

Voluntary Cleanup Program Corrective Action Final Report

**L. Kane Tank Farm
Whitestone Logging Company
PO Box 260
Hoonah, Alaska 99892**

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Summary

Whitestone Logging Company purchased the former L. Kane Tank Farm (port USS 2577) and surrounding property from Corky Thompson in 2001 with the understanding that Whitestone would demolish the tank farm and remove associated contaminated soil.

On August 17, 1998 Jason Ginter of Smith Bayliss LeResche Inc (SBL) dug 18 shallow test pits at the tank farm to determine if the tanks had leaked and if so, to what extent. We found diesel and gasoline contamination present in 10 of the samples taken during the 1998 site investigation. Based on the footprint of our three to four foot deep test holes, we determined that at least 270 cubic yards of petroleum-contaminated material was present at the tank farm site. Laboratory analysis showed the material to contain up to 19,000 ppm diesel range organics (DRO), 1,400 ppm gasoline range organics (GRO) and 233.9 ppm total BTEX compounds (benzene, toluene, ethylbenzene, and xylenes) including 0.078 ppm benzene.

We submitted a Corrective Action Plan to Sally Schlichting at the Alaska Department of Environmental Conservation (ADEC) on October 16, 1998. Sally approved the Corrective Action Plan in her letter dated November 18, 1998. Both the Corrective Action Plan and the approval letter are attached.

On June 19, 2001 Whitestone began dismantling the tank farm. Whitestone started removing contaminated soil on June 21, 2001. Soil removal operations continued at the site until June 25, 2001. They hauled all contaminated soil removed from the L Kane Tank Farm property to their rock quarry near the Hoonah airport. The 2,000 cubic yards of soil removed from the site is stockpiled in a lined, covered cell on rock at the quarry area.

Due to the depth of the contaminated material at the west end of the excavation area, Whitestone was unable to remove all contaminated soil from the former tank farm. Soils remaining in place at depths greater than 15 feet contain DRO ranging from 540 ppm to 22,000 ppm; GRO ranging from 410 ppm to 3,500 ppm; and BTEX compounds up to 17.6 ppm. In one location benzene is present in remaining soils at 0.22 ppm.

After conferring with Bill Janes, ADEC, while working at the site, we directed Whitestone Logging to backfill the excavation area. Prior to backfilling, we added 1,000 pounds of ammonium nitrate to the excavation bottom to enhance in situ remediation. Whitestone Logging then backfilled the first 5 feet of the excavation using large shot rock material to enhance the drainage at the site for future nutrient addition and water flushing. Whitestone installed five injection points at the upslope side of the excavation for nutrient addition, and four monitoring wells down slope for future site monitoring.

Site cleanup activities, site maps showing sample locations and sample results are detailed in this report.

Statement of Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person(s) who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that falsification of information submitted to DEC, could lead to a civil action or criminal action, under any and all applicable provisions of Alaska law, including AS 46.03.760 and 46.03.790.



Site Assessment Findings and Analysis

Site

Former L. Kane Tank farm
Port USS 2577
Hoonah, Alaska

Applicant

Whitestone Logging Company
PO Box 260
Hoonah, Alaska 99892
(907) 945-3626

Contractors

Excavation and Hauling

Whitestone Logging Company

Environmental Compliance

Smith Bayliss LeResche Inc
119 Seward Street Suite #10
Juneau, Alaska 99801
(907) 586 6813

Site Description

The L. Kane Tank Farm was located off First Street in Hoonah, Alaska in a mixed zone of commercial and residential properties. Prior to the demolition of the tank farm the site was covered with dense low vegetation. The tanks were connected to elevated piping that carried fuel to the L. Kane Store and to the end of the dock directly across First Street from the store.

Sample Locations

(see Site Maps)

Site Map

(see Vicinity Map and Site Maps)

Discovery of Contamination and Previous Investigations

A Phase I Environmental Assessment conducted by Agra Earth and Environmental in July, 1997 identified diesel contaminated soils at the tank farm. Soils in the vicinity of the central tank contained 9,600 ppm diesel range organics. On August 17, 1998 Jason Ginter of Smith Bayliss LeResche Inc (SBL) dug 18 shallow test pits at the tank farm to determine if the tanks had leaked and if so, to what extent. We found diesel and gasoline contamination present in 10 of the samples taken during the 1998 site investigation.

Nature of Contamination

The contamination at the site consists of petroleum products as stored in the tank farm. Laboratory analysis from the August 1998 site investigation found up to 19,000 ppm diesel range organics (DRO), 1,400 ppm gasoline range organics (GRO) and 233.9 ppm total BTEX compounds (benzene, toluene, ethylbenzene, and xylenes) including 0.078 ppm benzene.

Sampling Results and Analysis

Source and Extent of Contamination

The contamination source was the five 20,000 gallon aboveground storage tanks at the site and the plumbing associated with the tank farm. Whitestone removed about 2,000 cubic yards of contaminated material from the site, and an unknown amount of contaminated material remains in place at the site.

Soil Sample Locations

(see Site Maps)

Horizontal and Vertical Extent of Contamination

(see Site Maps)

Migration Pathways

The contamination started at about one foot below the ground surface around the tanks and continued to the subsurface water level at about 14 feet below the ground surface directly beneath the tanks. Heading west towards Port Frederick, the contaminated lens tapered off to a "smear zone" of petroleum contamination transported by the rise and fall of the subsurface water level.

Volume of Contaminated Soil

Whitestone removed and hauled about 2,000 cubic yards of petroleum-contaminated soil to their approved stockpile site near the Hoonah airport. An unknown quantity of soil remains in place at the site.

Cleanup Level Determination

Cleanup Standards

The 1998 Corrective Action Plan and ADEC's response to the Corrective Action Plan put the cleanup standards for this site at Matrix Level B, which requires cleanup to 100 ppm for GRO and 200 ppm for DRO.

Depth to Subsurface Water

Depth to subsurface water at the site varied from 14 to 19 feet below the ground surface.

Mean Annual Precipitation

The mean annual rainfall for the Hoonah area is about 60 inches per year.

Soil Type

Soil at the site consisted of sand and silt with some gravel and cobbles throughout.

Potential Receptors

Groundwater is not used in this area. The City of Hoonah collects its water from the dam at Elephant Mountain and distributes it to the residents and businesses of Hoonah.

Corrective Action

Record searches and interviews put the age of the tank farm at over 50 years. The tanks had contained diesel, gasoline, kerosene and possibly bunker oil in the past. The oldest tank appeared to be tank #5 (as shown on figure 1). This tank was rumored to have originally had a wooden bottom, with a steel plate bottom retrofitted. It is possible that the oldest tanks had been in place for over 70 years.

On June 19, 2001 Whitestone began dismantling the five 20,000 gallon steel tanks and associated piping. Whitestone started removing contaminated soil on June 21, 2001. Whitestone contracted SBL to conduct the site assessment and sampling work during the tank farm demolition work.

Jason Ginter and Al Kegler of SBL conducted the site assessment and sampling work at the former tank farm. We field screened soils at the site using our HNU Systems Model PI-101 photoionization detector and the hot water sheen test. We used our field screening results to direct the excavation work and pinpoint where closure samples would be taken from.

Whitestone began excavation work directly under the former tank locations. We found petroleum-contaminated material to extend down to the level of the subsurface water, which we found at about 14 feet below the ground surface directly below the former tank locations. Whitestone removed contaminated soil to about two feet below the water level at the upper pit. The contaminated soil lens appeared heaviest directly below the tanks and also along the soil/water interface.

The contaminated soil lens plunged heading west away from the tank farm to depths reaching 20 feet below the ground surface, along the soil/water interface. The farther away from the former tank locations, the deeper and thinner the contaminated lens. At about 50 feet west of

the former tank locations, we had to remove between 12 and 16 feet of clean material to get to the contaminated soil at depth.

Due to the depth of the contaminated material at the west end of the excavation area, Whitestone was unable to remove all contaminated soil from the former tank farm. We took samples to characterize contaminated soil that had been left in place and to determine clean closure where appropriate. We sent all samples to ARI in Seattle, WA. ARI analyzed all samples for DRO, GRO and total BTEX compounds. Samples locations are shown on Figures 1 and 2. Sample results are listed in the following tables.

Sample Results in ppm

Sample ID	DRO	GRO	Benzene	Total BTEX
UP01	22,000	410	Nondetect	2.209
UP02	Nondetect	Nondetect	Nondetect	Nondetect
UP03	24	Nondetect	Nondetect	Nondetect
UP04	18	Nondetect	Nondetect	Nondetect
UP05	21	Nondetect	Nondetect	Nondetect
UP06	32	Nondetect	Nondetect	Nondetect
UP07	9.5	Nondetect	Nondetect	Nondetect
UP08	57	Nondetect	Nondetect	Nondetect
UP09*	1,900	3,500	0.16	7.46
UP10*	890	3,100	Nondetect	17.62
UP11	6.9	Nondetect	Nondetect	Nondetect
UP12	30	Nondetect	Nondetect	Nondetect
UP13	12	Nondetect	Nondetect	Nondetect
UP14	Nondetect	Nondetect	Nondetect	Nondetect
UP15	28	Nondetect	Nondetect	Nondetect
UP16	Nondetect	Nondetect	Nondetect	Nondetect
UP17	14	Nondetect	Nondetect	Nondetect
UP18	540	Nondetect	Nondetect	Nondetect
UP19	150	Nondetect	Nondetect	Nondetect
UP20**	7,400	210	Nondetect	1.39
UP21**	6,200	190	Nondetect	1.219
UP22	2,200	13	Nondetect	Nondetect
LK01	8	Nondetect	Nondetect	Nondetect
LK02	8.5	Nondetect	Nondetect	Nondetect

*, ** denote field duplicate samples

All samples with UP-, and LK- prefixes were taken from main excavation, within 50 feet of former tank locations.

Sample ID	DRO	GRO	Benzene	Total BTEX
FP1	5.6	Nondetect	Nondetect	Nondetect
FP2	26	Nondetect	Nondetect	Nondetect
FP3	2,200	47	Nondetect	0.537
FP4	6.1	Nondetect	Nondetect	Nondetect
FP5	6	Nondetect	Nondetect	Nondetect
FP6	9,700	620	Nondetect	7.89

Samples with the FP- prefix were taken from the west side of the excavation area, which Whitestone separated from the main excavation by a dike to prevent water from the main excavation from flowing west while contaminated soil removal was underway.

Due to the present of contaminants at depth as the excavation work continued west, Whitestone advanced two test pits west of the main work area to determine the extent of migration along the smear zone, if any. Whitestone did not remove any contaminated soil from either of the test pits. We only found petroleum-contaminated soil at the soil/water interface in the northernmost test pit. Locations of the test pits can be found on Figures 1 and 2. Laboratory results are listed below.

Test Pit Sample Results

Sample ID	DRO	GRO	Benzene	Total BTEX
WP1	5.4	Nondetect	Nondetect	Nondetect
WP2	Nondetect	Nondetect	Nondetect	Nondetect
WP3	Nondetect	Nondetect	Nondetect	Nondetect
CP1	570	830	0.220	2.41
CP2	Nondetect	Nondetect	Nondetect	Nondetect
CP3	Nondetect	Nondetect	Nondetect	Nondetect

Samples with the WP- prefix were taken from the south test pit; samples with the CP- prefix were taken from the north test pit.

We also took samples from the removed soil to characterize contaminants. About 2,000 cubic yards of petroleum-contaminated soils are stockpiled in lined, covered cells at Whitestone's rock pit near the Hoonah airport. Results are listed in the following table.

Sample ID	DRO	GRO	Benzene	Total BTEX
CZ01	8,000	580	Nondetect	4.23
CZ02	10,000	490	Nondetect	5.72
CZ03	9,300	920	0.460	20.33
CZ04	7,100	550	Nondetect	3.18
CZ05	6,100	380	Nondetect	2.82
CZ05A	12,000	720	0.095	33.875
CZ06	20,000	560	Nondetect	3.494
CZ07	17,000	590	Nondetect	3.497
CZ08	3,300	110	Nondetect	0.59
CZ09*	6,600	340	Nondetect	2.088
CZ10*	6,000	270	Nondetect	1.259
CZ11	13,000	390	Nondetect	2.73
CZ12	7,300	450	Nondetect	2.98

* field duplicate samples

Soils remaining in place at depths greater than 15 feet contain DRO ranging from 540 ppm to 22,000 ppm; GRO ranging from 410 ppm to 3,500 ppm; and BTEX compounds up to 17.6 ppm. In one location benzene is present in remaining soils at 0.22 ppm.

After conferring with Bill Janes, ADEC, we directed Whitestone Logging to backfill the excavation area. Whitestone used large shot rock to fill first five feet of the excavation areas and added 1,000 pounds of high nitrogen fertilizer. The large rock fill was used to enhance the flow of the fertilizer through the smear zone at the soil/water interface.

Conclusions

Whitestone Logging demolished and removed the five aboveground storage tanks at the site and removed all associated plumbing. Whitestone also removed 2,000 cubic yards of gasoline and diesel contaminated soil from the tank farm site. Removed soils contained up to 20,000 ppm diesel and 920 ppm gasoline. All soil removed from the site is currently stockpiled in a lined, covered cell, constructed of 10-mil polyethylene tarps with log shoring. The stockpile cell is located at Whitestone's rock quarry near the Hoonah airport.

An unknown quantity of contaminated soil remains in place at the site. Field observations, confirmed by laboratory analysis, showed that the majority of the gross contamination has been successfully removed from the site. Closure samples with sample results exceeding ADEC cleanup levels show that the contaminants left in place are at or below the soil/water interface at depths greater than 15 feet below the ground surface. Visual observation and the laboratory results show the contaminants at the site as weathered.

Whitestone extended all excavation areas to the water table. We did observe a slight sheen on the water in the main excavation area and deployed sorbent pads to collect any product that may be present. Sorbent recovery was minimal. We did not find free product in any of the excavation areas.

The vertical extent of the contaminated area dwindled to a thin "smear zone" about 70 feet west and down gradient of the tank farm. Whitestone advanced two test pits farther west of the main excavation area to determine how far this smear zone extended. We found soil with elevated field screening readings in one of the test pits, and only at the groundwater interface. The laboratory sample taken from this material contained 570 ppm diesel and 830 ppm gasoline.

With ADEC consent, Whitestone filled in the excavation area, having reached the feasible limits of the contaminated soil removal operations. Whitestone added 1,000 pounds of ammonium nitrate fertilizer to the soils left in place to assist in in-situ remediation. Whitestone also used large shot rock fill for the first five feet of fill material when backfilling the excavation area for additional pore-space for aeration, again to assist in in-situ treatment of the remaining contaminated material.

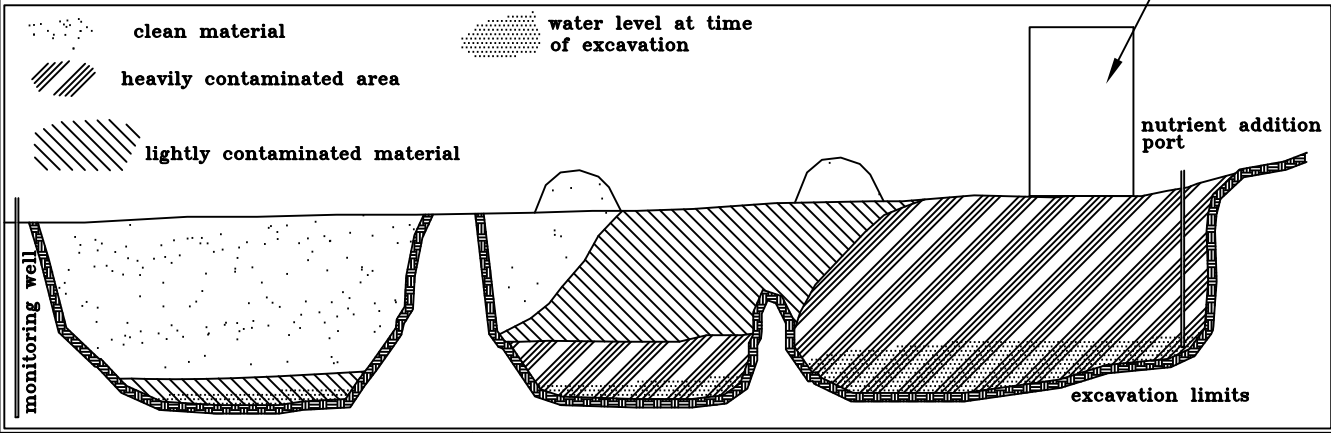
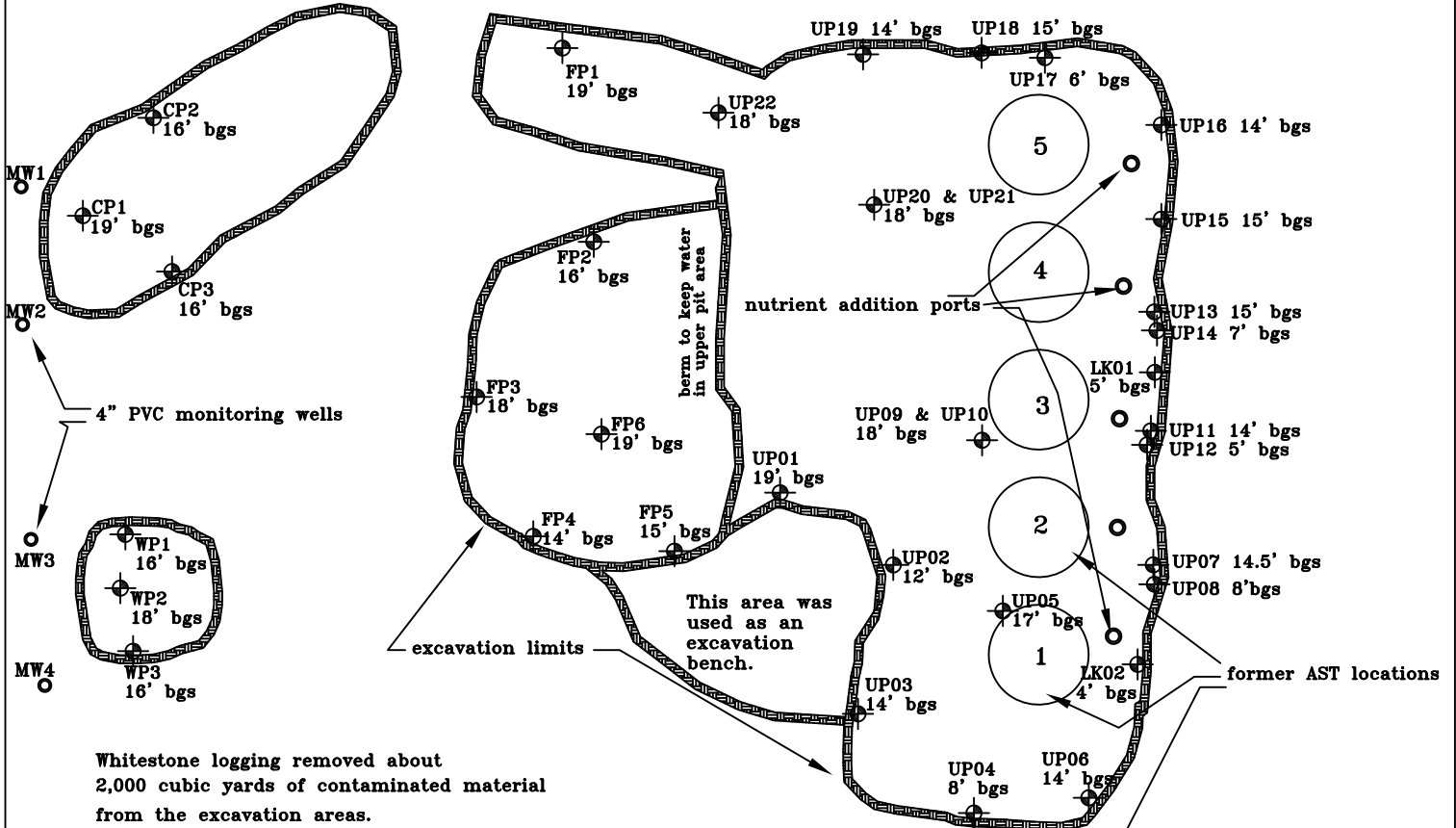
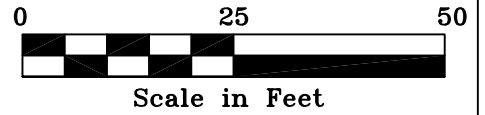
Whitestone installed five nutrient addition ports above (east of) the former tank farm area, and four monitoring ports below (west of) the excavation areas. These ports can be used for nutrient addition and to monitor the effectiveness of site remediation efforts.

We found that Whitestone Logging removed the bulk of the contaminated material from the site, and that the site is a good candidate for in-situ treatment and monitoring. Whitestone plans to aerate and add fertilizer to soils currently stockpiled at their Hoonah airport quarry. This material may be suitable for inclusion in future asphalt paving projects in Hoonah.

Jason Ginter
Environmental Chemist
Smith Bayliss LeResche Inc
24 April 2002



UP22
18' bgs denotes sample location and depth below ground surface



Sampled by J Ginter and A Kegler, 6/21 - 6/25/01
Lab: ARI, Seattle WA

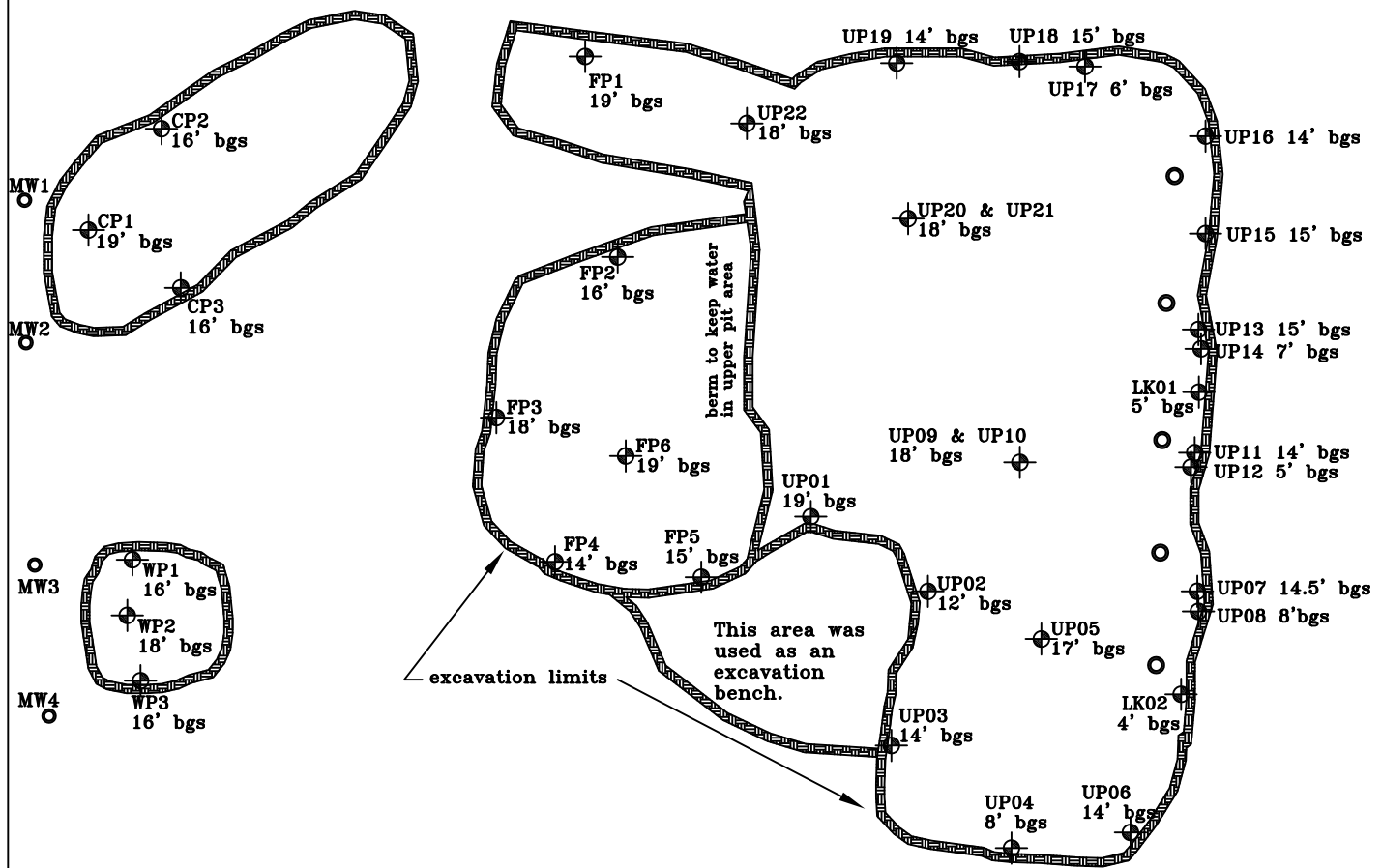
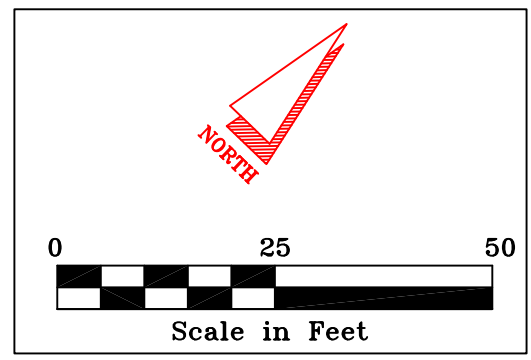
ACAD 8/21/01 by JGG

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Client: Whitestone logging
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Project: L Kane tank farm



UP22
18' bgs denotes sample location and depth below ground surface



Sample Results in parts per million (ppm)

sample#	UP01	UP02	UP03	UP04	UP05	UP06	UP07	UP08	UP09	UP10	UP11	UP12	UP13	UP14	UP15
Diesel range	22,000	n/d	24	18	21	32	9.5	57	1,900	890	6.9	30	12	n/d	28
Gasoline range	410	n/d	n/d	n/d	n/d	n/d	n/d	n/d	3,500	3,100	n/d	n/d	n/d	n/d	n/d
Total BTEX	2.209	n/d	n/d	n/d	n/d	n/d	n/d	n/d	0.16	890	n/d	n/d	n/d	n/d	n/d
Benzene	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	7.46	17.62	n/d	n/d	n/d	n/d	n/d

sample#	UP16	UP17	UP18	UP19	UP20	UP21	UP22	LK01	LK02	FP1	FP2	FP3	FP4	FP5	FP6	CP1	CP2	CP3	WP1	WP2	WP3
Diesel range	n/d	14	540	150	7,400	6,200	2,200	8	8.5	5.6	26	2,200	6.1	6	9,700	570	n/d	n/d	5.4	n/d	9.6
Gasoline range	n/d	n/d	n/d	n/d	210	190	190	n/d	n/d	n/d	n/d	47	n/d	n/d	620	830	n/d	n/d	n/d	n/d	n/d
Total BTEX	n/d	n/d	n/d	n/d	1.39	1.219	n/d	n/d	n/d	n/d	n/d	0.537	n/d	n/d	7.89	2.41	n/d	n/d	n/d	n/d	n/d
Benzene	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	0.22	n/d	n/d	n/d	n/d	n/d

Sampled by J Ginter and A Kegler, 6/21 - 6/25/01
Lab: ARI, Seattle WA

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ACAD 8/21/01 by JGG