in areas where the highest PID readings were measured. Fifty nine field screen samples and seven analytical samples were collected from the excavated areas. The Soil Sampling Plan shows locations where the field screen and laboratory samples were collected. A total of 50 cubic yards of soil, about 1/3 waste oil and 2/3 diesel contamination, was excavated and temporarily stockpiled on-site. Six field screen samples and two analytical samples were collected from the stockpile. The stockpile was covered.

On 7-14-99, the laboratory faxed us preliminary analytical results for samples collected from the Tank #3 pit and the contaminated soil stockpile. The preliminary results showed high DRO concentrations at field screen location #21, between Tank #2 and Tank #3. We decided to try removing more of the contaminated soil before the stockpile was hauled to SPI for remediation, and to collect additional samples from the pit area so the extent of remaining contamination could be estimated more accurately.

On 7-15-99, the **Tank #3 pit was re-excavated** to within several inches of groundwater [Photo 8]. An additional 10 to 12 cubic yards of moderately contaminated soil was removed, placed directly in a dump truck, and hauled to Soil Processing Inc. (SPI) for thermal remediation. The contaminated soil was from 7 to 9 feet below ground, between locations #15 and #29. The pit was excavated one foot closer to the shop than the excavation on 7-9-99. The strongest petroleum odor and PID readings was on the north and east portion of the pit between locations #24 and #30. Elevated PID readings were still detected at locations #15, #21 and #30, but excavation was stopped, just above groundwater, to ensure soil under the southeast corner of the shop footing was not undermined. Two lab samples were collected from the pit bottom, above groundwater. There was no sheen or evidence of free product on the water.

After the soil had been hauled to SPI, on 7-15-99, the soil under the liner was field screened for contamination. Ten field screen samples were collected at about 0.5 feet below ground. PID measurements ranged from <1 to 11 ppm, indicating soil under the stockpile had not been contaminated by the stockpile material. Thermally remediated soil was field screened and sampled by Crowfalls Environmental & Consulting prior to being hauled back to the site and used to fill the excavated areas. Ten field screen samples and five analytical samples were collected from the remediated soil stockpiles.

ANALYTICAL RESULTS

Table 1 presents results for field screen and analytical soil samples collected from the excavated areas. Table 2 presents field screen and analytical sample results for the soil stockpile, and field screen results for samples SP-7 through SP-16, collected from soil under the stockpile after it had been removed to be remediated. Table 3 presents results of samples collected from the remediated soil at the SPI facility.

Field screen samples from the excavations had PID measurements ranging from 0 to 460 ppm. The PetroFLAG tests indicated that several of the interim samples had diesel and residual range contamination in excess of 10,000 ppm.

Analytical sample results show that most of the contamination was consistent with a weathered middle distillate (diesel range product). Sample DFS-99-6, collected from the waste oil pit, also contained lube oil. Overall, the results indicate that diesel fuel contamination was present in the soil at levels exceeding cleanup standards. The analytical samples contained relatively low GRO concentrations--from 8.55 to 12.9 ppm, and BTEX ranging from undetected (U) to 0.23 ppm. Benzene was not detected. DRO values varied from 62 to 5860, and RRO varied from 85 to 4500 ppm.

TABLE 1 – SUMMARY OF ANALYTICAL RESULTS

Sample ID	Depth	PID ppm	P'FLAG ppm	GRO mg/kg	DRO mg/kg	RRO mg/kg	BTEX mg/kg
1 - 1	2.7	114	>5000				
1 - 2	3.5	6					
1 - 3	4.6	0					
2	3.7	0					
3	3	28	112				
4	2	205					
4 - 2	3	0					
5	2	5					
6	2	579	>5000				
7	1	293	>5000				
8	1	38	>5000				
9	3	27					
10 - 1	2	24					
10 - 2	4	80					
10 - 3	6	15					
11 - 1	2	42					
11 - 2	4	120					
11 - 3	6	38					
11 - 4 DFS-99-1	7	5	568	12.9	1270	284	0.23
12 - 1	1.5	18					
12 - 2	3	12					
13 - 1	1.5	27					
13 - 2	3	15					
14 - 1	1.5	25					
14 - 2	3	12					
15 - 1 DFS-99-4	7	330		9.49	424	93.8	U
15 - 2	8	231					
15 - 3	9	141	4030				
15 - 4 DFS-99-8	9.2	325	2185		62	84.9	
16 - 1	7	58					
16 - 2	8	6					
16 - 3	9	42					

Sample ID	Depth	PID	P'FLAG	GRO	DRO	RRO	BTEX
17-1	3	120					
17-2	4.5	15					
18-1	3	460					
18-2	5	38					
19-1	3	78					
19-2	5	11					
20	9	21					
21-1 DFS-99-5	7	137		8.55	5860	4500	U
21-2	9	44	1024				
21-3 DFS-99-9	9.2	162	0		998	4220	
22-1	8	12					
22-2	7	4					
22-3	8	13					
22-4	9.2	2					
23-1	8	10					
23-2	7	45					
23-3	8	11					
23-4	9.2	7	515				
24-1	3	17					
24-2	7	18					
24-3	8	10					
25 DFS-99-2	7	42	162	U			U
26 DFS-99-3	7	<1		U			U
27	7	1					
28	7	0					
29	9.2	3	0				
30	9.2	278	160				
31	5.4	<1					
32	5.4	1.8					
Cleanup Method	Two			300	250	11000	Table 1

Notes: Blank cells indicate that the constituent was not analyzed for
 Samples highlighted in bold indicate laboratory analytical samples
 Method Two cleanup levels for BTEX are listed individually in Table 1 of the revised regulations

Prior to remediation, soil samples collected from the stockpile had PID values from 155 to 428 ppm. Analytical results showed that the stockpile soil was highly contaminated with DRO and RRO. DRO levels in the analytical samples were 979 and 15,600 ppm, and RRO levels were 81 and 24,400 ppm. The analytical samples showed GRO and BTEX at much lower levels than the DRO/RRO.

The soil beneath the stockpile was field screened after the stockpile had been hauled to SPI for remediation. Results were very low, indicating contamination had not migrated from the stockpile to the soil under the pile. Samples were not collected for lab analysis.

TABLE 2 – SUMMARY OF ANALYTICAL RESULTS (STOCKPILE)

Sample ID	Depth Feet	PID ppm	P'FLAG ppm	GRO mg/kg	DRO mg/kg	RRO mg/kg	BTEX mg/kg
SP-1	2	158	>10000				
SP-2 DFS-99-6	2	253	>10000	476	15600	24400	11.5
SP-3	2	127					
SP-4	2	395					
SP-5	2	155					
SP-6 DFS-99-7	2	428	286	13	979	80.6	0.11
SP-7	0.5	<1	Samples collected from clean Soil beneath stockpile after Contaminated soil was removed				
SP-8	0.5	11					
SP-9	0.5	2					
SP-10	0.5	1					
SP-11	0.5	2					
SP-12	0.5	4					
SP-13	0.5	2					
SP-14	0.5	1					
SP-15	0.5	4					
SP-16	0.5	2					

NOTES: Blank cells indicate that the constituent was not analyzed for
 Samples highlighted in bold indicate laboratory analytical samples

Table 3 shows the results of post-remediation sampling of the contaminated soil. Ten grab samples were field screened using a PID and 5 grab samples were collected for lab analysis. Testing of the ten field screen samples indicated that no volatile hydrocarbons were present in the soil, however, lab analysis showed low levels of DRO and RRO were still present after thermal remediation. DRO ranged from 87 to 170 ppm, and RRO ranged from 860 to 2200 ppm. The DRO and RRO levels are less than the Method Two cleanup levels.

TABLE 3 – SUMMARY OF ANALYTICAL RESULTS (POST-REMEDIATION)

Sample ID	Location	PID ppm	P'FLAG ppm	GRO mg/kg	DRO mg/kg	RRO mg/kg	BTEX mg/kg
Soil Pile #1							
1	Top	0					
2	N. Side	0			1 4 0	1 4 0 0	
3	E. Side	0			8 7	8 6 0	
4	S. Side	0					
5	W. Side	0			1 7 0	2 2 0 0	
Soil Pile #2							
6	Top	0					
7	N. Side	0					
8	E. Side	0			1 7 0	1 6 0 0	
9	S. Side	0			1 3 0	1 4 0 0	
10	W. Side	0					
Cleanup Method 2				3 0 0	2 5 0	1 1 0 0 0	Table 1

NOTES: Blank cells indicate that the constituent was not analyzed for
 Samples highlighted in bold indicate laboratory analytical samples

APPLICABLE REGULATIONS

Farm or residential tanks of 1,000 gallons or less capacity used for storing motor fuel for noncommercial purposes are exempt from Federal and State regulations related to underground storage tanks (USTs). If product is discharged from a tank, the discharge must be reported to the Alaska Department of Environmental Conservation (ADEC). If the product was discharged and reported prior to January 22, 1999, the release investigation and cleanup may be done in accordance with ADEC Regulation 18AAC75, *Oil and Hazardous Substances Pollution Control*, effective May 14, 1992, and the associated general guidance document *Interim Guidance for Non-UST Soil Cleanup Levels*, dated July 17, 1991. Releases reported since January 22, 1999 must comply with the revised regulation which became effective on January 22, 1999. The applicable soil cleanup levels for this site, taken from Table B2 - Method Two of the revised regulations, are listed at the bottom of Table 1 (herein).

QUALITY CONTROL SUMMARY

The Laboratory data report showed the samples were received in good condition and quality assurance/quality control criteria was in compliance with the ADEC and/or CT&E's Assurance Program Plan.

CONCLUSION AND RECOMMENDATION

Approximately 90 percent of the contaminated soil was removed from the site. We estimate 5 to 10 cubic yards of soil contaminated with diesel and residual range product could not be excavated because of the proximity to the shop foundation [Figure 2].

Lab analytical results also show there is contamination in the bottom of the waste oil excavation (location 11 at 7 feet). Field screen results show the PID readings dropped from 120 ppm at 4', to 38 ppm at 6' and to 5 ppm at 7'. The hydrocarbon odor disappeared between 6 and 7 feet. PetroFLAG test results indicated the combined diesel/residual range contamination should have been 500 ppm or less. Lab sample DFS-99-1 may have included some contaminated soil from the surface which fell into the pit when we cleaned up under the birch tree. Our field screening experience at this site indicates 1270 ppm DRO would probably drop to the cleanup level (250 ppm) in several feet, yielding 1 to 2 cubic yards of soil which exceeds the cleanup level.

All other materials that had elevated PID readings when field screened, were excavated. Evidence from the extensive field screening and analytical testing performed at this site indicates that the subject property has been fully assessed. The residual contamination still present at 7 to 9 feet below ground is weathered and does not pose a threat to groundwater or to the public. All excavated soil materials were thermally remediated by Soil Processing Inc., and returned to the site to be used to backfill the excavated areas. We believe the tank removal, assessment, and cleanup at this site has been satisfactorily completed and we recommend that no further action be required.

CLOSURE

The findings and conclusions in this report describe the conditions present at the time the subject site was assessed. The assessment was performed in general accordance with the standards of care and diligence normally practiced by recognized consulting firms in performing services of a similar nature. To the best of our knowledge the information is true, accurate, and complete.

Sincerely,

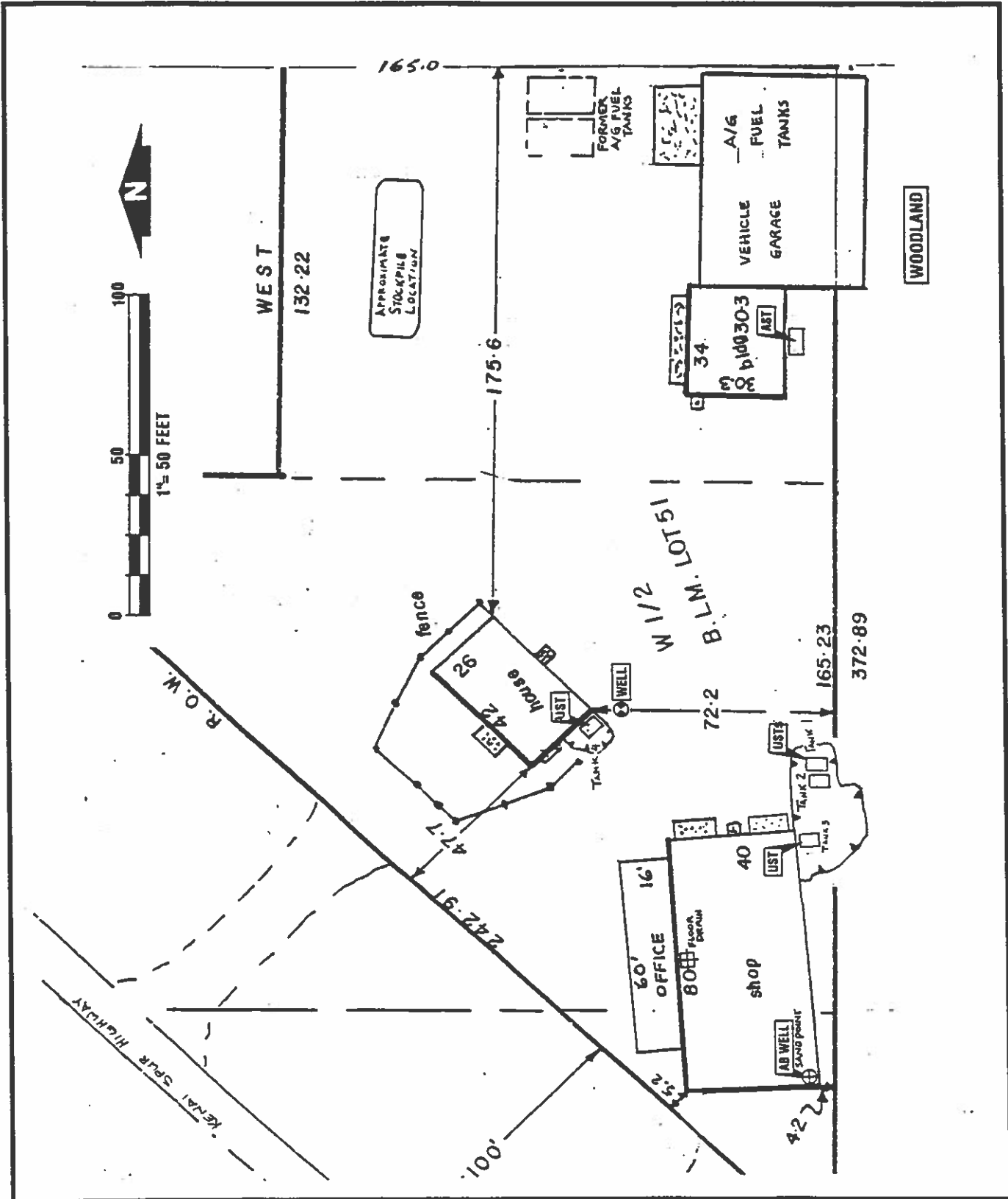


Ronald T. Rozak, PE
Principal Investigator



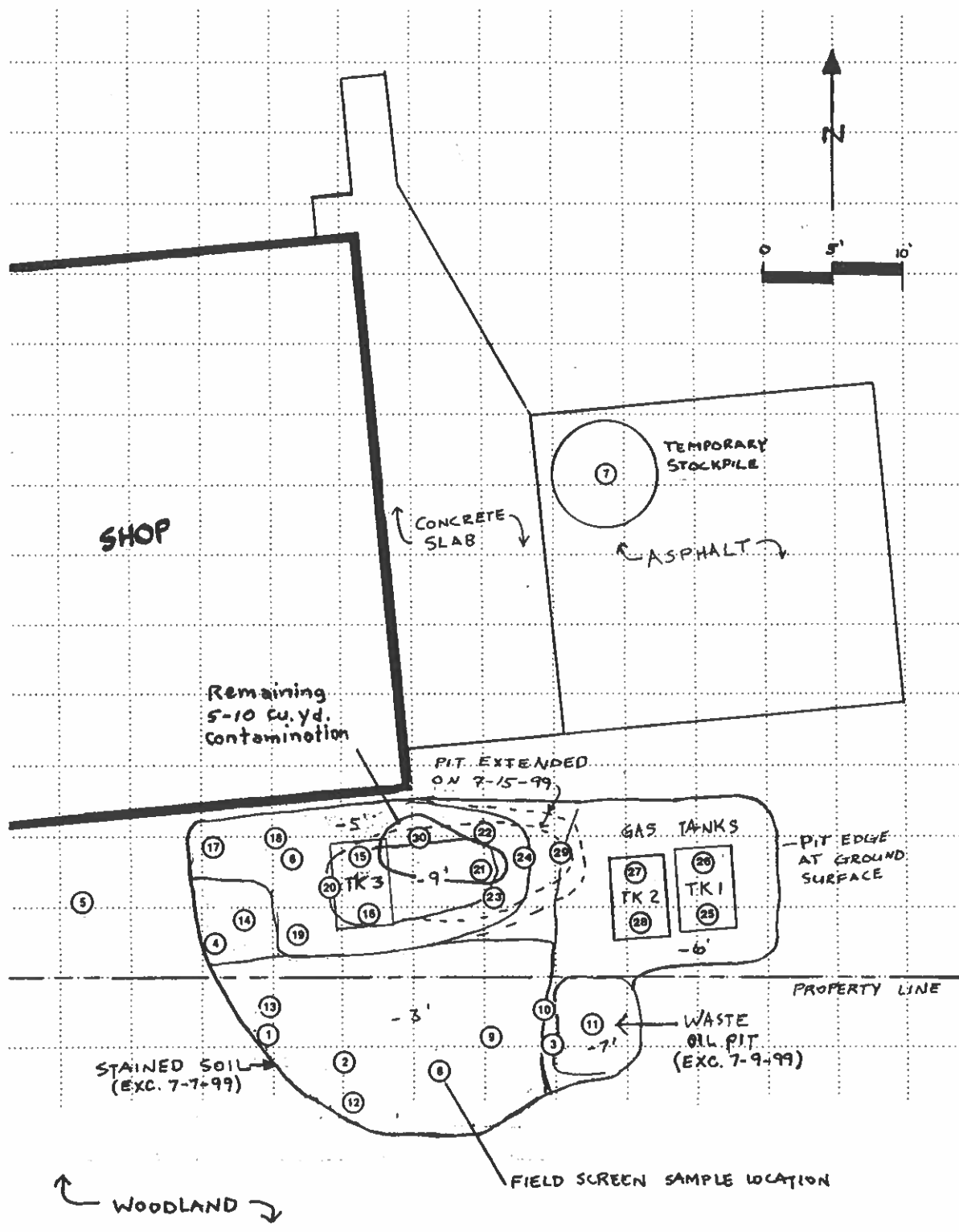
Attachments:

- Site Map
- Site and Sample Plans
- Field Screen Records
- Photographs
- Laboratory Analyses and Deliverables
- Field Screen Procedures



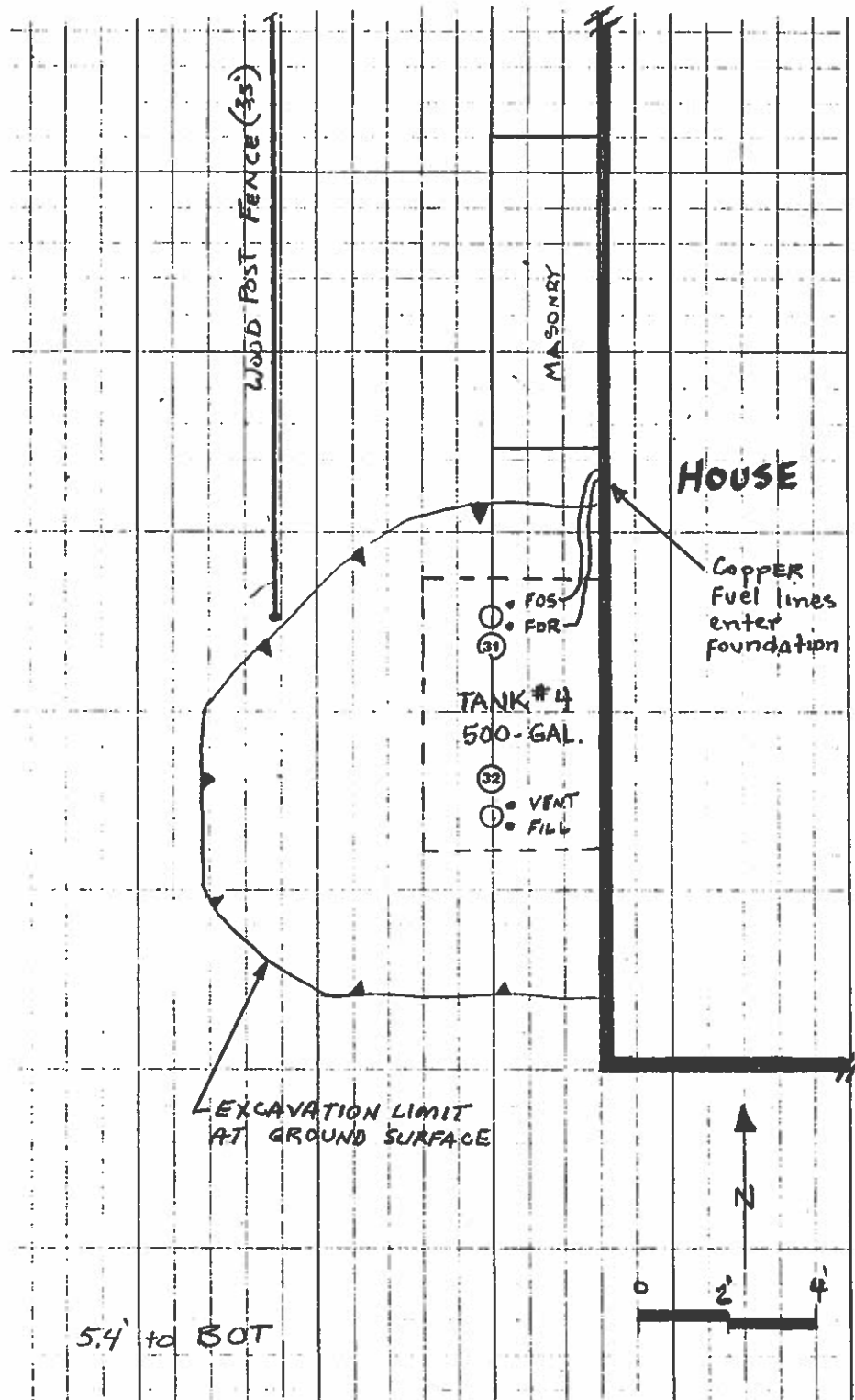
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FIGURE 1. SITE MAP
 DOYLES FUEL SERVICE
 MILE 8.5 SPUR HWY.
 MAP. 11-9-99



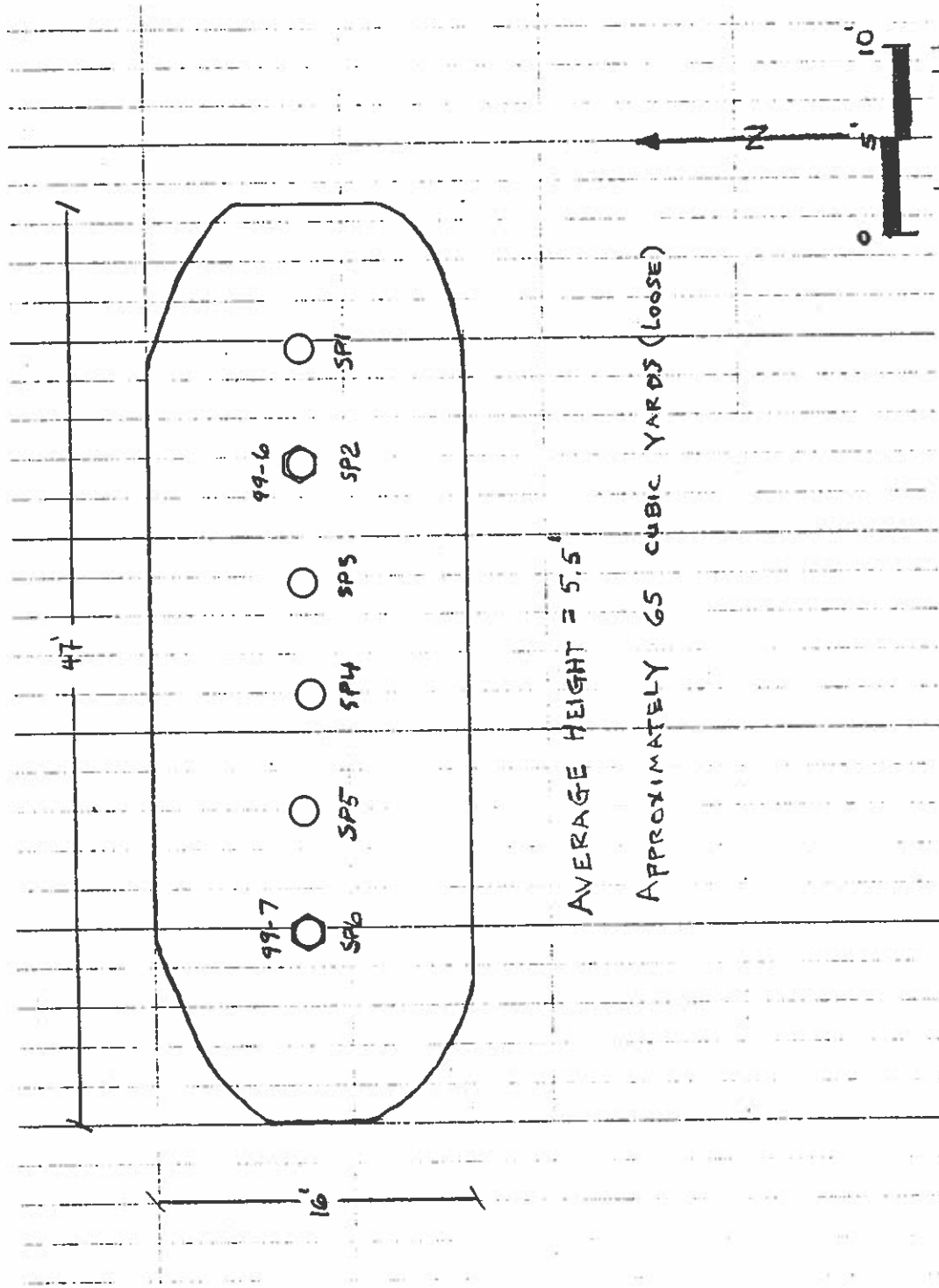
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FIGURE 2. SOIL SAMPLING PLAN (SHOP)
 DOYLES FUEL SERVICE
 MILE 8.5 SPUR HWY.
 MAP. 11-9-99



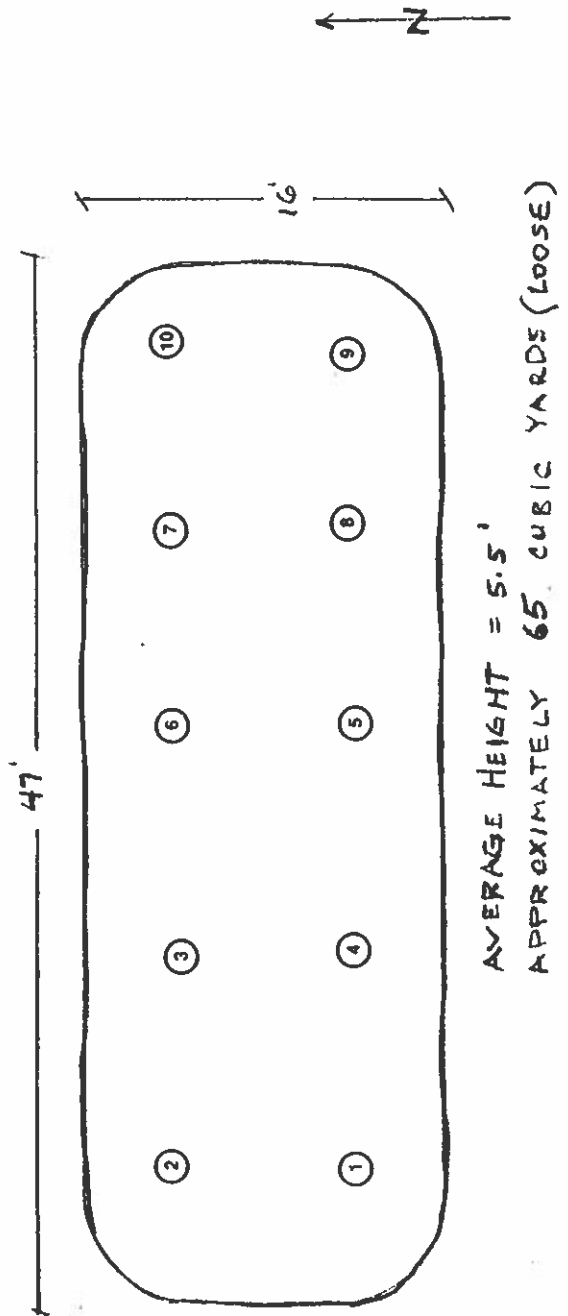
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FIGURE 3. SOIL SAMPLING PLAN (HOUSE)
 DOYLES FUEL SERVICE
 MILE 8.5 SPUR HWY.
 MAP. 11-9-99



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FIGURE 4. SOIL SAMPLING PLAN (STOCKPILE)
 DOYLES FUEL SERVICE
 MILE 8.5 SPUR HWY.
 MAP. 11-9-99



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FIGURE 5. SOIL SAMPLING PLAN
 (AFTER STOCKPILE HAD BEEN REMOVED)
 DOYLES FUEL SERVICE
 MAP. 11-9-99

SAMPLING RECORD - CONTINUED ON 7-9-99

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PROJECT TANK CLOSURES

DATE 7-7-99

LOCATION DOYLE'S FUEL SERVICE
MILE 8.5 KANAI SPUR HWY

WEATHER OVERCAST @ 0840
PARTIAL CLOUDY @ 1045
5-10 mph

RECORDED BY K HOLLINGSWORTH

59 °F 10:45 AM ____ °F ____ PM

INSTRUMENT Microtip HL 2000 Calibrated Checked Cal.
 TEI 580 B 0925 - 100 ppm

Note: PID categories are: (C)= cold, or (W)= warm, (H)= Dexsil Retro-Flag soil extraction test results

TIME/DATE	SAMPLE	LOCATION	DEPTH	DESCRIPTION	HC ODOR		PID (ppm)	
					NONE	L: M: H:	C	W: H:
0900		1-1	2.7	DARK GRAY SILT LOAM W/ FINE ROOTS S16, W12 (OG. = -1.0) Waste oil odor		X	C	114
0910		1-2	3.5	OLIVE GRAY SILT, FIRM MEDIUM SAND STARTS AT 3.6 septic		X	C	6
0920		1-3	4.6	MEDIUM SAND LT/OLIVE GRAY	?		C	0
0930		2	3.7	MEDIUM SAND, OLIVE S18.5, W6.5	X		C	0
1000		3	3.0	FINE SAND SILT GRN GRAY S19, E8 2' BELOW O.G. SEPTIC	X		C	28
1010		4	2.0	GRAVEL S9, W15 1' BELOW O.G.		X	C	205
1030		4-2	3.0	LT BROWN LOAM	X		C	0
1035		5	2.0	OLIVE SAND S5, W24 -0.8' from O.G.	X		C	5
1040		6	2.0	SAND S4, W9 1.5' below O.G.	X		C	579
1045		7		DARK GRAY LOAM 5 YARD PILE ON LINER FIBER GLASS 2002	X		C	293, 259
1050		8		DARK GRAY GRAVEL SOIL PILE IN EXCAVATION Waste oil	X		C	38, 99

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PetroFLAG™ Hydrocarbon Test Kit - Field Data

PetroFLAG is a trademark of Dexsil corporation.

Date: 7-7-99

Calibration Time/Date: _____

Operator: K HOLLINGSWORTH

Calibration Temperature: _____

Location: ROZAK GARAGE

FOR DOYLES FUEL SERVICE

MILE 8.5 KENAI SPUR HIGHWAY

No.	Sample ID	Weight	Time/Date	Reading (ppm)	DF ¹	RF ²	Actual (ppm)	Comments
1	1-1	10g	1150/7-7-99	EEEE/EEEE	1	5/10	> 5000	
2	3	10g		112 / 62	1	5/10		
3	6	10g		EEEE/EEEE	1	5/10	> 5000	
4	7	10g	v	EEEE / EEEE	1	5/10	> 5000	
5	8	10g	1215 / 7-7-99	EEEE/ EEEE	1	5/10	> 5000	
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

¹DF = Dilution Factor, e.g., for 5 gram soil sample DF=10g/5g=2, and actual concentration equals reading times DF (reading (ppm) x DF = actual concentration).

²RF = Response Factor, selected for the hydrocarbon contamination at the site.

SAMPLING RECORD - RESUMED FROM 7-7-99

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PROJECT TANK CLOSURE

DATE 7-9-99

LOCATION MILE 8.5 KENAI SPUR HIGHWAY
DOYLE'S FUEL SERVICE

WEATHER PARTLY CLOUDY
10-15 mph

RECORDED BY KH SAMPLED BY: RT ROZAK

68 °F 1100 AM _____ °F _____ PM

INSTRUMENT Microtip HL 2000 Calibrated Checked Cal.
 TEI 580 B 0900

Note: PID categories are (C)= cold, or (W)= warm, (H)= Oexsil PetroPAG soil extraction test results

TIME/DATE	SAMPLE	LOCATION	DEPTH	DESCRIPTION	HC ODOR		PID (ppm)
					NONEL	M/H	
0900		9	3	SILT STAINED (W.O. pit SW) wo odor	X		27
		10	2	SILT BLACK STAIN (W.O. pit side) Trash	X		24
		11	2	GREY SILT, BLACK STAIN, oily waste, cans Fill material wo. odor		X	42
		11	4	dark grey sand, fill wo odor		X	120
		10	4	gray sand, native? W.O. odor edge of pit		X	80
		11	6	light grey sand, cleaner soil less odor		X	38
		10	6	light grey sand, barely W.O. odor	X		15
1000	DFS-99-1	11	7	SAND Lt grain, no odor (some slough in pit from birch tree exc.)	X		5
		12	1.5	dark brown silt w/b		X	13
		12	3	sand no stain	X		12
		13	1.5	dark brown silt		X	27
		13	3	sand, olive	X		15
		14	1.5	silt diesel? barely noticeable stain	X		25
		14	3	sand	?		12
1225		32	1	TANK #4, top, south end (fill)	X		<1
1228		31	1	top, north end (FOS FOR)	X		<1
1240		32	6	Bottom - 1', south	X		1.8
1245		31	6	Bottom - 1', North	X		<1

SAMPLING RECORD

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PROJECT TANK CLOSURE

DATE 7-9-99

LOCATION MILE 8.5 KENAI SPUR HIGHWAY
DORLES FUEL SERVICE

WEATHER PARTIAL CLOUDY
15 mph

RECORDED BY RON ROZAK

___ °F ___ AM ___ °F ___ PM

INSTRUMENT Microtip HL 2000 Calibrated Checked Cal.
 TEI 580 B

Note: PID categories are (C)= cold, or (W)= warm. (H)= Densit Petrolog soil extraction test results

TIME/DATE	SAMPLE	LOCATION	DEPTH	DESCRIPTION	HC ODCR		PID (ppm)	
					NONE L	MH	C	H
1140 1135	DF9-99-2	25		TANK 1 SOUTH BOT - 1'	X		42 55	
1130	DF5-99-3	26		TANK 1 NORTH BOT - 1'	X		<1	
1220		27		TANK 2 NORTH BOT - 1'	X		1	
1225		28		TANK 2 SOUTH BOT - 1'	X		0	
1315		15		TANK 3 NORTH BOT - 1'	X		330	
1320		16		TANK 3 SOUTH BOT - 1'	X		58	

SAMPLING RECORD

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PROJECT TANK CLOSURE - CONTAMINATED SP

DATE 7-9-99

LOCATION MILE E.S. KENAI SPUR HIGHWAY
ECLY'S FUEL SERVICE

WEATHER PARTLY CLOUDY

RECORDED BY K HOLLINGSWORTH

10-15 mph

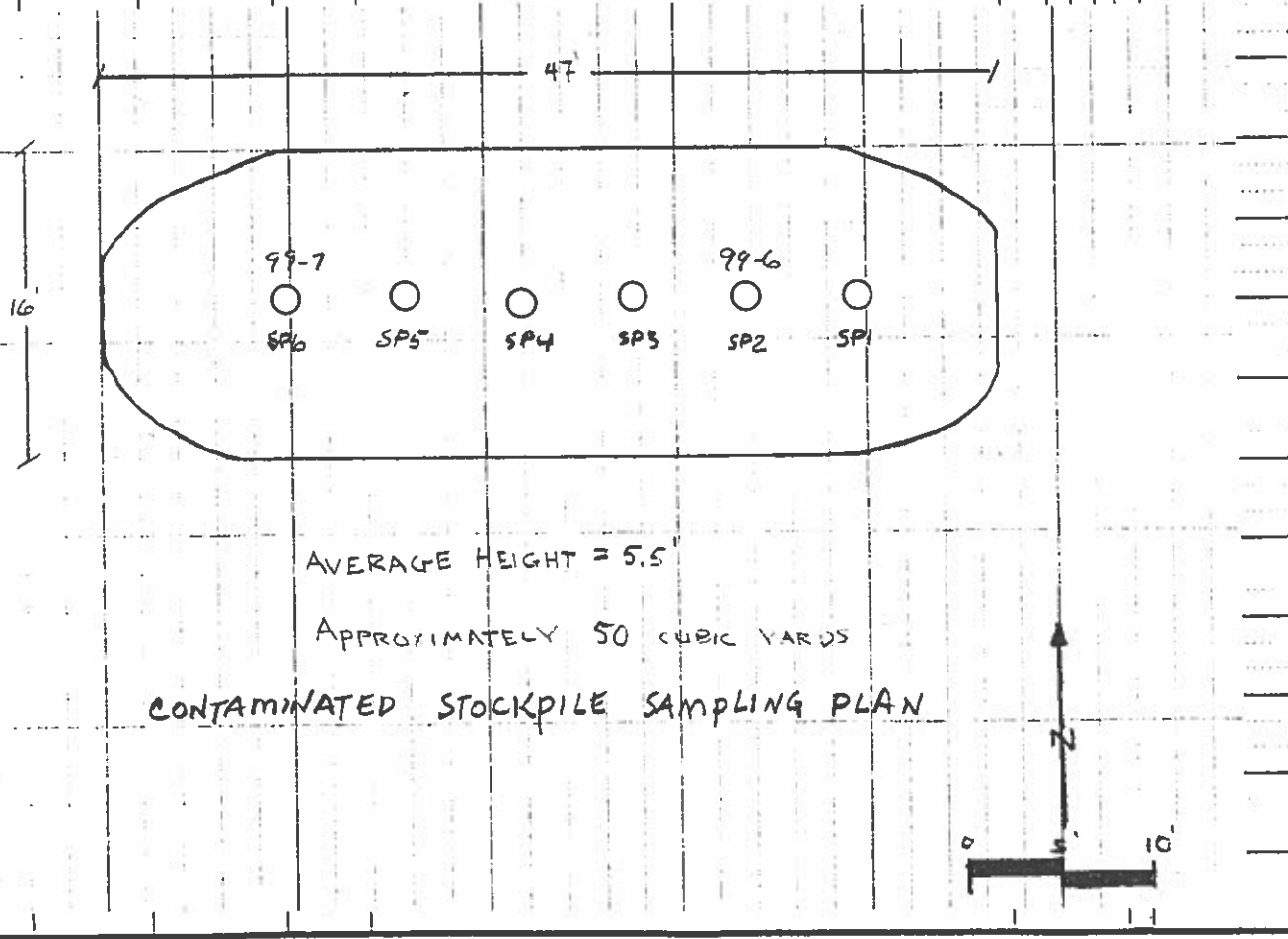
 °F AM 67 °F 3:40 PM

INSTRUMENT Microtip HL 2000 Calibrated Checked Cal.

TEI 580 B

Note: PID categories are: (C) = cold, or (W) = warm, (H) = Dexsil PetroPlac soil extraction test results

TIME/DATE	SAMPLE	LOCATION	DEPTH	DESCRIPTION	HC ODOR		PID (ppm)
					NONE	MIH	
1545		SP1	2	woil SANDY SILT DARK BROWN	X	C	158
1550	199-6 e1630	SP2	2	FINE ROOTS SANDY SILT BROWN more diesel than w.o. odor	X	C	253
1555		SP3	2	septic SANDY SILT LIGHT BROWN	X	C	127
1600		SP4	2	thinner - septic FINE SAND, SILT LIGHT BROWN	X	C	395
1605		SP5	2	wo SANDY SILT BROWN septic	X	C	155
1610	199-7 e1640	SP6	2	diesel SAND LIGHT BROWN	X	C	428



SAMPLING RECORD

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PROJECT TANK CLOSURE
Re-Excavation of Tank #3 PIT

DATE 7-15-99

LOCATION MILE 8.5 KENAI SPUR HIGHWAY
DOYLE'S FUEL SERVICE

WEATHER OVERCAST
4 mph

RECORDED BY K HOLLINGSWORTH

58 °F 0900 AM ___ °F ___ PM

INSTRUMENT Microtip HL 2000 Calibrated Checked Cal.
 TEI 580 B 102 ppm at 0855

Note: PID categories are: (C)= cold, or (W)= warm. (M)= Dexsil, Petro-Flag and extractable test results

TIME/DATE	SAMPLE	LOCATION	DEPTH	DESCRIPTION	HC ODOR			PID (ppm)
					NONE	L	M/H	
7-15-99 0835		22	7	<u>BACK FILL MATERIAL</u>	?			4
		24	7		X			18
		23	7	<u>thinner</u>	X			45
		22	8		X			13
		24	8		X			10
		23	8		X			11
		22	9.2		X			2
				<u>GRAY SAND</u>				
		29	9.2		X			3
		23	9.2		X			7
		30	9.2	<u>septic → thinner</u> <u>TAKEN RIGHT AT GW</u>	X			278
		15	9.2		X			325
		21	9.2		?	X		162

PetroFLAG™ Hydrocarbon Test Kit - Field Data

PetroFLAG is a trademark of Dexsil corporation.

Date: 7.10.99

Calibration Time/Date: 1355 6-22-99

Operator: R.T. ROZAK

Calibration Temperature: 23.9°C

Location: DOYLE'S Fuel Service
UG Tank Closure, Mile 8.5 Spur Hwy

Test Temp = 21.2°C - 21.7°C
Tests @ ROZAK Garage

No.	Sample ID	Weight	Time/Date	Reading (ppm)	DF ¹	RF ²	Actual (ppm)	Comments	
1	Blank	-	1100/7.10	6 / 2	-	7/10			
2									
3									
4	11e7'	5.1	1100/7.10.99	284 / 480	2	7/10	568	W.O. pit PID = 5	
5	15e9'	5.1		4E / 1209	2		2(1209/2.6) = 4030	Shop W.O. PID = 141	
6	21e9'	5.1		512 / 326	2		1024	Shop W.O. PID = 206	
7	25e7'	5.1		81 / 48	2		162	Gas HCl PID = 52	
8	sp1	5.1		4E / 4E	2		4E x 2 ⇒ 10k+	DK Brn Stain W.O PID = 159	
9	sp2	5.0		4E / 4E	2		4E x 2 ⇒ 10k+	Stain W/DSL PID = 253	
10	sp6	5.1		148 / 95	2	✓	296	Lt Brn, Sand Dsl PID = 428	
11	Finish		1230/						
12									
13									
14	AFTER TANK 3 PIT RE-EXCAVATED								PID
15	BLANK	-		5	-	7	5	-	
16	15 at 9.2'	2g	1000/7-15-99	437	5	7	2185	325	
17	21 at 9.2'	2g		0	5	7	0	high mercury 162	
18	23 at 9.2'	2g		03	5	7	515	7	
19	29 at 9.2'	2g		0	5	7	0	3	
20	30 at 9.2'	2g	1100	32	5	7	160	high mercury 278	

¹DF = Dilution Factor. e.g., for 5 gram soil sample DF=10g/5g=2, and actual concentration equals reading times DF (reading (ppm) x DF = actual concentration).

²RF = Response Factor, selected for the hydrocarbon contamination at the site.

SAMPLING RECORD

PROJECT TANK CLOSURE - STOCKPILE CLEANUP DATE 7-15-99

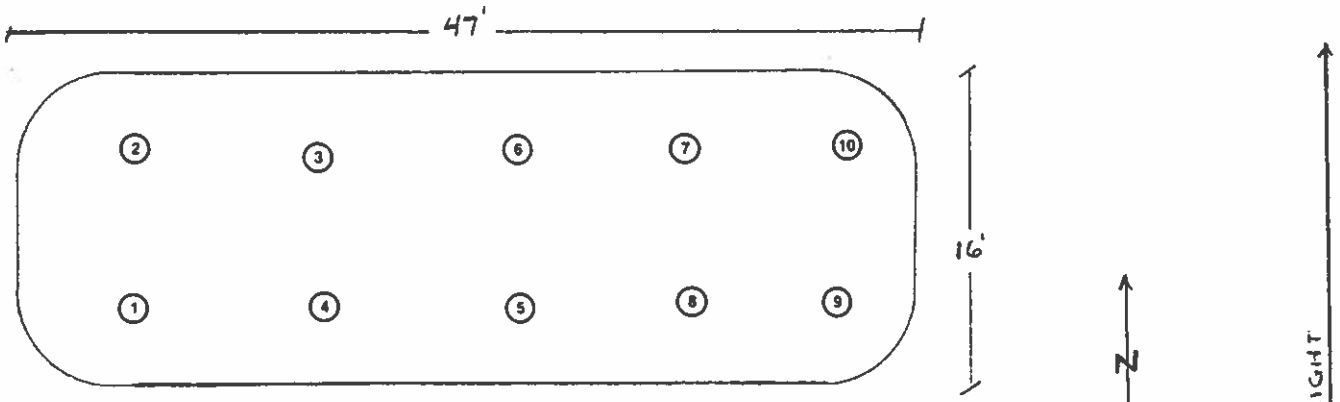
LOCATION FIELD SCREEN UNDER STOCKPILE FOOTPRINT WEATHER LIGHT RAIN

LOCATION MILE 8.5 KENAI SPUR HIGHWAY

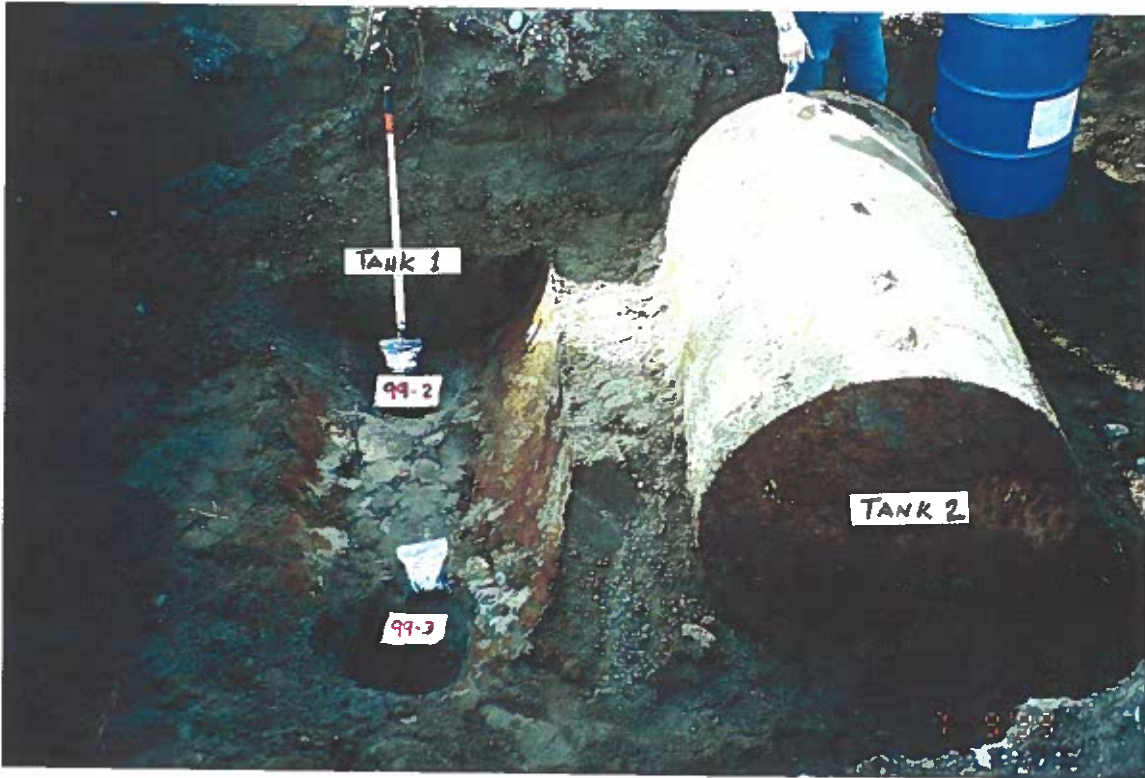
RECORDED BY RON ROZAK

INSTRUMENT Microtip HL 2000 Calibrated Checked Cal. _____
 TEI 580 B 102 ppm Note: PID categories are: (C)= cold, or (W)= warm, (H)= Oxyfil PetroPac soil extraction test results

TIME/DATE	SAMPLE	LOCATION	DEPTH BGS	DESCRIPTION	HC ODOR		PID (ppm)
					NONE/L	M/H	
7-15-99 1345		1	0-5'	GRAVEL, GRAY	X		<1
		2		SAND, BROWN septic	X		11
		3		GRAVEL, GRAY BROWN	X		2
		4		GRAVEL, GRAY	X		1
		5		GRAVEL, GRAY	X		2
		6		GRAVEL, BROWN sl. thinner	X		4
		7		GRAVEL, GRAY	X		2
		8		GRAVEL, GRAY	X		1
		9		GRAVEL, GRAY sl. thinner	X		4
✓ 1410		10	↓	GRAVEL, GRAY	X		2



AVERAGE HEIGHT = 5.5'
 APPROXIMATELY 65 CUBIC YARDS (LOOSE)



View to south. Lab sample locations shown



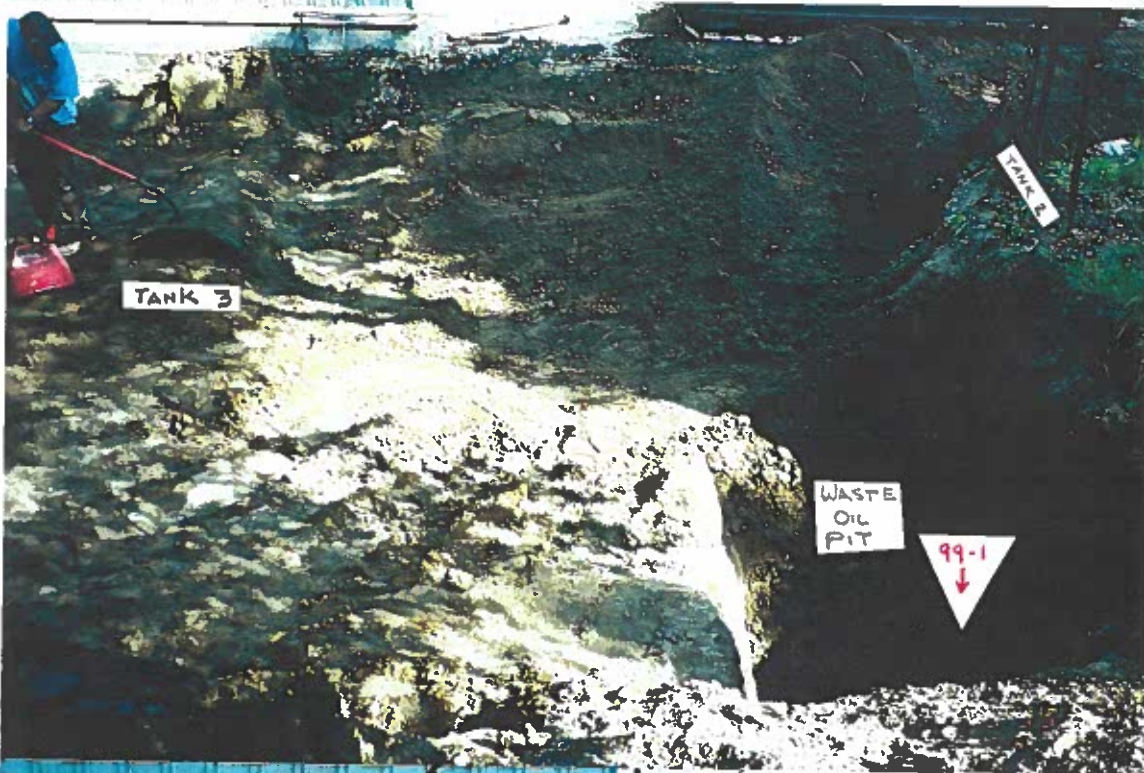
View to south. Field screening locations shown.



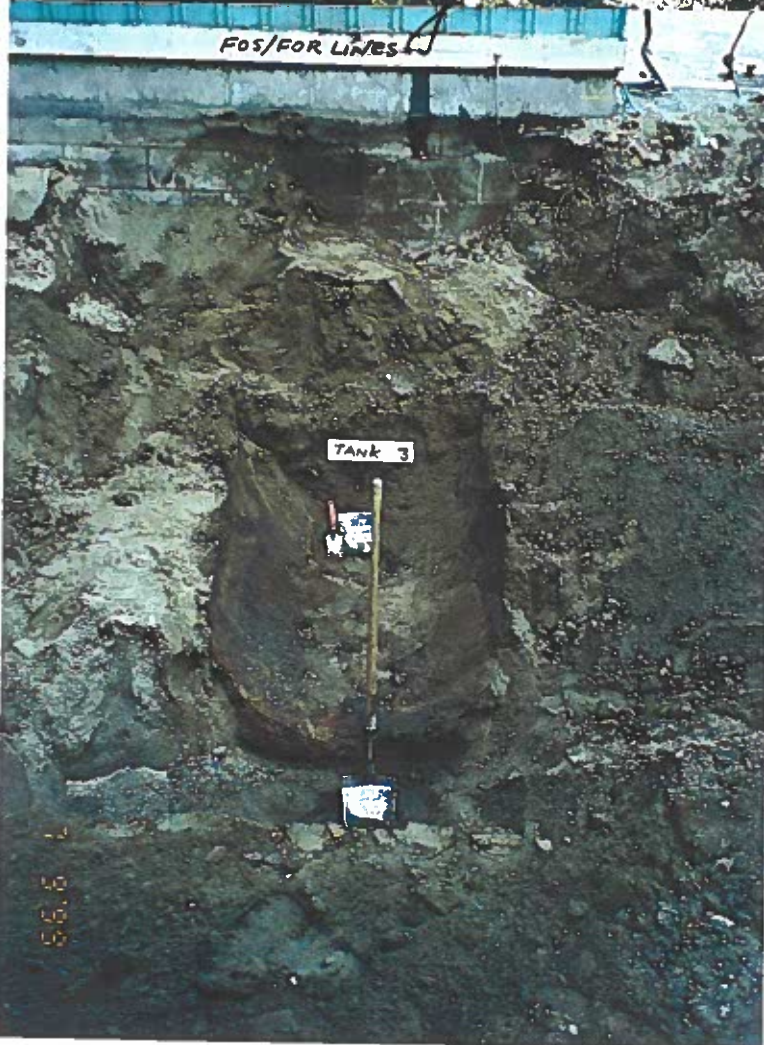
View to east



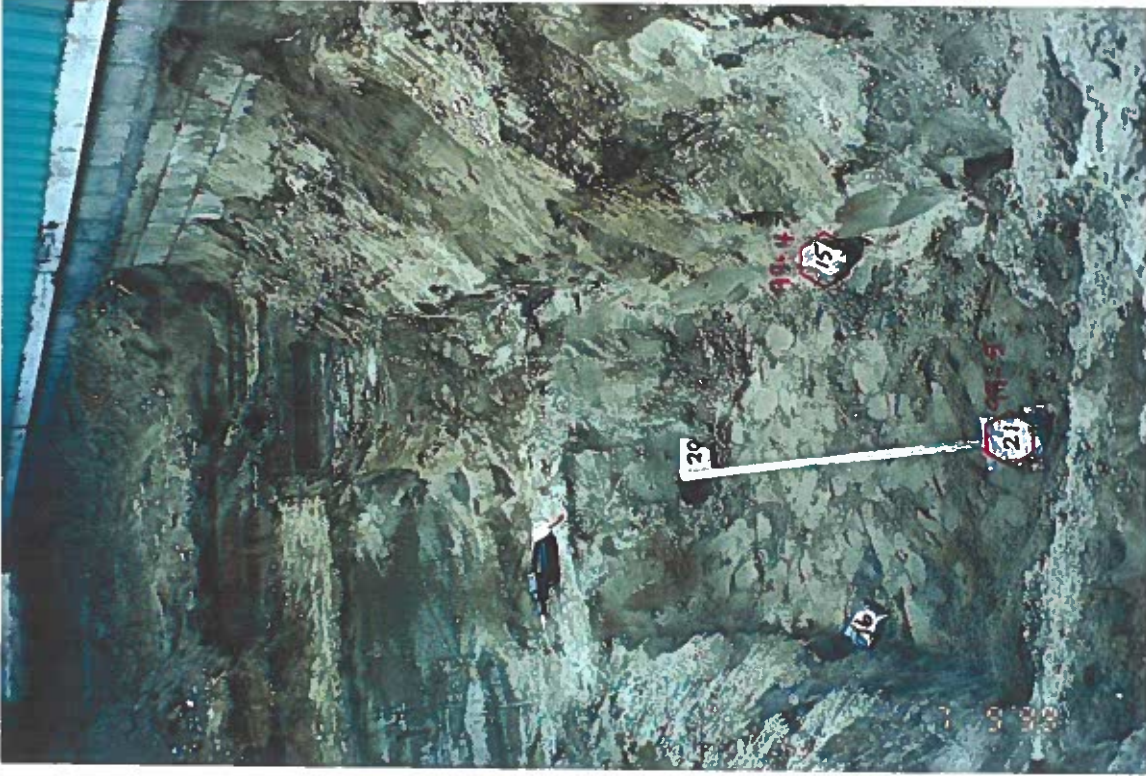
View to east. Field screening locations shown



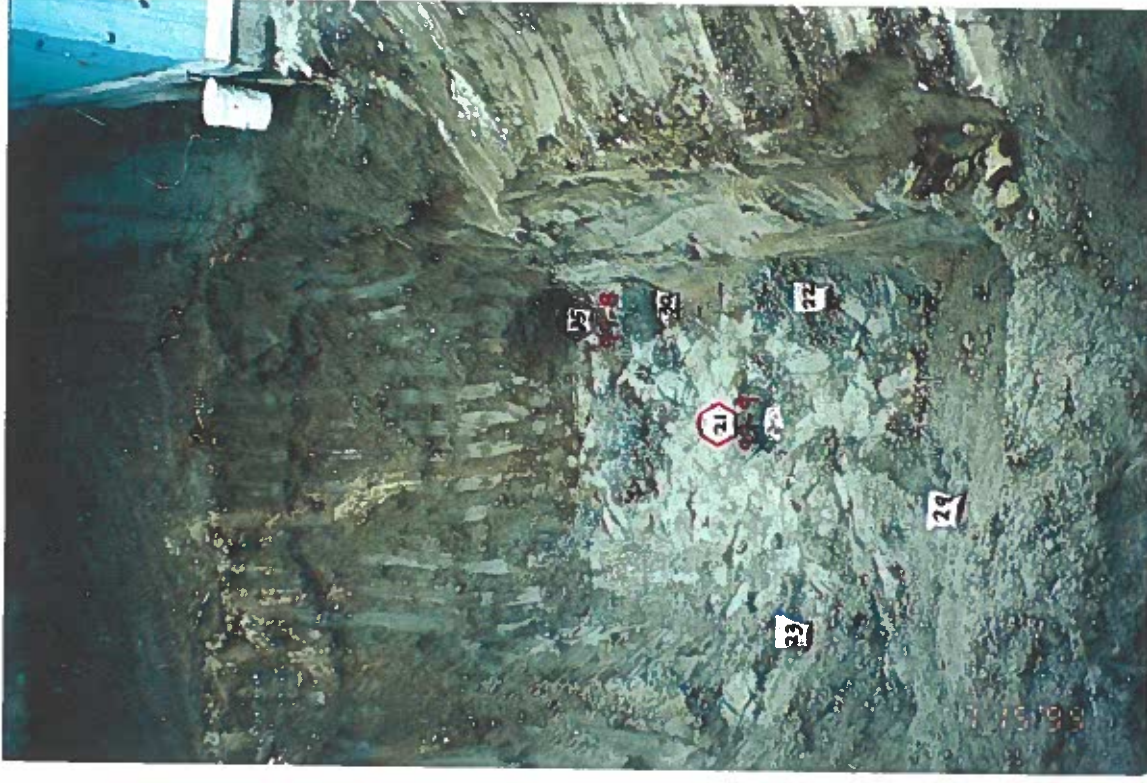
View to north.



View to north.
Lab sample locations shown



View to west, of pit bottom.
Field screening and lab sample locations shown. (7-9-99)



View to west, of pit bottom.
Field screening and lab sample locations shown. (7-15-99)