SITE ASSESSMENT REPORT
FOR
SALCO INDUSTRIAL SERVICE
MONROE, MONROE COUNTY, MICHIGAN
TDD # TO5-9410-169
PAN # EMI0647SAA
DOCUMENT CONTROL #: TAT-05-25-05109

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1. INTRODUCTION

On October 28, 1994, the United States Environmental Protection Agency (U.S. EPA) tasked Ecology & Environment, Inc. (E & E), Technical Assistance Team (TAT) to conduct a site assessment at the Salco Industrial Service (SIS) site, Monroe, Monroe County, Michigan. Tasks were to be completed under Technical Directive Document (TDD) Number T05-9410-169. The specific tasks for the TAT included: prepare and implement a health and safety plan; compile available information; perform a site assessment, including air monitoring; prepare and implement a site sampling plan; and provide photo and written documentation of activities to evaluate the threat to human health and the environment. These activities were to be conducted at the Salco Industrial Service facility to evaluate the site's threat based on Title 40 Code of Federal Regulations (CFR) 300.415, National Contingency Plan (NCP). TAT members (TATMs) performing the assessment included Michael Dieckhaus, Karen Smith, Kristin Ahlgren, and John Doerr.

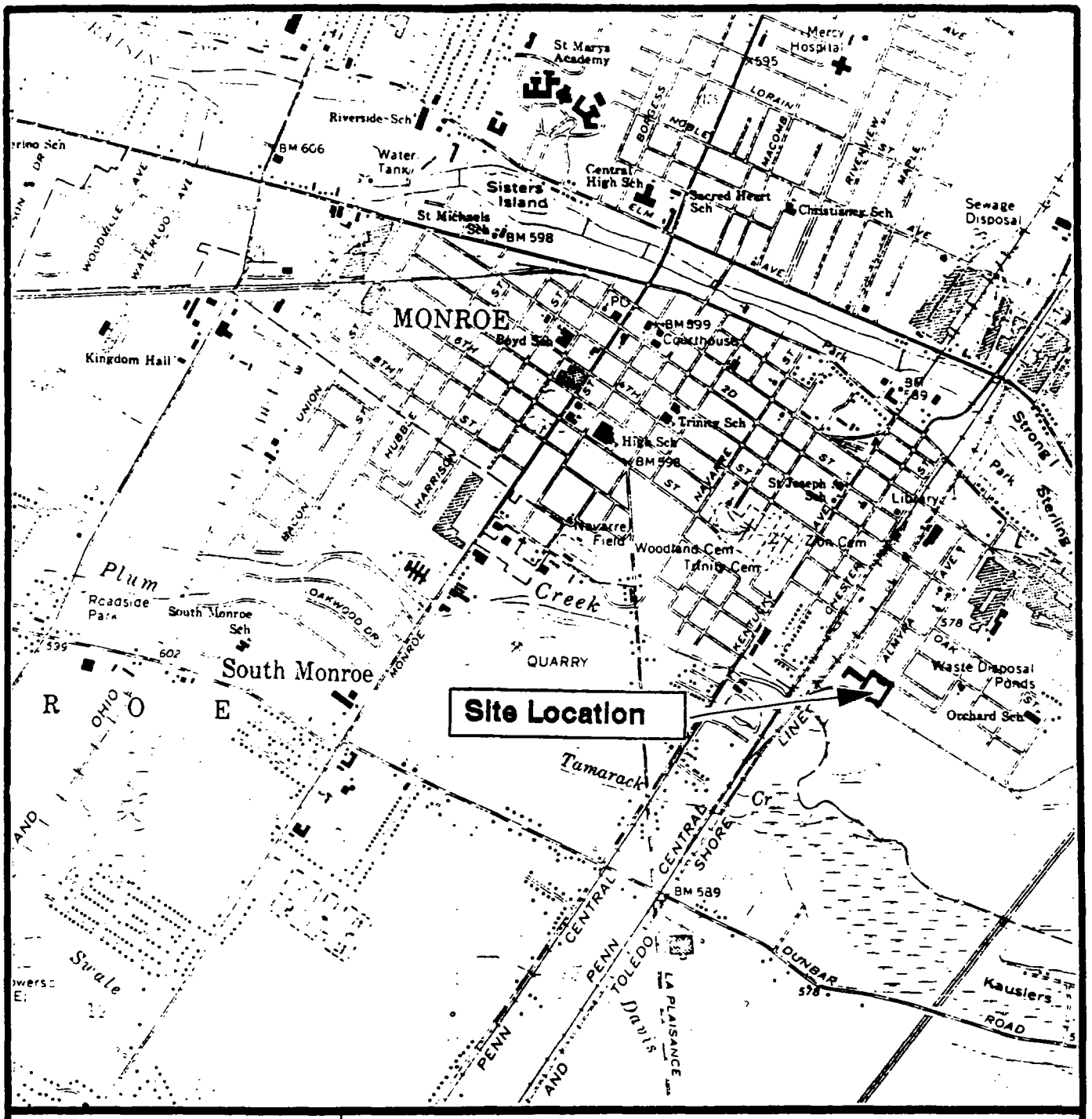
2. BACKGROUND

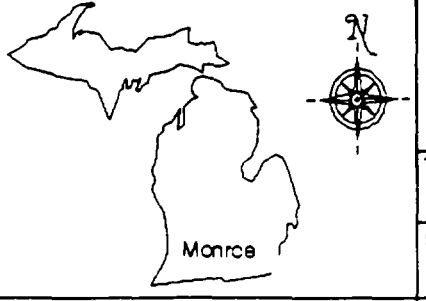
2.1 SITE DESCRIPTION

The SIS facility, approximately 1-acre in size, formerly generated, transported, and stored hazardous waste and waste petroleum products. The non-operational facility, located at 704 Conant Street, is situated in the northwest quarter of the southwest quarter of Section 8, T7S, R9E (coordinates 41° 54' 9" north, 83° 23' 6" west) in Monroe, Monroe County, Michigan (Figure 2-1). The site consists of an aboveground storage tank (AST) farm with 23 ASTs of various sizes with combined capacity in excess of 200,000 gallons, an office/storage building, 2 roll-off boxes, and a tanker truck (Figure 2-2). According to verbal reports, a previous inventory of the tanks included hazardous and nonhazardous liquids; however, there are no formal records available regarding this information. The facility is surrounded by a chain link fence with a locked sliding gate on the eastern boundary of the site. The fence, however, has a 3-feet wide gap on the south perimeter.

The site is situated in a general manufacturing and residential area that is approximately ½ of a mile west of highway I-75. The property is bordered by Wood Street to the north, Conant Street to the east, the right-of-way for the Detroit and Toledo Shore Line railroad to the south, and a casting facility to the west. The north side of Wood Street consists of a residential area, and a composting facility for the City of Monroe is located to the south of the railroad.

The facility is located approximately ¾ mile to the southeast of the downtown area of Monroe. The Orchard School is





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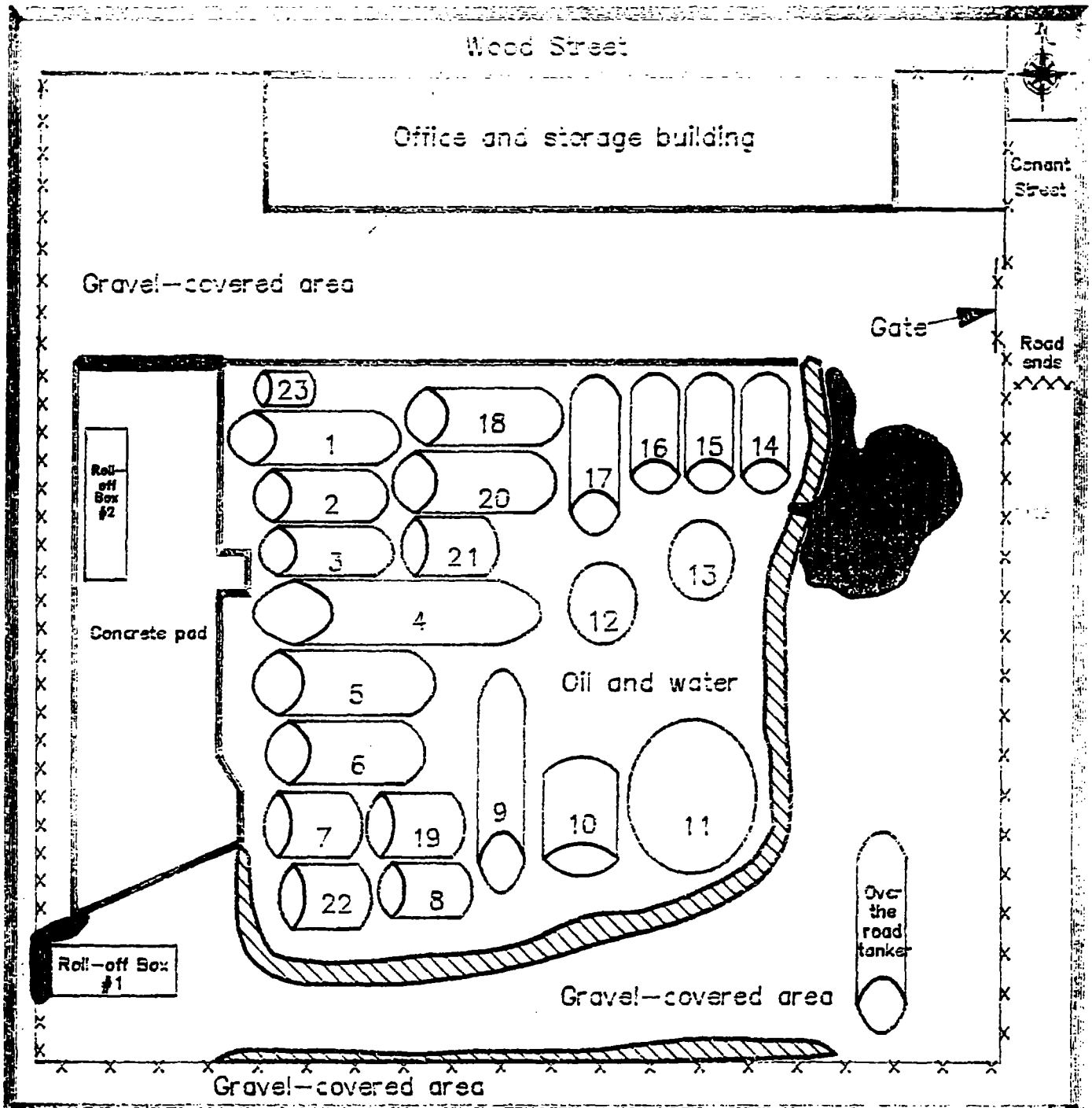
Technical Assistance Team
Region V

TITLE: Site Location Map		FIGURE #: 2-1
SITE: Salco Industrial Service		SCALE: 1:24000
SOURCE/DATE: USGS 7.5 Minute Series Monroe, Michigan Quadrangle 1979	CITY: Monroe STATE: Michigan	TDD #: T05-9410-169



LEGEND

- Weeds
- 6 foot chain link fence
- 6 foot wood fence
- Earthen berms
- 3 foot high concrete wall
- Oil-stained soil

SOURCE/DATE
Ecology & Environment, Inc.
February 24, 1993

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TITLE: Site Features Map	FIGURE #: 2-2
SITE: Saico Industrial Services	SCALE: None
CITY: Monroe STATE: Michigan	TDD #: T05-9410-169

situated approximately 1/3 of a mile to the west of the site. Plum Creek, a tributary of Lake Erie, is located approximately 900 feet to the southwest of the site.

Soils in the area of the site are typically silty clay loam of the Lenawee series, which are very poorly drained and moderately slowly permeable soils on lake plains. Slopes formed by these soils are between zero and two percent and are thus nearly level.

2.2 SITE HISTORY

According to file information, the earliest known date of waste storage at the facility was October 5, 1979, when Salco Inc., the operating company name at the time, moved to the site and initiated waste storage. In August 1980, Salco Inc., received a U.S. EPA generator, transporter, and treatment, storage, and disposal facility number. On July 2, 1984, a letter from U.S. EPA to Salco approved a modified closure plan for the facility. U.S. EPA sent a letter to Salco on May 1, 1986, which requested a closure certification from the owner/operator, requested submittal of a plan to investigate and cleanup hazardous waste released from tank #6, and required a clean closure at the site.

According to MDNR files, on February 15, 1988, ownership of Salco, Inc., was exchanged. On September 24, 1991, the current owner of the property agreed to an order by MDNR to remove wastes from the tank farm. Approximately 13,500 gallons of waste oil; 11,700 gallons of contaminated rainwater from the tank secondary containment area and an underground storage tank (UST), which collected rinsate from the loading and unloading pad; and some peripheral solid waste was removed for disposal.

On January 21, 1992, in a letter to MDNR, an individual associated with the site expressed an interest in correcting problems at the facility and in performing on-site oil reclamation. At the time, the tank farm consisted of 22 ASTs, each full of primary waste oils. The combined tank contents were

approximately 200,000 gallons of waste oils. On October 2, 1992, the aforementioned individual documented in a letter to MDNR that he never received the funding or time to initiate his oil reclamation operations at the site and was no longer associated with the property. MDNR determined in December 1992, that Salco, Inc., had performed no demonstrable cleanup of the site.

On March 2, 1993, the current owners purchased the title to the property, facility, and tank wastes. In April 1994, in an attempt to get the owners to clean up the site, the City of Monroe issued a Blight Violation notice to the new owners for conditions including; the deteriorating building, high weeds, abandoned tires, and old drums.

On June 20, 1994, MDNR met with a representative of the current owners who agreed to remediate the tank farm, including disposal of the wastes. The owner claimed that samples had been collected from all of the tanks in January and February 1994. The sample results were not made available at the time of the meeting, and follow-up letters from MDNR to the owner in July 1994, obtained no response.

In September 1994, the City of Monroe documented in a letter to MDNR that the building was deteriorated (leaking roof and structurally unsound wall on south side), the perimeter of the site was not secure, and the area around the tanks was stained with an unknown material.

On September 9, 1994, MDNR requested assistance from the U.S. EPA Resource Conservation and Recovery Act (RCRA) program. On October 6, 1994, the SIS site was referred from the U.S. EPA Region V RCRA Enforcement Branch to the U.S. EPA Region V Office of Superfund, Emergency Response Branch for assessment of the site's potential threats. On October 24, 1994, U.S. EPA On-Scene Coordinator Rose Ellison was assigned to the site. On November 2, 1994, a meeting was held in Monroe between U.S. EPA, MDNR, the City of Monroe attorney, and the director of the wastewater treatment plant concerning the site. At that time, MDNR provided analytical results from one of the oil samples that they obtained

from the owner's contractor. The analytical results indicated that the oil had no concentrations of arsenic, cadmium, chromium, lead, or polychlorinated biphenyls (PCBs) above regulatory levels. The total halogen results were approximately 10,490 parts per million (ppm) for the oil sample. No other analytical results have been received by the MDNR. From November 1994 to February 1995, the U.S. EPA attorney worked to gain access to the site to enable U.S. EPA to conduct a site assessment. Access was granted by the owner's attorney on February 10, 1995.

3. SITE ACTIVITIES

On February 16, 1995, U.S. EPA OSC Rose Ellison and TATMs Dieckhaus, Smith, Ahlgren, and Doerr met at the SIS facility. The assessment team established a support zone to the west of the office building and to the north of the tank containment area. As the set-up was completed, Mi-Jack Lift Products delivered a Simon AT-60 articulating personnel lift. The personnel lift would be used for sampling tanks which were elevated and only had deteriorating ladders to provide access. The assessment team conducted an exterior reconnaissance of the site in Level D personal protective equipment (PPE). The ambient temperature was approximately 30°F with partly cloudy skies. Air monitoring was conducted using a Microtip Photoionization Detector (PID) and a Thyac II radiation meter. Background readings during the exterior assessment were 9 parts per million (ppm) and <0.03 milliRems per hour (mR/h), respectively. The PID readings were probably elevated due to the composting area situated to the south of the site, which contained decaying leaves, brush, grass, wood, and other organic matter.

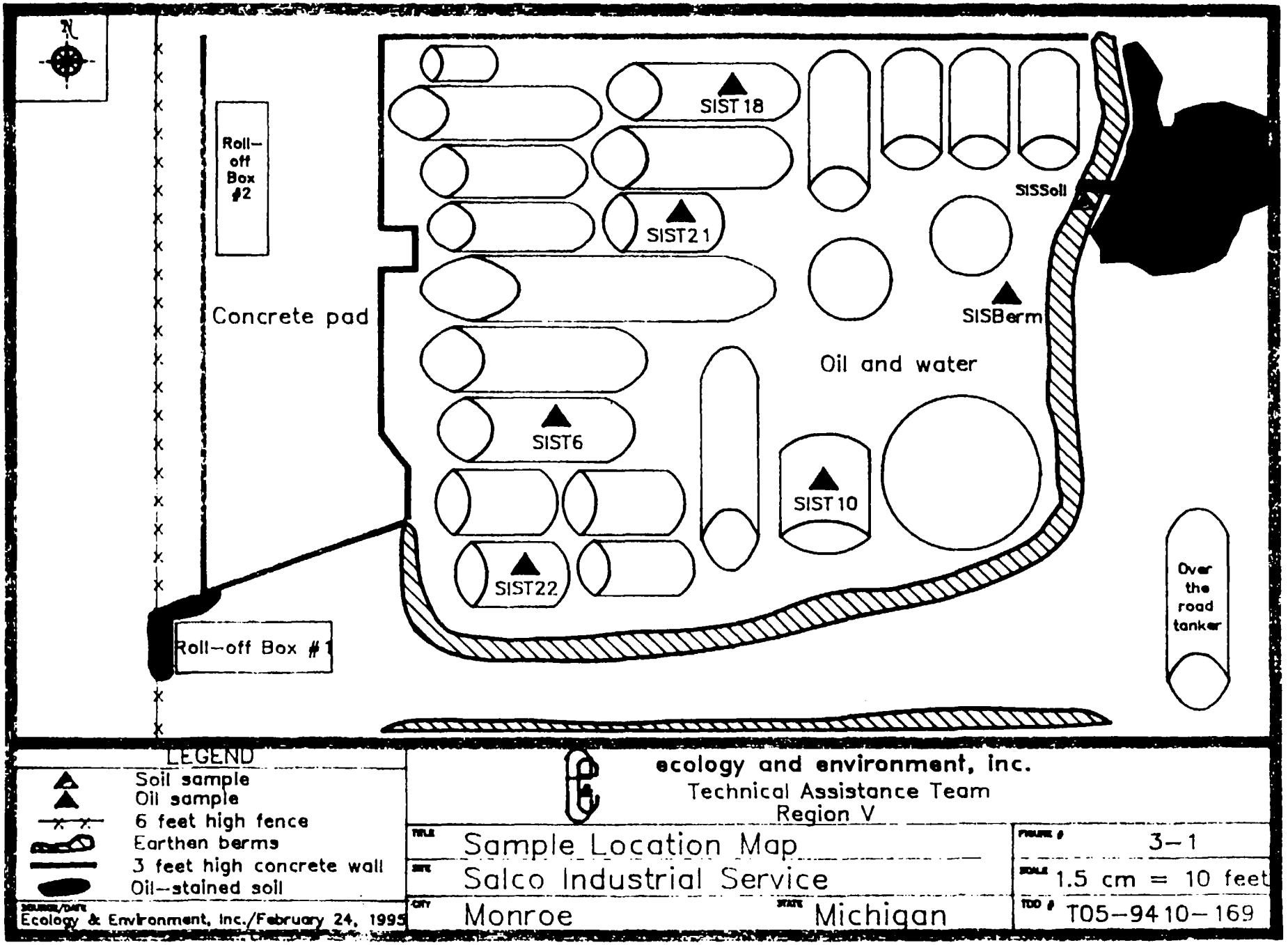
An office/storage building was located on the northern portion of the property. One personnel door was located on each of the south and east sides of the building. There were also two garage doors located on the south side of the building. The personnel door on the south side of the building was open, and windows along that wall were broken. A below-grade area for truck loading and unloading was located to the south of the eastern garage door and was filled with sections of 8-inch corrugated-plastic hose (see photographs in Appendix A).

The AST containment area, which was approximately 90 feet from east to west and 80 feet from north to south, had a 3-feet high concrete wall along its north perimeter and along a 70-feet section of the west perimeter. An earthen berm approximately eight inches high was present on the east, south, and a portion of the west perimeters of the containment area. There was approximately four inches of oil and frozen water standing throughout the containment area. One section of the east earthen berm showed evidence that in the past, oil had overflowed from the containment area to the gravel and soil beyond the containment area. Surface soil and gravel were visibly stained in this area, and the dimensions of the stain were approximately 30 feet from east to west and 20 feet from north to south (Figure 2-2).

There were 23 ASTs inside the containment area, 3 of which were upright, vertical tanks, and the remaining 20 were horizontal tanks (Figure 3-1). The tanks have a estimated combined capacity of 215,000 gallons. Most of the hatches and access ports on the tops of the tanks were either uncovered or partially covered, which allowed rainwater to collect inside the tanks and cause overflow of contents into the containment area. All of the tanks appeared to be rusted and in a deteriorating state.

The exterior of each tank had previously been numbered, so in most cases, these numbers were utilized for assessment and sampling purposes. The horizontal tanks were butted closely together and most had grated walkways connecting one tank to another. Tank #8, located in the south portion of the containment area, had a three feet wide by two feet high hole cut in the top of the tank. A dark stain under the hole on the exterior of tank #8 indicated that the material in the tank had overflowed into the containment area.

Two roll-off boxes were located on the western portion of the site. A 20 cubic yard roll-off box, designated as roll-off box #1, was located near the southwest corner of the site. This


N
Roll-off Box #2
SIST 18
SISSoil
SIST 21
Concrete pad
SISBerm
Oil and water
SIST6
SIST 10
SIST22
Roll-off Box #1
Over the road tanker
LEGEND
Soil sample
Oil sample
6 feet high fence
Earthen berms
3 feet high concrete wall
Oil-stained soil
Ecology & Environment, Inc./February 24, 1995
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Technical Assistance Team
Region V
TITLE Sample Location Map
SITE Salco Industrial Service
CITY Monroe
STATE Michigan
FIGURE # 3-1
SCALE 1.5 cm = 10 feet
TDD # T05-9410-169

roll-off box was covered with a heavy tarpaulin. Oil staining on the exterior west side of the box and on the soil located under the west side of the box indicated that an oily material was leaking. Oil-stained soils extended from the west side of the box, under the fence, and onto the facility directly west of the site.

The second roll-off box, designated roll-off box #2, was approximately 42 cubic yards in volume. Roll-off box #2 was covered with a black tarpaulin and was located in a concrete-lined area west of the tank containment area. The concrete-lined area was surrounded on the west, south, and east sides by a 3-feet high concrete containment wall. The concrete floor of this area was approximately 1 foot below the ground level of the area directly north. The concrete-lined area was filled with ice and water, but oil-stained soil was evident along the north side. The oil-stained soil was visible on the south edge of a gravel area, which slopes down to the concrete containment area.

Gravel covered most of the site not already included in the tank containment area, concrete containment area, and building. The gravel appeared to have been recently laid between the building and the concrete containment area. Additional gravel on the site created roadways to the north, east, and south of the tank containment area. An earthen berm was located along the south side of the site along the property fence. This berm stretched the length of the tank containment area on the south side of the gravel access road. Additional gravel, of the same type that was on site, was lying in an area south of the property fence in the railroad right-of-way. An over-the-road tanker was located near the southeast corner of the site.

After completion of the site reconnaissance, the assessment team divided into two groups. The first group, consisting of TATMs Smith and Doerr, performed an examination in Level B PPE of the interior of the building and contents of roll-off box #1. The second group, consisting of TATMs Dieckhaus and Ahlgren, used

the personnel lift and began to air monitor and check the contents of the vertical tanks.

The interior building reconnaissance found that the structure was primarily empty except for three drums that were discovered in the southern portion of the building near the furnace. Only one of the three drums appeared to have material in it. This drum was approximately 2/3 full and was labelled "Kerosene". Air monitoring conducted with the PID, combustible gas indicator (CGI), and radiation meter indicated no levels above background inside the building. The examination of the contents of roll-off box #1 revealed that the box was covered with two tarpaulins and lined with polyethylene sheeting that also covered the top of the material in the box. The material was not visible, and air monitoring of the space under the tarpaulins registered 2 ppm above background on the PID and at background levels with the CGI.

After completion of the building and roll-off box reconnaissance, the first assessment group with OSC Ellison began air monitoring, measuring the dimensions, checking the contents, and sampling the horizontal tanks that were less than 10 feet in height and were readily accessible by stairs, ladders, and grated walkways. This included all tanks except tanks #10, 11, 12, and 13, which were accessed and sampled from the personnel lift by the second group.

Air monitoring of most of the tanks indicated that the head space of the tanks contained organic vapor levels between 1 and 43 ppm above background on the PID, but the material in the tanks, when exposed to air during sampling, only emanated organic vapors between 1 and 4 ppm. CGI readings of all of the tanks' head spaces at the time of sampling were at background. The aforementioned readings allowed both groups to complete tank sampling in Level C PPE with continued air monitoring.

Both groups conducted air monitoring and measurements of the tanks and their contents. Measurements of the material contained in the tanks that were greater than 10 feet in height were

obtained by sending a weighted measuring tape to the bottom of the tank. The contents of the tanks that were less than 10 feet in height were measured with a metal pole. The dimensions of the tanks were also measured at this time with the measuring tape. The estimated capacities were calculated from the dimensions (tank dimensions and calculated capacities were recorded on the tank data sheets found in the sampling plan in Appendix B). Descriptions of the material and any multi-layers in the tanks were recorded when the tanks were sampled. The tank capacities, descriptions of the contents of the tanks, analytical results, and removal plans for each tank are presented in Table 1.

The assessment team sampled 22 tanks in the tank containment area. One sample was collected from each of the 22 tanks, but tank #23 was not sampled as it was found to be empty. Tank samples were labelled, "SIST" along with a number corresponding to the tank number. The sampling revealed that the tanks contained oily liquids varying in color from brown to black and in viscosity from liquid to sludge.

In addition to the tank samples, OSC Ellison instructed TATMs Dieckhaus and Ahlgren to collect a sample of the oil from the tank containment area and a soil sample from the visually-contaminated area east of the earthen berm. A sample of the oil was collected from the east side of the containment area near tank #13. The oil sample, collected from the containment area, was designated SISBerm. The soil sample was collected at the breach in the earthen berm from soil that was black and oily. The soil consisted of sand, loam, and gravel, and the sample was designated sample SISSoil.

TATMs Dieckhaus and Ahlgren, upon completion of sampling, covered the large hole in the top of tank #8 with polyethylene sheeting, duct tape and a wooden board. This measure was taken per OSC Ellison's instructions to limit precipitation entering the tank and causing the contents to overflow into the containment area.

TABLE 3-1
Salco Industrial Service Site
Tank Information

TANK #	CONTENTS	CAPACITY (gallons)	VOLUME (gallons)	ANALYTICAL (results in ppm)	TANK ACTION
1	2 feet dark brown liquid 0.5 feet black sludge 1 foot light brown liquid 3 feet unknown material	8,056	2,302 575 1,150 3,453	NA	TBD
2	2 feet dark brown liquid 1 foot black sludge 3 feet unknown material	6,042	1,726 863 2,589	NA	TBD
3	2 feet dark brown liquid 1 foot black sludge 3.5 feet unknown material	6,042	1,726 863 3,021	NA	TBD
4	8 feet 9 inches brown liquid	21,878	21,270	NA	TBD
5	6 feet brown liquid	13,793	9,195	NA	TBD
6	3 feet brown/black liquid 3 feet brown/black liquid 2 feet green/white sludge	9,959	3,735 3,735 2,489	Total halides 4,200 PCB 1254 2 PCB 1260 1.2	TBD
7	2 feet dark brown liquid 1 foot black sludge 4.5 feet unknown material	6,013	1,503 752 3,382	NA	TBD
8	2 inches dark brown liquid 2 inches clear solid (ice) 6 ft 2 inch light brown liquid 6 inches sludge	4,624	103 103 3,802 308	NA	TBD
9	1 foot dark brown liquid 6 inches black sludge 6 feet light brown liquid	8,753	1,167 584 7,002	NA	TBD
10	9 feet yellow/black liquid 1 foot black sludge	10,358	8,878 986	Total halides 9,100 Benzene 0.781 * Tetrachloroethylene 2.54 *	TBD

NA = not analyzed
TBD = to be determined

* These were analyzed under the toxocity characteristic leaching procedure (TCLP).

TABLE 3-1 (cont.)
Salco Industrial Service Site
Tank Information

TANK #	CONTENTS	CAPACITY (gallons)	VOLUME (gallons)	ANALYTICAL (results in ppm)	TANK ACTION
11	2 feet brown/black liquid 6 inches brown/black ice 7.5 feet brown/black liquid	28,185	4,698 1,174 17,616	NA	TBD
12	22 feet green/brown liquid	13,505	12,918	NA	TBD
13	3 feet clear liquid 14.5 feet black sludge 2 feet clear liquid	13,505	1,762 8,514 1,174	NA	TBD
14	6 feet brown liquid 2 feet brown sludge	6,013	4,510 1,503	NA	TBD
15	3 feet brown liquid 5 feet brown sludge	6,013	2,255 3,758	NA	TBD
16	6 feet brown liquid 2 feet brown sludge	6,013	4,510 1,503	NA	TBD
17	6 feet brown liquid 2 feet brown sludge	8,080	6,060 2,020	NA	TBD
18	6 feet brown liquid 2 feet brown sludge	9,031	6,774 2,257	Total halides 13,000	TBD
19	2.5 feet brown liquid 6 inches black sludge 4.5 feet unknown material	6,013	1,879 376 3,382	NA	TBD
20	8 feet brown liquid	9,776	9,776	NA	TBD

NA = not analyzed
TBD = to be determined

TABLE 3-1 (cont.)
Salco Industrial Service Site
Tank Information

TANK #	CONTENTS	CAPACITY (gallons)	VOLUME (gallons)	ANALYTICAL (results in ppm)	TANK ACTION
21	8 feet brown liquid	7,896	7,896	Total halides 7,200 PCB 1248 72	TBD
22	2.5 feet dark brown liquid 1 foot black sludge 4 feet unknown material	5,073	4,755	Total halides 9,100 PCB 1248 260	TBD
23	Empty	3,000	0	NA	TBD
	TOTAL:	217,621	198,332		

NA = not analyzed
TBD = to be determined

At the conclusion of sampling, OSC Ellison instructed the TAT assessment team to send five tank oil samples, the containment oil sample, and the soil sample for laboratory analysis. These samples were removed from the site when the assessment team departed at the end of the day. The remainder of the tank samples were packaged in coolers, sealed with Chain-of-Custody seals, and left inside the on-site building (see copies of these Chain-of Custody forms in the sampling plan in Appendix B). The assessment team locked and secured the gate and departed after packaging the samples for transport.

The soil sample, five tank oil samples, and one containment oil sample were stored on ice in a sample cooler and hand delivered on February 17, 1995, to Biological and Environmental Control Laboratories, Inc. (BECL), 615 Front Street, Toledo, Ohio. These soil and oil samples were analyzed for toxicity characteristic leaching procedure (TCLP) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, pesticides, and herbicides, as well as PCBs, flash point, pH, total organic halides (TOX), and reactive cyanide and sulfide.

4.0 ANALYTICAL RESULTS

Samples collected from the SIS site were obtained in accordance with the site sampling plan (Appendix B). The soil sample, five tank oil samples, and one containment oil sample were analyzed according to U.S. EPA Solid Waste 846 Methods by Biological and Environmental Control Laboratories, Inc. (BECL), Toledo, Ohio. These samples were analyzed for TCLP VOCs, SVOCs, metals, pesticides, and herbicides, as well as PCBs, flash point, pH, TOX, and reactive cyanide and sulfide under TDD # T05-9502-801.

The analytical results for samples collected from tanks indicated elevated levels of total halides (between 4,200 ppm and 13,000 ppm). The sample results from tank #10 (sample #SIST10) had levels of benzene (0.781 ppm) and tetrachloroethylene (2.54 ppm) that were above the associated regulatory levels for toxicity characteristic "hazardous waste" according to 40 CFR Section 261.24 (a). PCBs were detected at elevated levels in tank #21 (PCB 1248, 72 ppm) and tank #22 (PCB 1248, 260 ppm). See Table 1 for a summary of analytical results from tanks # 6, 10, 18, 21, and 22.

The sample results of oil collected from the east side of the tank containment area (sample SISBerm) indicated elevated levels of total halides (5,300 ppm), PCB 1248 (11 ppm), and PCB 1254 (1.2 ppm). Sample results from soil sample SISSoil, which was collected from visibly oil-stained soils to the east of the containment area, indicated elevated levels of total halides (2,200 ppm), PCB 1248 (2 ppm), and PCB 1254 (0.3 ppm). The complete analytical results and quality assurance review for the

soil and oil data are provided in Appendix C. Descriptions of the samples and the tank layers can be found in the tank sample data sheets located in the site sampling plan (Appendix B).

5.0 DISCUSSION OF POTENTIAL THREATS

The site assessment at the SIS site was conducted to evaluate the threat to public health and the environment posed by the potential for imminent release of hazardous substances from the site.

Conditions at the SIS site present an imminent and substantial endangerment to public health, or welfare, or the environment based upon factors set forth in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300.415 (b)(2). These factors include:

(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;

Both soil sample SISSoil and oil sample SISBerm results indicated the presences of PCB 1248 and PCB 1254, as well as the presence of total halides. Although the site is fenced, there is no security, and there is a 3-feet wide gap in the fence on the south boundary of the site. The oil-contaminated soils and oil in the containment area are at the surface. Once inside the fence, trespassers/vandals, birds, and wild animals could potentially come into contact with these oily materials. There is also a potential for workers from the facility to the west of the site to come into contact with the oil-contaminated soils from roll-off box #1.

(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

There are 23 ASTs inside the containment area. The combined contents of the tanks is approximately 198,332 gallons. Most of the hatches and access ports on the tops of the tanks were either uncovered or partially covered. All of the tanks appeared to be rusted and in a deteriorating state. Analytical results from tank #22, which has approximately 4,800 gallons of material, indicated that the liquid and sludge portion near the top has elevated levels of PCB 1248 (260 ppm) and total halides (9,100 ppm). Analytical results from the liquids in tank #21, of which there is approximately 7,900 gallons, indicated elevated levels of PCB 1248 (72 ppm) and total halides (7,200 ppm). Analytical results from the material in tank #10, which has approximately 10,000 gallons of liquid and sludge, indicated levels of benzene (0.781 ppm) and tetrachloroethylene (2.54 ppm) that are above the regulatory level for toxicity characteristic "hazardous waste" according to 40 CFR Section 261.24 (a). The regulatory levels and EPA hazardous waste numbers for toxicity characteristic are 0.5 ppm and D018 for benzene and 0.7 ppm and D039 for tetrachloroethylene.

In addition to the uncovered hatches and ports, tank #8 has a 3 feet wide and 2 feet high hole cut in the top of the tank. A dark stain under the hole on the exterior of tank #8 indicated that the material in the tank had been overflowing into the containment area. Historical leakage from this and other tanks is clearly evidenced by the oily liquid within the tank containment area. Although the tanks contain approximately 200,000 gallons of material, the containment area (approximate dimensions of 90 feet by 80 feet by 8 inches) will hold only another 35,000 gallons in addition to the oil and water that is already present in the containment area. The height of the earthen berms on the east, south, and west sides limit the volume

that the area will contain. Oily material has already been released from the east side of the containment area, and further erosion of the earthen berms could release the material that is already present. All of the aforementioned conditions create the threat of a release from one or more of the ASTs on site.

(iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

There are several areas of visibly oil-contaminated surface soils on the site. One area is located directly to the east of the tank containment area. Oil staining of soil and gravel, with dimensions of approximately 30 feet from east to west and 20 feet from north to south, are present in this area. A soil sample collected from the stain indicated elevated levels of total halides (2,200 ppm), PCB 1248 (2 ppm), and PCB 1254 (0.3 ppm). This surface soil contamination derived from a spill from the tank containment area, which could potentially occur again.

Oil-staining, visible on the exterior west side of roll-off box #1, indicates that the roll-off box was, and possibly still is, leaking oily material. The leaking material has stained surface soils located under the west side of the box, and extended under the fence, and onto the facility directly west of the site.

Contaminated surface soils from both areas may migrate off site as leaking oil continues to migrate. The potential also exists for contaminants in surficial soils to become windborne as dust and migrate off site. There are no secondary berms or containment dikes on the east or west boundaries of the site to limit the spread of additional oil from either the roll-off box or the tank containment area. These conditions create the potential for contaminants in the oil to migrate.

(v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

Rain and snow melt may cause the oil in the surface soils outside the containment area and roll-off box #1 to migrate off site. Most of the hatches, access ports, and holes on the tops of the tanks were either uncovered or partially covered; therefore, rain may cause the contents of the tanks to overflow and be released. The tank containment area has approximately 35,000 gallons of freeboard before the oil and water in the containment area would spill over or through the earthen berms on the east, south, and west sides. This freeboard is only an estimate, and the actual figure could be significantly reduced if the earthen berms were eroded by heavy rains. Rain and snow melt continue to accumulate in the containment area creating not only the threat of a release, but also additional contaminated water. Both samples SISBerm and SISSoil indicated the presence of total halides, PCB 1248, and PCB 1254. These hazardous substances may migrate from the soil contaminated areas and tank containment areas to other areas on site, as well as off site.

6.0 SUMMARY

Observations during the site assessment indicate that the conditions at the Salco Industrial Services site constitute an imminent and substantial endangerment to public health and welfare. This conclusion is based upon observations by the OSC and TAT, as evaluated against the criteria set forth in the NCP.

Based upon analytical results, observations, and information provided to TAT, the most substantial threats on site include the potential release of the contents of the tanks, and the release of oil from the associated containment area. Analytical results from several of the tank and berm liquids indicated the presence of PCBs, total halides, and TCLP benzene and tetrachloroethylene. The surficial soil contamination on the east and west sides of the site poses a contact threat to nearby human and animal populations. Both the soil contamination and oil from the tanks and containment area pose a migration threat to other on-site areas, as well as off site.

A Spill Prevention Control and Countermeasures inspection was not conducted, but measurements taken during the site assessment indicate that the containment area walls, berms, and overall capacity is inadequate to contain the volume of tank storage capacity. Plum Creek, which flows into Lake Erie, is located approximately 900 feet downgrade and to the southwest of the site. This is the most proximal navigable waterway that would be affected by a release from the site.

APPENDIX A

ANNOTATED PHOTOGRAPHS

Site: Salco Industrial
Photo No: 1
Direction: Southwest
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: View of tank layout with cement and earthen containment walls.

Site: Salco Industrial
Photo No: 2
Direction: Southwest
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Empty tanker truck and stained soil to the east of the earthen berm.

Site: Salco Industrial
Photo No: 7
Direction: Northeast
Camera: Minolta 35mm
Photographer: Ahlgren

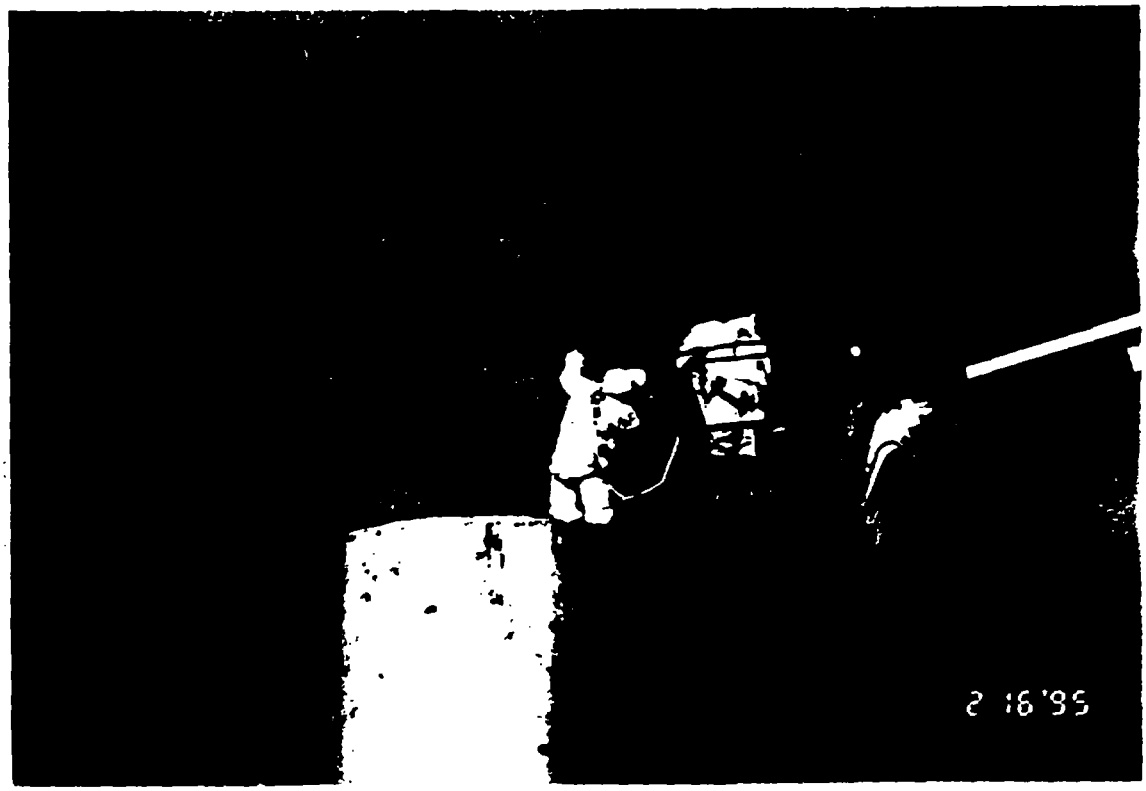
Date: February 16, 1995
Subject: West side of tank containment area. Note end of concrete wall and start of earthen berm.

Site: Salco Industrial
Photo No: 8
Direction: West
Camera: Minolta 35mm
Photographer: Ahlgren

Date: February 16, 1995
Subject: Operation of personnel lift for aerial viewing and sampling of tall tanks.

Site: Salco Industrial
Photo No: 9
Direction: Southwest
Camera: Minolta 35mm
Photographer: Doerr

Date: February 16, 1995
Subject: TAT members sampling and air monitoring tank #13 from the personnel lift.



Site: Salco Industrial
Photo No: 10
Direction: West
Camera: Minolta 35mm
Photographer: Doerr

Date: February 16, 1995
Subject: TAT members in personnel lift sampling tank #13 with sludge judge.

Site: Salco Industrial
Photo No: 3
Direction: Southwest
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Oil-stained soil on the north and west sides of roll-off box #1 .

Site: Salco Industrial
Photo No: 4
Direction: South
Camera: Minolta 35mm
Photographer: Dieckhaus

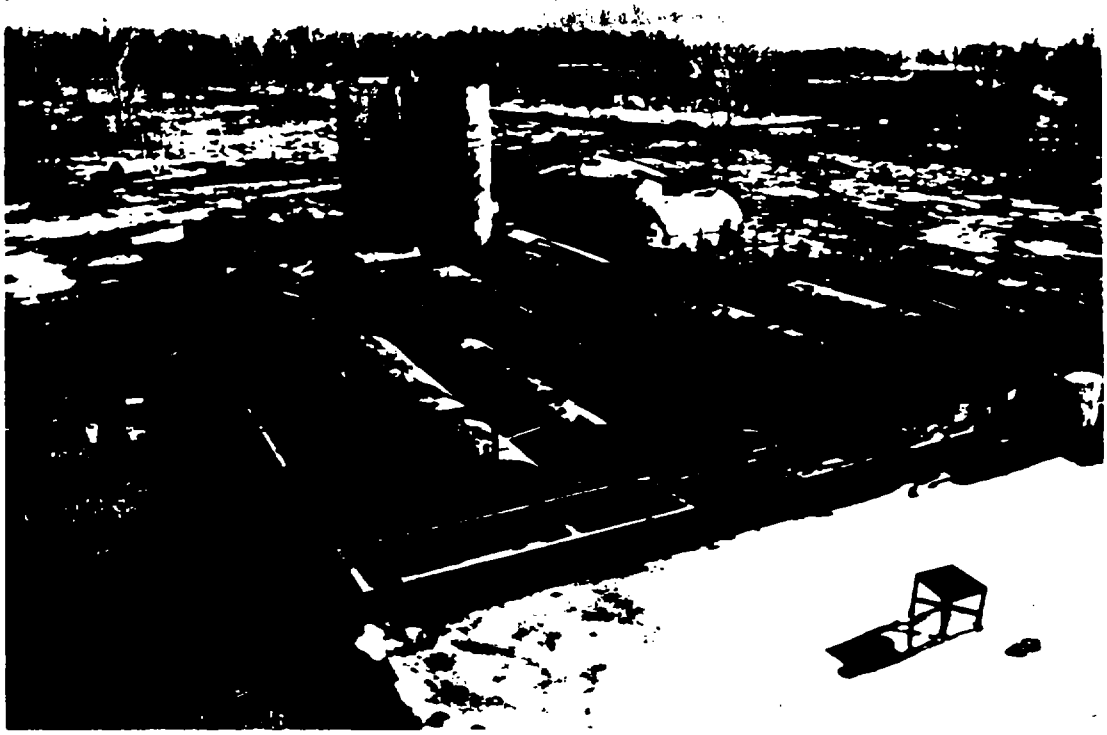
Date: February 16, 1995
Subject: Close-up photograph of oil-stained soils on the west side of the roll-off box next to the west fence.

Site: Salco Industrial
Photo No: 5
Direction: West
Camera: Minolta 35mm
Photographer: Ahlgren

Date: February 16, 1995
Subject: Close-up photograph of soil staining and breach in earthen berm.

Site: Salco Industrial
Photo No: 6
Direction: North
Camera: Minolta 35mm
Photographer: Ahlgren

Date: February 16, 1995
Subject: Roll-off box #2 located on the concrete pad with oil staining on containment wall.

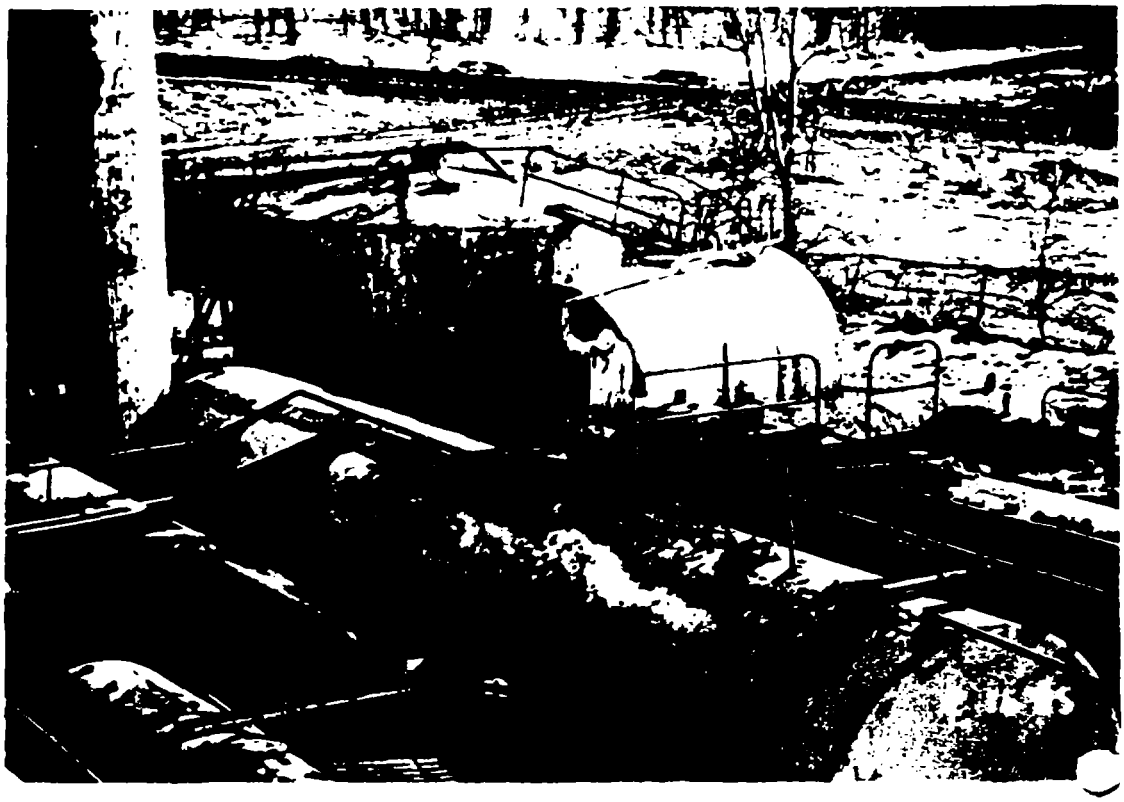


Site: Salco Industrial
Photo No: 11
Direction: Southeast
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Aerial view of tank containment area.

Site: Salco Industrial
Photo No: 12
Direction: South
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Aerial view of both roll-off boxes and concrete containment area.



Site: Salco Industrial
Photo No: 13
Direction: Southeast
Camera: Minolta 35mm
Photographer: Dieckhaus

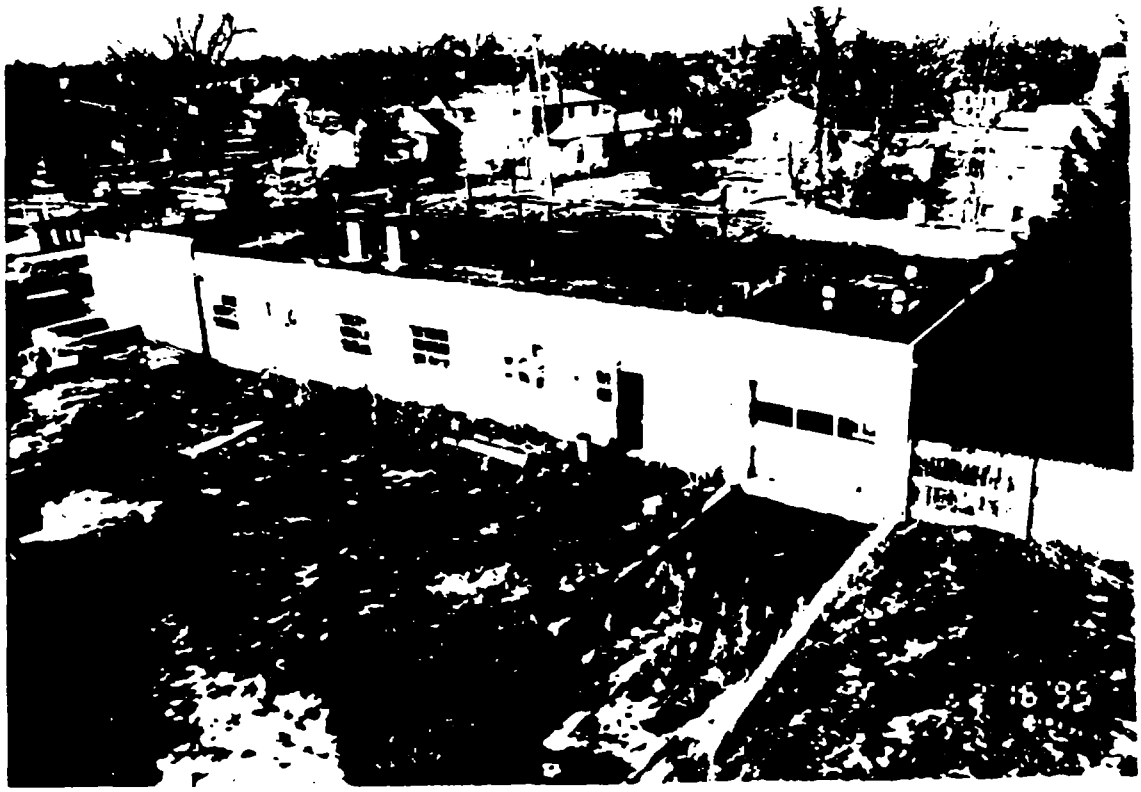
Date: February 16, 1995
Subject: TAT member sampling tank with glass thief.

Site: Salco Industrial
Photo No: 14
Direction: Southeast
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Aerial view of tank containment area with earthen berm and concrete containment wall.

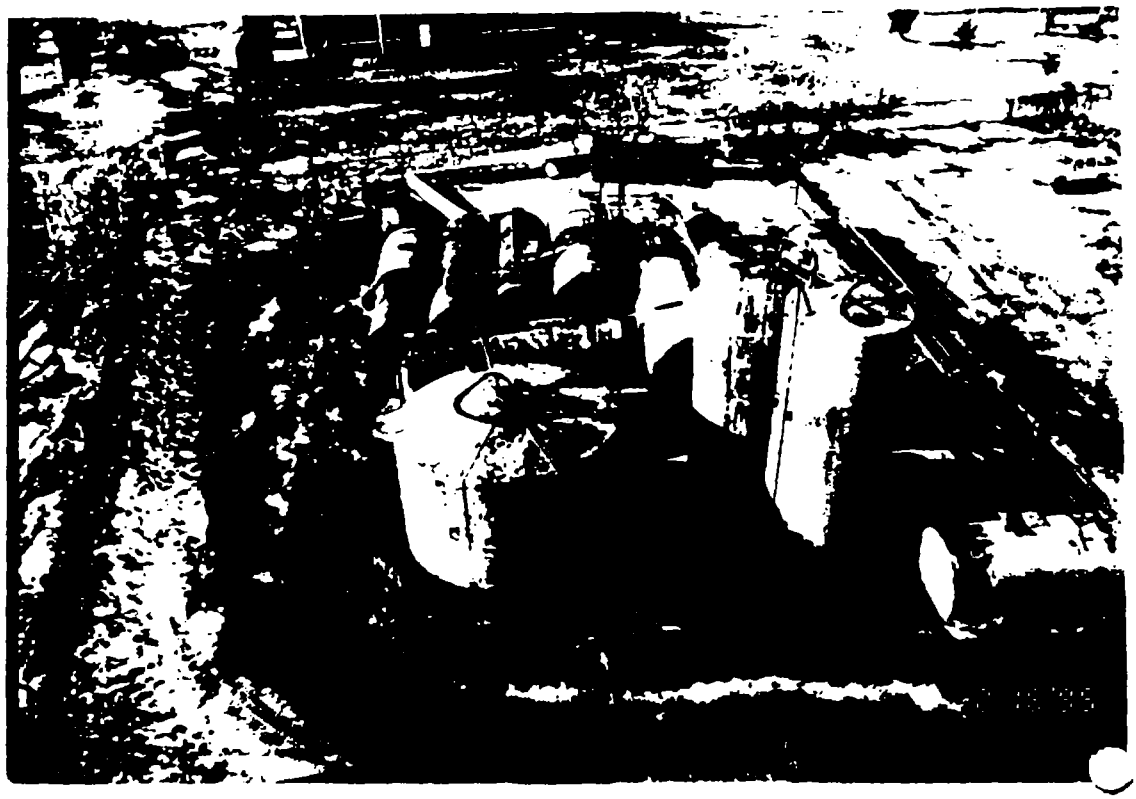
Site: Salco Industrial
Photo No: 15
Direction: West
Camera: Minolta 35mm
Photographer: Ahlgren

Date: February 16, 1995
Subject: Tank containment area with breached earthen berm and oil in containment area.



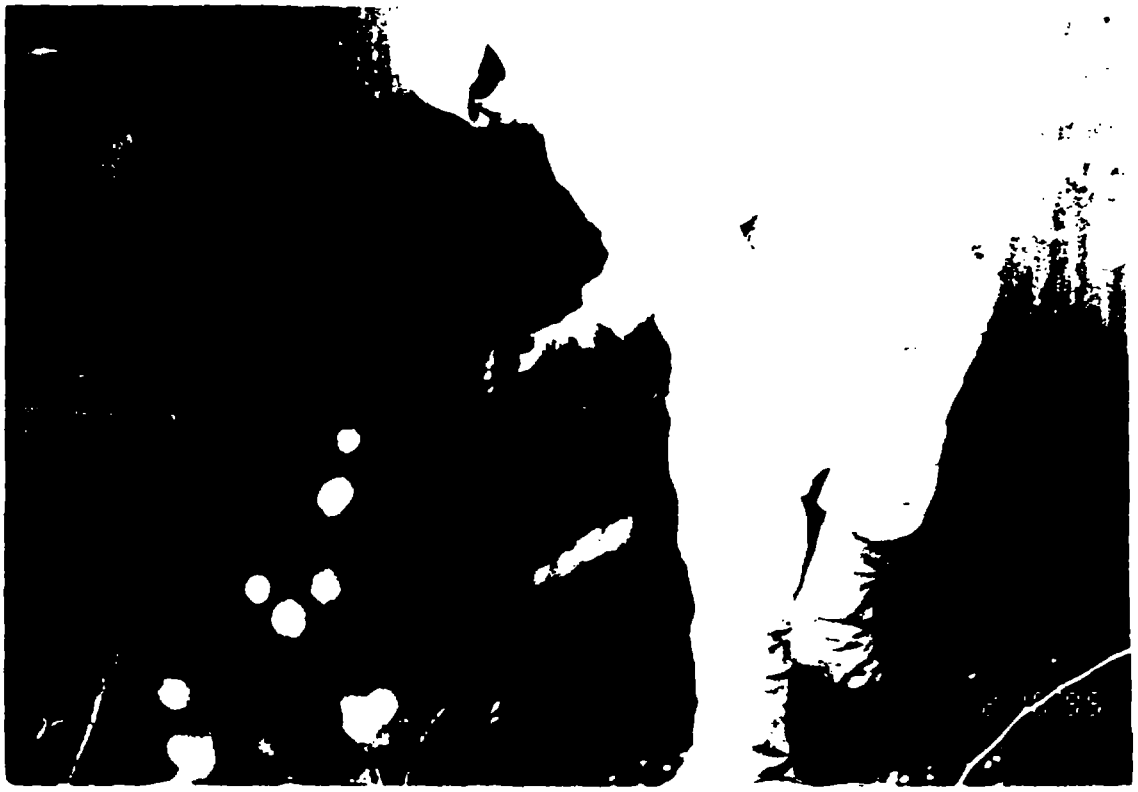
Site: Salco Industrial
Photo No: 16
Direction: Northwest
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Aerial view of office and storage building.



Site: Salco Industrial
Photo No: 17
Direction: West
Camera: Minolta 35mm
Photographer: Dieckhaus

Date: February 16, 1995
Subject: Aerial view of site from the personnel lift.



Site: Salco Industrial
Photo No: 18
Direction: West
Camera: Minolta 35mm
Photographer: Ahlgren

Date: February 16, 1995
Subject: TAT member sampling oil and water in the tank containment area.

Site: Salco Industrial
Photo No: 19
Direction: West
Camera: Minolta 35mm
Photographer: Ahlgren

Date: February 16, 1995
Subject: Location of soil sample at breach in earthen berm on the east side of the tank containment area.

8

APPENDIX B

SAMPLING PLAN

SAMPLING PLAN

PURPOSE

This plan will outline the collection of samples from the Salco Industrial Service (SIS) site at 704 Conant Street, Monroe, Monroe County, Michigan. The SIS site is a former generator, transporter, and storage facility of hazardous waste and is comprised of office buildings, an aboveground storage tank (AST) farm, and other waste containers. Samples will be collected from 22 ASTs which may contain oil, solvents, waste oils, and/or water. Soil samples will also be collected from areas of visible oil-staining. The analytical results from these samples will be used by U.S. EPA to determine the presence of hazardous waste or petroleum products in the storage tanks and in soils. Based on the analytical results from the tank samples, U.S. EPA will be able to determine an estimate of the volume and type of hazardous waste, hazardous substances, or petroleum products present and more accurately establish cost estimates to clean up the tanks and site soils. The analytical results will also enable U.S. EPA to determine whether funds will be utilized from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Oil Pollution Act (OPA) to remove the materials from the tanks and any contaminated soils.

SOILS

Surface soil samples will be collected from areas in which there is visible oil or other contamination. Surface grab samples will be collected from the soil of each area according to Ecology and Environment, Inc.'s (E & E's), soil sampling SOPs (see soil sampling SOPs in Appendix A). Up to 5 soil samples will be analyzed for polychlorinated biphenyls (PCBs), hazardous waste ignitability (flash point), hazardous waste reactivity (cyanide/sulfide), hazardous waste corrosivity (pH), total organic halides (TOX), and toxicity (toxicity characteristic leaching procedure (TCLP) tests). This will allow U.S. EPA to determine if materials on site are hazardous based on 40 CFR Section 300.

TANKS

Samples will be collected from the 22 aboveground storage tanks. Tanks will first be checked for contents and possible multi-layers. Samples will be collected from the oil/waste, solvent, or sludge layers as one sample from the tank. This will result in as many as 22 oil/waste samples.

Up to 6 oil/waste samples may be sent to the laboratory for analytical results. The other samples will be archived and stored on site for later analysis. The 6 oil/waste samples will be sent

to the laboratory and analyzed for PCBs, flash point, reactivity (cyanide/sulfide), pH, TOX, and TCLP tests.

QA/QC PROTOCOL

OSWER Directive 9360.4-01 will be used to determine the level of quality assurance. The following methods will be used for analysis:

Soil Analysis

Flash Point	Method 1010
pH	Method 9040
Reactivity (cyanide/	Section 7.3.3.2
sulfide)	Section 7.3.4.1
TCLP metals	Method 1311 + 6010
TCLP volatile organic comp.(VOCs)	Method 1311 + 8260
TCLP semi-volatile organic (SVOCs)	Method 1311 + 8270
TCLP pesticides	Method 1311 + 8080
TCLP herbicides	Method 1311 + 8150
PCBs	Method 8080
TOX	Method 9020

Tank Oil/Waste Analysis

flash point	Method 1010
pH	Method 9040
Reactivity (cyanide/	Section 7.3.3.2
sulfide	Section 7.3.4.1
TCLP metals	Method 1311 + 6010
TCLP VOCs	Method 1311 + 8260
TCLP SVOCs	Method 1311 + 8270
TCLP pesticides	Method 1311 + 8080
TCLP herbicides	Method 1311 + 8150
PCBs	Method 8080
TOX	Method 9020

The lab will analyze matrix spike(s) and matrix spike duplicate(s) for the soil and tank samples.

SAMPLING PLAN

SITE NAME: Salco Industrial Service TDD#: T05-9410-169
Analytical TDD#: T05-9502-801

SAMPLERS: Michael Dieckhaus Project Code: ZT3051
Kristin Ahlgren/Karen Smith
John Doerr

LAB:

Biological & Environmental Control Labs
705 Front Street
Toledo, Ohio, 43505

DATE OF SAMPLING:
2/16/95 (soil/tanks)

DATE SHIPPED:
2/16/95 (soil/tanks)

TYPE OF LAB: COMMERCIAL

GUARANTEED TURNAROUND TIME:
14 calendar days(soils/tanks)/14 calendar days hardcopy

MATRIX	NO. OF SAMPLES
Soils	5
Tanks Oil/waste	22

PURPOSE OF SAMPLING:

- X Site Characterization
- X Extent of Contamination
- ___ Confirm Presence of Suspected Contaminant
- ___ Disposal/Treatment of Materials
- ___ Confirm Efficiency of Existing Treatment Systems
- X Other: Determine Cost Estimates for Removal and Disposal
- X Other: Determine Funding Source for Potential Removal (OPA or CERCLA)

APPENDICES:

A	Soil and Tank Sampling SOPs
B	Tank Sample Data Sheets
C	Field Sample Data Sheets
D	Chain-of-Custody

SAMPLING METHODS:

See attached soil and tank sampling SOPs in Appendix A. Soil samples will be collected with a wooden or stainless steel spoon or shovel. Grab soil samples will be directly transferred to the appropriate jars. A field sample data sheet will be completed for each soil sample collected, and the sample number placed on the jar label will match the sample number on the field sample data sheet. The field sample data sheet will also include observations and air monitoring of each soil sample.

A number of methods may be employed to sample the material in the tanks. The sampling method will depend upon tank accessibility, tank material consistency, and the volume of material. The following methods are those that may be employed for sampling the tanks from the top. The first method that may be used is a sludge judge. The sludge judge will be used to collect a sample of an oil/waste layer that is greater than 3 feet in depth. The second method that may be employed is a disposable bailer. One bailer will be used for each tank that has a low viscosity oil/waste layer that is less than 1 foot thick. Another method for tank sampling is a bacon bomb sampler. The bacon bomb will be used to sample viscous oil/waste layers that are less than 2 feet thick and that cannot be sampled with a bailer. One other method to sample tank material from the top is using a Masterflex peristaltic pump with Tygon or silicone tubing. The Masterflex will be used for sampling the tank waters and low viscosity oil/wastes. The final method that may be used to sample the tanks is with a glass jar or high density polyethylene container attached to a rope or string as a dipping device.

The following methods may be utilized to sample the tanks if the material is beneath a personnel access hatch that is near the ground. The access hatch will be removed, and a sample of the oil/waste will be collected with a glass thief tube, a dipping device (glass jar to transfer material to the sample jar), or a large spoon.

DECON PROCEDURE:

After every sample, non-dedicated sampling equipment, including the sludge judge and bacon bomb, will be decontaminated by washing them with a soap and water mix, triple rinse with distilled water, single rinse with acetone, and final triple rinse with distilled water. Dedicated sampling equipment will be disposed of with PPE. After the samples are collected, the outside of the closed sample jars will be dry-wiped with a paper towel to remove gross material. The jars will then be cleaned with a soap and water solution and triple rinsed with water.

DISPOSAL OF RINSATE AND DECON MATERIALS:

Rinsate, PPE, and decon materials, with the PRP's permission, will be included with on-site wastes.

DISPOSAL OF SAMPLES:

Samples will be disposed of by the laboratory performing the analyses.

ADDITIONAL MATERIALS REQUIRED:

Sludge judges, Masterflex peristaltic pump, bacon bomb, disposable bailers, glass thieves, Tygon and silicone tubing, AT-60 aerial personnel lift, spray paint, 50-foot measuring tape, 8-foot dip-stick, mean streak markers, chain-of-custody forms, chain-of-custody seals, preservatives, coolers, vermiculite, duct and strapping tape, labels, ziploc baggies, wrenches, flags, twine, and rope.

DATA VALIDATION:

The TAT will perform data validation, according to OSWER Directive 9360.4-01, of the analytical data package for soil and oil/waste samples to ensure that lab results meet QA level II standards.

TANK SAMPLE DATA SHEETS:

A tank sample data sheet will be completed by the TAT for each tank that is inspected or sampled. Tank sample data sheets will record a description of the layers of material in the tank, the number of the sample and which layer each sample corresponds with air monitoring readings, thickness of layer, and analyses to be performed on the oil/waste or tank water.

SAMPLE NUMBERING AND JAR LABELLING

Tank water, oil/waste, and soil sample jars will be numbered, and the corresponding number will be placed on the field sample data sheets or tank sample data sheets. Sample jars will have the sample number placed on the lid of the jar, as well as a label placed on the side of the jar.

SOILS

No. of Samples: apx. 5 No. of Grabs: 5
No. of Composites: 0
No. of Duplicates: 0

****

ANALYSIS	NO. OF SAMPLES	SAMPLE QUANTITY
Flash point	5 (only if soil is saturated)	16 oz
pH	5	included
Reactivity (cyanide/ sulfide)	5	included
TCLP	5	32 oz
PCBs	5	16 oz
TOX	5	included
Archive	5	32 oz
	Quantity per Sample:	128 oz

TOTAL NO. OF CONTAINERS REQUIRED:

10 32 oz clear wide-mouth glass
10 16 oz clear wide-mouth glass

Ice required as a preservative.

TANK WATERS

No. of Samples: apx. 0 No. of Composites: 0

No. of Equipment blanks: 0 No. of Grabs: 0

****

ANALYSIS	NO. OF SAMPLES	SAMPLE QUANTITY
pH	0	16 oz
Reactivity (cyanide/ sulfide)	0	32 oz
TCLP	0	2 L
PCBs	0	1 L
TOX	0	2 L
Oil and Grease	0	included
Archive	0	32 oz
	Quantity per Sample:	80 oz 5 L

TOTAL NO. OF CONTAINERS REQUIRED:

_____ 32 oz poly narrow-mouth

_____ 32 oz glass

_____ 16 oz poly narrow-mouth

_____ 1 Liter glass amber

_____ 2 Liter glass amber

Ice required as a preservative for PCB samples.
NaOH required as a preservative for reactive cyanide and sulfide.
H_2SO_4 required as a preservative for TOX and oil and grease.

TANK OIL/WASTE

No. of Samples: apx. 22 No. of Grabs: 22
No. of Composites: 0
No. of Duplicates: 0

****

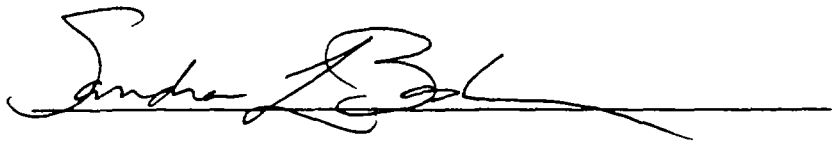
ANALYSIS	NO. OF SAMPLES	SAMPLE QUANTITY
Flash point	6	16 oz
pH	6	included
Reactivity (cyanide/ sulfide)	6	included
TCLP	6	32 oz
PCBs	6	16 oz
TOX	6	included
Archive	16	32 oz
	Quantity per Sample:	64 oz

TOTAL NO. OF CONTAINERS REQUIRED:

__22__ 32 oz clear wide-mouth glass

__12__ 16 oz clear wide-mouth glass

Ice required as a preservative.

PLAN REVIEWED BY: 

APPENDIX A

SOIL AND TANK SAMPLING SOPs

EPA/540/P-91/008
OSWER Directive 9360.4-07
January 1991

COMPENDIUM OF ERT WASTE SAMPLING PROCEDURES

Sampling Equipment Decontamination

Drum Sampling

Tank Sampling

Chip, Wipe, and Sweep Sampling

Waste Pile Sampling

Interim Final

Environmental Response Team
Emergency Response Division

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, DC 20460

Notice

This document has been reviewed in accordance with U.S. Environmental Protection Agency policy and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

The policies and procedures established in this document are intended solely for the guidance of government personnel, for use in the Superfund Removal Program. They are not intended, and cannot be relied upon, to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. The Agency reserves the right to act at variance with these policies and procedures and to change them at any time without public notice.

Depending on circumstances and needs, it may not be possible or appropriate to follow these procedures exactly in all situations due to site conditions, equipment limitations, and limitations of the standard procedures. Whenever these procedures cannot be followed as written, they may be used as general guidance with any and all modifications fully documented in either QA Plans, Sampling Plans, or final reports of results.

Each Standard Operating Procedure in this compendium contains a discussion on quality assurance/quality control (QA/QC). For more information on QA/QC objectives and requirements, refer to the *Quality Assurance/Quality Control Guidance for Removal Activities*, OSWER directive 9360.4-01, EPA/540/G-90/004.

Questions, comments, and recommendations are welcomed regarding the Compendium of ERT Waste Sampling Procedures. Send remarks to:

Mr. William A. Coakley
Removal Program QA Coordinator
U.S. EPA - ERT
Raritan Depot - Building 18, MS-101
2890 Woodbridge Avenue
Edison, NJ 08837-3679

For additional copies of the Compendium of ERT Waste Sampling Procedures, please contact:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4600

Table of Contents

List of Exhibits

Acknowledgments

Preparation of this document was directed by William A. Coakley, the Removal Program QA Coordinator of the Environmental Response Team, Emergency Response Division. Additional support was provided under U.S. EPA contract #68-03-3482 and U.S. EPA contract #68-WO-0036.

1.0 SAMPLING EQUIPMENT DECONTAMINATION: SOP #2006

1.1 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) describes methods used for preventing or reducing cross-contamination, and provides general guidelines for sampling equipment decontamination procedures at a hazardous waste site. Preventing or minimizing cross-contamination in sampled media and in samples is important for preventing the introduction of error into sampling results and for protecting the health and safety of site personnel.

Removing or neutralizing contaminants that have accumulated on sampling equipment ensures protection of personnel from permeating substances, reduces or eliminates transfer of contaminants to clean areas, prevents the mixing of incompatible substances, and minimizes the likelihood of sample cross-contamination.

1.2 METHOD SUMMARY

Contaminants can be physically removed from equipment, or deactivated by sterilization or disinfection. Gross contamination of equipment requires physical decontamination, including abrasive and non-abrasive methods. These include the use of brushes, air and wet blasting, and high-pressure water cleaning, followed by a wash/rinse process using appropriate cleaning solutions. Use of a solvent rinse is required when organic contamination is present.

1.3 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

This section is not applicable to this SOP.

1.4 INTERFERENCES AND POTENTIAL PROBLEMS

- The use of distilled/deionized water commonly available from commercial vendors may be acceptable for decontamination of sampling equipment provided that it has been verified by laboratory analysis to be analyte free.

- An untreated potable water supply is not an acceptable substitute for tap water. Tap water may be used from any municipal water treatment system for mixing of decontamination solutions.

- Acids and solvents utilized in the decontamination sequence pose the health and safety risks of inhalation or skin contact, and raise shipping concerns of permeation or degradation.

- The site work plan must address disposal of the spent decontamination solutions.

- Several procedures can be established to minimize contact with waste and the potential for contamination. For example:

  - Stress work practices that minimize contact with hazardous substances.

  - Use remote sampling, handling, and container-opening techniques when appropriate.

  - Cover monitoring and sampling equipment with protective material to minimize contamination.

  - Use disposable outer garments and disposable sampling equipment when appropriate.

1.5 EQUIPMENT/APPARATUS

- appropriate personal protective clothing
- non-phosphate detergent
- selected solvents
- long-handled brushes
- drop cloths/plastic sheeting
- trash container
- paper towels
- galvanized tubs or buckets
- tap water

- distilled/deionized water
- metal/plastic containers for storage and disposal of contaminated wash solutions
- pressurized sprayers for tap and deionized/distilled water
- sprayers for solvents
- trash bags
- aluminum foil
- safety glasses or splash shield
- emergency eyewash bottle

1.6 REAGENTS

There are no reagents used in this procedure aside from the actual decontamination solutions and solvents. In general, the following solvents are utilized for decontamination purposes:

- 10% nitric acid[1]
- acetone (pesticide grade)[2]
- hexane (pesticide grade)[2]
- methanol

[1] Only if sample is to be analyzed for trace metals.
[2] Only if sample is to be analyzed for organics.

1.7 PROCEDURES

As part of the health and safety plan, develop and set up a decontamination plan before any personnel or equipment enter the areas of potential exposure. The equipment decontamination plan should include:

- the number, location, and layout of decontamination stations
- which decontamination apparatus is needed
- the appropriate decontamination methods
- methods for disposal of contaminated clothing, apparatus, and solutions

1.7.1 Decontamination Methods

All personnel, samples, and equipment leaving the contaminated area of a site must be decontaminated. Various decontamination methods will either physically remove contaminants, inactivate contaminants by disinfection or sterilization, or do both.

In many cases, gross contamination can be removed by physical means. The physical decontamination techniques appropriate for equipment decontamination can be grouped into two categories: abrasive methods and non-abrasive methods.

Abrasive Cleaning Methods

Abrasive cleaning methods work by rubbing and wearing away the top layer of the surface containing the contaminant. The following abrasive methods are available:

- Mechanical: Mechanical cleaning methods use brushes of metal or nylon. The amount and type of contaminants removed will vary with the hardness of bristles, length of brushing time, and degree of brush contact.

- Air Blasting: Air blasting is used for cleaning large equipment, such as bulldozers, drilling rigs or auger bits. The equipment used in air blast cleaning employs compressed air to force abrasive material through a nozzle at high velocities. The distance between the nozzle and the surface cleaned, as well as the pressure of air, the time of application, and the angle at which the abrasive strikes the surface, determines cleaning efficiency. Air blasting has several disadvantages: it is unable to control the amount of material removed, it can aerate contaminants, and it generates large amounts of waste.

- Wet Blasting: Wet blast cleaning, also used to clean large equipment, involves use of a suspended fine abrasive delivered by compressed air to the contaminated area. The amount of materials removed can be carefully controlled by using very fine abrasives. This method generates a large amount of waste.

Non-Abrasive Cleaning Methods

Non-abrasive cleaning methods work by forcing the contaminant off of a surface with pressure. In general, less of the equipment surface is removed using non-abrasive methods. The following non-abrasive methods are available:

- High-Pressure Water: This method consists of a high-pressure pump, an operator-controlled directional nozzle, and a high pressure hose. Operating pressure usually ranges from 340 to 680 atmospheres (atm) which relates to flow rates of 20 to 140 liters per minute.

- Ultra-High-Pressure Water: This system produces a pressurized water jet (from 1,000 to 4,000 atm). The ultra-high-pressure spray removes tightly-adhered surface film. The water velocity ranges from 500 m/sec (1,000 atm) to 900 m/sec (4,000 atm). Additives can enhance the method. This method is not applicable for hand-held sampling equipment.

Disinfection/Rinse Methods

- Disinfection: Disinfectants are a practical means of inactivating infectious agents.

- Sterilization: Standard sterilization methods involve heating the equipment. Sterilization is impractical for large equipment.

- Rinsing: Rinsing removes contaminants through dilution, physical attraction, and solubilization.

1.7.2 Field Sampling Equipment Cleaning Procedures

Solvent rinses are not necessarily required when organics are not a contaminant of concern and may be eliminated from the sequence specified below. Similarly, an acid rinse is not required if analysis does not include inorganics.

1. Where applicable, follow physical removal procedures specified in section 1.7.1.

2. Wash equipment with a non-phosphate detergent solution.

3. Rinse with tap water.

4. Rinse with distilled/deionized water.

5. Rinse with 10% nitric acid if the sample will be analyzed for trace organics.

6. Rinse with distilled/deionized water.

7. Use a solvent rinse (pesticide grade) if the sample will be analyzed for organics.

8. Air dry the equipment completely.

9. Rinse again with distilled/deionized water.

Selection of the solvent for use in the decontamination process is based on the contaminants present at the site. Use of a solvent is required when organic contamination is present on-site. Typical solvents used for removal of organic contaminants include acetone, hexane, or water. An acid rinse step is required if metals are present on-site. If a particular contaminant fraction is not present at the site, the nine-step decontamination procedure listed above may be modified for site specificity. The decontamination solvent used should not be among the contaminants of concern at the site.

Table 1 on page 4 lists solvent rinses which may be required for elimination of particular chemicals. After each solvent rinse, the equipment should be air dried and rinsed with distilled/deionized water.

Sampling equipment that requires the use of plastic tubing should be disassembled and the tubing replaced with clean tubing, before commencement of sampling and between sampling locations.

1.8 CALCULATIONS

This section is not applicable to this SOP.

1.9 QUALITY ASSURANCE/ QUALITY CONTROL

One type of quality control sample specific to the field decontamination process is the rinsate blank. The rinsate blank provides information on the effectiveness of the decontamination process employed in the field. When used in conjunction with field blanks and trip blanks, a rinsate blank can detect contamination during sample handling, storage and sample transportation to the laboratory.

Table 1: Recommended Solvent Rinse for Soluble Contaminants

SOLVENT	SOLUBLE CONTAMINANTS
Water	• Low-chain hydrocarbons • Inorganic compounds • Salts • Some organic acids and other polar compounds
Dilute Acids	• Basic (caustic) compounds • Amines • Hydrazines
Dilute Bases -- for example, detergent and soap	• Metals • Acidic compounds • Phenol • Thiols • Some nitro and sulfonic compounds
Organic Solvents[1] - for example, alcohols, ethers, ketones, aromatics, straight-chain alkanes (e.g., hexane), and common petroleum products (e.g., fuel, oil, kerosene)	• Nonpolar compounds (e.g., some organic compounds)

[1] - WARNING: Some organic solvents can permeate and/or degrade protective clothing.

A rinsate blank consists of a sample of analyte-free (i.e, deionized) water which is passed over and through a field decontaminated sampling device and placed in a clean sample container.

Rinsate blanks should be run for all parameters of interest at a rate of 1 per 20 for each parameter, even if samples are not shipped that day. Rinsate blanks are not required if dedicated sampling equipment is used.

1.10 DATA VALIDATION

This section is not applicable to this SOP.

1.11 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA and specific health and safety procedures.

Decontamination can pose hazards under certain circumstances even though performed to protect health and safety. Hazardous substances may be incompatible with decontamination methods. For example, the decontamination solution or solvent may react with contaminants to produce heat, explosion, or toxic products. Decontamination methods may be incompatible with clothing or equipment; some solvents can permeate or degrade protective clothing. Also, decontamination solutions and solvents may pose a direct health hazard to workers through inhalation or skin contact, or if they combust.

The decontamination solutions and solvents must be determined to be compatible before use. Any method that permeates, degrades, or damages personal protective equipment should not be used. If decontamination methods pose a direct health hazard, measures should be taken to protect personnel or the methods should be modified to eliminate the hazard.

3.0 TANK SAMPLING: SOP #2010

3.1 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to provide protocols for sampling tanks and other confined spaces from outside the vessel.

3.2 METHOD SUMMARY

The safe collection of a representative sample should be the criterion for selecting sample locations. A representative sample can be collected using techniques or equipment that are designed for obtaining liquids or sludges from various depths. The structure and characteristics of storage tanks present problems with collection of samples from more than one location; therefore, the selection of sampling devices is an important consideration.

Depending on the type of vessel and characteristics of the material to be sampled, one can choose a bailer, glass thief, bacon bomb sampler, sludge judge, COLIWASA, or subsurface grab sampler to collect the sample. For depths of less than 5-feet, a bailer, COLIWASA, or sludge judge can be used. A sludge judge, subsurface grab sampler, bailer, or bacon bomb sampler can be used for depths greater than 5-feet. A sludge judge or bacon bomb can be used to determine if the tank consists of various strata.

All sample locations should be surveyed for air quality prior to sampling. At no time should sampling continue with an LEL reading greater than 25%.

All personnel involved in tank sampling should be advised as to the hazards associated with working in unfavorable conditions.

3.3 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Samples collected from tanks are considered waste samples and, as such, addition of preservatives is not required due to the potential reaction of the sample with the preservative. Samples should, however, be cooled to 4°C and protected from sunlight in order to minimize any potential reaction due to the light sensitivity of the sample.

Sample bottles for collection of waste liquids, sludges, or solids are typically wide-mouth amber jars with Teflon-lined screw caps. Actual volume required for analysis should be determined in conjunction with the laboratory performing the analysis.

Waste sample handling procedures should be as follows:

1. Place sample container in two Ziploc plastic bags.
2. Place each bagged container in a 1-gallon covered can containing absorbent packing material. Place the lid on the can.
3. Mark the sample identification number on the outside of the can.
4. Place the marked cans in a cooler, and fill remaining space with absorbent packing material.
5. Fill out a chain of custody form for each cooler, place it in plastic, and affix it to the inside lid of the cooler.
6. Secure and custody seal the lid of cooler.
7. Arrange for the transportation appropriate for the type of hazardous waste involved.

3.4 INTERFERENCES AND POTENTIAL PROBLEMS

Sampling a storage tank requires a great deal of manual dexterity, often requiring the sampler to climb to the top of the tank upon a narrow vertical or spiral stairway or ladder while wearing protective clothing and carrying sampling equipment.

Before climbing onto the vessel, perform a structural survey of the tank to ensure the sampler's

safety and accessibility prior to initiating field activities.

As in all opening of containers, take extreme caution to avoid ignition or combustion of volatile contents. All tools used must be constructed of a non-sparking material and electronic instruments must be intrinsically safe.

All sample locations should be surveyed for air quality prior to sampling. At no time should sampling continue with an LEL reading greater than 25%.

3.5 EQUIPMENT/APPARATUS

Storage tank materials include liquids, sludges, still bottoms, and solids of various structures. The type of sampling equipment chosen should be compatible with the waste. Samplers commonly used for tanks include: the bacon bomb sampler, the sludge judge, glass thief, bailer, COLIWASA, and subsurface grab sampler.

- sampling plan
- safety equipment
- tape measure
- weighted tape line or equivalent
- camera/film
- stainless steel bucket or bowl
- sample containers
- Ziploc plastic bags
- logbook
- labels
- field data sheets
- chain of custody forms
- flashlight (explosion proof)
- coolers
- ice
- decontamination supplies
- bacon bomb sampler
- sludge judge
- glass thief
- bailer
- COLIWASA
- subsurface grab sampler
- water/oil level indicator
- OVA (organic vapor analyzer or equivalent)
- explosimeter/oxygen meter
- high volume blower

3.6 REAGENTS

Reagents are not typically required for the preservation of waste samples. However, reagents will be utilized for decontamination of equipment. Decontamination solutions required are specified in ERT SOP #2006, Sampling Equipment Decontamination.

3.7 PROCEDURES

3.7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are needed.

2. Obtain necessary sampling and monitoring equipment.

3. Decontaminate or preclean equipment, and ensure that it is in working order.

4. Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.

6. Identify and mark all sampling locations.

3.7.2 Preliminary Inspection

1. Inspect the external structural characteristics of each tank and record in the site logbook. Potential sampling points should be evaluated for safety, accessibility, and sample quality.

2. Prior to opening a tank for internal inspection, the tank sampling team should:

   - Review safety procedures and emergency contingency plans with the Safety Officer,

   - Ensure that the tank is properly grounded,

   - Remove all sources of ignition from the immediate area.

3. Each tank should be mounted using appropriate means. Remove manway covers using non-sparking tools.

4. Collect air quality measurements for each potential sample location using an explosimeter/oxygen meter for a lower explosive limit (LEL/O_2) reading and an OVA/HNU for an organic vapor concentration. Both readings should be taken from the tank headspace, above the sampling port, and in the breathing zone.

5. Prior to sampling, the tank headspace should be cleared of any toxic or explosive vapor concentration using a high volume blower. No work should start if LEL readings exceed 25%. At 10% LEL, work can continue but with extreme caution.

3.7.3 Sampling Procedures

1. Determine the depth of any and all liquid-solid interface, and depth of sludge using a weighted tape measure, probe line, sludge judge, or equivalent.

2. Collect liquid samples from 1-foot below the surface, from mid-depth of liquid, and from 1-foot above the bottom sludge layer. This can be accomplished with a subsurface grab sampler or bacon bomb. For liquids less than 5-feet in depth, use a glass thief or COLIWASA to collect the sample.

   If sampling storage tanks, vacuum trucks, or process vessels, collect at least one sample from each compartment in the tank. Samples should always be collected through an opened hatch at the top of the tank. Valves near the bottom should not be used, because of their questionable or unknown integrity. If such a valve cannot be closed once opened, the entire tank contents may be lost to the ground surface. Also, individual strata cannot be sampled separately through a valve near the bottom.

3. Compare the three samples for visual phase differences. If phase differences appear, systematic iterative sampling should be performed. By halving the distance between two discrete sampling points, one can determine the depth of the phase change.

4. If another sampling port is available, sample as above to verify the phase information.

5. Measure the outside diameter of the tank and determine the volume of wastes using the depth measurements. (See Appendix C for calculations.)

6. Sludges can be collected using a bacon bomb sampler, glass thief, or sludge judge.

7. Record all information on the sample data sheet or site logbook. Label the container with the appropriate sample tag.

8. Decontaminate sampling equipment as per ERT SOP #2006, Sampling Equipment Decontamination.

3.7.4 Sampling Devices

Bacon Bomb Sampler

The bacon bomb sampler (Figure 9, Appendix B) is designed to collect material from various levels within a storage tank. It consists of a cylindrical body, usually made of chrome-plated brass and bronze with an internal tapered plunger that acts as a valve to admit the sample. A line attached to the top of the plunger opens and closes the valve. A line is attached to the removable top cover which has a locking mechanism to keep the plunger closed after sampling.

1. Attach the sample line and the plunger line to the sampler.

2. Measure and then mark the sampling line at the desired depth.

3. Gradually lower the bacon bomb sampler by the sample line until the desired level is reached.

4. When the desired level is reached, pull up on the plunger line and allow the sampler to fill before releasing the plunger line to seal off the sampler.

5. Retrieve the sampler by the sample line. Be careful not to pull up on the plunger line and thereby prevent accidental opening of the bottom valve.

6. Rinse or wipe off the exterior of the sampler body.

7. Position the sampler over the sample container and release its contents by pulling up on the plunger line.

8. Cap the sample container tightly and place prelabeled sample container in a carrier.

9. Replace the bung or place plastic over the tank.

10. Log all samples in the site logbook and on field data sheets and label all samples.

11. Package samples and complete necessary paperwork.

12. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

Sludge Judge

A sludge judge (Figure 10, Appendix B) is used for obtaining an accurate reading of solids which can settle, in any liquid, to any depth. The sampler consists of 3/4-inch plastic pipe in 5-foot sections, marked at 1-foot increments, with screw-style fittings. The top section includes a nylon line for raising the sampler.

1. Lower the sludge judge to the bottom of the tank.

2. When the bottom has been reached, and the pipe has filled to surface level, tug slightly on the rope as you begin to raise the unit. This will seat the check valve, trapping the column of material.

3. When the unit has been raised clear of the tank liquid, the amount of sludge in the sample can be read using the 1-foot increments marked on the pipe sections.

4. By touching the pin extending from the bottom section against a hard surface, the material is released from the unit.

5. Cap the sample container tightly and place prelabeled sample container in a carrier.

6. Replace the bung or place plastic over the tank.

7. Log all samples in the site logbook and on field data sheets and label all samples.

8. Package samples and complete necessary paperwork.

9. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

Subsurface Grab Sampler

Subsurface grab samplers (Figure 11, Appendix B) are designed to collect samples of liquids at various depths. The sampler is usually constructed of aluminum or stainless steel tubing with a polypropylene or Teflon head that attaches to a 1-liter sample container.

1. Screw the sample bottle onto the sampling head.

2. Lower the sampler to the desired depth.

3. Pull the ring at the top which opens the spring-loaded plunger in the head assembly.

4. When the bottle is full, release the ring, lift sampler, and remove sample bottle.

5. Cap the sample container tightly and place prelabeled sample container in a carrier.

6. Replace the bung or place plastic over the tank.

7. Log all samples in the site logbook and on field data sheets and label all samples.

8. Package samples and complete necessary paperwork.

9. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

Glass Thief

The most widely used implement for sampling is a glass tube commonly referred to as a glass thief (Figure 7, Appendix B). This tool is simple, cost effective, quick, and collects a sample without having to decontaminate. Glass thieves are typically 6mm to 16mm I.D. and 48 inches long.

1. Remove cover from sample container.

2. Insert glass tubing almost to the bottom of the

tank or until a solid layer is encountered. About 1 foot of tubing should extend above the tank.

3. Allow the waste in the tank to reach its natural level in the tube.

4. Cap the top of the sampling tube with a tapered stopper or thumb, ensuring liquid does not come into contact with stopper.

5. Carefully remove the capped tube from the tank and insert the uncapped end in the sample container. Do not spill liquid on the outside of the sample container.

6. Release stopper and allow the glass thief to drain until the container is approximately 2/3 full.

7. Remove tube from the sample container, break it into pieces and place the pieces in the tank.

8. Cap the sample container tightly and place prelabeled sample container in a carrier.

9. Replace the bung or place plastic over the tank.

10. Log all samples in the site logbook and on field data sheets and label all samples.

11. Package samples and complete necessary paperwork.

12. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

In many instances a tank containing waste material will have a sludge layer on the bottom. Slow insertion of the sample tube down into this layer and then a gradual withdrawal will allow the sludge to act as a bottom plug to maintain the fluid in the tube. The plug can be gently removed and placed into the sample container by the use of a stainless steel lab spoon.

Bailer

The positive-displacement volatile sampling bailer (manufactured by GPI or equivalent) (Figure 12, Appendix B) is perhaps the most appropriate for collecting water samples for volatile analysis. Other bailer types (messenger, bottom fill, etc.) are less desirable, but may be mandated by cost and site conditions. Generally, bailers can provide an acceptable sample, providing that the sampling personnel use extra care in the collection process.

1. Make sure clean plastic sheeting surrounds the tank.

2. Attach a line to the bailer.

3. Lower the bailer slowly and gently into the tank so as not to splash the bailer into the tank contents.

4. Allow the bailer to fill completely and retrieve the bailer from the tank.

5. Begin slowly pouring from the bailer.

6. Cap the sample container tightly and place prelabeled sample container in a carrier.

7. Replace the bung or place plastic over the tank.

8. Log all samples in the site logbook and on field data sheets and label all samples.

9. Package samples and complete necessary paperwork.

10. Transport sample to decontamination zone to prepare it for transport to an analytical laboratory.

COLIWASA

Some equipment is designed to collect a sample from the full depth of a tank and maintain it in the transfer tube until delivery to the sample bottle. These designs include primarily the Composite Liquid Waste Sampler (COLIWASA) (Figure 8, Appendix B) and modifications thereof. The COLIWASA is a much cited sampler designed to permit representative sampling of multiphase wastes from tanks and other containerized wastes. One configuration consists of a 152 cm by 4 cm I.D. section of tubing with a neoprene stopper at one end attached by a rod running the length of the tube to a locking mechanism at the other end. Manipulation of the locking mechanism opens and closes the sampler by raising and lowering the neoprene stopper.

The major drawbacks associated with using a COLIWASA concern decontamination and costs. The sampler is difficult if not impossible to decontaminate in the field and its high cost in relation to alternative procedures (glass tubes) make it an impractical throwaway item. It still has applications, however, especially in instances where a true representation of a multiphase waste is absolutely necessary.

1. Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.

2. Slowly lower the sampler into the liquid waste. Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sample tube is lower than that outside the sampler, the sampling rate is too fast and will result in a non-representative sample.

3. When the sampler stopper hits the bottom of the waste container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.

4. Slowly withdraw the sample from the waste container with one hand while wiping the sampler tube with a disposable cloth or rag with the other hand.

5. Carefully discharge the sample into a suitable sample container by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in a sample container.

6. Cap the sample container tightly and place prelabeled sample container in a carrier.

7. Replace the bung or place plastic over the tank.

8. Log all samples in the site logbook and on field data sheets and label all samples.

9. Package samples and complete necessary paperwork.

10. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

3.8 CALCULATIONS

Refer to Appendix C for calculations to determine tank volumes.

3.9 QUALITY ASSURANCE/ QUALITY CONTROL

There are no specific quality assurance activities which apply to the implementation of these procedures. However, the following general QA procedures apply:

- All data must be documented on field data sheets or within site logbooks.

- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and they must be documented.

3.10 DATA VALIDATION

This section is not applicable to this SOP.

3.11 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and specific health and safety procedures. More specifically, the hazards associated with tank sampling may cause bodily injury, illness, or death to the worker. Failure to recognize potential hazards of waste containers is the cause of most accidents. It should be assumed that the most unfavorable conditions exist, and that the danger of explosion and poisoning will be present. Hazards specific to tank sampling are:

- Hazardous atmospheres can be flammable, toxic, asphyxiating, or corrosive.

- If activating electrical or mechanical equipment would cause injury, each piece of equipment should be manually isolated

to prevent inadvertent activation while workers are occupied.

- Communication is of utmost importance between the sampling worker and the standby person to prevent distress or injury going unnoticed. The Illuminating Engineers Society Lighting Handbook requires suitable illumination to provide sufficient visibility for work.

- Noise reverberation may disrupt verbal communication with standby personnel.

- Tank vibration may affect multiple body parts and organs of the sampler depending on vibration characteristics.

- General hazards include falling scaffolding, surface residues (which could cause electrical shock, incompatible material reactions, slips, or falls), and structural objects (including baffles/trays in horizontal/vertical tanks, and overhead structures).

5.0 WASTE PILE SAMPLING: SOP #2017

5.1 SCOPE AND APPLICATION

The objective of this Standard Operating Procedure (SOP) is to outline the equipment and methods used in collecting representative samples from waste piles, sludges or other solid or liquid waste mixed with soil.

5.2 METHOD SUMMARY

Stainless steel shovels or scoops should be used to clear away surface material before samples are collected. For samples at depth, a decontaminated auger may be required to advance the hole, then another decontaminated auger used for sample collection. For a sample core, thin-wall tube samplers or grain samplers may be used. Near surfaces samples can be collected with a clean stainless steel spoon or trowel.

All samples collected, except those for volatile organic analysis, should be placed into a Teflon-lined or stainless steel pail and mixed thoroughly before being transferred to an appropriate sample container.

5.3 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Chemical preservation of solids is generally not recommended. Refrigeration to 4°C is usually the best approach, supplemented by a minimal holding time.

Wide mouth glass containers with Teflon-lined caps are typically used for waste pile samples. Sample volume required is a function of the analytical requirements and should be specified in the work plan.

5.4 INTERFERENCES AND POTENTIAL PROBLEMS

There are several variables involved in waste sampling, including shape and size of piles, compactness, and structure of the waste material. Shape and size of waste material or waste piles vary greatly in areal extent and height. Since state and federal regulations often require a specified number of samples per volume of waste, size and shape must be used to calculate volume and to plan for the correct number of samples. Shape must also be accounted for when planning physical access to the sampling point and when selecting the appropriate equipment to successfully collect the sample at that location.

Material to be sampled may be homogeneous or heterogeneous. Homogeneous material resulting from known situations may not require an extensive sampling protocol. Heterogeneous and unknown wastes require more extensive sampling and analysis to ensure the different components are being represented.

The term "representative sample" is commonly used to denote a sample that has the properties and composition of the population from which it was collected, in the same proportions as found in the population. This can be misleading unless one is dealing with a homogenous waste from which one sample can represent the whole population.

The usual options for obtaining the most "representative sample" from waste piles are simple or stratified random sampling. Simple random sampling is the method of choice unless (1) there are known distinct strata; (2) one wants to prove or disprove that there are distinct strata; or (3) one is limited in the number of samples and desires to minimize the size of a "hot spot" that could go unsampled. If any of these conditions exist, stratified random sampling would be the better strategy.

This strategy, however, can be employed only if all points within the pile can be accessed. In such cases, the pile should be divided into a three-dimensional grid system; the grid sections assigned numbers; and the sampling points chosen using random-number tables or random-number generators. The only exceptions to this are situations in which representative samples cannot be collected safely or where the investigative team is trying to determine worst-case conditions.

If sampling is limited to certain portions of the pile, a statistically based sample will be representative only of that portion, unless the waste is homogenous.

5.5 EQUIPMENT/APPARATUS

Waste pile solids include powdered, granular, or block materials of various sizes, shapes, structure, and compactness. The type of sampler chosen should be compatible with the waste. Samplers commonly used for waste piles include: stainless steel scoops, shovels, trowels, spoons, and stainless steel hand augers, sampling triers, and grain samplers.

Waste pile sampling equipment check list:

- sampling plan
- maps/plot plan
- safety equipment, as specified in the health and safety plan
- compass
- tape measure
- survey stakes or flags
- camera and film
- stainless steel, plastic, or other appropriate homogenization bucket or bowl
- 1-quart mason jars w/Teflon liners
- Ziploc plastic bags
- logbook
- labels
- chain of custody forms and seals
- field data sheets
- cooler(s)
- ice
- decontamination supplies/equipment
- canvas or plastic sheet
- spade or shovel
- spatula
- scoop
- plastic or stainless steel spoons
- trowel
- continuous flight (screw) auger
- bucket auger
- post hole auger
- extension rods
- T-handle
- thin-wall tube sampler
- sampling trier
- grain sampler

5.6 REAGENTS

No chemical reagents are used for the preservation of waste pile samples; however, decontamination solutions may be required. If decontamination of equipment is required, refer to ERT Standard Operating Procedure (SOP) #2006, Sampling Equipment Decontamination, and the site-specific work plan.

5.7 PROCEDURES

5.7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.

2. Obtain necessary sampling and monitoring equipment.

3. Decontaminate or preclean equipment, and ensure that it is in working order.

4. Prepare schedules, and coordinate with staff, client, and regulatory agencies, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.

6. Use stakes or flagging to identify and mark all sampling locations. Specific site factors, including extent and nature of contaminants, should be considered when selecting sample locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.

5.7.2 Sample Collection

SAMPLING WITH SHOVELS AND SCOOPS

Collection of samples from surface portions of the pile can be accomplished with tools such as spades, shovels, and scoops. Surface material can be removed to the required depth with this equipment, then a stainless steel or plastic scoop can be used to collect the sample.

Accurate, representative samples can be collected with this procedure depending on the care and

precision demonstrated by sample team members. Use of a flat, pointed mason trowel to cut a block of the desired material can be helpful when undisturbed profiles are required. A stainless steel scoop, lab spoon, or plastic spoon will suffice in most other applications. Care should be exercised to avoid the use of devices plated with chrome or other materials. Plating is particularly common with implements such as garden trowels.

Use the following procedure to collect surface samples:

1. Carefully remove the top layer of material to the desired sample depth with a precleaned spade.

2. Using a precleaned stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of material from the area which came in contact with the spade.

3. If volatile organic analysis is to be performed, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

SAMPLING WITH AUGERS AND THIN-WALL TUBE SAMPLERS

This system consists of an auger, a series of extensions, a "T" handle, and a thin-wall tube sampler (Figure 13, Appendix B). The auger is used to bore a hole to a desired sampling depth, and is then withdrawn. The sample may be collected directly from the auger. If a core sample is to be collected, the auger tip is then replaced with a thin-wall tube sampler. The system is then lowered down the borehole, and driven into the pile at the completion depth. The system is withdrawn and the core collected from the thin-wall tube sampler.

Several augers are available. These include: bucket, continuous flight (screw), and post hole augers. Bucket augers are better for direct sample recovery since they provide a large volume of sample in a short time. When continuous flight augers are used, the sample can be collected directly from the flights, which are usually at 5-foot intervals. The continuous flight augers are satisfactory for use when a composite of the complete waste pile column is desired. Post hole augers have limited utility for sample collection as they are designed to cut through fibrous, rooted, swampy areas.

Use the following procedure for collecting waste pile samples with the auger:

1. Attach the auger bit to a drill rod extension, and attach the "T" handle to the drill rod.

2. Clear the area to be sampled of any surface debris. It may be advisable to remove the first 3 to 6 inches of surface material for an area approximately 6 inches in radius around the drilling location.

3. Begin augering, periodically removing and depositing accumulated materials onto a plastic sheet spread near the hole. This prevents accidental brushing of loose material back down the borehole when removing the auger or adding drill rods. It also facilitates refilling the hole, and avoids possible contamination of the surrounding area.

4. After reaching the desired depth, slowly and carefully remove the auger from boring. When sampling directly from the auger, collect sample after the auger is removed from boring and proceed to Step 10.

5. Remove auger tip from drill rods and replace with a precleaned thin-wall tube sampler. Install proper cutting tip.

6. Carefully lower the tube sampler down the borehole. Gradually force the tube sampler into the pile. Care should be taken to avoid scraping the borehole sides. Avoid hammering the drill rods to facilitate coring as the vibrations may cause the boring walls to collapse.

7. Remove the tube sampler, and unscrew the drill rods.

8. Remove the cutting tip and the core from device.

9. Discard the top of the core (approximately 1-inch), as this represents material collected before penetration of the layer of concern. Place the remaining core into the appropriate labeled sample container. Sample homogenization is not required.

10. If volatile organic analysis is to be performed, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

11. If another sample is to be collected in the same hole, but at a greater depth, reattach the auger bit to the drill and assembly, and follow steps 3 through 11, making sure to decontaminate the auger and tube sampler between samples.

SAMPLING WITH A TRIER

This system consists of a trier and a "T" handle. The auger is driven into the waste pile and used to extract a core sample from the appropriate depth.

Use the following procedure to collect waste pile samples with a sampling trier:

1. Insert the trier (Figure 14, Appendix B) into the material to be sampled at a 0° to 45° angle from horizontal. This orientation minimizes spillage of the sample. Extraction of the samples might require tilting of the sample containers.

2. Rotate the trier once or twice to cut a core of material.

3. Slowly withdraw the trier, making sure that the slot is facing upward.

4. If volatile organic analysis is to be performed, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are being collected, place samples from the other sampling intervals into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

SAMPLING WITH A GRAIN SAMPLER

The grain sampler (Figure 15, Appendix B) is used for sampling powdered or granular wastes or materials in bags, fiberdrums, sacks, similar containers or piles. This sampler is most useful when the solids are no greater than 0.6 cm (1/4 inch) in diameter.

This sampler consists of two slotted telescoping brass or stainless steel tubes. The outer tube has a conical, pointed tip at one end that permits the sampler to penetrate the material being sampled. The sampler is opened and closed by rotating the inner tube. Grain samplers are generally 61 to 100 cm (24 to 40 inch) long by 1.27 to 2.54 cm (1/2 to 1 inch) in diameter and are commercially available at laboratory supply houses.

Use the following procedures to collect waste pile samples with a grain sampler:

1. With the sampler in the closed position, insert it into the granular or powdered material or waste being sampled from a point near a top edge or corner, through the center, and to a point diagonally opposite the point of entry.

2. Rotate the sampler inner tube into the open position.

3. Wiggle the sampler a few times to allow material to enter the open slots.

4. With the sampler in the closed position, withdraw it from the material being sampled.

5. Place the sampler in a horizontal position with the slots facing upward.

6. Rotate the outer tube and slide it away from the inner tube.

7. If volatile organic analysis is to be performed, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

5.8 CALCULATIONS

This section is not applicable to this SOP.

5.9 QUALITY ASSURANCE/ QUALITY CONTROL

There are no specific quality assurance activities which apply to the implementation of these procedures. However, the following QA procedures apply:

- All data must be documented on field data sheets or within site logbooks.

- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

5.10 DATA VALIDATION

This section is not applicable to this SOP.

5.11 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA and specific health and safety procedures.

APPENDIX B

TANK SAMPLE DATA SHEETS

TANK SAMPLE DATA SHEET

SITE NAME Saico Industrial Service LOCATION: 704 Conant, Monroe, Mich.

SAMPLERS: Dean TDD/PAN #: TO5-9410-169

TANK #: 1 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 7' (semi)

Height: ___

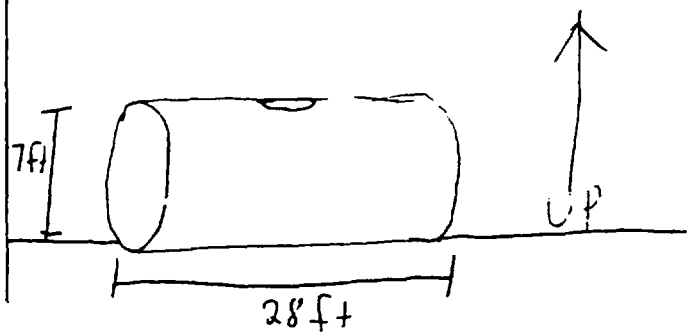
Length: 28

Depth - from top to:

1st liquid: .5'

1st solid: 4.0' full

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

access uncovered.

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: 21.6 @ 0% LEL Radiation Meter: NT

SAMPLE #: SIST1 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers	2	Physical State		Color	Clarity	Layer Thick	Volume
	Liq.	Solid	Sludge				8,056 gal
Top	1			DK Brn	Opaque	2.0'	2,302 gal
Middle			2	Black	opaque	0.5'	575
Bottom	3			lt Brn	Translucent	1.0'	1,150

Comments: hit on solids at ~ ft (Bottom 3' material unknown + not sampled.) 3 ft = 3,453 gallons

VOLUME CALCULATIONS

Total volume in tank = 7,480 gal

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS Dave TDD/PAN #: TO5-9410-169

TANK #: 2 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 7' Same

Height: ___

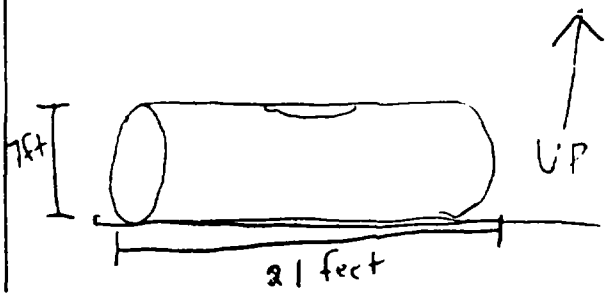
Length: 21'

Depth - from top to:

1st liquid: 1.0'

1st solid: 4.0'

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

- access hatch uncovered.

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: 21% O2 0% LEL Radiation Meter: NT

SAMPLE #: SIST2 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume (gals)
	Liq.	Solid	Sludge				6042
Top	X			Dk Brn	Opaque	2.0'	1,726
Middle			X	Black	Opaque	1.0'	863
Bottom							

Comments: hit on solids at ~ 4.0' (bottom 3' material unknown + not sampled) 3ft = 2,589

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume in tank = 5,178 gal

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Calco Industrial Service LOCATION: 704 Conant, Monroe, Michig

SAMPLERS Dean TDD/PAN #: T05-9410-169

TANK #: 3 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 7

Height: ___

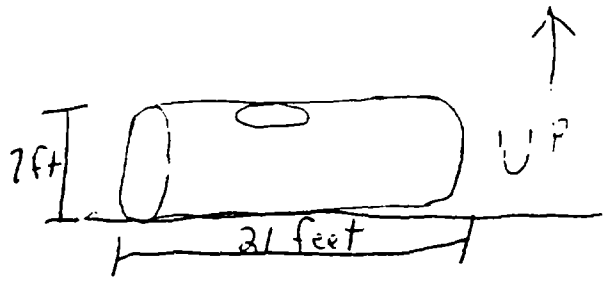
Length: 21

Depth - from top to:

1st liquid: 0.5'

1st solid: 3.5'

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: 21% O2 0% LEL Radiation Meter: NT

SAMPLE #: SIST 3 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume
	Liq.	Solid	Sludge				6042
Top	X			Dk Brn	Opaque	2.0	1,726
Middle			X	Black	Opaque	1.0	863
Bottom							

Comments: Hit on solids at ~ 3.5' (Bottom 3.5' material unknown not sampled). 3.5 ft = 3,021 gallons

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume in tank = 5,616 gal

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Saico Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 4 TYPE OF TANK: ___ Vertical ✓ Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 9'

Height: ____

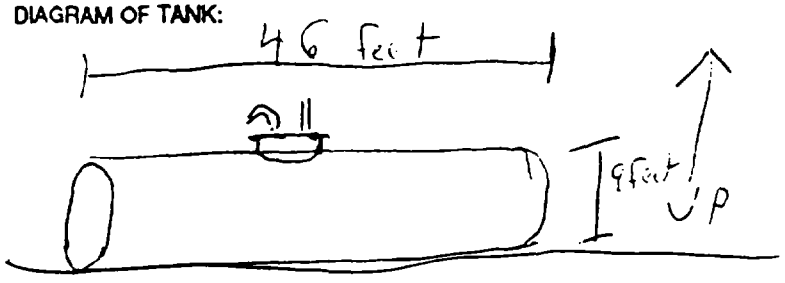
Length: 46'

Depth - from top to:

1st liquid: 3"

1st solid: —

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: 10.0 ppm CGI: 21% O2 0% LEL Radiation Meter: —

SAMPLE #: SIST4 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume (gals)
	Liq.	Solid	Sludge				21,878
Top	X			BRN	OPG	8'9"	
Middle	X			↓		↓	
Bottom	X			↓		↓	

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Saico Industrial Service LOCATION: 704 Conant, Monroe, Michig.

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 5 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 9'

Height: ____

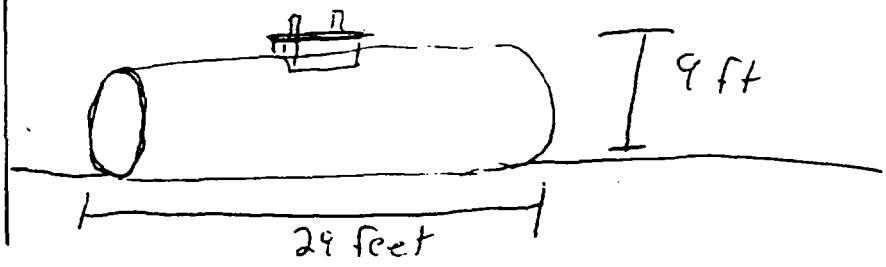
Length: 29'

Depth - from top to:

1st liquid: 3'

1st solid: ____

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SISTS DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume (Gals)
	Liq.	Solid	Sludge				13,793
Top	X			BRN	CFG	6'	
Middle	X			↓	↓	↓	
Bottom	X			↓	↓	↓	

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Safeco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 6 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: ____

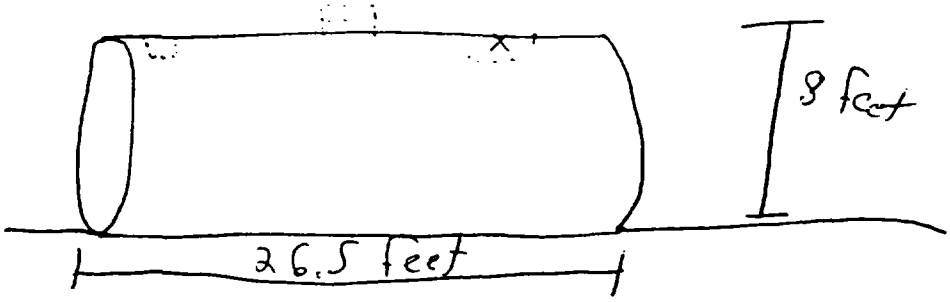
Length: 26.5

Depth - from top to: Full

1st liquid: < 1 inch

1st Sludge: 6 ft

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SISTG DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				9959
Top	X			BRN - BLK	CPQ	~ 3	3,735
Middle	X			BRN - BLK	CPQ	~ 3	3,735
Bottom			X	GRN - WHT	CPQ	~ 2	2,489

Comments: Not homogenous within the tank, sludge did prec. out.

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ total volume material in tank = 9,959 gals

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Saico Industrial Service LOCATION 704 Conant, Monroe, Michigan

SAMPLERS Dave TDD/PAN #: T05-9410-169

TANK #: 7 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: ____

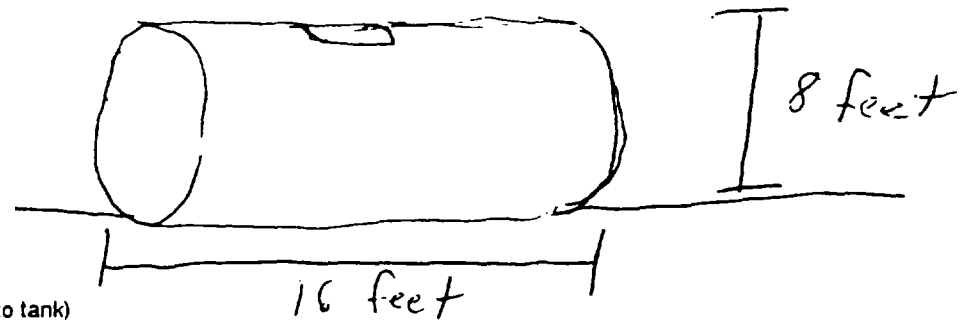
Length: 16

Depth - from top to:

1st liquid: 0.5'

1st solid: 3.5'

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SFST7 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gal
	Liq.	Solid	Sludge				6,013
Top	X			Dk Brn	opaque	2.0	1,503
Middle			X	Black	opaque	1.0	752
Bottom							

Comments: hit on solids at ~ 3.5' (Bottom 4.5 ft material unknown + not sampled). 4.5 ft = 3,382 gal.

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material in tank = 5,637

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS. Dacre TDD.PAN #: T05-9410-169

TANK #: 8 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 7.5

Height: ____

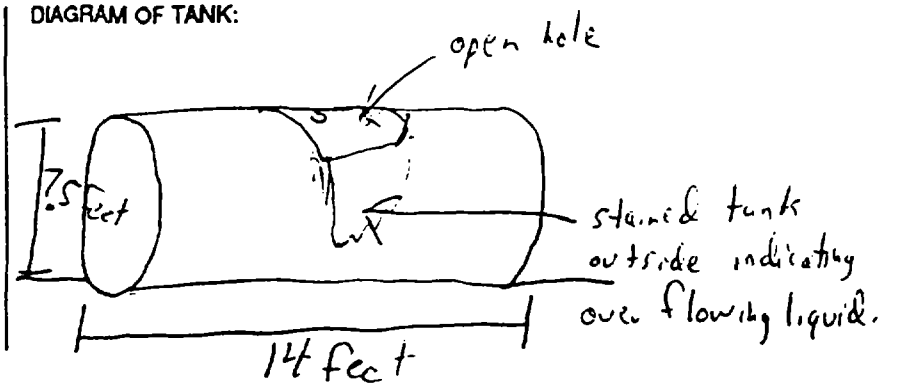
Length: 14'

Depth - from top to:

1st liquid: 0.5ft

1st solid: ____

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

Hole (3ft wide + 2ft high) on top of tank has visible staining under it as evidence that tank material is over flowing.

AIR MONITORING

Instrument Readings: Hnu/OVA: < 1 ppm CGI: 0% LEL 21% O_2 Radiation Meter: NT

SAMPLE #: SIST8 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				4624
Top	X			DK Brn	Opaque	2"	103
Middle		X		-	-	2"	103
Bottom	X		X	lt Brn	Translucent	6'2" - 6"	3,802 - 308

Comments: Tank open to bottom, Thick sludge on bottom 6" sample tube only reach to ~4.0'

VOLUME CALCULATIONS Total volume material in tank = 4,316 gal

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Dorr TDD/PAN #: T05-9410-169

TANK #: 9 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 7.5 ↻ same

Height: _____

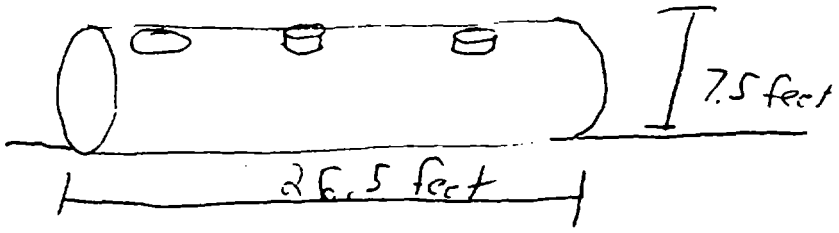
Length: 26.5

Depth - from top to:

1st liquid: 0ft (full)

1st solid: —

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SIS19 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				8753
Top	X			DK Brn	opaque	1'	1,167
Middle	X		X	Black	opaque	0.5'	584
Bottom	X			Lt Brn	Translucent	6'	7,002

Comments: Tank open to bottom sampled only to ~4.0'

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material in tank = 8,753 gals

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS Hilgren / Dieckhaus TDD/PAN #: T05-9410-169

TANK #: 10 TYPE OF TANK : ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 10.5

Height: ___

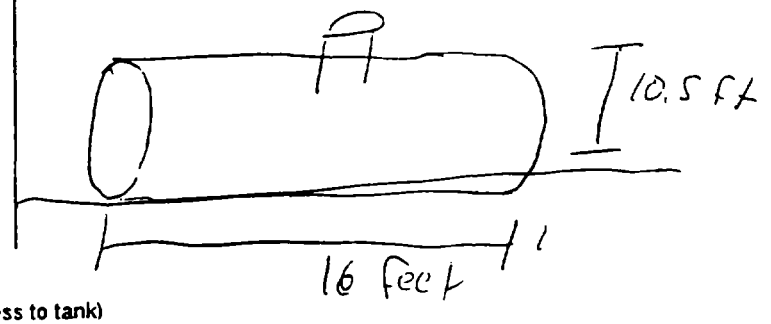
Length: 16

Depth - from top to:

1st liquid: 0.5 ft

1st solid: 9.5 ft

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SISTIO DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				10358
Top	↓			Yellow-Black	transparent	9'	8,878
Middle	↓			↓	↓	↓	
Bottom	↓		1Ft Sludge	↓	↓	1'	986

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material in tank = 9,864

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Salco Industrial Service LOCATION: 704 Conant, Monroe, Mich.

SAMPLERS: Ehlgren/Dieckhaus TDD/PAN #: T05-9410-169

TANK #: 11 TYPE OF TANK: ✓ Vertical ___ Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 20'

Height: 12'

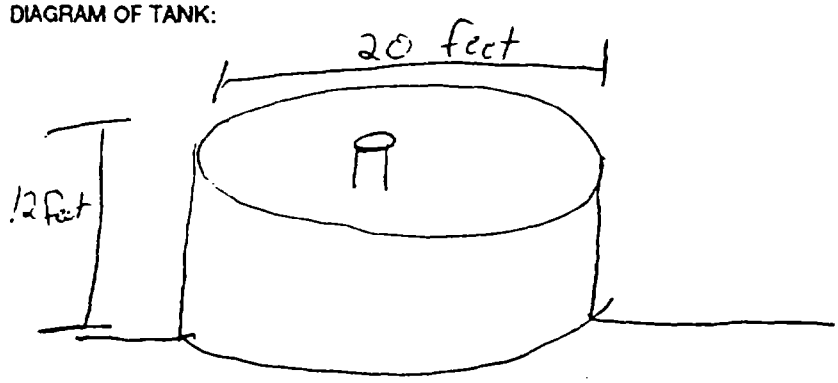
Length: ___

Depth - from top to:

1st liquid: 2 ft

1st solid: —

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)
No attached access ladder.

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: 0%LEL/21%O2 Radiation Meter: NT

SAMPLE #: SISTII DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				28,135
Top	2'			T.Brown-Black	opaque	2'	4,698
Middle	4-6" ice			Brown Black	opaque	4-6"	1,174
Bottom	~7½"			Brown-Black	opaque	~7½"	17,616

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material in tank = 23,488 gals

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Mich.

SAMPLERS: Ahlgren/Dreiklaus TDD/PAN #: T05-9410-169

TANK #: 12

TYPE OF TANK: X Vertical ___ Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 10'

Height: 23

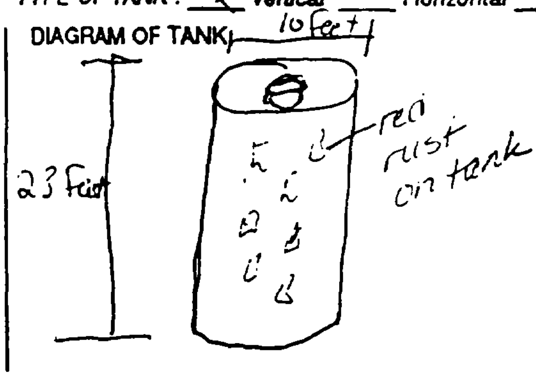
Length: ______

Depth - from top to:

1st liquid: 1 ft

1st solid: —

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

No Ladder. ~~rusted & missing rungs~~ [illegible]

AIR MONITORING 21% O2

Instrument Readings: Hnu/OVA: Microtip 40 Meter units [illegible] Background CGI: 0% LEL Radiation Meter: NT

SAMPLE #: SIST 12 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				13,505
Top	↓			Greenish Brown	transparent	22'	(12,918)
Middle	↓			↓	↓	↓	↓
Bottom	↓			↓	↓	↓	↓

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Ahlgren / Dieckhaus TDD PAN #: TC5-9410-169

TANK #: 13 TYPE OF TANK: ✓ Vertical ____ Horizontal ____ Horizontal with compartments

DIMENSIONS:

Diameter: 10'

Height: 23'

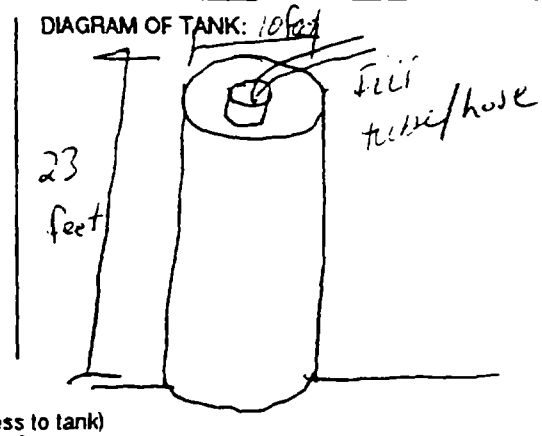
Length: ____

Depth - from top to:

1st liquid: 3.5 ft

1st solid: —

DIAGRAM OF TANK: 10 feet



COMMENTS: (on condition and access to tank)

Ladder rusted & missing rungs.

AIR MONITORING 2' from opening

Instrument Readings: Hnu/OVA: Microtip 43 units above background CGI: 0% LEL Radiation Meter: —

SAMPLE #: SISTL3 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume
	Liq.	Solid	Sludge				13,505
Top	3FT H2O			Clear		3'	1,762
Middle			14.5FT Black	Black	translucent	14.5'	8,514
Bottom	2FT H2O			Clear		2'	1,174

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$

Total volume material in tank = 11,450 gal

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 14 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: ____

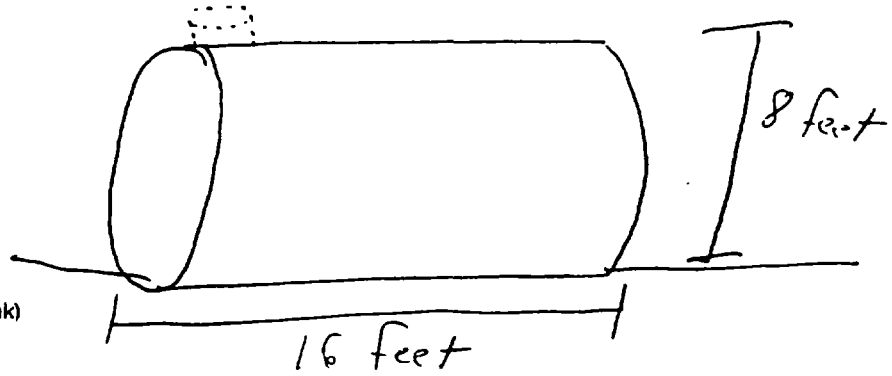
Length: 16

Depth - from top to:

1st liquid: < 1"

1st solid (sludge): ~6'

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings (Hnu/OVA): 5 ppm CGI: — Radiation Meter: —

SAMPLE #: SIST14 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				6,013
Top	X			BRN	OPQ	≈ 3'	2,255
Middle	X			BRN	OPQ	≈ 3'	2,255
Bottom			X	BRN	OPQ	~2'	1,503

Comments: apx. 1" into tank occured a slushy (potentially frozen water layer apx. 8" – 12" thick

VOLUME CALCULATIONS Total volume material = 6,013 gal.

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Sm. Th TDD/PAN #: T05-9410-169

TANK #: 15 TYPE OF TANK: ____ Vertical _X_ Horizontal ____ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: _____

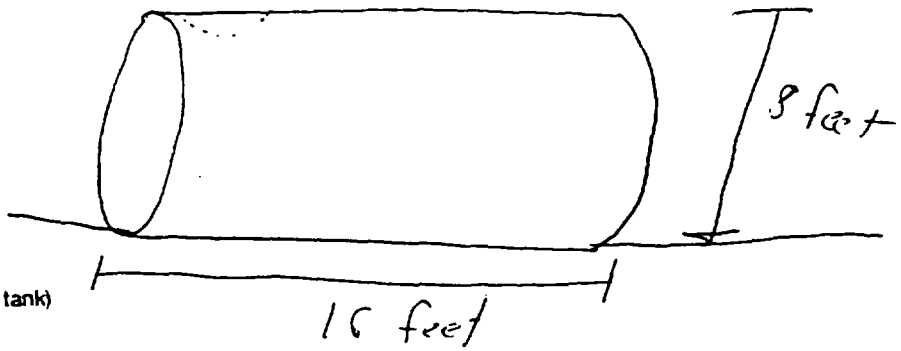
Length: 16

Depth - from top to:

1st liquid: < 1 inch

1st ~~Solid~~ Sludge: 3 ft

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: (Hnu)/OVA: 3 ppm CGI: 0% LEL / 21% O_2 Radiation Meter: N T

SAMPLE #: SISTI5 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				6,013
Top	X			BRN	OPQ	~ 3'	2,255
Middle			light X	BRN		5'	3,758
Bottom			light X	BRN			

Comments: The sludge portion was more "gummy" than thick.

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material = 6,013 gal.

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Saico Industrial Service LOCATION: 704 Conant, Monroe, Michig

SAMPLERS: Sim Yip TDD/PAN #: T05-9410-169

TANK #: 16 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: ___

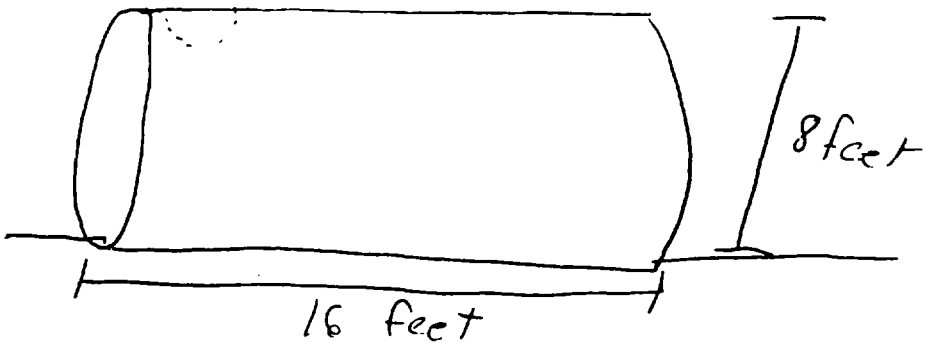
Length: 16

Depth - from top to:

1st liquid: < 1 inch

1st ~~Solid~~ Sludge: 6 ft

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SISTI6 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				6,013
Top	X			BRN	OPQ	~ 3'	2,255
Middle	X			↓	↓	~ 3'	2,255
Bottom			X	↓	↓	~ 2'	1,503

Comments:

VOLUME CALCULATIONS Total volume material = 6,013 gal.

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 17 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8'

Height: ____

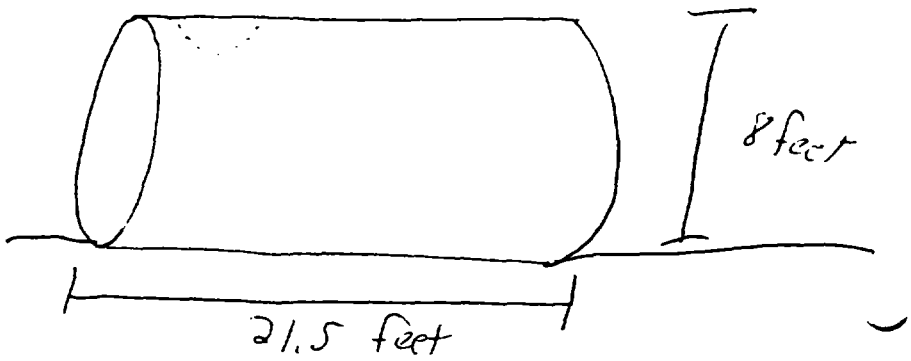
Length: 21.5

Depth - from top to:

1st liquid: < 1 inch

1st solid (sludge): 6 ft

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SIST17 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				8,080
Top	X			BRN	OPQ	~3'	3,030
Middle	X			↓	↓	~3'	3,030
Bottom			X	↓	↓	~2'	2,020

Comments:

VOLUME CALCULATIONS Total volume material = 8,080 gal.

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 18 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: ____

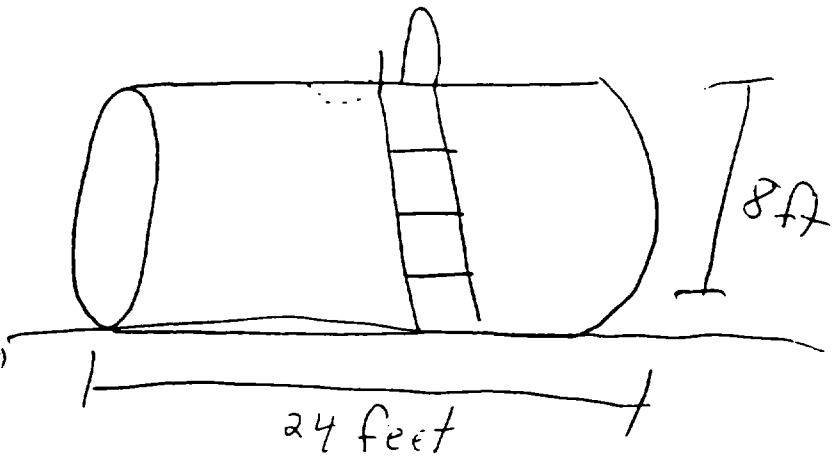
Length: 24

Depth - from top to:

1st liquid: < 1 inch

1st solid: 6 ft

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: 5ppm CGI: — Radiation Meter: —

SAMPLE #: SIST18 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				9031
Top	X			BRN	CLR	~2'	2,258
Middle	X			BRN		~4'	4,516
Bottom			X	BRN		~2'	2,257

Comments: apx. 1' into tank was a 8" thick "slushy" layer potentially partially frozen water.

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material = 9,031 gal

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS Dacier TDD/PAN #: T05-9410-169

TANK #: 19 TYPE OF TANK: ____ Vertical __X__ Horizontal ____ Horizontal with compartments

DIMENSIONS:

Diameter: 8

Height: ____

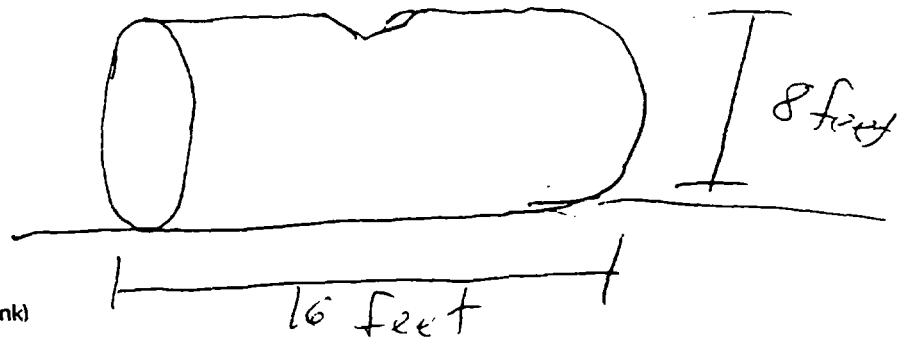
Length: 16

Depth - from top to:

1st liquid: 0.5

1st solid: 3.5'

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: NT Radiation Meter: NT

SAMPLE #: SIST19 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				GC 13
Top	x			Brn	Opaque	2.5'	1,879
Middle			x	Black	opaque	0.5'	376
Bottom							

Comments: Hit solids at ~3.5' (Bottom 4.5' unknown + not sampled). 4.5ft = 3,382 gal

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material = 5,637 gal

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME Calco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 20 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8 (same)

Height: ____

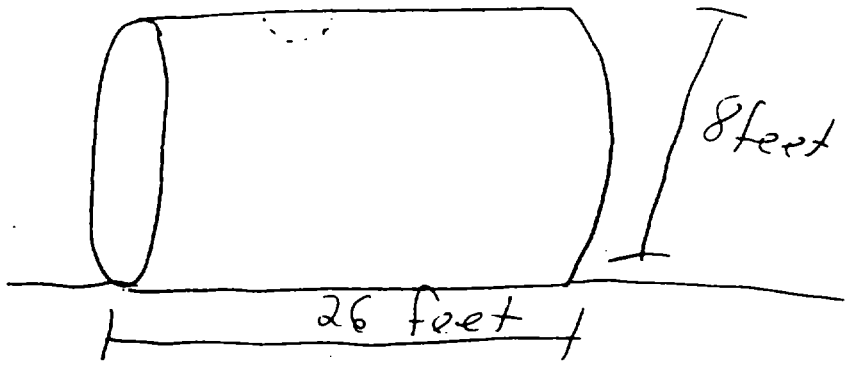
Length: 26

Depth - from top to:

1st liquid: <1 inch

1st solid: —

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

30 ppm - headspace of material AIR MONITORING

Instrument Readings: Hnu/OVA: 7ppm CGI: 0% LEL/21% O_2 Radiation Meter: NT

SAMPLE #: SIST20 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume
	Liq.	Solid	Sludge				9,776
Top	X			BRN	OPQ	8'	9,776
Middle	X			↓	↓	↓	↓
Bottom	X			↓	↓	↓	↓

Comments: appeared to be slightly more "refined" than the other Ben samples (liquids)

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: Smith TDD/PAN #: T05-9410-169

TANK #: 21 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8 (same as)

Height: ___

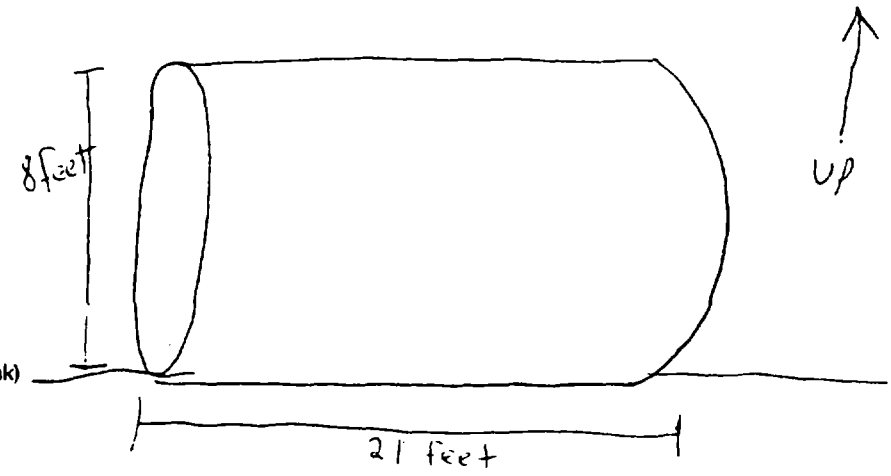
Length: 21

Depth - from top to:

1st liquid: < 1"

1st solid: —

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: 0% LEL/21% O_2 Radiation Meter: < 0.03 m Rem

SAMPLE #: SIS21 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume
	Liq.	Solid	Sludge				7,896
Top	X			BRN	OPQ	8'	(7,896)
Middle	X			↓	↓	↓	↓
Bottom	X			↓	↓	↓	↓

Comments:

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material in tank = (7,896 gal.)

Conversion of cubic feet to gallons: multiply by 7.48

TANK SAMPLE DATA SHEET

SITE NAME: Salco Industrial Service LOCATION: 704 Conant, Monroe, Michigan

SAMPLERS: [illegible] TDD/PAN #: T05-9410-169

TANK #: 22 TYPE OF TANK: ___ Vertical X Horizontal ___ Horizontal with compartments

DIMENSIONS:

Diameter: 8 (same as Height)

Height: ____

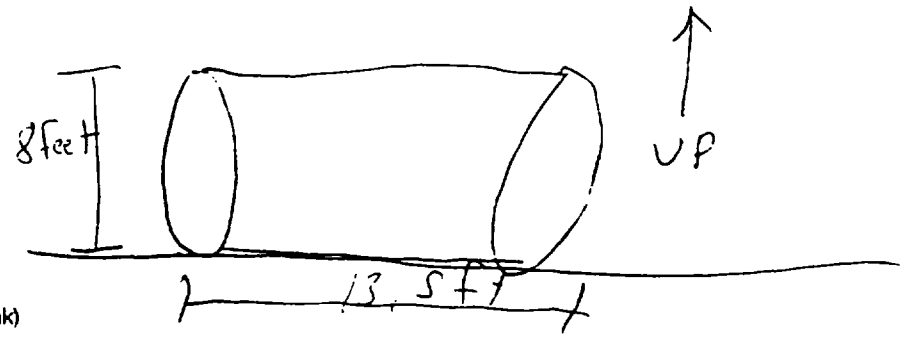
Length: 13.5

Depth - from top to:

1st liquid: 0.5

1st solid: 4.0'

DIAGRAM OF TANK:



COMMENTS: (on condition and access to tank)

AIR MONITORING

Instrument Readings: Hnu/OVA: NT CGI: 0% LEL/21% O_2 Radiation Meter: <0.03 m Rem

SAMPLE #: SFST22 DESCRIPTION OF SAMPLE Date Collected: 2/16/95

Layers		Physical State		Color	Clarity	Layer Thick	Volume gals
	Liq.	Solid	Sludge				5,073
Top	X			DK Brn	Opaque	2.5'	1,585
Middle			X	Black	Opaque	1.0'	634
Bottom							

Comments: Hit solids at ~4.0' (Bottom 4' material unknown + not sampled). 4 ft = 2,536 gal.

VOLUME CALCULATIONS

Volume of a cylinder: $V = \pi r^2 h$ Total volume material = 4,755 gal.

Conversion of cubic feet to gallons: multiply by 7.48

APPENDIX C

FIELD SAMPLE DATA SHEETS

Ecology and Environment, Inc.
Field Sample Data Sheet

Site Name Solco Industrial Service County Monroe State Michigan

Collectors Michael Dieckhaus EPA Site # TO5-9410-169

Sample # S I S Brown Date Collected 2/16/95 Temperature 33 °F

Sample Tag # _____ Time 1630 hours

TRANSECT INFORMATION

Letter _____ Compass Direction _____ - _____

Station # _____ Distance Between Stations ____ to ____ = ____ ft.

GROUNDWATER

Water Table Depth ___ ft.
Sample Depth ___ ft.
Color _____
Odor _____
Oil _____
Device _____

SOIL

Device:
- Auger
- Core
- Split Spoon
- Cylinder Cup
- Spade

Depth _____ ft or in

Soil Type
- Rock
- Gravel
- Sand
- Clay
- Silt
- Muck
- Loam
- Peat

Color _____

SURFACE WATER

Color _____ Odor _____
Temp _____ pH _____
Stream Data (measure after sample collection)
Width _____ ft
Depth _____ ft or in
Velocity _____ ft/sec
Flow Direction _____

Device:
- Kemmerer
- Bucket
- Direct

Surface _____
Bottom _____

WASTE

Color Brown Odor —
Solid-Sludge-~~Liquid~~ oily
Device:
- Bucket
- Trowel
- Core
- Other Dip jar

AIR

Media _____
Wind Dir. _____
Barom. Press. _____
Time Ran _____ min
Avg Flow Rate _____ l/min
Device _____

SEDIMENT

Color: Odor:
Bottom:
- Ooze
- Gravel
- Rock
- Organic
- Sand
- Clay
- Shell

Device:
- Ponar
- Eckman
- Bucket
- Trowel

SAMPLE PREPARATION

Container/Size:
- ~~Glass Jar~~
- Plastic Jar
- Acetate Core
- ~~Teflon Cap~~
- Foil Cap

Storage:
- ~~Wet Ice~~
- Dry Ice
- Ambient

Preservative Added:
- H_2SO_4
- $NaOH$
- HNO_3
- Other ____

Cleaning Procedure:
- Low-High Concentration
- ~~Detergent Wash~~
- Hexane Rinse
- Other Solvent Rinse-specify _____
- Water Rinse
- Acetone Rinse

ANALYSIS

Organics:
- Volatiles
- Base/Neutral
- Acid
- Pesticide
- PCB
- TCLP Organics

Inorganics:
- Total Metals
- Cyanide
- TCLP Metals

RCRA:
- Ignitability
- Corrosivity
- Reactivity
- Other _____

REMARKS

Sample was of oil emulsion located on the east side of the tank containment area next to tank #13. Oil was brown and was ~ 2 inches deep on top of ice.

Ecology and Environment, Inc.
Field Sample Data Sheet

Site Name Salco Industrial Service County Monroe State Michigan

Collectors Michael Dieckhaus EPA Site # TQ5-9410-169

Sample # SISSoil Date Collected 2/16/95 Temperature 33 °F

Sample Tag # _____ Time 1615

TRANSECT INFORMATION

Letter _____ Compass Direction _____ - _____

Station # _____ Distance Between Stations ____ to ____ = ____ ft.

GROUNDWATER

Water Table Depth ____ ft.
Sample Depth ____ ft.
Color _____
Odor _____
Oil _____
Device _____

SURFACE WATER

Color _____ Odor _____
Temp _____ pH _____
Stream Data (measure after sample collection)
Width _____ ft
Depth _____ ft or in
Velocity _____ ft/sec
Flow Direction _____
Device:
Kemmerer
Bucket
Direct
Surface _____
Bottom _____

AIR

Media _____
Wind Dir. _____
Barom. Press. _____
Time Ran _____ min
Avg Flow Rate _____ l/min
Device _____

SOIL

Device:
Auger
Core
Split Spoon
Cylinder Cup
(Spade)
Depth surface-6inches or (in)
Soil Type Oil-contaminated
Rock Silt
(Gravel) Muck
(Sand) (Loam)
Clay Peat
Color Light-brown-black

WASTE

Color _____ Odor _____
Solid-Sludge-Liquid
Device:
Bucket
Trowel
Core
Other _____

SEDIMENT

Color: Odor:
Bottom:
Ooze Sand
Gravel Clay
Rock Shell
Organic
Device:
Ponar
Eckman
Bucket
Trowel

SAMPLE PREPARATION

Container/Size:
(Glass Jar)
Plastic Jar
Acetate Core
(Teflon Cap)
Foil Cap

Storage:
(Wet Ice)
Dry Ice
Ambient

Preservative Added:
H_2SO_4
NaOH
HNO_3
(Other ice)

Cleaning Procedure:
Low-High Concentration
(Detergent Wash)
Hexane Rinse
Other Solvent Rinse-specify _____
Water Rinse
Acetone Rinse

ANALYSIS

Organics:
Volatiles
Base/Neutral
Acid
Pesticide
(PCB)
(TCLP Organics)

Inorganics:
Total Metals
Cyanide
(TCLP Metals)

RCRA:
(Ignitability)
Corrosivity
Reactivity
Other _____

REMARKS

Sample was of visually oil-contaminated soil located directly east of the earthen berm of tank containment area. Sample was collected from oil-contaminated soil outside berm + of berm itself.

APPENDIX D

CHAIN-OF-CUSTODY

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

Archive "(left on-site)

REGION 5
230 South Dearborn Street
Chicago, Illinois 60604

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
2T3051	Salco Industrial Service

SAMPLERS: *(Signature)*

2-T3051 Salco Industrial Service

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS
SIS-T9	2/16/95			X	Tank #9	4							
SIS-T10	2/16/95			X	Tank #10	2							
SIS T11	2/16/95			X	Tank #11	5							

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	COC Seal # S 171557 Seal # S 173549

Distribution: White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — Laboratory File

5-

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

Salco

REGION 5
230 South Dearborn Street
Chicago, Illinois 60604

CHAIN OF CUSTODY RECORD

PROJ NO.: 2T3054
PROJECT NAME: T05-9502-801 - Salco

SAMPLERS: (Signature) John Dacri [illegible] Karen Smith [illegible] M. [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	32 oz TCLP	16 oz React, pH, Flash	16 oz TOX, PCB	Flash pt.	32 oz React, pH +	React, TOX, PCB	REMARKS
SST6	2/16/95	1415		X	Tank 6	3	1	1	1				Attn: All Samples
SSST10	↓	1400		↓	Tank 10	3	1	1	1				Should be High Concentration
SSST18		1254			Tank 18	3	1	1	1				High Hazard
SSST21		1315			Tank 21	3	1	1	1				
SSST22		1500			Tank 22	2	1				1		QA level II
SSSoil		1615			Stained soil outside Berm	2	1				1		T.A.T.: 14 calender day
SSS[illegible]	↓	11:30		↓	Liquid inside Berm	2	1				1		Verbal
													21 calender day Hard
													copy
													No Preservatives Added
													custody seal # 173507

Remarks (column header block): B.L.C. Front St. Toledo Oh. Norm [illegible] 419-693-5301

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	2/17/95 1130				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		Patricia [illegible]	2/17/95 11:31	Remit Results To: David J. Iacovoni, Ecology and Environment Inc., 1?551 Universal Dr., Taylor MI 48180, 313-946-04[illegible]	

Distribution: White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — Laboratory File

Fax: [illegible] 1438 5- 04011

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

Archive/Inactive

CHAIN OF CUSTODY RECORD

REGION 5
230 South Dearborn Street
Chicago, Illinois 60604

PROJ. NO.	PROJECT NAME
2T30A	Salco Industrial Service

SAMPLERS: *(Signature)*

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS							REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	
				COC seals # 170317	

Distribution: White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — Laboratory File

ENVIRONMENTAL PROTECTION AGENCY
Office of Enforcement

Archive (left on-site)

CHAIN OF CUSTODY RECORD

REGION 5
230 South Dearborn Street
Chicago, Illinois 60604

PROJ. NO.	PROJECT NAME
ZT3051	Salco Industrial Service

SAMPLERS: *(Signature)* [illegible]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS							REMARKS
[illegible]	[illegible]			✓	[illegible]	[illegible]							Archive Samples
[illegible]					[illegible]	[illegible]							
[illegible]					[illegible]	[illegible]							
[illegible]					[illegible]	[illegible]							
[illegible]					[illegible]	[illegible]							
[illegible]					[illegible]	5							
[illegible]					[illegible]	1							
[illegible]					[illegible]	1							

2/14/95 2/14/95

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks: COC seal #'s 170299 170316	

Distribution: White — Accompanies Shipment; Pink — Coordinator Field Files; Yellow — Laboratory File

5- [illegible]

APPENDIX C

SOIL AND OIL ANALYTICAL DATA and REVIEW MEMOS

ecology and environment, inc.
'2251 UNIVERSAL TAYLOR MICHIGAN 48180 TEL 313 946-0900
International Specialists in the Environment

M E M O R A N D U M

DATE: March 21, 1995

TO: Michael Dieckhaus, TAT Project Manager, E & E, Detroit, MI MD

FROM: Herbert B. Langer, TAT Chemical Engineer, E & E, Detroit, MI HL

THROUGH: Sandra L. Basham, ATATL, E & E, Detroit, MI SLB
David Hendren, TAT Analytical Services Manager, E & E, Chicago, IL
Mary J. Ripp, TAT QA Reports Manager, E & E, Chicago, IL

SUBJECT: Miscellaneous Analyses Data Quality Assurance Review, Salco Industries Site, Monroe, Monroe County, Michigan

REFERENCE: Analytical TDD T05-9502-801 Project TDD T05-9410-169
Analytical PAN EMI0647AAA Project PAN EMI0647SAA

The data quality assurance (QA) review of six liquid and one solid samples, collected from the Salco Industries Site, is complete. The samples were collected on February 16, 1995, by the Technical Assistance Team (TAT) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to BEC Laboratories, Toledo, Ohio, for analysis. The laboratory analyses were performed according to United States Environmental Protection Agency (U.S. EPA) Solid Waste-846 (SW-846) Methods 1020 for flash point, 9020 for total organic halides, 9040 for pH, and sections 7.3.3.2 for reactive cyanide and 7.3.4.1 for reactive sulfide.

Sample Identification

E & E Identification No.	Laboratory Identification No.
SIST6	95T02708
SIST10	95T02709
SIST18	95T02710
SIST21	95T02711
SIST22	95T02712
SISSOIL	95T02713
SISBERM	95T02714

Data Qualifications

I. Sample Holding Time: Acceptable

The samples were collected February 16, 1995, and received by the laboratory February 17, 1995. The analyses were completed March 2, 1995, within the holding times outlined in the SW-846 methods.

II. Initial and Continuing Calibration Verification: Acceptable

Calibrations were performed on each instrument used. P-xylene was used to calibrate the flash point instrument. The compound flashed at 79.5 degrees, which is within the correct range for the compound. Buffers with pH of 4, 7, and 10 standard units, were used to calibrate the pH instrument. Standards at multiple concentrations were used to establish calibration curves for reactive cyanide and sulfide, and total organic halide analyses. The correlation coefficients for these calibrations were acceptable.

III. Blanks: Acceptable

Method blanks were prepared and analyzed at the required frequency during the analytical runs. None of the target analytes were detected in the blanks.

IV. Optional Quality Control Checks: Acceptable

Matrix spikes (MS) and method spikes were prepared and analyzed during the analytical runs. The percent recoveries of the spike compounds were within the laboratory's quality control guidelines. The relative percent difference between spike duplicate results were also within the laboratory's quality control guidelines.

VI. Overall Assessment of Date for Use: Acceptable

The overall usefulness of the data is based on the criteria outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990), Data Validation Procedures, Section 9.0, Generic Data Validation Procedures, and Section 2.7, Quality Assurance Requirements. Based upon the information provided, the data are considered acceptable for use.

Ecology & Environment, Inc.
12251 Universal

Taylor, MI 48180
ATTN: David Iacovone

HEADQUARTERS/LABORATORY
705 FRONT STREET
TOLEDO, OHIO 43605
PHONE: (419) 693-5307
FAX: (419) 691-0418

ENVIRONMENTAL LABORATORY
1632 ENTERPRISE PARKWAY
TWINSBURG, OHIO 44087
PHONE: (216) 425-8200
FAX: (216) 425-1349

lab no. 95T02703

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST6 - tank 6 - 2/16/95 @ 1415

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	greater than 200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Total Halides		4200 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than4 mg/Kg
pH in 10% Solution	SW-846, 9040	6.78

date completed: 03/02/95 | tech: AAT/CSY/CAC | approved by

Ecology & Environment, Inc.
12251 Universal

Taylor, MI 48180
ATTN: David Iacovone

HEADQUARTERS/LABORATORY
705 FRONT STREET
TOLEDO, OHIO 43605
PHONE: (419) 693-5307
FAX: (419) 691-0418

ENVIRONMENTAL LABORATORY
1632 ENTERPRISE PARKWAY
TWINSBURG, OHIO 44087
PHONE: (216) 425-8200
FAX: (216) 425-1349

lab no 95T02709

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST10 - tank 10 - 2/16/95 @ 1400

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	197°F-200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Total Halides		9100 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than 4 mg/Kg
pH in 10% Solution	SW-846, 9040	6.56

date completed: 03/02/95 | tech: AAT/CSY/CAC/DGH | approved by:

Ecology & Environment, Inc.
12251 Universal

Taylor, MI 48180
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lab no 95T02710

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST18 - tank 18 - 2/16/95 @ 1254

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	greater than 200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Total Halides		13000 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than 4 mg/Kg
pH in 10% Solution	SW-846, 9040	6.66

date completed: 03/02/95 | tech: AAT/CSY/CAC/DGH | approved by:

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lab no: 95T02711
p.o. no.:

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST21 - tank 21 - 2/16/95 @ 1315

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	greater than 200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Total Halides		7200 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than 4 mg/Kg
pH in 10% Solution	SW-846, 9040	5.85

date completed: 03/02/95 | tech: AAT/CSY/CAC/DGH | approved by:

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lab no. 95T02712

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST22 - tank 22 - 2/16/95 @ 1500

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	greater than 200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Total Halides		9100 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than 4 mg/Kg
pH in 10% Solution	SW-846, 9040	6.18

date completed: 03/02/95 | tech. CSY/AAT/CAC/DGH | approved by:

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lab no 95T02713

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISSOIL - stained soil outside berm - 2/16/95 @ 1615

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	greater than 200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Extractable Organic Halides		2200 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than 4 mg/Kg
pH in 10% Solution	SW-846, 9040	7.09

date completed: 03/02/95 | tech: CSY/AAT/CAC/DGH | approved by:

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lab no. 95T02714

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISBERM - liquid inside berm - 2/16/95 @ 1630

RESULTS:

ANALYTE	METHOD	RESULT
Flash Point - SETAFLASH	SW-846, 1020	greater than 200°F
Reactive Cyanide	SW-846, 7.3.3.2	less than 0.1 mg/Kg
Total Halides		5300 mg/Kg
Reactive Sulfide	SW-846, 7.3.4.1	less than 4 mg/Kg
pH in 10% Solution	SW-846, 9040	5.91

date completed 03/02/95 | tech AAT/CAC/CSY/DGH | approved by

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M E M O R A N D U M

DATE: March 21, 1995

TO: Michael Dieckhaus, TAT Project Manager, E & E, Detroit, MI

FROM: Herbert B. Langer, TAT Chemical Engineer, E & E, Detroit, MI

THROUGH: Sandra L. Basham, ATATL, E & E, Detroit, MI
David Hendren, TAT Analytical Services Manager, E & E, Chicago, IL
Mary J. Ripp, TAT QA Reports Manager, E & E, Chicago, IL

SUBJECT: TCLP Semivolatile Organic Compound Analysis Data Quality Assurance Review, Salco Industries Site, Monroe, Monroe County, Michigan

REFERENCE: Analytical TDD T05-9502-801 Project TDD T05-9410-169
Analytical PAN EMI0647AAA Project PAN EMI0647SAA

The data quality assurance (QA) review of six liquid and one solid samples, collected from the Salco Industries Site, is complete. The samples were collected on February 16, 1995, by the Technical Assistance Team (TAT) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to BEC Laboratories, Toledo, Ohio, for analysis. The laboratory analyses were performed according to the United States Environmental Protection Agency (U.S. EPA) Solid Waste-846 (SW-846) Method 1311 for Toxicity Characteristic Leaching Procedure (TCLP) extraction and Method 8270 for the determination of semivolatile organic compounds in the TCLP leachate.

Sample Identification

E & E Identification No.	Laboratory Identification No.
SIST6	95T02708
SIST10	95T02709
SIST18	95T02710
SIST21	95T02711
SIST22	95T02712
SISSOIL	95T02713
SISBERM	95T02714

Data Qualifications

I. Sample Holding Time: Acceptable

The samples were collected February 16, 1995, and received by the laboratory on February 17, 1995. The samples were extracted February 21 and 22, 1995, and analyses were completed February 24, 1995. All activities were performed within the required holding times for the method and matrices.

II. GC/MS Tuning: Acceptable

Decafluorotriphenylphosphine instrument tuning compound was run within twelve hours of each sample analysis, as required. All ion abundance criteria were met.

III. Initial and Continuing Calibration Verification: Acceptable

Initial calibration was performed February 2, 1995, and continuing calibrations were performed within twelve hours of each analysis. All initial calibration average response factors were greater than zero, as required. Continuing calibration relative response factors were greater than 0.05, as required.

Percent relative standard deviations between calibration response factors were less than 30, for target compounds, as required. Percent differences between initial and continuing calibration response factors for target compounds were less than 25, as required.

IV. Internal Standards: Acceptable

The percent difference between the internal standard areas for the daily standards and samples were within the required limits. Internal standard retention times were acceptable.

V. Method Blank: Acceptable

A method blank was prepared and analyzed during the sample run. None of the target compounds were detected in the method blank.

VI. Optional Quality Control Analyses: Acceptable

A. Matrix Spike/Matrix Spike Duplicate (MS/MSD):

A MS was prepared and analyzed with the analytical run that included samples SIST06 and SISBERM. A MS and MSD were prepared and analyzed with the run that included the rest of the samples. Percent recoveries of the spike compounds and relative percent

differences between MS and MSD results were within the laboratory's quality control guidelines.

B. Surrogate Recovery:

A total of six surrogate compounds were added to each sample, blank, MS, and MSD. The percent recoveries of the surrogate compounds were within the laboratory's quality control guidelines, with the exception of the phenol-d6 surrogate recovery for sample SIST10. Since no compounds were detected in the sample and only one of the six surrogate recoveries for the sample was outside the quality control guidelines, the results for the sample are considered acceptable as reported.

VII. Compound Identification: Acceptable

All response times for detected compounds were within 0.06 units of the daily standards, as required. All compounds detected in the samples were present in the daily standards.

VIII. Compound Quantitation and Reported Detection Limits: Acceptable

Sample concentrations and reported detection limits were correctly adjusted to reflect sample dilutions, matrix effects, and dry weight factors.

IX. Overall Assessment of Data for Use: Acceptable

The overall usefulness of the data is based on the criteria outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990), Data Validation Procedures, Section 4.0, BNAs by GC/MS Analysis, and Section 2.7, Quality Assurance Requirements. Based upon the information provided, the data are considered acceptable for use as reported.

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lab no 95T02708
p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST6 - tank 6 - 2/16/95 @ 1415

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	less than 0.5 mg/L
m & p-Cresol	200.0 mg/L	less than 0.5 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.5 mg/L **
Hexachlorobenzene	0.13 mg/L	less than 0.5 mg/L **
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.5 mg/L
Hexachloroethane	3.0 mg/L	less than 0.5 mg/L
Nitrobenzene	2.0 mg/L	less than 0.5 mg/L
Pentachlorophenol	100.0 mg/L	less than 1.0 mg/L
Pyridine	5.0 mg/L	less than 0.5 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.5 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.5 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	71.6	21-100
Phenol-d6	86.9	10-94
Nitrobenzene-d5	70.9	35-114
2-Fluorobiphenyl	107	43-116
2,4,6-Tribromophenol	113	10-123
p-Terphenyl-d14	120	33-141

1) Results reported as "less than" but at a higher value than the Method PQL has been elevated due to sample extract matrix interference.

** PQLs for these compounds exceed regulatory threshold limit

date completed:	tech	approved by:
02/27/95	AMG	

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lab no. 95T02709
p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST10 - tank 10 - 2/16/95 @ 1400

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	less than 0.080 mg/L
m & p-Cresol	200.0 mg/L	less than 0.080 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.080 mg/L
Hexachlorobenzene	0.13 mg/L	less than 0.080 mg/L
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.080 mg/L
Hexachloroethane	3.0 mg/L	less than 0.080 mg/L
Nitrobenzene	2.0 mg/L	less than 0.080 mg/L
Pentachlorophenol	100.0 mg/L	less than 0.16 mg/L
Pyridine	5.0 mg/L	less than 0.080 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.080 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.080 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	95.1	21-100
Phenol-d6	107 **	10-94
Nitrobenzene-d5	72.6	35-114
2-Fluorobiphenyl	116	43-116
2,4,6-Tribromophenol	117	10-123
p-Terphenyl-d14	134	33-141

1) A value reported as "less than" but at a higher value than the Method PQL has been elevated due to sample extract matrix interference.

** Surrogate recovery exceeds acceptable range limit

date completed	tech:	approved by:
02/27/95	AMG	

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lab no. 95T02710

p.o. no.

rev: 0

SAMPLE DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST18 - tank 18 - 2/16/95 @ 1254

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	less than 0.200 mg/L
m & p-Cresol	200.0 mg/L	less than 0.200 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.200 mg/L **
Hexachlorobenzene	0.13 mg/L	less than 0.200 mg/L **
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.200 mg/L
Hexachloroethane	3.0 mg/L	less than 0.200 mg/L
Nitrobenzene	2.0 mg/L	less than 0.200 mg/L
Pentachlorophenol	100.0 mg/L	less than 0.400 mg/L
Pyridine	5.0 mg/L	less than 0.200 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.200 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.200 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	77.6	21-100
Phenol-d6	85.3	10-94
Nitrobenzene-d5	76.8	35-114
2-Fluorobiphenyl	99.0	43-116
2,4,6-Tribromophenol	102	10-123
p-Terphenyl-d14	110	33-141

1) A value reported as "less than" but at a higher value than the Method PQL has been elevated due to sample extract matrix interference.

** PQLs for these compounds exceed regulatory threshold limit

date completed: 02/27/95 | tech: AMG | approved by:

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lab no. 95T02711

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST21 - tank 21 - 2/16/95 @ 1315

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	0.0595 mg/L
m & p-Cresol	200.0 mg/L	0.102 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.04 mg/L
Hexachlorobenzene	0.13 mg/L	less than 0.04 mg/L
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.04 mg/L
Hexachloroethane	3.0 mg/L	less than 0.04 mg/L
Nitrobenzene	2.0 mg/L	less than 0.04 mg/L
Pentachlorophenol	100.0 mg/L	less than 0.08 mg/L
Pyridine	5.0 mg/L	less than 0.04 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.04 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.04 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	74.9	21-100
Phenol-d6	77.6	10-94
Nitrobenzene-d5	78.0	35-114
2-Fluorobiphenyl	81.2	43-116
2,4,6-Tribromophenol	90.7	10-123
p-Terphenyl-d14	100	33-141

date completed 02/27/95 | tech AMG | approved by:

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lab no. 95T02712

p.o. no.

rev: 0

SAMPLE DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST22 - tank 22 - 2/16/95 @ 1500

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	less than 0.200 mg/L
m & p-Cresol	200.0 mg/L	less than 0.200 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.200 mg/L **
Hexachlorobenzene	0.13 mg/L	less than 0.200 mg/L **
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.200 mg/L
Hexachloroethane	3.0 mg/L	less than 0.200 mg/L
Nitrobenzene	2.0 mg/L	less than 0.200 mg/L
Pentachlorophenol	100.0 mg/L	less than 0.400 mg/L
Pyridine	5.0 mg/L	less than 0.200 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.200 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.200 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	80.8	21-100
Phenol-d6	85.9	10-94
Nitrobenzene-d5	65.6	35-114
2-Fluorobiphenyl	105	43-116
2,4,6-Tribromophenol	103	10-123
p-Terphenyl-d14	123	33-141

1) A value reported as "less than" but at a higher value than the Method PQL hass been elevated due to sample extract matrix interference.

** PQLs for these compounds exceed regulatory threshold limit

date completed:	tech:	approved by
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lab no 95T02713
p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISSOIL - stained soil outside berm - 2/16/95 @ 1615

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	less than 0.04 mg/L
m & p-Cresol	200.0 mg/L	less than 0.04 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.04 mg/L
Hexachlorobenzene	0.13 mg/L	less than 0.04 mg/L
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.04 mg/L
Hexachloroethane	3.0 mg/L	less than 0.04 mg/L
Nitrobenzene	2.0 mg/L	less than 0.04 mg/L
Pentachlorophenol	100.0 mg/L	less than 0.08 mg/L
Pyridine	5.0 mg/L	less than 0.04 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.04 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.04 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	75.4	21-100
Phenol-d6	76.6	10-94
Nitrobenzene-d5	74.0	35-114
2-Fluorobiphenyl	79.0	43-116
2,4,6-Tribromophenol	87.3	10-123
p-Terphenyl-d14	105	33-141

date completed: 02/24/95 | tech: AMG | approved by:

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lab no. 95T02714

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISBERM - liquid inside berm - 2/16/95 @ 1630

ANALYSIS: Semi-Volatile Organics in the TCLP Extract

PROCEDURE: SW-846, Method 8270

RESULTS:

COMPOUND	LIMIT	RESULTS
o-Cresol	200.0 mg/L	less than 0.04 mg/L
m & p-Cresol	200.0 mg/L	less than 0.04 mg/L
2,4-Dinitrotoluene	0.13 mg/L	less than 0.04 mg/L
Hexachlorobenzene	0.13 mg/L	less than 0.04 mg/L
Hexachloro-1,3-butadiene	0.5 mg/L	less than 0.04 mg/L
Hexachloroethane	3.0 mg/L	less than 0.04 mg/L
Nitrobenzene	2.0 mg/L	less than 0.04 mg/L
Pentachlorophenol	100.0 mg/L	less than 0.08 mg/L
Pyridine	5.0 mg/L	less than 0.04 mg/L
2,4,5-Trichlorophenol	400.0 mg/L	less than 0.04 mg/L
2,4,6-Trichlorophenol	2.0 mg/L	less than 0.04 mg/L

SURROGATE RECOVERY:

COMPOUND	% RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	80.9	21-100
Phenol-d6	83.8	10-94
Nitrobenzene-d5	85.4	35-114
2-Fluorobiphenyl	87.2	43-116
2,4,6-Tribromophenol	90.9	10-123
p-Terphenyl-d14	94.5	33-141

date completed:	tech:	approved by
02/27/95	AMG	

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M E M O R A N D U M

DATE: March 21, 1995

TO: Michael Dieckhaus, TAT Project Manager, E & E, Detroit, MI MJD

FROM: Herbert B. Langer, TAT Chemical Engineer, E & E, Detroit, MI HBL

THROUGH: Sandra L. Basham, ATATL, E & E, Detroit, MI SLB
David Hendren, TAT Analytical Services Manager, E & E, Chicago, IL
Mary J. Ripp, TAT QA Reports Manager, E & E, Chicago, IL

SUBJECT: TCLP Volatile Organic Compound Analysis Data Quality Assurance Review, Salco Industries Site, Monroe, Monroe County, Michigan

REFERENCE: Analytical TDD T05-9502-801 Project TDD T05-9410-169
Analytical PAN EMI0647AAA Project PAN EMI0647SAA

The data quality assurance (QA) review of six liquid and one solid samples, collected from the Salco Industries Site, is complete. The samples were collected on February 16, 1995, by the Technical Assistance Team (TAT) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to BEC Laboratories, Toledo, Ohio, for analysis. The laboratory analyses were performed according to the United States Environmental Protection Agency (U.S. EPA) Solid Waste-846 (SW-846) Method 1311 for Toxicity Characteristic Leaching Procedure (TCLP) extraction and Method 8240 for the determination of volatile organic compounds in the TCLP leachate.

Sample Identification

E & E Identification No.	Laboratory Identification No.
SIST6	95T02708
SIST10	95T02709
SIST18	95T02710
SIST21	95T02711
SIST22	95T02712
SISSOIL	95T02713
SISBERM	95T02714

Data Qualifications

I. Sample Holding Time: Acceptable

The samples were collected February 16, 1995, and received by the laboratory February 17, 1995. TCLP extractions were performed between February 22 and March 1, 1995. Analyses were completed March 3, 1995. All activities were performed within the required holding times for the methods and matrices.

II. GC/MS Tuning: Acceptable

Bromofluorobenzene instrument tuning compound was run within twelve hours of each sample analysis, as required. All ion abundance criteria were met.

III. Initial and Continuing Calibration Verification: Acceptable

Initial calibrations were performed January 16 and February 21, 1995. Continuing calibrations were performed within twelve hours of each analysis, as required. All initial calibration average response factors were greater than zero, as required. Continuing calibration relative response factors were greater than 0.05, as required.

Percent relative standard deviations between initial calibration response factors were less than 30, for detected compounds, as required. Percent differences between initial and continuing calibration response factors for detected compounds were less than 25, as required.

IV. Internal Standards: Acceptable

The percent difference between the internal standard areas for the daily standards and samples were within the required limits. Internal standard retention times were acceptable.

V. Method Blank: Acceptable

A method blank was prepared and analyzed for each sample run. None of the target compounds were detected in the method blanks.

VI. Optional Quality Control Analyses: Acceptable

A. Matrix Spike/Matrix Spike Duplicate (MS/MSD):

A MS and MSD were prepared and analyzed during the analytical run. Percent recoveries of the spike compounds and relative percent differences between MS and MSD results were within the laboratory's quality control guidelines.

B. Surrogate Recovery:

A total of three surrogate compounds were added to each sample, blank, MS, and MSD. The percent recoveries of the surrogate compounds were within the laboratory's quality control guidelines.

VII. Compound Identification: Qualified

All response times for detected compounds were within 0.06 units of the daily standards, except methyl ethyl ketone and chlorobenzene. Positive identification of these compounds cannot be considered absolute and positive results for these compounds have been qualified J, as estimates.

VIII. Compound Quantitation and Reported Detection Limits: Acceptable

The compound quantitation and reported detection limits have been correctly adjusted to reflect dilutions and matrix effects.

IX. Overall Assessment of Data for Use: Acceptable

The overall usefulness of the data is based on the criteria outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990), Data Validation Procedures, Section 5.0, VOAs by GC/MS Analysis, and Section 2.7, Quality Assurance Requirements. Based upon the information provided, the data are considered acceptable for use as reported with the above stated qualifications.

Data Qualifiers and Definitions

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the contract required detection limits or quality control criteria were not met.

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lab no 95T02708

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST6 - tank 6 - 2/16/95 @ 1415

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	less than 0.200 mg/L
Carbon Tetrachloride	0.5 mg/L	less than 0.200 mg/L
Chlorobenzene	100 mg/L	less than 0.200 mg/L
Chloroform	6.0 mg/L	less than 0.200 mg/L
1,4-Dichlorobenzene	7.5 mg/L	less than 0.200 mg/L
1,2-Dichloroethane	0.5 mg/L	less than 0.200 mg/L
1,1-Dichloroethylene	0.7 mg/L	less than 0.200 mg/L
Methyl Ethyl Ketone	200 mg/L	less than 0.400 mg/L
Tetrachloroethylene	0.7 mg/L	less than 0.200 mg/L
Trichloroethylene	0.5 mg/L	less than 0.200 mg/L
Vinyl Chloride	0.2 mg/L	less than 0.200 mg/L

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	102	76-114
Toluene-d8	98.1	88-110
4-Bromofluorobenzene	99.9	86-115

NOTE: A value reported as "less than" but at a higher value than the Method PQL has been elevated due to dilution of the sample done to prevent overloading of the Mass Spectrometer.

date completed 03/01/95 | tech JM | approved by

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p.o. no

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST10 - tank 10 - 2/16/95 @ 1400

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	0.781 mg/L (1)
Carbon Tetrachloride	0.5 mg/L	less than 0.200 mg/L *
Chlorobenzene	100 mg/L	0.381 mg/L J
Chloroform	6.0 mg/L	less than 0.200 mg/L *
1,4-Dichlorobenzene	7.5 mg/L	less than 0.200 mg/L *
1,2-Dichloroethane	0.5 mg/L	less than 0.200 mg/L *
1,1-Dichloroethylene	0.7 mg/L	less than 0.200 mg/L *
Methyl Ethyl Ketone	200 mg/L	0.816 mg/L J
Tetrachloroethylene	0.7 mg/L	2.54 mg/L
Trichloroethylene	0.5 mg/L	0.299 mg/L
Vinyl Chloride	0.2 mg/L	less than 0.200 mg/L *

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	83.2	76-114
Toluene-d8	93.0	88-110
4-Bromofluorobenzene	102	86-115

* A value reported as "less than" but at a higher value than the Method PQL has been elevated due to dilution of the sample done to prevent overloading of the Mass Spectromet

1) The result for this compound exceeds the regulatory threshold limit.

date completed	tech	approved by
02/27/95	JM	

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST18 - tank 18 - 2/16/95 @ 1254

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	less than 0.2 mg/L (0.149)
Carbon Tetrachloride	0.5 mg/L	less than 0.200 mg/L *
Chlorobenzene	100 mg/L	less than 0.200 mg/L *
Chloroform	6.0 mg/L	less than 0.200 mg/L *
1,4-Dichlorobenzene	7.5 mg/L	less than 0.200 mg/L *
1,2-Dichloroethane	0.5 mg/L	less than 0.200 mg/L *
1,1-Dichloroethylene	0.7 mg/L	less than 0.200 mg/L *
Methyl Ethyl Ketone	200 mg/L	less than 0.400 mg/L *
Tetrachloroethylene	0.7 mg/L	less than 0.200 mg/L *
Trichloroethylene	0.5 mg/L	less than 0.200 mg/L *
Vinyl Chloride	0.2 mg/L	less than 0.200 mg/L *

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	86.0	76-114
Toluene-d8	92.2	88-110
4-Bromofluorobenzene	93.0	86-115

* A value reported as "less than" but at a higher value than the Method PQL has been elevated due to dilution of the sample done to prevent overloading of the Mass Spectrometer

date completed: 02/27/95 | tech: JM | approved by:

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST21 - tank 21 - 2/16/95 @ 1315

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	less than 0.200 mg/L *
Carbon Tetrachloride	0.5 mg/L	less than 0.200 mg/L *
Chlorobenzene	100 mg/L	less than 0.200 mg/L *
Chloroform	6.0 mg/L	less than 0.200 mg/L *
1,4-Dichlorobenzene	7.5 mg/L	less than 0.200 mg/L *
1,2-Dichloroethane	0.5 mg/L	less than 0.200 mg/L *
1,1-Dichloroethylene	0.7 mg/L	less than 0.200 mg/L *
Methyl Ethyl Ketone	200 mg/L	less than 0.400 mg/L *
Tetrachloroethylene	0.7 mg/L	less than 0.200 mg/L *
Trichloroethylene	0.5 mg/L	less than 0.200 mg/L *
Vinyl Chloride	0.2 mg/L	less than 0.200 mg/L *

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	86.3	76-114
Toluene-d8	95.8	88-110
4-Bromofluorobenzene	95.2	86-115

* A value reported as "less than" but at a higher value than the Method PQL has been elevated due to dilution of the sample done to prevent overloading of the Mass Spectrometer

date completed 02/27/95 | tech: JM | approved by:

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST22 - tank 22 - 2/16/95 @ 1500

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	less than 0.200 mg/L *
Carbon Tetrachloride	0.5 mg/L	less than 0.200 mg/L *
Chlorobenzene	100 mg/L	less than 0.200 mg/L *
Chloroform	6.0 mg/L	less than 0.200 mg/L *
1,4-Dichlorobenzene	7.5 mg/L	less than 0.200 mg/L *
1,2-Dichloroethane	0.5 mg/L	less than 0.200 mg/L *
1,1-Dichloroethylene	0.7 mg/L	less than 0.200 mg/L *
Methyl Ethyl Ketone	200 mg/L	less than 0.400 mg/L *
Tetrachloroethylene	0.7 mg/L	less than 0.200 mg/L *
Trichloroethylene	0.5 mg/L	less than 0.200 mg/L *
Vinyl Chloride	0.2 mg/L	less than 0.200 mg/L *

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	92.3	76-114
Toluene-d8	95.7	88-110
4-Bromofluorobenzene	91.2	86-115

* A value reported as "less than" but at a higher value than the Method PQL has been elevated due to dilution of the sample done to prevent overloading of the Mass Spectromet

date completed:	tech	approved by
02/24/95	JM	

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bec no: 95T02713
p.o. no:

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISSOIL - stained soil outside berm - 2/16/95 @ 1615

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	less than 0.025 mg/L
Carbon Tetrachloride	0.5 mg/L	less than 0.025 mg/L
Chlorobenzene	100 mg/L	less than 0.025 mg/L
Chloroform	6.0 mg/L	less than 0.025 mg/L
1,4-Dichlorobenzene	7.5 mg/L	less than 0.025 mg/L
1,2-Dichloroethane	0.5 mg/L	less than 0.025 mg/L
1,1-Dichloroethylene	0.7 mg/L	less than 0.025 mg/L
Methyl Ethyl Ketone	200 mg/L	less than 0.050 mg/L
Tetrachloroethylene	0.7 mg/L	less than 0.025 mg/L
Trichloroethylene	0.5 mg/L	less than 0.025 mg/L
Vinyl Chloride	0.2 mg/L	less than 0.025 mg/L

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	86.3	76-114
Toluene-d8	97.9	88-110
4-Bromofluorobenzene	92.8	86-115

date completed: 02/24/95 | tech: JM | approved by:

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lab no 95T02714

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISBERM - liquid inside berm - 2/16/95 @ 1630

ANALYSIS: Volatile Organics in the TCLP-ZHE Extract

PROCEDURE: SW-846, Method 8240

RESULTS:

COMPOUND	LIMIT	RESULTS
Benzene	0.5 mg/L	less than 0.025 mg/L
Carbon Tetrachloride	0.5 mg/L	less than 0.025 mg/L
Chlorobenzene	100 mg/L	less than 0.025 mg/L
Chloroform	6.0 mg/L	less than 0.025 mg/L
1,4-Dichlorobenzene	7.5 mg/L	less than 0.025 mg/L
1,2-Dichloroethane	0.5 mg/L	less than 0.025 mg/L
1,1-Dichloroethylene	0.7 mg/L	less than 0.025 mg/L
Methyl Ethyl Ketone	200 mg/L	less than 0.050 mg/L
Tetrachloroethylene	0.7 mg/L	less than 0.025 mg/L
Trichloroethylene	0.5 mg/L	less than 0.025 mg/L
Vinyl Chloride	0.2 mg/L	less than 0.025 mg/L

SURROGATE RECOVERY:

Compound	% Recovery	Acceptable Range
1,2-Dichloroethane-D4	90.6	76-114
Toluene-d8	102	88-110
4-Bromofluorobenzene	91.0	86-115

date completed: 03/03/95 | tech.: JM | approved by:

ecology and environment, inc.
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MEMORANDUM

DATE: March 21, 1995

TO: Michael Dieckhaus, TAT Project Manager, E & E, Detroit, MI

FROM: Herbert B. Langer, TAT Chemical Engineer, E & E, Detroit, MI

THROUGH: Sandra L. Basham, ATATL, E & E, Detroit, MI
David Hendren, TAT Analytical Services Manager, E & E, Chicago, IL
Mary J. Ripp, TAT QA Reports Manager, E & E, Chicago, IL

SUBJECT: Polychlorinated Biphenyl (PCB) Compound Analysis Data Quality Assurance Review, Salco Industries Site, Monroe, Monroe County, Michigan

REFERENCE: Analytical TDD T05-9502-801 Project TDD T05-9410-169
Analytical PAN EMI0647AAA Project PAN EMI0647SAA

The data quality assurance (QA) review of six liquid and one solid samples, collected from the Salco Industries Site, is complete. The samples were collected on February 16, 1995, by the Technical Assistance Team (TAT) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to BEC Laboratories, Toledo, Ohio, for analysis. The laboratory analyses were performed according to United States Environmental Protection Agency (U.S. EPA) Solid Waste-846 (SW-846) Method 8080 for the determination of PCBs.

Sample Identification

E & E Identification No.	Laboratory Identification No.
SIST6	95T02708
SIST10	95T02709
SIST18	95T02710
SIST21	95T02711
SIST22	95T02712
SISSOIL	95T02713
SISBERM	95T02714

Data Qualifications

I. Sample Holding Time: Acceptable

The samples were collected February 16, 1995, and received by the laboratory on February 17, 1995. The samples were extracted February 23, 1995, and analyses were completed March 2, 1995. All activities were performed within the required holding times for the method and matrices.

II. Instrument Performance: Acceptable

Peak resolution on the standard chromatograms was adequate. Surrogate compound retention time shifts were less than 0.3 percent, as required for the capillary columns used.

III. Initial and Continuing Calibration Verification: Acceptable

Initial calibration was performed February 17, 1995, using the target Aroclors at five different concentrations. The percent relative standard deviations for the initial calibrations met the requirements outlined in the SW-846 Method. Continuing calibration was performed daily. Percent differences between initial and continuing calibration response factors were less than fifteen, as required.

IV. Method Blank: Acceptable

Method blanks were prepared and analyzed during the analytical runs. None of the target Aroclors were detected in the method blanks.

V. Optional Quality Control Analyses: Acceptable

A. Matrix Spike/Matrix Spike Duplicate (MS/MSD):

A MS and MSD were prepared and analyzed during each analytical run. Percent recoveries of the spike Aroclors and relative percent differences between MS and MSD results were within the laboratory's quality control guidelines.

B. Surrogate Recovery:

A total of two surrogate compounds were added to each sample, blank, MS, and MSD. The percent recoveries of the surrogate compounds were within the laboratory's quality control guidelines.

VI. Compound Identification: Acceptable

Positive results were identified using correct retention time windows and fingerprint patterns.

VII. Compound Quantitation and Reported Detection Limits: Acceptable

Reported values, both positive and non-detect, were correctly adjusted to reflect sample dilutions, matrix effects, and dry weight factors.

VIII. Overall Assessment of Data for Use: Acceptable

The overall usefulness of the data is based on the criteria outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990), Data Validation Procedures, Section 7.0, PCBs, and Section 2.7, Quality Assurance Requirements. Based upon the information provided, the data are acceptable for use as reported.

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ce no. 95T02708

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST6 - tank 6 - 2/16/95 @ 1415

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results
Aroclor 1016	< 1.0 mg/Kg
Aroclor 1221	< 1.0 mg/Kg
Aroclor 1232	< 1.0 mg/Kg
Aroclor 1242	< 1.0 mg/Kg
Aroclor 1248	< 1.0 mg/Kg
Aroclor 1254	2.0 mg/Kg
Aroclor 1260	1.2 mg/Kg

Surrogate Recovery:

Tetrachloro-m-xylene	76%
Decachlorobiphenyl	84%

date completed	tech	approved by
02/22/95	PDB/FG	

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST10 - tank 10 - 2/16/95 @ 1400

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results
Aroclor 1016	< 1.0 mg/Kg
Aroclor 1221	< 1.0 mg/Kg
Aroclor 1232	< 1.0 mg/Kg
Aroclor 1242	< 1.0 mg/Kg
Aroclor 1248	< 1.0 mg/Kg
Aroclor 1254	< 1.0 mg/Kg
Aroclor 1260	< 1.0 mg/Kg

Surrogate Recovery:

Tetrachloro-m-xylene	75%
Decachlorobiphenyl	86%

date completed 02/22/95 | tech: PDB/FG | approved by:

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lab no. 95T02710

p.o. no.

rev: 0

SAMPLE DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST18 - tank 18 - 2/16/95 @ 1254

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results
Aroclor 1016	< 1.0 mg/Kg
Aroclor 1221	< 1.0 mg/Kg
Aroclor 1232	< 1.0 mg/Kg
Aroclor 1242	< 1.0 mg/Kg
Aroclor 1248	< 1.0 mg/Kg
Aroclor 1254	< 1.0 mg/Kg
Aroclor 1260	< 1.0 mg/Kg

Surrogate Recovery:

Tetrachloro-m-xylene	79%
Decachlorobiphenyl	88%

date completed: 02/22/95 | tech: PDB/FG | approved by

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST21 - tank 21 - 2/16/95 @ 1315

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results
Aroclor 1016	< 1.0 mg/Kg
Aroclor 1221	< 1.0 mg/Kg
Aroclor 1232	< 1.0 mg/Kg
Aroclor 1242	< 1.0 mg/Kg
Aroclor 1248	72 mg/Kg
Aroclor 1254	< 1.0 mg/Kg
Aroclor 1260	< 1.0 mg/Kg

Surrogate Recovery:

Tetrachloro-m-xylene	79%
Decachlorobiphenyl	90%

date completed:	tech:	approved by:
02/22/95	PDB/FG	

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95T02712

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST22 - tank 22 - 2/16/95 @ 1500

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results
Aroclor 1016	< 5.0 mg/Kg
Aroclor 1221	< 5.0 mg/Kg
Aroclor 1232	< 5.0 mg/Kg
Aroclor 1242	< 5.0 mg/Kg
Aroclor 1248	260 mg/Kg
Aroclor 1254	< 5.0 mg/Kg
Aroclor 1260	< 5.0 mg/Kg

Surrogate Recovery:

Tetrachloro-m-xylene	80%
Decachlorobiphenyl	99%

* Elevated PQL due to dilution necessary to bring sample concentration within range of the calibratin curve.

date completed	tech	approved by
02/24/95	PDB/FG	

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lab no 95T02713

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISSOIL - stained soil outside berm - 2/16/95 @ 1615

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results
Aroclor 1016	< 0.1 mg/Kg
Aroclor 1221	< 0.1 mg/Kg
Aroclor 1232	< 0.1 mg/Kg
Aroclor 1242	< 0.1 mg/Kg
Aroclor 1248	2.0 mg/Kg
Aroclor 1254	0.3 mg/Kg
Aroclor 1260	< 0.1 mg/Kg

Surrogate Recovery:

Tetrachloro-m-xylene	47%
Decachlorobiphenyl	64%

date completed: 02/23/95 | tech: PDB/FG | approved by:

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lab no 95T02714

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISBERM - liquid inside berm - 2/16/95 @ 1630

ANALYSIS: PCBs

PROCEDURE: SW-846, Method 8080

RESULT:

Compound	Results *
Aroclor 1016	< 1.0 mg/Kg
Aroclor 1221	< 1.0 mg/Kg
Aroclor 1232	< 1.0 mg/Kg
Aroclor 1242	< 1.0 mg/Kg
Aroclor 1248	11 mg/Kg
Aroclor 1254	1.2 mg/Kg
Aroclor 1260	< 1.0 mg/Kg

Surrogate Recovery:

	Oil	Water
Tetrachloro-m-xylene	85%	67%
Decachlorobiphenyl	97%	70%

* These results are weighted average for the two phases (oil & water) of the sample.

date completed 02/23/95 | tech PDB/FG | approved by

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95T02708

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST6 - tank 6 - 2/16/95 @ 1415

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.10 mg/L
Barium	100.0 mg/L	0.89 mg/L
Cadmium	1.0 mg/L	less than 0.050 mg/L
Chromium	5.0 mg/L	less than 0.050 mg/L
Lead	5.0 mg/L	0.081 mg/L
Mercury	0.2 mg/L	less than 0.0020 mg/L
Selenium	1.0 mg/L	less than 0.10 mg/L
Silver	5.0 mg/L	less than 0.050 mg/L

date completed:	tech:	approved by:
02/28/95	DVV/BSG/MJK	

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95T02709

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST10 - tank 10 - 2/16/95 @ 1400

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.50 mg/L
Barium	100.0 mg/L	less than 2.5 mg/L
Cadmium	1.0 mg/L	less than 0.25 mg/L
Chromium	5.0 mg/L	less than 0.25 mg/L
Lead	5.0 mg/L	less than 0.25 mg/L
Mercury	0.2 mg/L	less than 0.015 mg/L
Selenium	1.0 mg/L	less than 0.50 mg/L
Silver	5.0 mg/L	less than 0.25 mg/L

* Elevated PQL due to sample matrix

date completed:	tech:	approved by:
02/28/95	DVV/MJK/BSG	

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ICE no. 95T02710

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST18 - tank 18 - 2/16/95 @ 1254

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.50 mg/L
Barium	100.0 mg/L	less than 2.5 mg/L
Cadmium	1.0 mg/L	less than 0.25 mg/L
Chromium	5.0 mg/L	less than 0.25 mg/L
Lead	5.0 mg/L	less than 0.25 mg/L
Mercury	0.2 mg/L	less than 0.015 mg/L
Selenium	1.0 mg/L	less than 0.50 mg/L
Silver	5.0 mg/L	less than 0.25 mg/L

* Elevated PQL due to sample matrix

date completed:	tech:	approved by:
02/28/95	DVV/MJK/BSG	

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ICO no. 95T02711

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST21 - tank 21 - 2/16/95 @ 1315

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.10 mg/L
Barium	100.0 mg/L	0.81 mg/L
Cadmium	1.0 mg/L	less than 0.050 mg/L
Chromium	5.0 mg/L	less than 0.050 mg/L
Lead	5.0 mg/L	0.12 mg/L
Mercury	0.2 mg/L	less than 0.0020 mg/L
Selenium	1.0 mg/L	less than 0.10 mg/L
Silver	5.0 mg/L	less than 0.050 mg/L

date completed: 02/28/95 | tech: DVV/JEB/MJK/BSG | approved by:

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95T02712

p.o. no

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST22 - tank 22 - 2/16/95 @ 1500

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.50 mg/L
Barium	100.0 mg/L	less than 2.5 mg/L
Cadmium	1.0 mg/L	less than 0.25 mg/L
Chromium	5.0 mg/L	less than 0.25 mg/L
Lead	5.0 mg/L	less than 0.25 mg/L
Mercury	0.2 mg/L	less than 0.0020 mg/L
Selenium	1.0 mg/L	less than 0.50 mg/L
Silver	5.0 mg/L	less than 0.25 mg/L

* Elevated PQL due to sample matrix

date completed:	tech:	approved by:
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95T02713

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISSOIL - stained soil outside berm - 2/16/95 @ 1615

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.10 mg/L
Barium	100.0 mg/L	0.98 mg/L
Cadmium	1.0 mg/L	0.063 mg/L
Chromium	5.0 mg/L	less than 0.050 mg/L
Lead	5.0 mg/L	0.32 mg/L
Mercury	0.2 mg/L	less than 0.0020 mg/L
Selenium	1.0 mg/L	less than 0.10 mg/L
Silver	5.0 mg/L	less than 0.050 mg/L

date completed:	tech:	approved by:
02/28/95	DVV/MJK/BSG	

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lab no. 95T02714

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISBERM - liquid inside berm - 2/16/95 @ 1630

ANALYSIS: Metals in the TCLP Extract by Method of Standard Additions as outlined in US EPA "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", SW-846, Third Edition, November, 1986.

RESULTS:

Analyte	Limit	Measured Concentration
Arsenic	5.0 mg/L	less than 0.10 mg/L
Barium	100.0 mg/L	0.77 mg/L
Cadmium	1.0 mg/L	less than 0.050 mg/L
Chromium	5.0 mg/L	less than 0.050 mg/L
Lead	5.0 mg/L	less than 0.050 mg/L
Mercury	0.2 mg/L	less than 0.0020 mg/L
Selenium	1.0 mg/L	less than 0.10 mg/L
Silver	5.0 mg/L	less than 0.050 mg/L

date completed: 02/28/95 | tech: DVV/BSG/MJK | approved by:

ecology and environment, inc.
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International Specialists in the Environment

MEMORANDUM

DATE: March 21, 1995

TO: Michael Dieckhaus, TAT Project Manager, E & E, Detroit, MI

FROM: Herbert B. Langer, TAT Chemical Engineer, E & E, Detroit, MI

THROUGH: Sandra L. Basham, ATATL, E & E, Detroit, MI
David Hendren, TAT Analytical Services Manager, E & E, Chicago, IL
Mary J. Ripp, TAT QA Reports Manager, E & E, Chicago, IL

SUBJECT: TCLP Pesticide and Herbicide Analysis Data Quality Assurance Review, Salco Industries Site, Monroe, Monroe County, Michigan

REFERENCE: Analytical TDD T05-9502-801 Project TDD T05-9410-169
Analytical PAN EMI0647AAA Project PAN EMI0647SAA

The data quality assurance (QA) review of six liquid and one solid samples, collected from the Salco Industries Site, is complete. The samples were collected on February 16, 1995, by the Technical Assistance Team (TAT) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to BEC Laboratories, Toledo, Ohio, for analysis. The laboratory analyses were performed according to United States Environmental Protection Agency (U.S. EPA) Solid Waste-846 (SW-846) Method 1311 for Toxicity Characteristic Leaching Procedure (TCLP) extraction, Method 8080 for the determination of pesticides, and Method 8150 for herbicides.

Sample Identification

E & E Identification No.	Laboratory Identification No.
SIST6	95T02708
SIST10	95T02709
SIST18	95T02710
SIST21	95T02711
SIST22	95T02712
SISSOIL	95T02713
SISBERM	95T02714

Data Qualifications

I. Sample Holding Time: Acceptable

The samples were collected February 16, 1995, and received by the laboratory on February 17, 1995. The samples were extracted February 21 and 22, 1995, and analyses were completed March 6, 1995. All activities were performed within the required holding times for the methods and matrices.

II. Instrument Performance: Acceptable

Peak resolution on the standard chromatograms was adequate. Retention time windows were reported and standard compound retention times fell within the retention time windows.

III. Initial and Continuing Calibration Verification: Acceptable

Initial calibrations were performed February 28 and March 3, 1995, using the target compounds at five different concentrations. The percent relative standard deviations for the initial calibrations met the requirements outlined in the SW-846 Method. Continuing calibration was performed daily. Percent differences between initial and continuing calibration response factors were less than fifteen, as required. Confirmation analysis was not required because no compounds were detected in the samples.

IV. Method Blank: Acceptable

Method blanks were prepared and analyzed during the analytical runs. None of the target compounds were detected in the method blanks.

V. Optional Quality Control Analyses: No Action

A. Matrix Spike/Matrix Spike Duplicate (MS/MSD):

A MS and MSD were prepared and analyzed during each analytical run. Percent recoveries of the spike compounds were within the laboratory's quality control guidelines. Relative percent differences between MS and MSD results for the run that contained samples SIST22 and SISSOIL were outside the laboratory's quality control guidelines. Since the MS and MSD analyses are optional and the sample used to prepare the spikes was not reported, no action was taken.

B. Surrogate Recovery:

A total of two surrogate compounds were added to each sample, blank, MS, and MSD. The percent recoveries of the surrogate

compounds from the samples and blanks were within the laboratory's quality control guidelines.

VI. Compound Identification: Acceptable

None of the target compounds were detected in the samples. Instrument calibration verified the instruments compound identification capabilities.

VII. Compound Quantitation and Reported Detection Limits: Acceptable

Instrument detection limits were correctly adjusted to reflect sample dilutions and matrix effects.

VIII. Overall Assessment of Data for Use: Acceptable

The overall usefulness of the data is based on the criteria outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990), Data Validation Procedures, Section 9.1, GC Analysis (i.e., Herbicides, Organophosphate, Pesticides), and Section 2.7, Quality Assurance Requirements. Based upon the information provided, the data are acceptable for use as reported.

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lab no 95T02708

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST6 - tank 6 - 2/16/95 @ 1415

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:

PESTICIDES	LIMIT	RESULTS
Chlordane	0.03 mg/L	less than 3 mg/L * (**)
Endrin	0.02 mg/L	less than 20 mg/L * (**)
Heptachlor	0.008 mg/L	less than 8 mg/L * (**)
Heptachlor Epoxide	0.008 mg/L	less than 8 mg/L * (**)
Lindane	0.4 mg/L	less than 400 mg/L * (**)
Methoxychlor	10.0 mg/L	less than 10,000 mg/L *(**)
Toxaphene	0.5 mg/L	less than 500 mg/L * (**)
HERBICIDES		
2,4-D	10.0 mg/L	less than 10 mg/L *
2.4.5-TP (Silvex)	1.0 mg/L	less than 1 mg/L *

* Elevated PQL due to matrix interference
** The PQL exceeds regulatory threshold limit

date completed	tech	approved by
03/06/95	PDB/MPM	

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p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST10 - tank 10 - 2/16/95 @ 1400

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:

PESTICIDES	LIMIT	RESULTS
Chlordane	0.03 mg/L	less than 0.6 mg/L * (**)
Endrin	0.02 mg/L	less than 0.04 mg/L * (**)
Heptachlor	0.008 mg/L	less than 0.16 mg/L * (**)
Heptachlor Epoxide	0.008 mg/L	less than 0.16 mg/L * (**)
Lindane	0.4 mg/L	less than 0.8 mg/L * (**)
Methoxychlor	10.0 mg/L	less than 20 mg/L * (**)
Toxaphene	0.5 mg/L	less than 10 mg/L * (**)
HERBICIDES		
2,4-D	10.0 mg/L	less than 1 mg/L *
2,4,5-TP (Silvex)	1.0 mg/L	less than 0.1 mg/L *

* Elevated PQL due to matrix interference
** The PQL exceeds the regulatory threshold limit

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p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST18 - tank 18 - 2/16/95 @ 1254

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:

PESTICIDES	LIMIT	RESULTS
Chlordane	0.03 mg/L	less than 1 mg/L * (**)
Endrin	0.02 mg/L	less than 0.08 mg/L * (**)
Heptachlor	0.008 mg/L	less than 0.3 mg/L * (**)
Heptachlor Epoxide	0.008 mg/L	less than 0.3 mg/L * (**)
Lindane	0.4 mg/L	less than 200 mg/L * (**)
Methoxychlor	10.0 mg/L	less than 4000 mg/L * (**)
Toxaphene	0.5 mg/L	less than 200 mg/L * (**)
HERBICIDES		
2,4-D	10.0 mg/L	less than 0.8 mg/L *
2,4,5-TP (Silvex)	1.0 mg/L	less than 0.08 mg/L *

* Elevated PQL due to matrix interference
** The PQL exceeds regulatory threshold limit

date completed:	tech:	approved by:
03/06/95	PDB/MPM	

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST21 - tank 21 - 2/16/95 @ 1315

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:

PESTICIDES	LIMIT	RESULTS
Chlordane	0.03 mg/L	less than 0.03 mg/L *
Endrin	0.02 mg/L	less than 0.002 mg/L *
Heptachlor	0.008 mg/L	less than 0.008 mg/L *
Heptachlor Epoxide	0.008 mg/L	less than 0.008 mg/L *
Lindane	0.4 mg/L	less than 0.04 mg/L *
Methoxychlor	10.0 mg/L	less than 1.0 mg/L *
Toxaphene	0.5 mg/L	less than 0.5 mg/L *
HERBICIDES		
2,4-D	10.0 mg/L	less than 1 mg/L *
2,4,5-TP (Silvex)	1.0 mg/L	less than 0.1 mg/L *

* Elevated PQL due to matrix interference

date completed:	tech:	approved by:
03/06/95	PDB/MRM	

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ce no. 95T02712

p.o. no.

rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SIST22 - tank 22 - 2/16/95 @ 1500

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:

PESTICIDES	LIMIT	RESULTS
Chlordane	0.03 mg/L	less than 1 mg/L * (**)
Endrin	0.02 mg/L	less than 0.08 mg/L * (**)
Heptachlor	0.008 mg/L	less than 0.3 mg/L * (**)
Heptachlor Epoxide	0.008 mg/L	less than 0.3 mg/L * (**)
Lindane	0.4 mg/L	less than 200 mg/L * (**)
Methoxychlor	10.0 mg/L	less than 4000 mg/L * (**)
Toxaphene	0.5 mg/L	less than 200 mg/L * (**)
HERBICIDES		
2,4-D	10.0 mg/L	less than 4 mg/L *
2,4,5-TP (Silvex)	1.0 mg/L	less than 0.4 mg/L *

* Elevated PQL due to matrix interference
** The PQL exceeds regulatory threshold limit

date completed:	tech:	approved by:
03/06/95	PDB/MRM	

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bec no. 95T02713

p.o. no.

rev: 0

SAMPLE DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISSOIL - stained soil outside berm - 2/16/95 @ 1615

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:

PESTICIDES	LIMIT	RESULTS
Chlordane	0.03 mg/L	less than 0.003 mg/L
Endrin	0.02 mg/L	less than 0.0002 mg/L
Heptachlor	0.008 mg/L	less than 0.0008 mg/L
Heptachlor Epoxide	0.008 mg/L	less than 0.0008 mg/L
Lindane	0.4 mg/L	less than 0.004 mg/L
Methoxychlor	10.0 mg/L	less than 0.1 mg/L
Toxaphene	0.5 mg/L	less than 0.05 mg/L
HERBICIDES		
2,4-D	10.0 mg/L	less than 0.5 mg/L *
2,4,5-TP (Silvex)	1.0 mg/L	less than 0.05 mg/L *

* Elevated PQL due to matrix interference

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rev: 0

SAMPLE
DESCRIPTION: T05-9502-801 - Project # ZT3054 - grab - Station # SISBERM - liquid inside berm - 2/16/95 @ 1630

ANALYSIS: Pesticides/Herbicides in the TCLP Extract

PROCEDURE: SW-846, Methods 8080 and 8150

RESULTS:	PESTICIDES	LIMIT	RESULTS
	Chlordane	0.03 mg/L	less than 0.02 mg/L *
	Endrin	0.02 mg/L	less than 0.1 mg/L * (**)
	Heptachlor	0.008 mg/L	less than 0.04 mg/L * (**)
	Heptachlor Epoxide	0.008 mg/L	less than 0.04 mg/L * (**)
	Lindane	0.4 mg/L	less than 2 mg/L * (**)
	Methoxychlor	10.0 mg/L	less than 50 mg/L * (**)
	Toxaphene	0.5 mg/L	less than 2.5 mg/L * (**)
	HERBICIDES		
	2,4-D	10.0 mg/L	less than 0.5 mg/L *
	2,4,5-TP (Silvex)	1.0 mg/L	less than 0.05 mg/L *

* Elevated PQL due to matrix interference
** The PQL exceeds regulatory threshold limit

date completed:	tech:	approved by:
03/06/95	PDB/MRM	

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International Specialists in the Environment

MEMORANDUM

DATE: March 21, 1995

TO: Michael Dieckhaus, TAT Project Manager, E & E, Detroit, MI

FROM: Herbert B. Langer, TAT Chemical Engineer, E & E, Detroit, MI

THROUGH: Sandra L. Basham, ATATL, E & E, Detroit, MI
David Hendren, TAT Analytical Services Manager, E & E, Chicago, IL
Mary J. Ripp, TAT QA Reports Manager, E & E, Chicago, IL

SUBJECT: TCLP Metals Analysis Data Quality Assurance Review, Salco Industries Site, Monroe, Monroe County, Michigan

REFERENCE: Analytical TDD T05-9502-801 Project TDD T05-9410-169
Analytical PAN EMI0647AAA Project PAN EMI0647SAA

The data quality assurance (QA) review of six liquid and one solid samples, collected from the Salco Industries Site, is complete. The samples were collected on February 16, 1995, by the Technical Assistance Team (TAT) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to BEC Laboratories, Toledo, Ohio, for analysis. The laboratory analyses were performed according to United States Environmental Protection Agency (U.S. EPA) Solid Waste-846 (SW-846) Method 1311 for Toxicity Characteristic Leaching Procedure (TCLP) extraction, and Methods 6010 and 7470, to determine Resource Conservation and Recovery Act (RCRA)-listed metals in the TCLP leachate.

Sample Identification

E & E Identification No.	Laboratory Identification No.
SIST6	95T02708
SIST10	95T02709
SIST18	95T02710
SIST21	95T02711
SIST22	95T02712
SISSOIL	95T02713
SISBERM	95T02714

Data Qualifications

I. Sample Holding Time: Acceptable

The samples were collected February 16, 1995, and received by the laboratory February 17, 1995. TCLP extractions were performed February 21 and 22, 1995. Analyses were completed February 28, 1995. All activities were performed within the required holding times for the methods and matrices.

II. Initial and Continuing Calibration Verification: Acceptable

Initial calibrations were performed at the beginning and end of each analytical run. Continuing calibration samples and blanks were analyzed after every ten samples during the run, as required. Calibration results were within 90 and 110 percent of the mean standard values, as required. Mercury calibration results were within 80 and 120 percent of the mean standard value, as required. The correlation coefficients for atomic absorption analysis calibrations were greater than 0.995, as required.

III. Blanks: Acceptable

Method blanks were prepared and analyzed at the required frequency during the analytical runs. None of the target analytes were detected in the method or calibration blanks.

IV. Instrument Interference Check Sample (ICS): Acceptable

An ICS was analyzed twice during the analytical run and all ICS results were within ±20 percent of the mean values, as required.

V. Optional Quality Control Checks: Acceptable

Matrix spikes (MS) and method spikes were prepared and analyzed during the analytical runs. The percent recoveries of the spike compounds were within the laboratory's quality control guidelines. The relative percent difference between spike duplicate results were also within the laboratory's quality control guidelines.

VI. Overall Assessment of Date for Use: Acceptable

The overall usefulness of the data is based on the criteria outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990), Data Validation Procedures, Section 3.0, Metallic Inorganic Parameters, and Section 2.7, Quality Assurance Requirements. Based upon the information provided, the data are considered acceptable for use.