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RCRA PERMIT PART B NUMBER HW50289 NAS FORT WORTH TX
5/1/1991
ARMY CORP OF ENGINEERS

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**NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS**

**ADMINISTRATIVE RECORD
COVER SHEET**

AR File Number 75

CARSWELL AIR FORCE BASE, TEXAS

RCRA Permit Part B Number HW50289

SUMMARY OF PERMIT SITES

7/1/91

Prepared By
U.S. Army Corps Of Engineers
Fort Worth District

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1. PURPOSE

This summary of permit sites is prepared in response to the RCRA Permit, Part B, Number HW50289, issued to Carswell Air Force Base (AFB) by the Texas Water Commission (TWC), dated 7 February 1991. The summary includes history, investigations, findings and recommendations.

2. BACKGROUND

Carswell Air Force Base (AFB) was established in 1942 and located six miles west of downtown Fort Worth, in Tarrant County, Texas. The base operates the Weapons Storage Area (WSA) located five miles west of the base on White Settlement Road.

Wastes have been generated and disposed of at Carswell AFB since the beginning of industrial operation in 1942. Major industrial operations include maintenance of jet engines, aerospace ground equipment, fuel systems, weapon systems and pneudraulic systems; maintenance of general and special purpose vehicles; aircraft corrosion control; and non-destructive inspection activities. The generated wastes are primarily oils, lubricants, recoverable fuels, spent solvents and cleaners.

The Installation Restoration Program (IRP) at Carswell AFB has progressed through Phases I and II. Phase I Records Search was completed in February 1984 by CH2M Hill, Inc., Phase II Confirmation/Quantification, Stage 1 was completed in October 1986 by Radian Corporation and Phase II Confirmation/ Quantification, Stage 2, Draft was dated in October 1988 by Radian Corporation. The individual summaries refer to testing done during these investigations.

IRP investigations have focused on twelve sites at Carswell AFB and on one site at the WSA. These IRP sites correspond to the following Solid Waste Management Units (SWMU's):

- SWMU No. 18, Fire Training Area No. 1
- SWMU No. 19, Fire Training Area No. 2
- SWMU No. 20, Waste Fuel Storage Tank
- SWMU No. 21, Waste Oil Tank
- SWMU No. 22, Landfill No. 4
- SWMU No. 23, Landfill No. 5
- SWMU No. 24, Waste Burial Area
- SWMU No. 28, Landfill No. 1
- SWMU No. 53, Storm Water Drainage System
- SWMU No. 62, Landfill No. 6

**SWMU No. 63, Entomology Dry Well
SWMU No. 64, French Underdrain System
SWMU No. 65, Weapons Area Storage Disposal Area
SWMU No. 67, Bldg 1340, Oil/Water Separator
SWMU No. 68, POL Tank Farm**

During the IRP investigations SWMU Sites 19, 20, and 21 were combined into one site and SWMU Sites 64 and 67 were also combined. In the summary these combined sites will also be addressed as one site.

Detailed reports for the SWMU's will be submitted for approval according to the work required for each site. The submittals are broken down as follows:

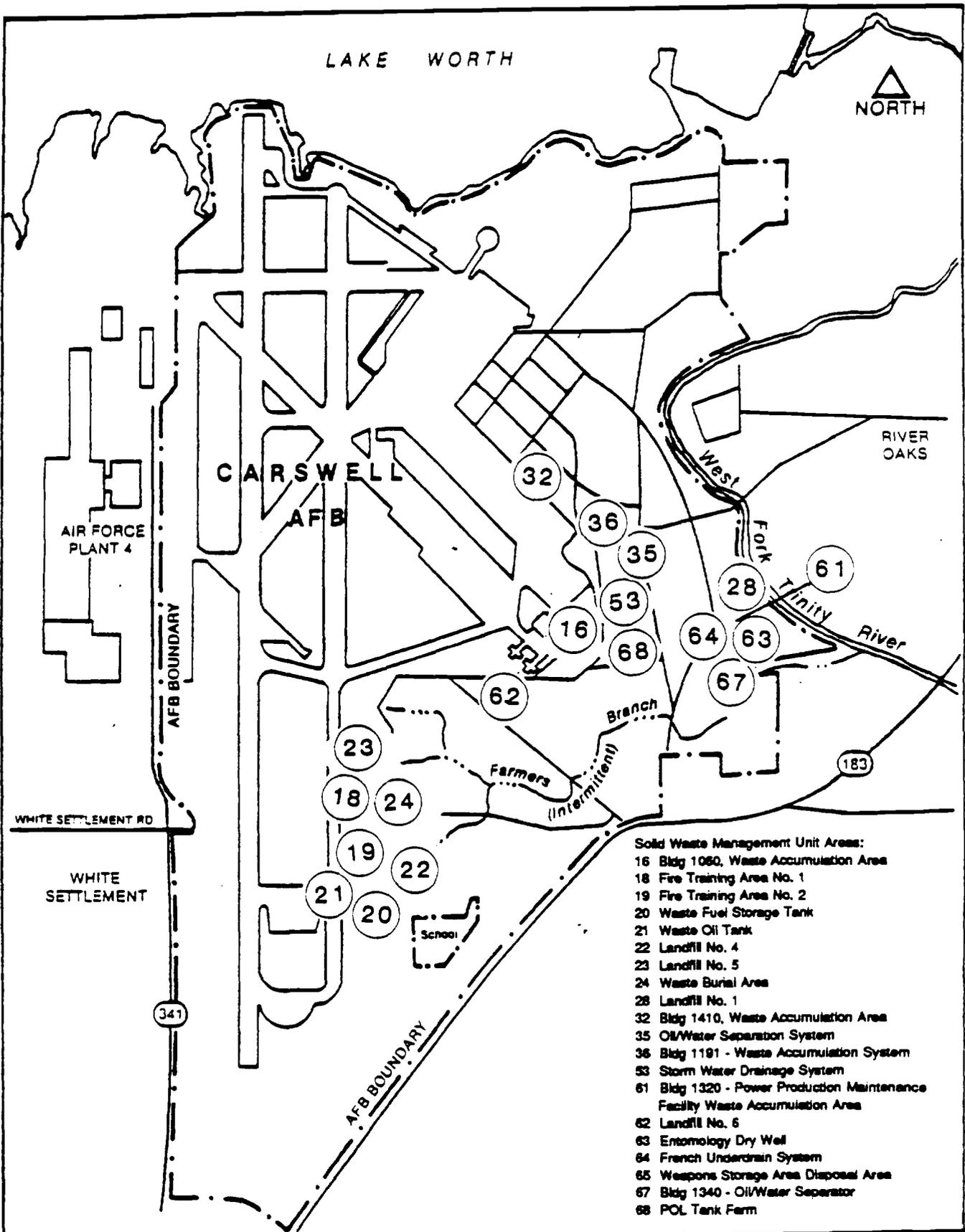
- 1. No Further Action Required.
SWMU No's 18 and 63**
- 2. Preliminary Remedial Action Plan.
SWMU No's 16, 22, 23, 24, 28, 32, 35, 36, 61 and 68**
- 3. Remedial Action Plan.
SWMU No's 19, 20, 21, 53 and 65**
- 4. Work Plan.
SWMU No's 62 and 64/67**

For SWMU No. 24, Waste Burial Area, a separate RCRA facility investigation/remediation plan for the removal of buried drums and an underground storage tank will be submitted.

The information contained in this summary was extracted from these past studies:

- 1. Installation Restoration Program Records Search For Carswell Air Force Base, February 1984, CH2M Hill.**
- 2. Installation Restoration Program, Stage 2, Carswell Air Force Base, October 1988, Radian Corporation.**
- 3. Installation Restoration Program, Stage 2 Remedial Investigation For The Flightline Area, February 1991, Radian Corporation.**
- 4. Subsurface Contamination Assessment, White House Communications, Project Number: D-832, April 18, 1990, Maxim Engineers, Inc.**
- 5. Installation Restoration Program, Stage 2, Site Characterization Report For The Flightline Area, November 1990, Radian Corporation.**

6. Installation Restoration Program, Stage 1, Draft Final Report, Weapons
Storage Area Site WSA-1, December 1988, Radian Corporation. ⁷⁵ ⁶



Carswell Air Force Base, Texas
 Solid Waste Management Unit Locations
 Figure 1



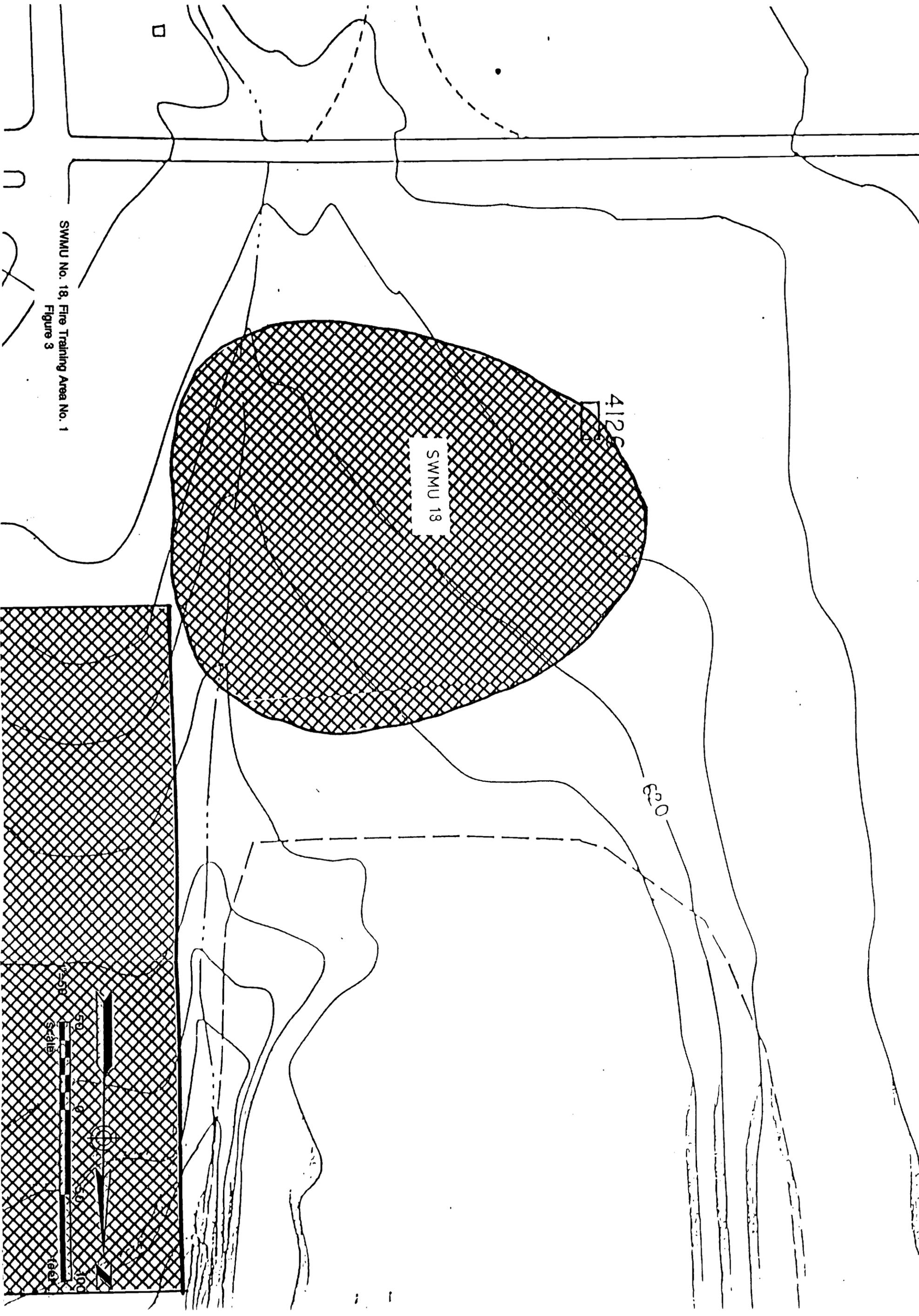
SWMU No. 16, Bldg. 1060, Waste Accumulation Area

Bldg 1060 is a Corrosion Control Shop for the Field Maintenance Squadron. The shop operations include paint stripping, cleaning and painting of small aircraft parts. The waste accumulation area is a container storage area for waste generated from shop operations. Waste is stored in 55-gallon drums on wooden palets in a fenced-off area of the asphalt parking lot. The fenced off area is approximately 20 feet wide by 40 feet long. The unit is not covered. Waste is transported by truck from this unit to the Central Waste Holding Area (SWMU No. 53). The fenced storage area was recently replaced by a curbed, covered accumulation point in the same vicinity.

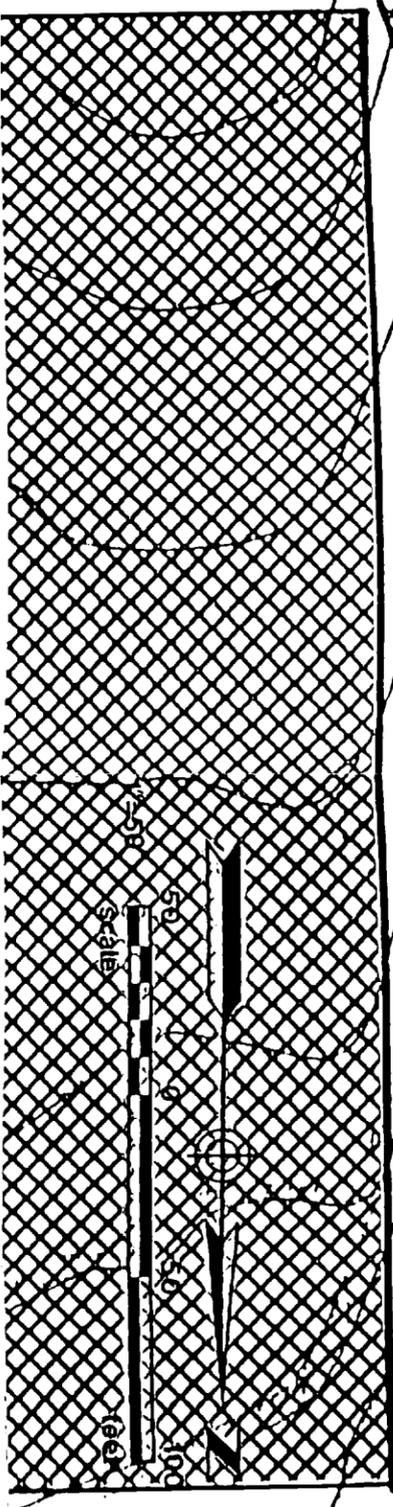
The unit manages paint lacquer, MEK with polyurethane paint, paint stripper, PD-680, plastic beads contaminated with paint, the filters from the paint booth, and rags containing paint and MEK. The unit manages approximately three 55-gallon drums of paint stripper every three to four months and three 55-gallon drums of PD-680 every three to four months.

At the time of the visual site inspection in February 1989, a dark stain on the soil was observed at the corner of the unit. The stain extended to a shallow storm water drainage feature approximately 20 feet from the unit. Staining was also observed near the edge of the drums.

Samples will be taken in and around the area of the old stain to determine if any soil contamination exists. Samples will be analyzed for total petroleum hydrocarbons, purgeable halocarbons, and purgeable aromatic hydrocarbons. If any contamination is found, the affected soil will be removed, properly disposed of, and replaced; clearance samples will also be taken. There is no documented history of releases to groundwater, therefore, groundwater will not be sampled unless soil sample results indicate possible groundwater contamination. A detailed preliminary remedial action plan will be submitted at a later date.



SWMU No. 18, Fire Training Area No. 1
Figure 3



SWMU No. 18 is located north of Landfill 5 and was the primary fire pit prior to 1963. The pit was gravel-lined, and had a low concrete curb around its perimeter and reportedly was adjacent to a small tributary of Farmers Branch. Several fire training exercises are reported to have taken place at this site each month, with waste oils and contaminated fuels being the primary flammable liquids used in the exercises. Small quantities of solvents are also reported to have been used in these exercises. The site now consists of a level, gravel-surfaced area on a drainage divide between an unnamed tributary of Farmers Branch and Farmers Branch.

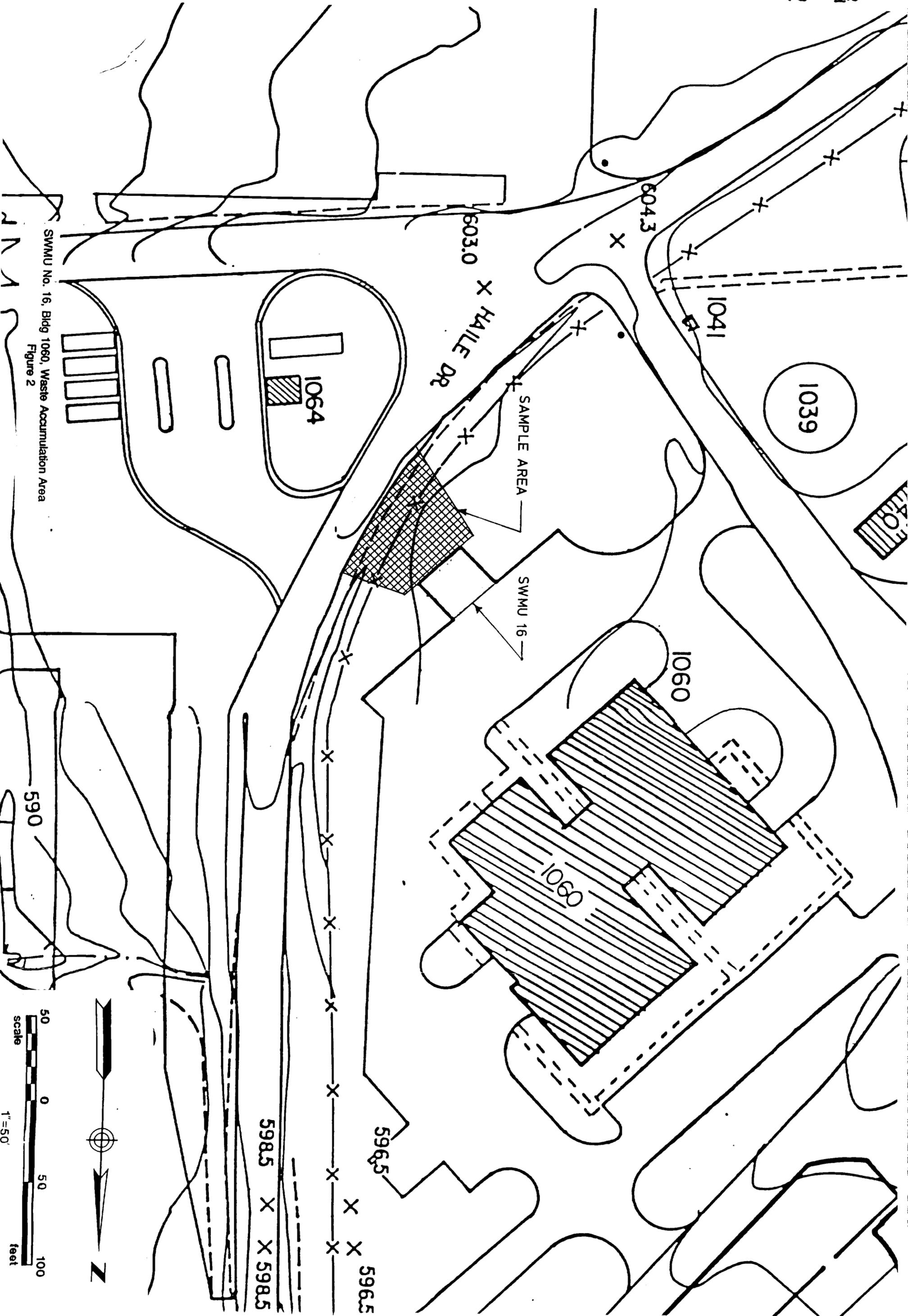
Two upper zone monitor wells were installed at the site. Upper zone materials consist of surficial deposits of clayey silt with variable amounts of fine sand and gravel, underlain by sand and gravel deposits. The thickness of the upper zone is approximately 14 feet at both wells. Generally the surficial clay and silt deposits are five feet thick and the sand and gravel deposits are eight to ten feet thick. The bedrock is shale and limestone of the Goodland Formation. Ground water occurs in the upper zone materials underlying the site at depths ranging from six to nine feet.

Samples of ground water were collected and analyzed from the two wells in two sampling rounds. Parameters analyzed were water quality indicators, heavy metals, petroleum hydrocarbons, purgeable halocarbons, purgeable aromatics, and extractable priority pollutants. Total dissolved solids ranged from 570 mg/L to 820 mg/L during the two sampling rounds. Maximum contaminant levels were exceeded by arsenic in both sampling rounds at only one well. Chromium also surpassed MCLs at the same well in the second round. Iron and manganese exceeded MCLGs during both sampling rounds at both wells. Lead was found in levels above the MCL at one well, but this was not confirmed with the graphite atomic absorption test. Petroleum hydrocarbons were not detected at the two wells. Purgeable halocarbons were not detected in the ground water at the site. Toluene was found in all ground water samples, ranging from 0.6 ug/L to 19 ug/L. Concentrations increased at both wells from the first to the second rounds, but were under the toluene MCLG of 2.0 mg/L. Several priority pollutants were detected in one well, however, the substances detected were at low levels and occasionally were detected in the reagent blank samples. Results of the Stage 2 investigations indicated low levels of TCE (range from none detected to 0.249 mg/Kg) were detected in one well at the site, located just north of SWMU No. 23, Landfill 5.

Samples of soil were collected during monitor well installation and at one hand-augered boring at the center of the site. Soil analysis consisted of metals, oil and grease, and volatile organic compounds (Methods 601 and 602). TCE

was detected at the hand augered boring and at the up gradient monitor well (range 0.249 - 0.257 mg/Kg). All other parameters were found to be within normal limits.

It is recommended that the two wells should continue to be monitored, primarily due to their proximity to the TCE plume in the ground water south of the site. Monitoring parameters should include volatile organic compounds, metals, and general water quality parameters. Results of the Stage 2 investigation indicates that there is no further action necessary at this time for SWMU No. 18. A detailed request for no further action will be submitted at a later date.



SWMU No. 16, Bldg 1060, Waste Accumulation Area
Figure 2

SWMU No. 19, Fire Department Training Area 2.
SWMU No. 20, Waste Fuel Storage Tank.
SWMU No. 21, Waste Oil Tank.

This summary includes SWMU No. 20, Waste Fuel Storage Tank and SWMU No. 21, Waste Oil Tank which are collocated and a part the Fire Department Training Area 2. SWMU No. 19 is located between the north-south taxiway and the radar facility. This site, with only slight modifications, has been used as a fire department training area since 1963. The fire ring is gravel-lined with a low earthen berm around its perimeter. In the past, a pit was present at the site to collect runoff from training exercised, but this pit has been filled. Two tanks located at the site have been used for storage for flammable liquids prior to training exercises. An 8,500 gallon aboveground tank, SWMU No. 20, is used to store clean or contaminated fuels, which are delivered to the ring via a pump and various pipes. An underground tank of approximately 9,500 gallons, SWMU No. 21, has been used for storage of waste oils and solvents from the flightline shops. Disposal of the underground tank contents was performed by commercial contractors, however, it is possible that waste oils from this tank have been used during training exercises in the past.

Five boreholes were drilled and five upper zone monitor wells were installed at the site. Upper zone materials consist of surficial deposits of clayey silt with variable amounts of fine sand and gravel, underlain by sand and gravel deposits. The thickness of the upper zone ranges from 18 feet to 40 feet. The surficial clay and silt deposits are 10 feet thick and the sand and gravel deposits are 2 to 27 feet thick. The thickness of sand and gravel deposits decrease abruptly toward the south as the bedrock elevation rises. The bedrock, shale and limestone of the Goodland Formation, underlies the upper zone materials at all locations. The top of the Goodland ranges from 18 to 40 feet. Limestone of the Goodland Formations crops out just southeast of the site near Landfill 4 in a stream that flows to Farmers Branch. Ground water occurs in the upper zone materials underlying the site at depths ranging from 15 feet to 30 feet.

Split-spoon samples from five soil borings and two monitor wells were collected and visually examined for evidence of contamination. Samples were selected for analysis of moisture content, heavy metals, petroleum hydrocarbons, volatile organic compounds, and semivolatle organic compounds. Heavy metals were detected at the normal ranges, with the exception of selenium in three borings (30-70 mg/Kg) and lead (20 mg/Kg) in one boring. Petroleum hydrocarbons were encountered at five boreholes. Samples analyzed from various depths showed an apparent trend of decreasing petroleum hydrocarbon concentrations with depth until sand was encountered (19-21 feet below ground surface), where the highest values were detected. TCE was not detected in any of the soil samples. 1,1,2,2-tetrachloroethane was

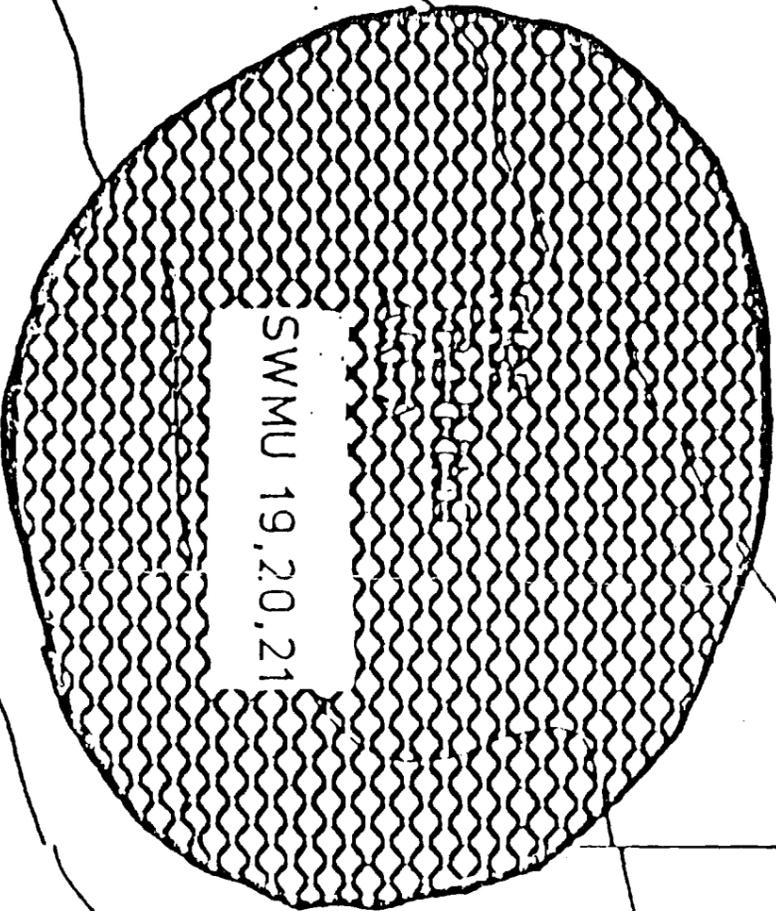
estimated at 1,300 ug/Kg in one hole in the sand layer. Maximum concentrations for the same hole included 370 ug/Kg for benzene and 37,000 ug/Kg for total xylenes (both in the first two feet of soil) and 5,000 ug/Kg for ethylbenzene (in the sand layer). Semivolatile organic compounds were encountered in only two bore holes with the following results: 2-methylnaphthalene (11,000 ug/Kg), 4-methylphenol (4,200 ug/Kg), phenol (500 ug/Kg), naphthalene (4,700 ug/Kg). The trend in concentration for naphthalene and 2-methylnaphthalene was high concentrations at the surface, decreasing concentrations with depth and then maximum concentrations in the sand zone at 19 feet below land surface. Phenol and methylphenol concentrations were highest at the surface, but were not detected at depth.

Samples of ground water were collected and analyzed from the two wells in two sampling rounds. Parameters analyzed were water quality indicators, heavy metals, petroleum hydrocarbons, purgeable halocarbons, purgeable aromatics, and extractable priority pollutants. Total dissolved solids ranged from 380 mg/L to 590 mg/L during the two sampling rounds. Concentrations of several metals were above federal regulatory limits for drinking water. Arsenic (3 wells), lead (4 wells), cadmium (1 well) and chromium (4 wells) exceeded MCLs in the first round. In the second sampling round, arsenic (2 wells), lead (4 wells), cadmium (1 well) and chromium (4 wells) concentrations exceeded MCLs. MCLGs were exceeded by iron and manganese in every ground water sample from the site. The only detection of petroleum hydrocarbons was in one monitor well (0.60 mg/L) in first round. Purgeable halocarbons were detected in all samples except for the first round sample in one well. TCE concentrations in two wells, tetrachloroethene in one well and vinyl chloride in one well were above their respective MCLs. Several purgeable aromatic compounds were detected in low levels in the ground water, however, all values were below MCLs. 1,2-dichlorobenzene was found in low levels in one well in the second sampling round.

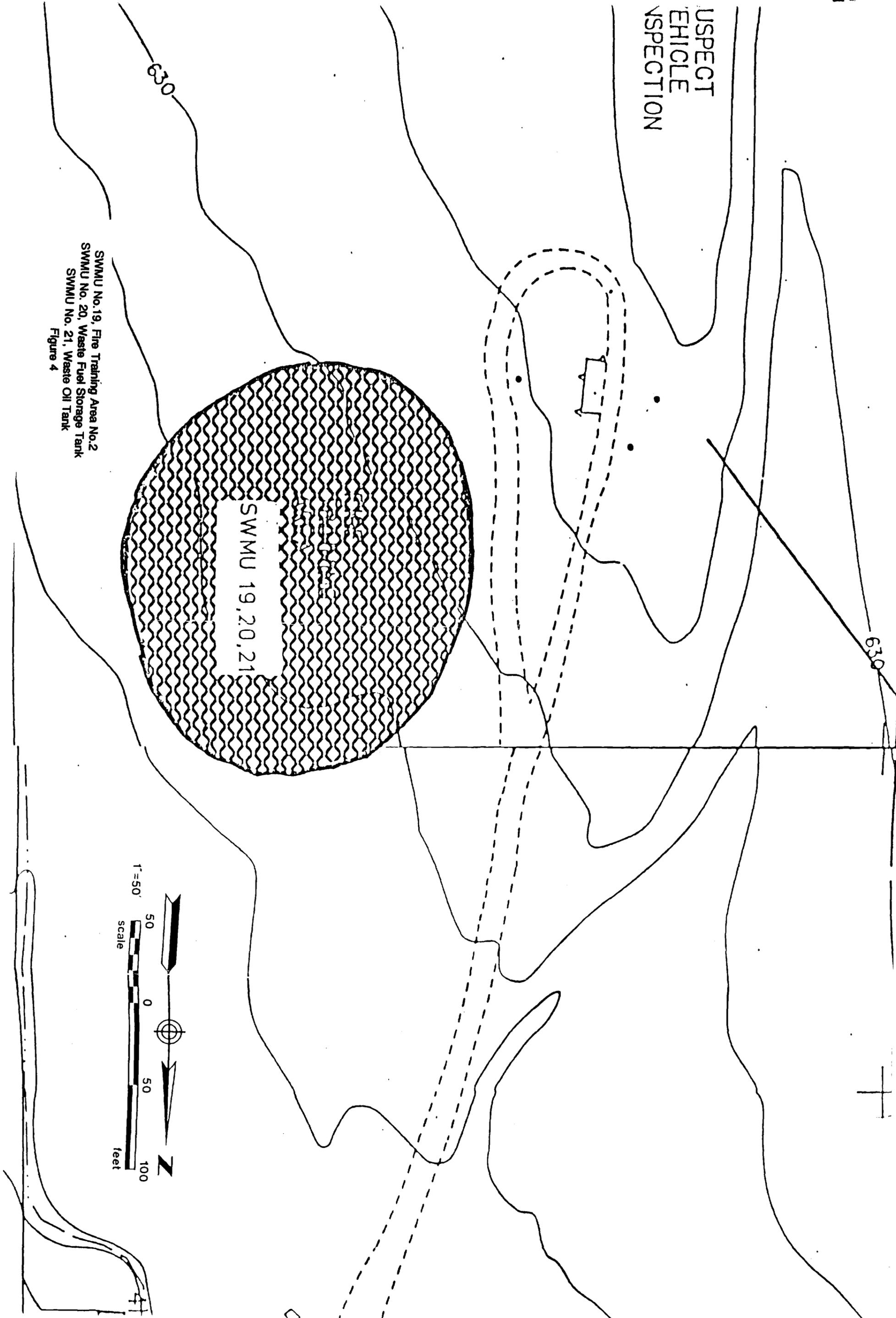
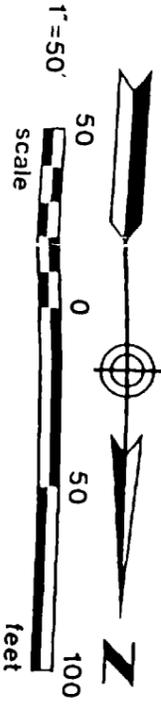
The Stage 2 investigations confirmed the findings of Stage 1. Although the site is upgradient of the Flightline Area TCE plume, ground water at some wells contained metals and volatile aromatic hydrocarbon compounds in concentrations exceeding federal MCLs. Petroleum hydrocarbons occur in the upper zone soil profile, both at and near the surface and at depths coinciding with a laterally continuous sand stratum and represent a potential source of ground water contamination downgradient of the site. Current plans are to remove and properly dispose the contaminated soil and construct a fully contained, concrete lined site for future fire department training. A remediation plan will be submitted concerning the contaminated soil. The remediation of the contaminated groundwater will be included with the flightline area preliminary action plan. This preliminary remediation action plan encompass SWMU No's, 19, Fire Department Training Area 2, 22, Landfill No. 4, SWMU No. 23, Landfill

No. 5, and SWMU No. 24, Waste Burial Area and will be submitted at a later date.

USPECT
EHICLE
SPECTION



SWMU No. 19, Fire Training Area No. 2
 SWMU No. 20, Waste Fuel Storage Tank
 SWMU No. 21, Waste Oil Tank
 Figure 4



SWMU No. 22 consists of ten acres of land located east of the runway and is currently the location of the radar site. The site was operated as the main landfill from approximately 1956 to 1975. At least six large pits, approximately twelve feet deep were filled with refuse which was burned and buried. Various materials suspected of being hazardous were reportedly disposed at this site, including drums of waste liquids, partially full paint cans and cadmium batteries. Written records indicate that waste paints, thinners, and strippers; oil containing absorbent materials; PD-680 (safety cleaning solvent) and oils may have been routinely disposed of at this site.

Eight monitoring wells were installed at the site. Upper deposits consist of clayey silt with variable amounts of fine sand and gravel underlain by sand and gravel deposits and vary in thickness from 17 feet to 39.5 feet. Bedrock, shale and limestone of the Goodland Formation was encountered at the base of the upper zone deposits at all locations with the exception of one boring. Ground water occurs in the upper zone materials underlying the site at depths ranging from approximately 13 feet to 28 feet.

Split-spoon samples were collected and visually examined for evidence of contamination and samples were selected for analysis of moisture content, metals, oil and grease, volatile and semivolatile organic compounds. Heavy metals were detected at the normal ranges, with the exception of silver (1.9 mg/Kg) in two holes. No oil and grease were detected. Toluene was detected in low levels (less than 8.8 ug/Kg) in the soil samples in two holes. Several phthalate compounds were detected in the soil samples at the site, however, the occurrences of these compounds were found to be invalid as the same compounds coincided with phthalates found in reagent blanks.

Ground water was sampled for chemical analysis twice in 1988. Samples were analyzed for water quality indicators, heavy metals, purgeable halocarbons, purgeable aromatics, and extractable priority pollutants. The total dissolved solids ranged from 430 mg/L to 920 mg/L, with the highest value in the first round of sampling. Sulfate concentrations increased in every well, except one, from the first to the second sampling round. MCLs were exceeded in Round 1 for lead, chromium, barium and cadmium. Round 2 results indicated that arsenic, lead, chromium and barium concentrations surpassed MCLs. Iron and manganese exceeded MCLGs during both sampling rounds. Purgeable halocarbons were detected in every upper zone monitor well at the site. TCE was the principal halocarbon, with values ranging from not detected to 4,200 ug/L. The only other compound surpassing MCLs for purgeable halocarbons was vinyl chloride, detected in both rounds at only one well. Toluene was detected in low levels (majority less than 10 ug/L, but up to 27 ug/L) from five

wells. Benzene was found exceeding MCLs in Round 1 at one well, however, it was not detected in the second sampling round. ⁷⁵ 18

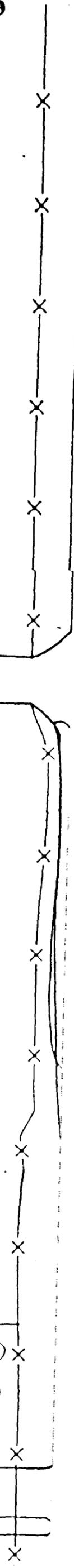
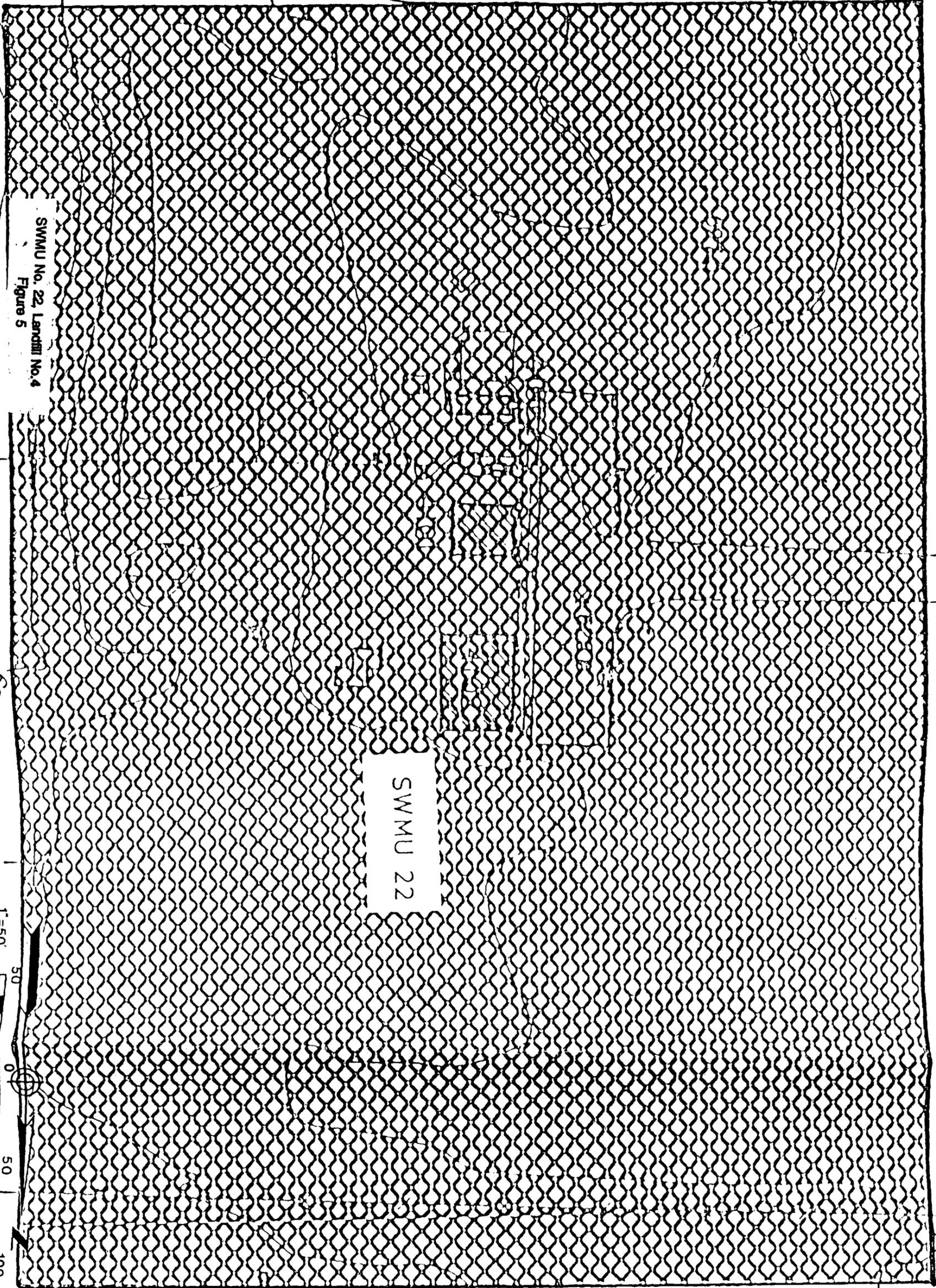
Results of Stage 2 field laboratory tests indicate that there is a TCE plume in the upper zone ground water in the area of SWMU No's 22, 23 and 24. Additional upper zone wells are recommended to determine the extent of TCE both upgradient and downgradient of the existing wells. Surface water sampling is recommended to determine the water quality of Farmers Branch and the ponds near Building 233. The preliminary evaluation of possible remedial alternatives indicated that ground water extraction and treatment would be recommended, however, in order to properly evaluate such an option, additional data on the aquifer characteristics are needed. Therefore, one or two aquifer tests, each consisting of a pumping well and three or more observation wells, are recommended to provide the data ultimately needed. SWMU No's 22, 23, and 24 appear to be best treated as combined sites in dealing with the problem of TCE in the ground water. A detailed preliminary remedial action plan will be submitted at a later date.

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SWMU No. 22, Landfill No. 4
Figure 5

SWMU 22

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SWMU No. 23 is located northwest of Landfill 4 and was constructed adjacent to a small tributary of Farmers Branch. The landfill was operated between 1963 and 1975 and was constructed by building a clay berm adjacent to the creek and then filling the area behind the berm up to its existing level. This site received all types of flightline wastes and refuse, and was regularly burned prior to covering.

Eight monitoring wells were installed at the site. The thickness of the upper zone ranges from 8 feet to at least 40 feet. The surficial clay and silt deposits are generally 5 to 10 feet thick and the sand and gravel deposits are 10 to 30 feet thick. The grain size of the sand and gravel generally increased with depth. Bedrock, shale and limestone of the Goodland Formation was encountered at the base of the upper zone deposits at all locations with the exception of two borings which were not deep enough to encounter bedrock. Ground water occurs in the upper zone materials underlying the site at depths ranging from less than 2 feet to 27 feet.

Split-spoon samples were collected in five of the borings and visually examined for evidence on contamination and samples were selected for analysis of moisture content, metals, oil and grease, volatile and semivolatile organic compounds. Heavy metals were detected at the normal ranges, with the exception of silver (1.8 mg/Kg) in two holes and arsenic (13 mg/Kg) in one hole. Oil and grease were only detected in one hole with a value of 15.0 mg/Kg. TCE was only revealed at one boring with a value of 22 ug/Kg. Soil samples contained toluene (up to 31 ug/Kg) in five of the seven samples analyzed. Several phthalate compounds and acetone were detected in the soil samples at the site. These compounds varied in concentrations of 100 to 800 ug/Kg.

Ground water was sampled for chemical analysis twice in 1988. Samples were analyzed for water quality indicators, heavy metals, purgeable halocarbons, purgeable aromatics, and extractable priority pollutants. The total dissolved solids (TDS) ranged from 380 mg/L to 770 mg/L. Except for two wells, there was a noticeable increase in TDS values between the two sampling events. Nitrate and sulfate concentrations increased in every well also. MCLs were exceeded in Round 1 for arsenic, lead and chromium. Round 2 results indicated that arsenic, lead, chromium and barium concentrations surpassed MCLs. Iron and manganese exceeded MCLGs during both sampling rounds. Purgeable halocarbons were detected in every monitor well at the site. The principal ground water contaminant is trichloroethene (TCE). TCE was detected in every sample from the monitor wells, except one. The TCE concentration ranged from 52 to 3,800 ug/L. 1,1,1-trichloroethane was detected (67 ug/L) in the first round at one well. Other purgeable halocarbons detected above MCL values included

vinyl chloride and trans-1,2-dichloroethene. The only detected purgeable aromatic was benzene, which was detected only in the first round and at one well. Water samples were analyzed for extractable priority pollutants and bis(2-ethylhexyl) phthalate was detected in low levels (5.2 ug/L).

SWMU No. 23, as discussed previously with SWMU No. 22, appears to be best treated as a combined site with SWMU No's 22 and 24 in dealing with the problem of TCE in the ground water. A detailed preliminary remedial action plan for the combined site will be submitted at a later date.

SWMU No. 24 is located adjacent to and north of White Settlement Road, where the road dead-ends at the taxiway. The site was used for burial of wastes during the 1960s. Various types of hazardous materials, including drums of cleaning solvents, leaded sludge, and possibly ordnance materials were reported disposed of at this site. Fort Worth District, Corps of Engineers is presently preparing the plans and specifications for the removal of drums reportedly containing TCE within the boundaries of this site.

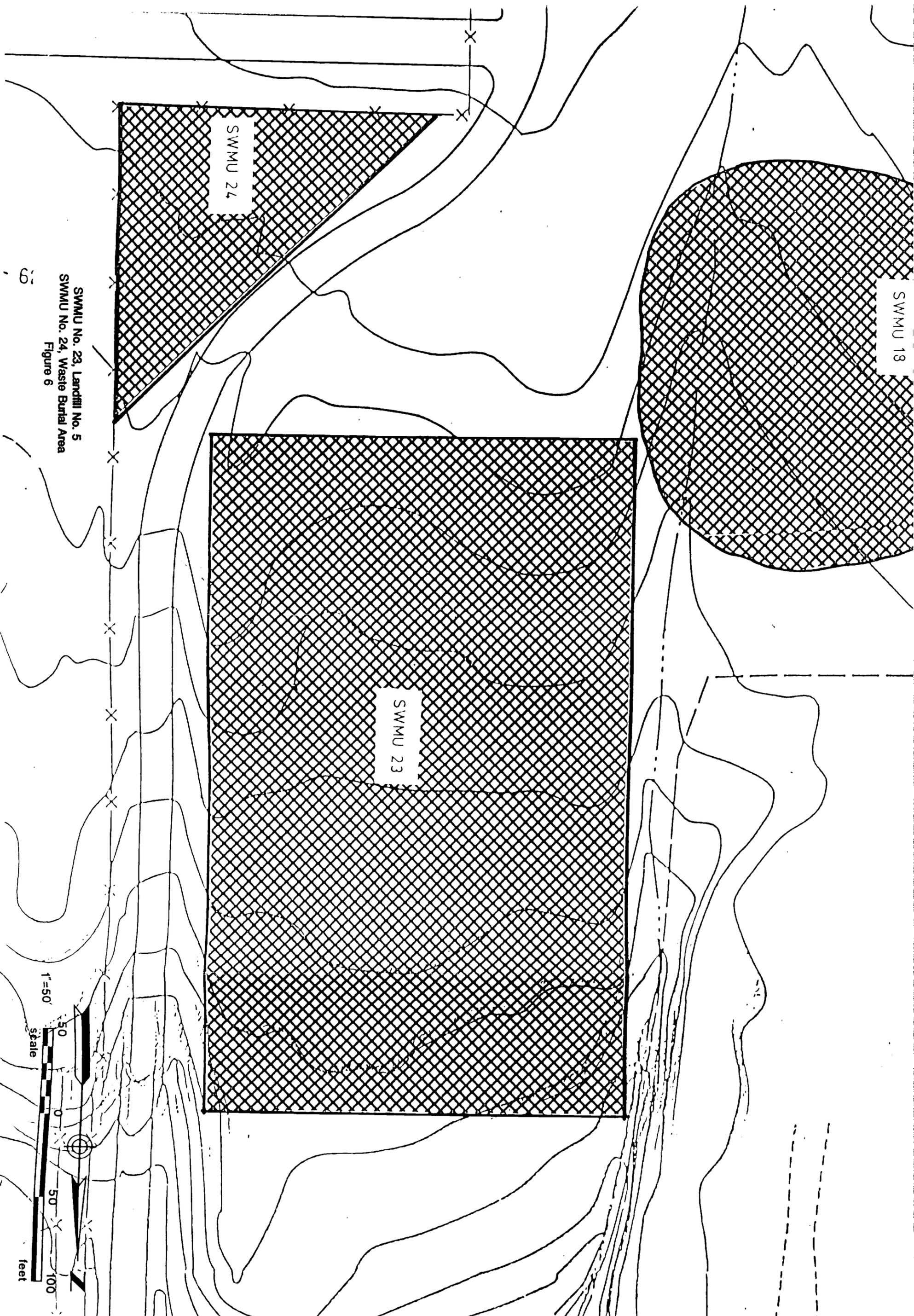
Three boreholes were drilled and three upper zone monitor wells were installed at the site. The upper zone materials consist of surficial deposits of clayey silt with variable amounts of fine sand and gravel, underlain by sand and gravel deposits. The thickness of the upper zone ranges from 31 feet to 39 feet. The surficial clay and silt deposits are 7 to 14 feet thick and the sand and gravel deposits are 19 to greater than 27 feet thick. Shale and limestone of the Goodland Formation underlie the upper zone materials and occurs at a maximum of greater than 39 feet west of the site and at its shallowest depth of 31 feet northwest of the site. Ground water occurs in the upper zone materials at a depth ranging from 20 feet to 30 feet.

Split-spoon samples were collected and analyzed for heavy metals, oil and grease, petroleum hydrocarbons, volatile organic compounds, semivolatle organic compounds, pesticides, and PCBs. No heavy metals were detected above the normal ranges. There was no detection of oil and grease or petroleum hydrocarbons. TCE was detected in one sample, however, this finding was not confirmed with a duplicate sample. Toluene was estimated in low levels (5.3 ug/Kg and 2.0 ug/Kg) in two samples. Various phthalate compounds were detected in the soil samples ranging up to 390 ug/Kg. Pesticides or PCBs were not detected in any soil samples at this site.

Ground water samples were sampled for chemical analysis in two rounds of sampling. Samples were analyzed for water quality indicators, heavy metals, oil and grease, petroleum hydrocarbons, phenols, purgeable halocarbons, purgeable aromatics, organochlorine pesticides and herbicides. Total dissolved solids concentrations were fairly uniform through the two sampling rounds, ranging from 510 to 670 mg/L. Water samples were found to exceed MCLs for chromium at one well during both rounds of sampling. Chromium also exceeded MCLs at a second well during the first round and at a third well during the second round of sampling. Iron and manganese exceeded MCLGs at the three wells during both sampling rounds. Ground water analyses detected oil and grease in all three monitor wells in Round 1. Values ranged from 0.3 mg/L to 1 mg/L. However in Round 2, oil and grease were not detected at any of the wells. Petroleum hydrocarbons were detected (0.40 and 0.60 mg/L) in the first

round, however, no petroleum hydrocarbons were detected in the second round. Phenols were detected in the first round and confirmed by a second column analysis. Concentrations of 2,4-dinitrophenol, 2-chlorophenol, and 2-methyl,-4,6-dinitrophenol were detected in the first round, but not the second round of sampling. Trichloroethene (TCE) was detected in concentrations greater than the MCL in all ground water sampled at the site. Values ranged from 1,900 ug/L to 11,000 ug/L. Chloroethene was detected at 850 ug/L in one well in the first round, but was not detected in the second round. Purgeable aromatics pesticides nor herbicides were not detected in the ground water at the site.

A geophysical survey was conducted by Ecology and Environment, inc., in February 1991 to determine/confirm the presence of buried drums at the site. The survey confirmed the location of approximately 9 drums located near the surface. A sample of one of the drums indicated the contents of the drums to be TCE. An RCRA Facility Investigation/ Remediation plan for the removal of buried drums and a suspected Underground storage tank is being prepared and will be submitted to TWC on 7 May 1991. A preliminary remedial action plan addressing the ground water contamination will be submitted at a later date.



SWMU No. 23, Landfill No. 5
SWMU No. 24, Waste Burial Area
Figure 6

6:

SWMU No. 28, Landfill No. 1.

SWMU No. 28 was reported to be the original base landfill and was operated during the 1940s. This site is located adjacent to the Trinity River levee at the current location of the Defense Reutilization and Marketing Office (DRMO) storage yard. No information is available concerning the past waste disposal practices at this site due to the time elapsed since this site was closed.

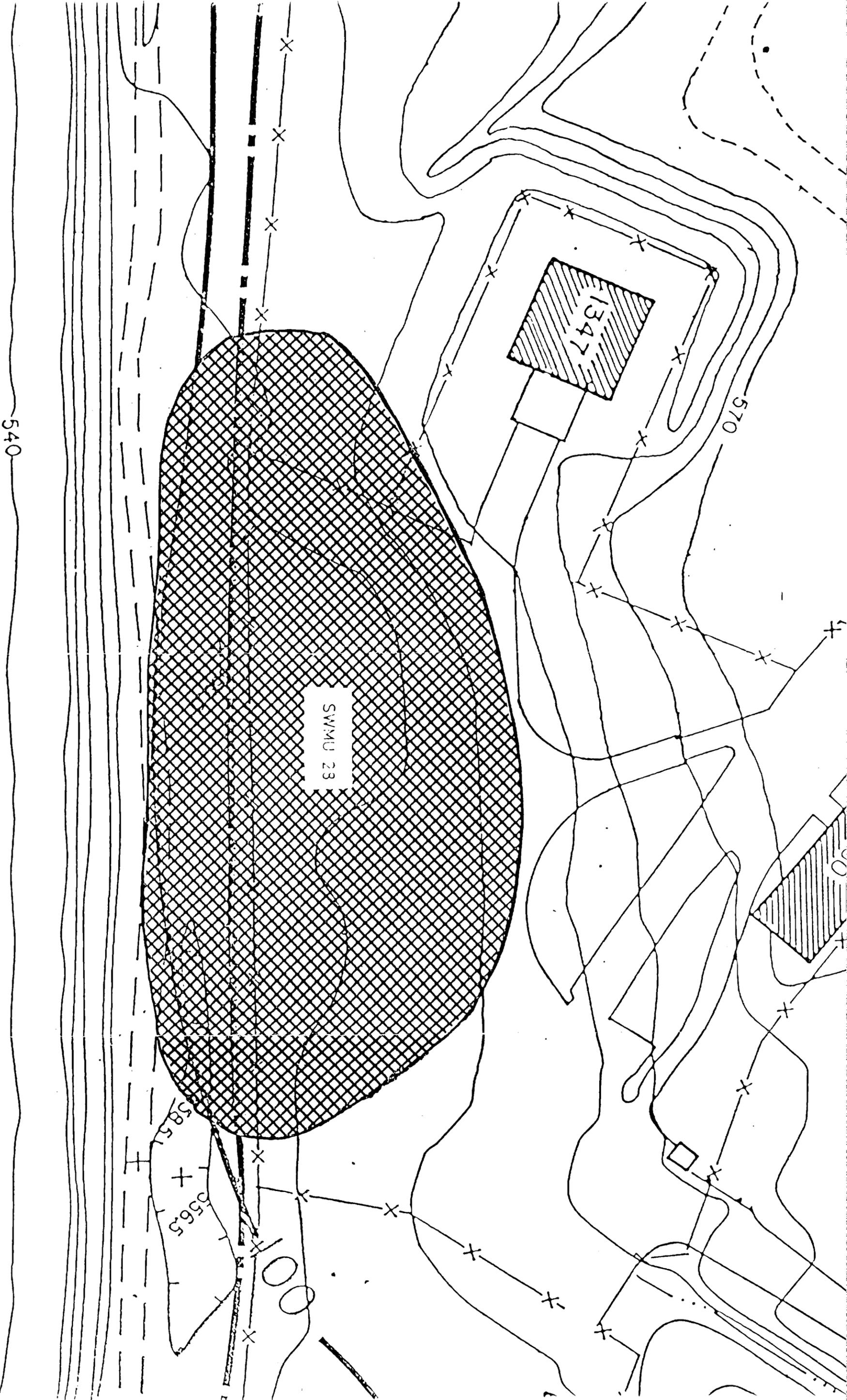
Six upper zone monitor wells were installed at the site. The subsurface conditions consists of fill, clay, and sandy clay. The large amount of fill material (asphalt, concrete, tar, wood chips) encountered in the clay beneath the DRMO indicates that the area has been extensively modified. The upper zone materials are a result of construction fill or rechannelling of the Trinity River. The surface of the Goodland Limestone dips relatively steeply to the east beneath the site, reflecting channel cutting and erosion of the limestone by the Trinity River. The land surface elevation does not dip eastward as steeply as the limestone; therefore, the lower elevation of the top of the Goodland at the extreme eastern edge of the site accounts for the relatively greater thickness of alluvium. The ground water depth ranges from 5 feet at one well, to a fairly consistent measurement of 20 feet at the other wells.

Soil samples from two wells were collected and analyzed for moisture content, heavy metals, oil and grease, volatile organic compounds, and semivolatile organic compounds. Heavy metals were compared with mean values of metal concentrations in U.S. soils and detected at above normal ranges for arsenic, cadmium and silver. Oil and grease were not detected. Toluene was detected in both wells sampled. Di-n-butylphthalate was confirmed in soil samples at both locations, with a maximum concentration of 380 ug/Kg.

Ground water was sampled for chemical analysis twice in 1988. Samples were analyzed for water quality indicators, heavy metals, oil and grease, purgeable halocarbons, purgeable aromatics, and extractable priority pollutants. Total dissolved solids concentrations for most samples were approximately 500 mg/L, with the exception of two wells in Round 1 with values of 1,100 mg/L and 1,300 mg/L. Sulfate concentrations that exceeded recommended standards were detected in one well for both rounds (460 mg/L and 360 mg/L, respectively). Water samples were found to exceed MCLs for arsenic, barium, cadmium, chromium, lead and selenium. Iron and manganese exceeded MCLGs during both sampling rounds for all wells. Other MCLGs that were surpassed are lead (one well) and cadmium (two wells). Oil and grease were found in concentrations less than 1 mg/L in ground water samples in the first round, from four wells, however, no detectable concentrations of oil and grease were detected in the second round. Trichloroethene exceeded the MCLGs in two wells (0.70 ug/L and 0.30 ug/L) and vinyl chloride was detected in one well with

a value of 0.40 ug/L which also exceeded the MCLGs. Toluene was detected during both sampling rounds in five wells with a maximum value of 26 ug/L. The only other purgeable aromatic compound detected was chlorobenzene during both sampling rounds at one well. Bis(2-ethylhexyl)phthalate was detected in two wells and di-n-butylphthalate was found in the second round of one well. 26

The soil investigation of this area did not indicate the presence of contaminants or waste materials. The Stage 1 study provided inconclusive evidence of disposal activities at this site. Based on the subsurface investigations and chemical analysis of Stage 2, the site does not appear to be a source of contaminants in the subsurface. Some metals concentrations above MCLs were detected in ground water and should continue to be monitored. Recommended monitoring parameters should include volatile halogenated organic compounds, metals, and general water quality parameters. Results of Stage 2 investigation show concentrations of metals in several downgradient wells in excess of the federal MCLs. No other contaminants were detected in soil or ground water samples at the site. Continuation of collecting and analyzing the ground water from the existing well network is recommended. Samples should be analyzed for volatile organic compounds, metals, and general water quality parameters. A detailed preliminary remediation action plan will be submitted at a later date.



SWMU No. 28, Landfill No. 1
Figure 7

WEST FORK TRINITY RIVER

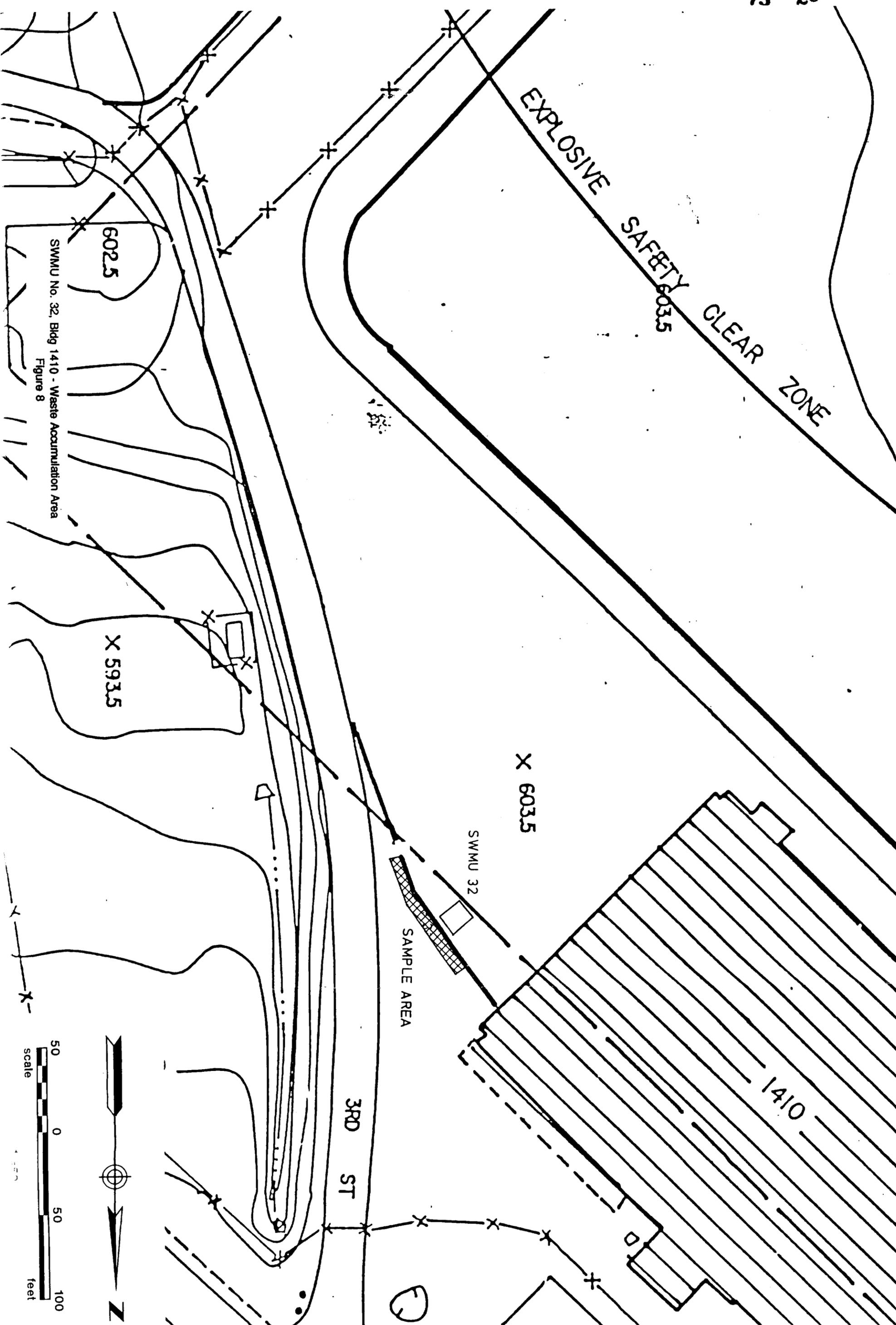


Building 1410 Waste Accumulation Area is an outdoor, uncovered, concrete-based container storage area. The unit manages wastes generated by the Engine Shop and Wheel and Tire Shop inside Building 1410. The waste from the Engine Shop is managed in drums on wooden pallets occupying one half of the site, while the waste from the Wheel and Tire Shop is transferred to drums occupying the other half of the site. In addition to the 55-gallon drums, the unit also consists of a 500-gallon tank. A contaminant retaining wall consisting of sandbags stacked two high is located along the perimeter of the unit. The unit is located approximately 25 yards from a storm drainage ditch. Some of the drums have open bungholes, others are secured by metal plates and locked. Wastes from this unit are disposed of by contractor removal through DRMO. A new curbed, covered accumulation point was recently constructed at this site and now houses all hazardous waste and hazardous material.

The unit manages 7808 engine oil drained from jet engines, carbon and fingerprint removers, PD-680 (Type II), waste JP-4 fuel, and a solvent manufactured by Rochester Midland designated SE 377E. The carbon and fingerprint removers are degreasers. The unit manages approximately 600 gallons of 7808 engine oil per year, 200 gallons of carbon and fingerprint remover per year, 550 gallons of PD-680 Type II per year, and 300 gallons of waste JP-4 per year.

There is no documented history of releases for this unit, but during the visual site inspection conducted in February 1989, the concrete within, and to some extent outside the sand bags, was stained with oily material that had either leaked from a drum or been spilled at this unit.

Soil samples will be taken to accurately define the area and depth of contamination that requires clean-up. Samples will be analyzed for Total Petroleum Hydrocarbons, BTEX, and TCLP for lead and chromium. Upon completion of the sampling, the contaminated soil will be removed, properly disposed of and replaced; clearance samples will also be taken. There is no documented history of releases to ground water; therefore, groundwater will not be sampled unless soil sample results indicate possible groundwater contamination. A detailed preliminary action plan will be submitted at a later date.



SWMU No. 32, Bldg 1410 - Waste Accumulation Area
Figure 8

50 0 50 100
scale feet



E

SWMU No. 35, Oil/Water Separation System

This unit consists of a main trench floor drain, underground conduits, and an oil/water separator outside Building 1194, Vehicle Refueling Shop. Floor rinsate washes down the drain through the conduits to the Oil/Water Separator. There, the oil is skimmed from the wastewater and the wastewater is pumped out onto the parking lot surface. The parking lot slopes towards the surrounding bare ground where a storm water sewer catches runoff from the area. The floor in the building is paved with concrete and slopes toward the drain. The trench is approximately 1 foot deep, 18 inches wide and 30 feet long. Reportedly, the underground conduits are also constructed of concrete. The oil/water separator is a below-ground concrete box located beneath an asphalted area. It is comprised of two main units, one for separation, and another for holding the skimmed oil. A pressure gauge sticking out of the ground indicates the oil level in the oil holding tank, and thus, the need for pumping it out. The separation unit has a capacity of 2,000 gallons. The construction details of the unit were not documented.

The unit manages floor washings which consist of wastewater contaminated with fuel, PD-680, anti-freeze, and transmission fluid, as well as waste oil.

There is no documented history of releases for this unit. Separated wastewater is reportedly released onto the parking lot surface. At the time of the visual site inspection conducted in February 1989, the soil in the area's runoff pathway appeared stained with oil.

Soil samples will be taken to accurately define the area and depth of contamination around the storm sewer drain. Upon completion of the sampling, the contaminated soil will be removed, properly disposed of and replaced; clearance samples will also be taken. Samples will be analyzed for Total Petroleum Hydrocarbons, TCLP for lead, and BTEX. The process for pumping out the holding tank in the separation system has been changed to eliminate the dumping of separated water onto the parking lot and subsequently contaminating the surrounding grassy area. Since the dumping of wastewater no longer is occurring, the removal of contaminated soil, confirming samples and backfilling with clean soil should complete the clean-up and restoration of this area. There is no documented history of releases to ground water; therefore groundwater will not be sampled unless soil samples results indicated possible groundwater contamination. A preliminary remedial action plan will be submitted at a later date.

This unit is located east of the Vehicle Maintenance Shop (Building 1191), at the corner of the parking lot. It holds wastes in 55-gallon drums from Vehicle Maintenance Operations. In addition, waste drums from various squadrons are held in this unit. Some of the drums rest directly on the asphalt pavement, others are on pallets. The waste drums from this unit are transferred by truck to the Central Waste Holding Area (SWMU No. 51). These drums are not picked up regularly; during the VSI conducted in February 1989, a facility representative stated that the last pickup had occurred in October 1988. Sand bags are located in the back of the unit for emergency containment of small releases. There are no provisions for secondary containment and the unit is adjacent to bare ground. Runoff drains onto unpaved ground and flows to an unlined storm water culvert. Evidence of oily material spillage was noted during the VSI. It included soil and asphalt oil staining as well as an oil film in the ponded rainwater.

The wastes managed include leaded and unleaded waste oil, drummed separately, waste MOGAS and waste antifreeze. These wastes may contain RCRA-hazardous materials.

There is no documented history of releases for this unit. Evidence of oily material spillage was noted during the visual site inspection conducted in February 1989 including ground staining with oil and an oil film in the ponded rainwater.

Soil samples will be taken to determine the area and depth of contamination. The contaminated soil will be removed, properly disposed of and replaced; clearance samples will also be taken. Samples will be analyzed for total petroleum hydrocarbons, TCLP for lead, and BTEX. There is no documented history of releases to groundwater; therefore, groundwater will not be sampled unless soil sample results indicate possible groundwater contamination. A detailed preliminary remedial action plan will be submitted at a later date.

132

1190

0

SAMPLE AREA

SWMU No. 35, Oil/Water Separator
SWMU No. 36, Bldg 1191 - Waste Accumulation Area
Figure 9

SWMU 36

1191

SAMPLE AREA

1192

5782



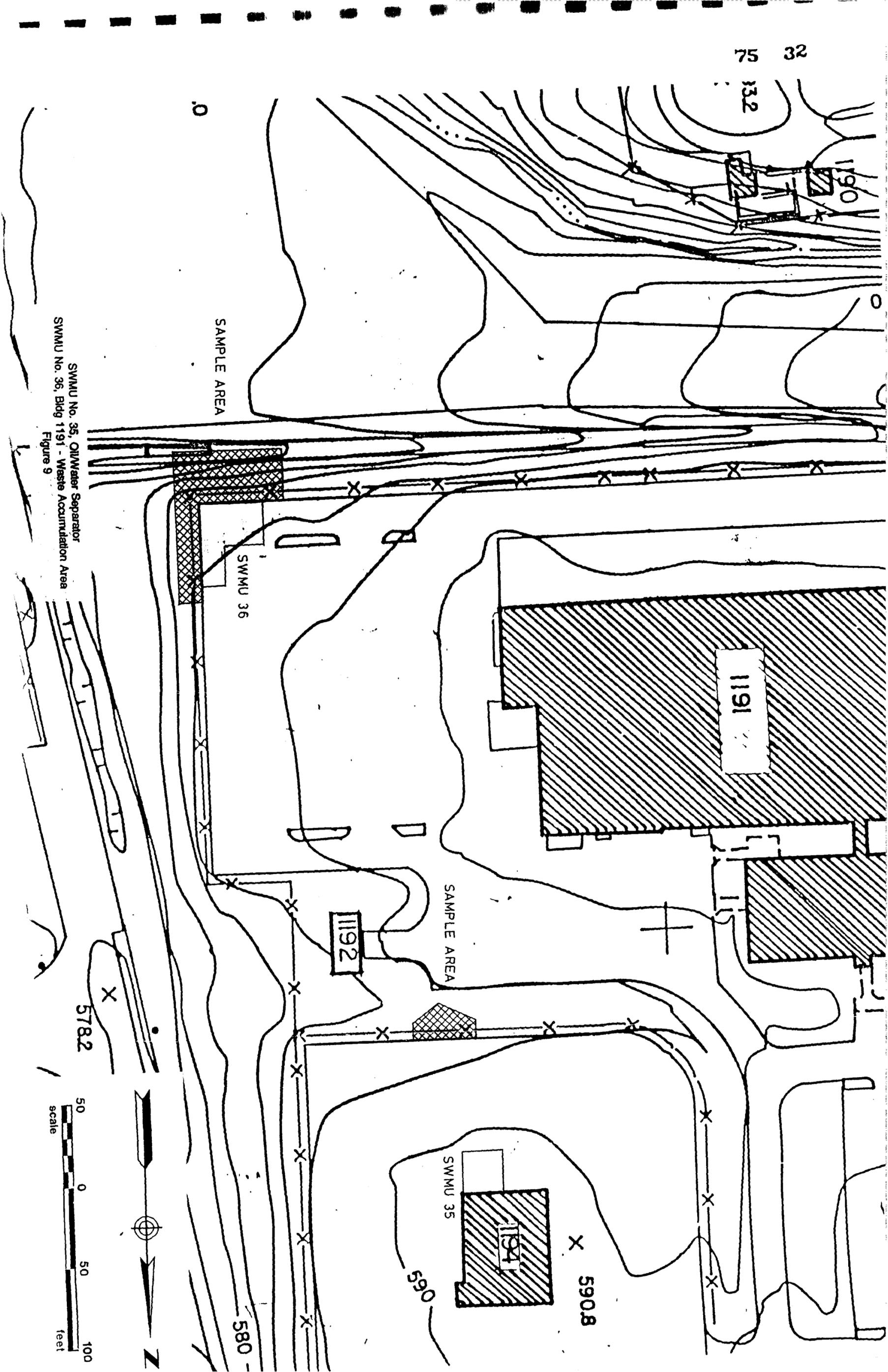
SWMU 35

1194

5908

590

580



SWMU No. 53 is a drainage ditch located east of Haile Drive adjacent to the main aircraft washrack and Hangers 1048 and 1049. The ditch receives runoff from the flightline area via three concrete drainage conduit located under Haile Drive. The ditch is unlined from Haile Drive to its intersection with the POL Tank Farm, at which point it becomes a concrete-lined ditch. The ditch enters a storm sewer at the intersection of Knights Lake Road and Hobby Shop Road. In addition to normal storm drainage, this ditch receives discharges from the aircraft washracks and the Fuel System Shop (Building 1048). Washrack wastes (PD-680, a cleaning solvent, and soap) can be discharged directly to the Facility 1190 oil/water separator, located adjacent to the flightline drainage ditch, or into the drainage ditch via an overflow pipe in the drain line between the washracks and the oil/water separator. Discharge to the oil/water separator or to the drainage ditch is controlled by a valve in the drain line just upstream of the separator.

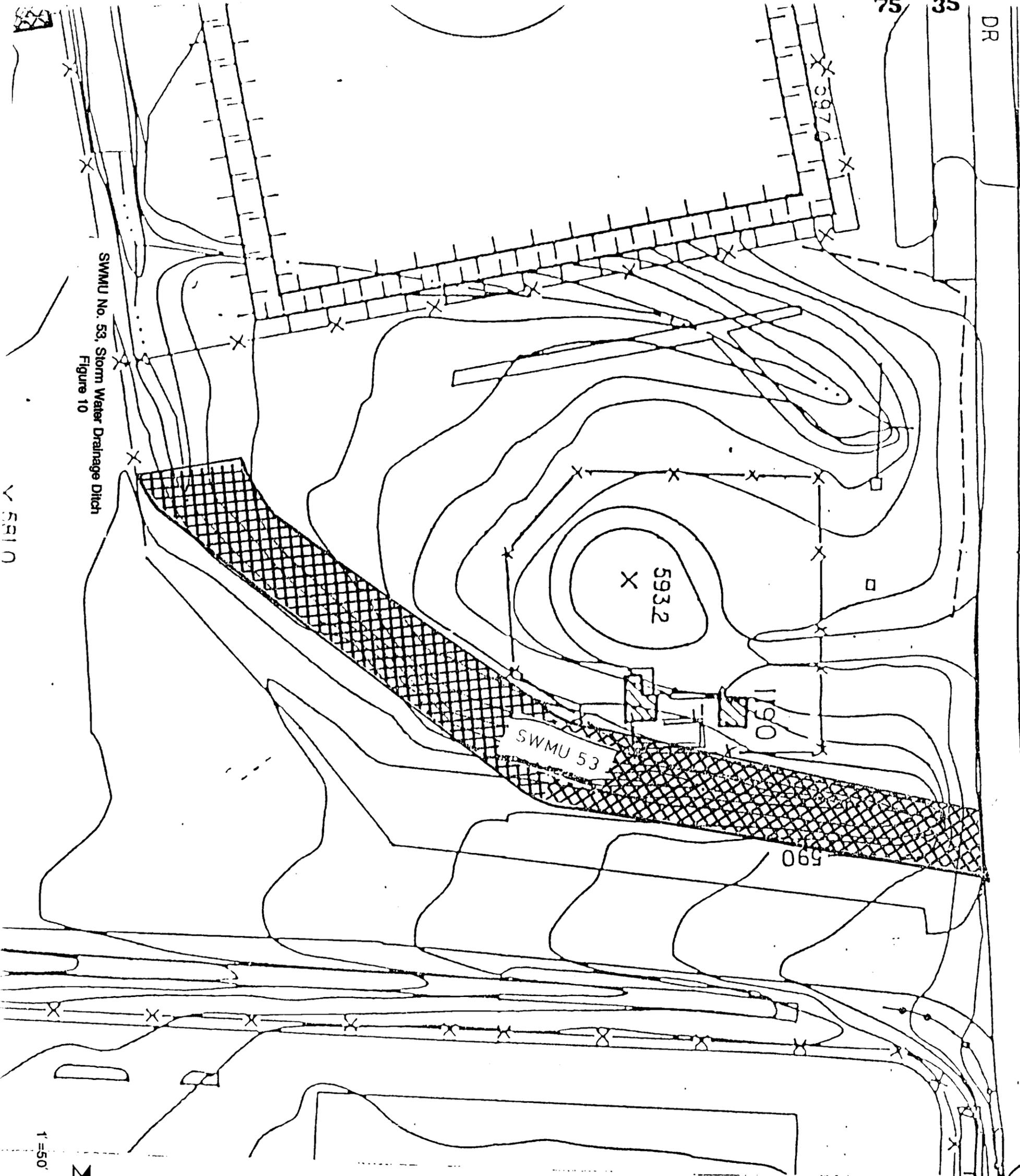
The investigation of SWMU No. 53 consisted of the collection of surface sediment samples at five locations during two sampling rounds. The borings were spaced evenly along the site between where the ditch emerges east of Haile Drive and to where the ditch becomes concrete-lined as it enters the POL Tank Farm. The geologic features were not evaluated from the surface samples collected in Stage 2. During Stage 1, the borings at the site extended to a maximum of ten feet below the surface, so only the most shallow sediments have been examined. In general, the soil is gravelly and hard and a very stiff clay is also present in the area. During Stage 1, it was observed that some gravels along the ditch were stained with a black, oily substance at a level equivalent to the observed stream level in the ditch. Water occurs in the shallow sediments below the ditch at depths between six inches and four feet below the surface. This level is substantially higher than that in nearby monitor wells at SWMU No. 68 and probably represents near-surface soil saturation related to the ditch, rather than the local ground-water body.

Surface soil samples were collected in two rounds approximately one month apart. Soils were tested for moisture content, heavy metals, petroleum hydrocarbons, volatile organic compounds and semivolatile organic compounds. Cadmium, lead and selenium were above normal ranges in most samples analyzed. Arsenic was detected at elevated levels during the first round of sampling in four of the five locations. However, arsenic was not detected in any samples from the second round of samples. Petroleum hydrocarbons were detected in every soil sample from the site. The highest values detected were 1,320 mg/Kg in the first round and 3,500 mg/Kg in the second round. The lowest concentration of petroleum hydrocarbons was in the first round with a value of 34 mg/Kg near the upstream limit of the ditch.

Benzene, ethylbenzene, toluene, and total xylenes were the volatile organic compounds detected in most samples. Benzene concentrations decreased between the first and second rounds and were generally less than 10 ug/Kg. Ethylbenzene was usually estimated at values below detection limits, with the exception of a concentration of 750 ug/Kg in the first round at one location. Toluene was found in all soil samples in concentrations ranging from 8.3 ug/Kg to 3,000 ug/Kg. Total xylenes were detected in every soil sample, with the exception of one location in the second round. There were numerous detections of semivolatile organic compounds at the site. In addition, there was an apparent trend between sampling events of decreasing concentrations at the upgradient location, while all other locations show increasing concentrations of semivolatiles.

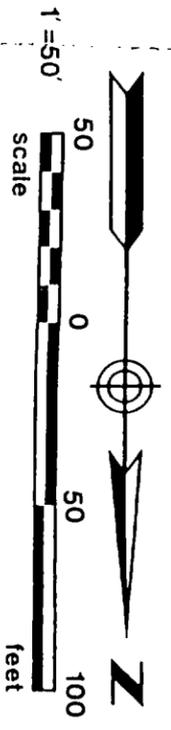
Stage 1 and 2 findings confirm the presence of petroleum hydrocarbon compounds and other organic compounds in the sediment of the drainage ditch. Trends of increasing or decreasing concentrations between sampling rounds and at different locations in the ditch may be attributed to conditions of variable stream flow, possible pooling or trapping of contaminants in some segments of the ditch and intermittent discharges of fuels or runoff that would influence the distribution of contaminants.

Prior to formal corrective action, the ditch should be dredged and contaminated soil and sediment removed. This action will remove a possible source of future contamination. The recommended corrective action for SWMU No. 53 is to concrete line the ditch, similar to the lined portion of the ditch as it flows through the POL Tank Farm. A detailed remedial action plan will be submitted at a later date.



SWMU No. 53, Storm Water Drainage Ditch
Figure 10

V 5810



SWMU No. 61, Bldg. 1320, Power Production Maintenance Facility Waste Accumulation Area

This unit is an outdoor container storage area for waste generated from inside Building 1320. Maintenance work on portable generators is conducted inside Building 1320. The unit consists of approximately twelve 55-gallon drums resting on wooden pallets which rested on railroad ties. The unit has a gravel base. The unit is uncovered and without a berm to provide secondary containment. Some of the drums are grounded. Some of the drums are not labeled; others were labeled but the writing is not legible. A bung hole on one of the drums was observed to be open, and another drum had a label dated 16 September 1986. Generally, conditions at this unit are poor. The outdoor storage area was recently replaced with a covered, curbed accumulation point.

The unit manages waste antifreeze, waste oil, and waste PD-680. Several 5-gallon cans of a hard material similar to roofing tar are also at this unit.

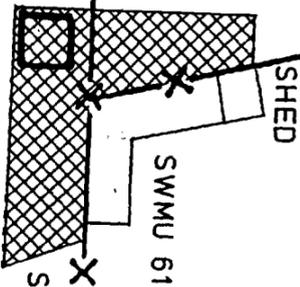
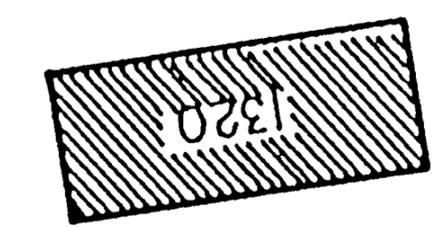
At this time of the visual site inspection conducted in February 1989, oily runoff from the unit was draining to a storm sewer (Storm Water Drainage System, SWMU No. 53).

Soil samples will be taken to determine the area and depth of contamination. The contaminated soil will be removed, properly disposed of and replaced; cleaner samples will also be taken. Samples will be analyzed for Total Petroleum Hydrocarbons and BTEX. There is no documented history of releases to groundwater; therefore, groundwater will not be sampled unless soil sample results indicate possible groundwater contamination. A detailed remedial action plan will be submitted at a later date.

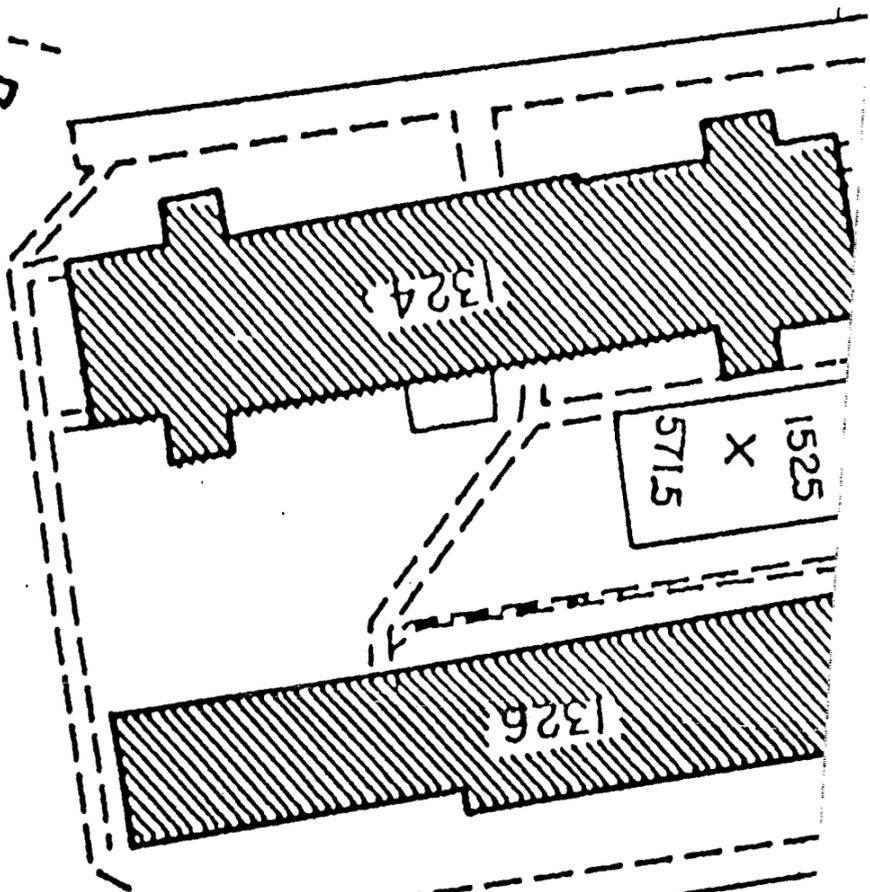
75 37

X 5715

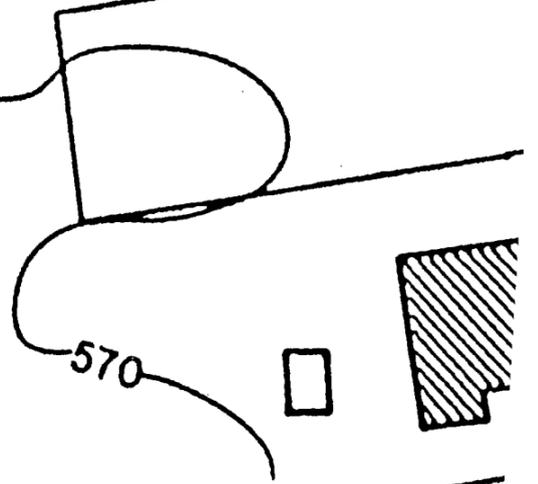
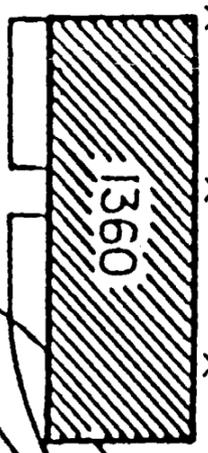
SWMU No. 61, Bldg 1320 - Power Production Maintenance
Facility Waste Accumulation Area
Figure 11



SAMPLE AREA



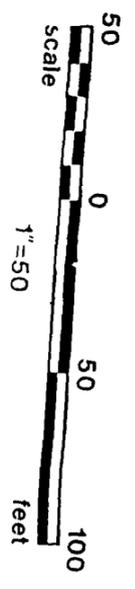
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X
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15705

X 5715

570

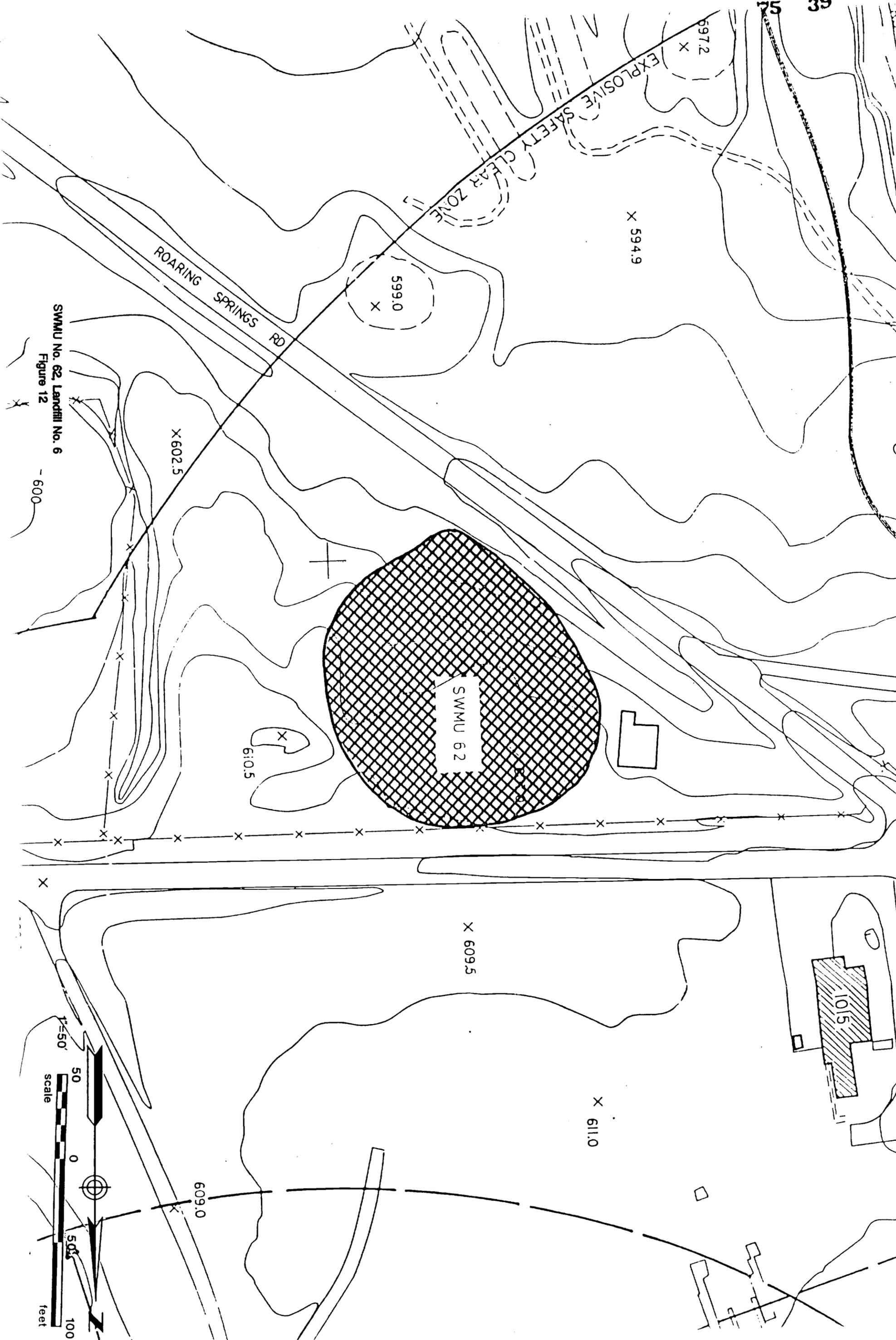


SWMU No. 62, Landfill No. 6

Landfill No. 6 was operated from about 1975 until 1978. The site is approximately 1 acre in size and is located between the golf course and the flightline perimeter road. The site is currently being used for recreational vehicle storage within a fenced area.

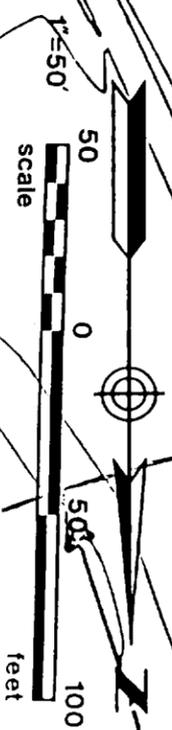
Landfill No. 6 was originally a gravel pit used for base construction activities. After the gravel had been removed, the site was used for the burial of construction rubble, trees, and miscellaneous trash. Several drums of hydraulic fluid were reportedly buried in a centrally located pit used for the collection of groundwater. Due to the proximity of SWMU No. 62 to the flightline shop, small quantities of other hazardous materials are also suspected to being buried there.

Monitoring wells will be installed to determine if contamination exists. If contamination is found then a thorough site investigation will be performed to determine extent of contamination and possible remediation alternatives. A detailed work plan will be submitted at a later date.



SWMU No. 62, Landfill No. 6
Figure 12

- 600



SWMU No. 63, Entomology Dry Well.

SWMU No. 63 is located in the vicinity of the new communications building (Building 1337), east of Rogner Drive near the base main gate. Immediately east of the site is the former location of the entomology shed (Building 1338) which was removed in 1981 and the site was regraded. A dry well at the site was used for disposal of insecticide rinsate between 1965 and 1981. Due to the dismantling of Building 1338 and regrading of the site, the exact location of the former dry well has not been determined. Building 1338 was used for the storage and mixing of insecticides including malathion, diazinon, dursban, and chlordane, and for storage and cleaning of spray equipment. Chlordane has been reported in samples taken from the well next to Building 1338, although no documented analytical results could be found during the records search to substantiate this report.

Three monitor wells were installed in Stage 1 and samples were obtained by hand augering at seven locations in the vicinity of the Entomology Dry Well during Stage 2. These samples were analyzed for the presence of organic compounds, specifically organochlorine pesticides and PCBs. Organochlorine pesticides were detected in all soil samples except one, the furthest upgradient sample. Chlordane was the most prevalent substance encountered, being detected in four locations. The highest value of 32,000 ug/Kg was in the sample furthest downgradient sampling location and closest to SWMU No. 64. Other chlordane findings ranged from 21 to 420 ug/Kg and heptachlor was only detected at one location, in a concentration of 980 ug/Kg. Two sample locations had findings of 4,4'-DDD and 4,4'-DDE with the highest concentrations of 140 ug/Kg and 29 ug/Kg, respectively. There were no other organochlorine pesticides detected in the soil at the site.

The results from the groundwater samples obtained during Stage 1 indicate that pesticides do not occur in the shallow upper zone groundwater. The principal effort for the Stage 2 investigations was to determine if pesticide contaminants occur in near surface soils. Based on the samples collected and analyzed from the site, pesticide compounds were detected in an apparent random pattern around the former location of the Entomology Shop in near the surface. Thus the available evidence indicates that pesticides have remained in the shallow soil.

A thorough subsurface soil investigation was conducted by Maxim Engineers to confirm or deny the extent of the presence of pesticides at the site. The investigation was conducted in March 1990 and consisted of 24 soil borings down to the depths of 9-10 feet. 20 of the 24 borings contained non-detectable concentrations of pesticides and PCB's. Very low concentrations of Chlordane (11-26 parts per billion) were found in three boring samples and one sample

contained low levels of Endrin Aldehyde (75 parts per billion) Based upon the random, low levels of pesticides found in the soil and the lack of pesticides found in the groundwater, SWMU No. 63 is being recommended for no further action required. A detailed request for no further action required will be submitted at a later date.

SWMU No. 64 is divided into two parts located to the south and west of SWMU No. 63, the entomology dry well. The Unnamed Stream, a small tributary of Farmers Branch, located south of the old entomology shed, and near the confluence of Farmers Branch and the Trinity River and a paved lot in the vicinity of an abandoned gasoline service station to the west of SWMU No. 63. The small stream is the discharge from an oil/water separator, SWMU No. 67, Bldg 1340 oil-water separator, located immediately south of the fenced civil engineering yard, and receives its perennial flow from ground water entering the separator. The separator is connected to a french underdrain system, SWMU No. 64, which was installed to aid in the removal of fuels from the ground either at SWMU No. 68, POL Tank Farm, or at the abandoned gasoline service station. This separator has not been routinely cleaned for a number of years and reportedly contains hydrocarbon constituents.

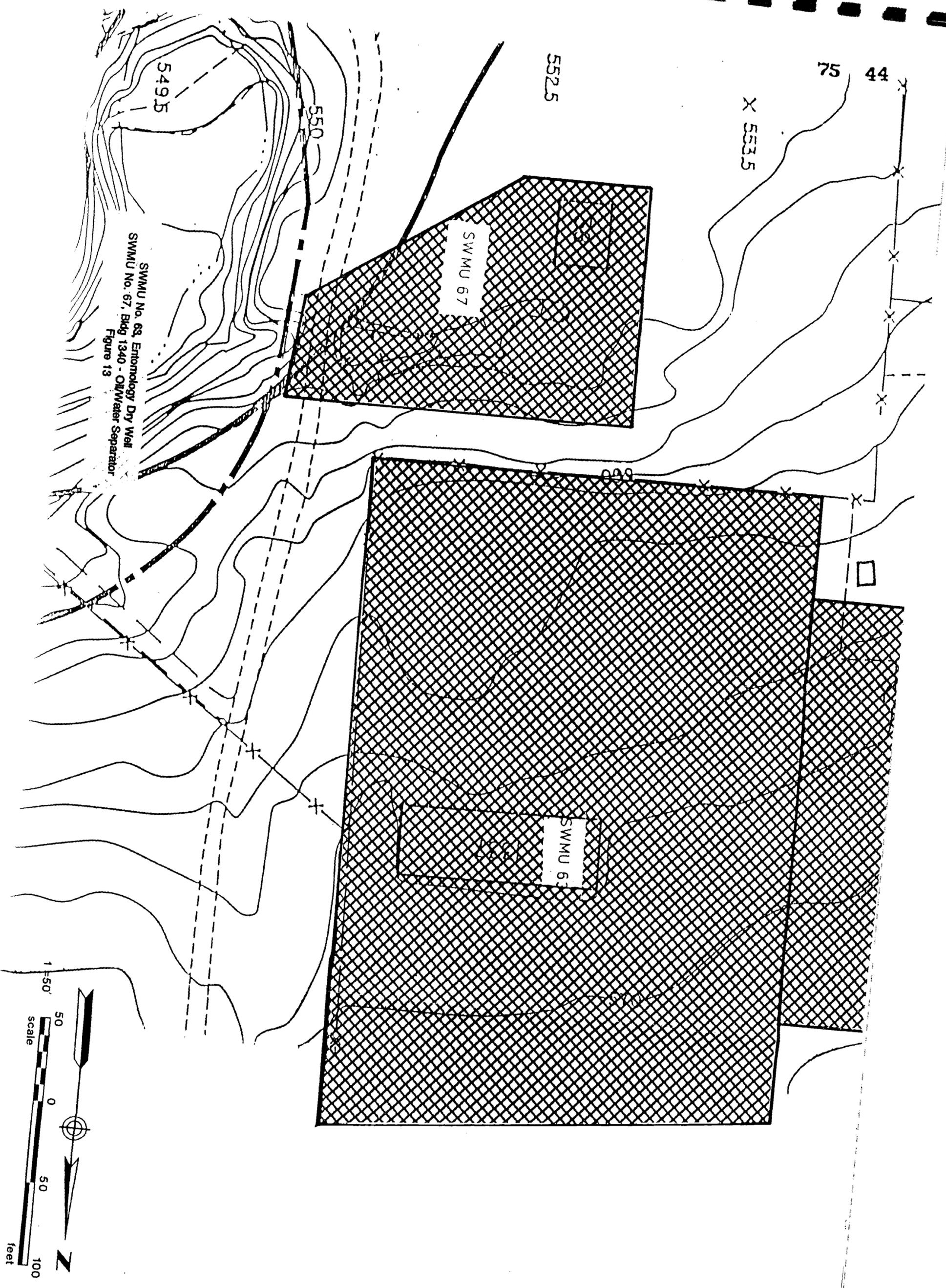
Soil samples were collected from four hand augered borings along the Unnamed Stream during Stage 1. All samples had values of selenium (9.1-24 mg/Kg) higher than the range of normally found in soils. The lead content of the shallow soil samples (18-20 mg/Kg) is at the high end of the normal range and higher than the lead content of most other soils analyzed at Carswell AFB. Oil and grease values were found to be high in almost all of the soil samples analyzed (27-240 mg/Kg). The concentrations were highest closest to the oil water separator and generally decrease with the distance downstream.

Samples of surface water were collected and analyzed from four locations in two sampling rounds. Samples were analyzed for water quality indicators, heavy metals, oil and grease, purgeable halocarbons, and purgeable aromatics. Total dissolved solids at the four sampling locations were less than 500 mg/L and remained relatively stable between sampling events. Chloride and nitrate concentrations increased between sampling rounds at all locations, with all values below Secondary Drinking Water Regulations, except for a sample from Round 2 in which chloride was detected at 710 mg/L, up from 24 mg/L for Round 1. Surface water samples from the stream had two metals that exceeded MCLs. Arsenic surpassed MCLs in the second sampling round at two locations and chromium matched MCLs in the second round from one location. Iron and manganese exceeded MCLGs in all samples taken from the site. Oil and grease was detected at all four locations and in every sample, except the second round at one location. The highest concentration was 2.4 mg/L, which was detected in the second round. With the exception of this increase, all other oil and grease concentrations decreased between samplings. The only detection of purgeable halocarbons occurred at the most downstream sampling location, with the finding of tetrachloroethene which was below MCLs. Benzene was detected in

levels exceeding MCLs at all four locations during the first round. Values ranged from 39 ug/L to 120 ug/L. However, in the second round of samples, benzene was not detected at any of the sample locations.

Results of the Stage 2 investigation indicates that the Unnamed Stream is receiving quantities of petroleum hydrocarbons. The decreasing concentrations of these contaminants with increasing distance downstream can be attributed to volatilization losses of these compounds to the atmosphere. Therefore, all contaminants in the stream can be attributed directly to the oil/water separator.

It is recommended that the stream should continue to be monitored and additional wells be installed in the vicinity of the old gasoline station. These wells should be screened in the upper zone, with water quality samples collected and analyzed for volatile organic compounds, petroleum hydrocarbons, metals, and general water quality parameters. A detailed work plan will be submitted at a later date.



SWMU No. 68, Entomology Dry Well
SWMU No. 67, Bldg 1340 - Oil/Water Separator
Figure 13

SWMU 67

SWMU 68

549.5

550

552.5

75

44

X 553.5

1" = 50'

50

0

50

100

feet

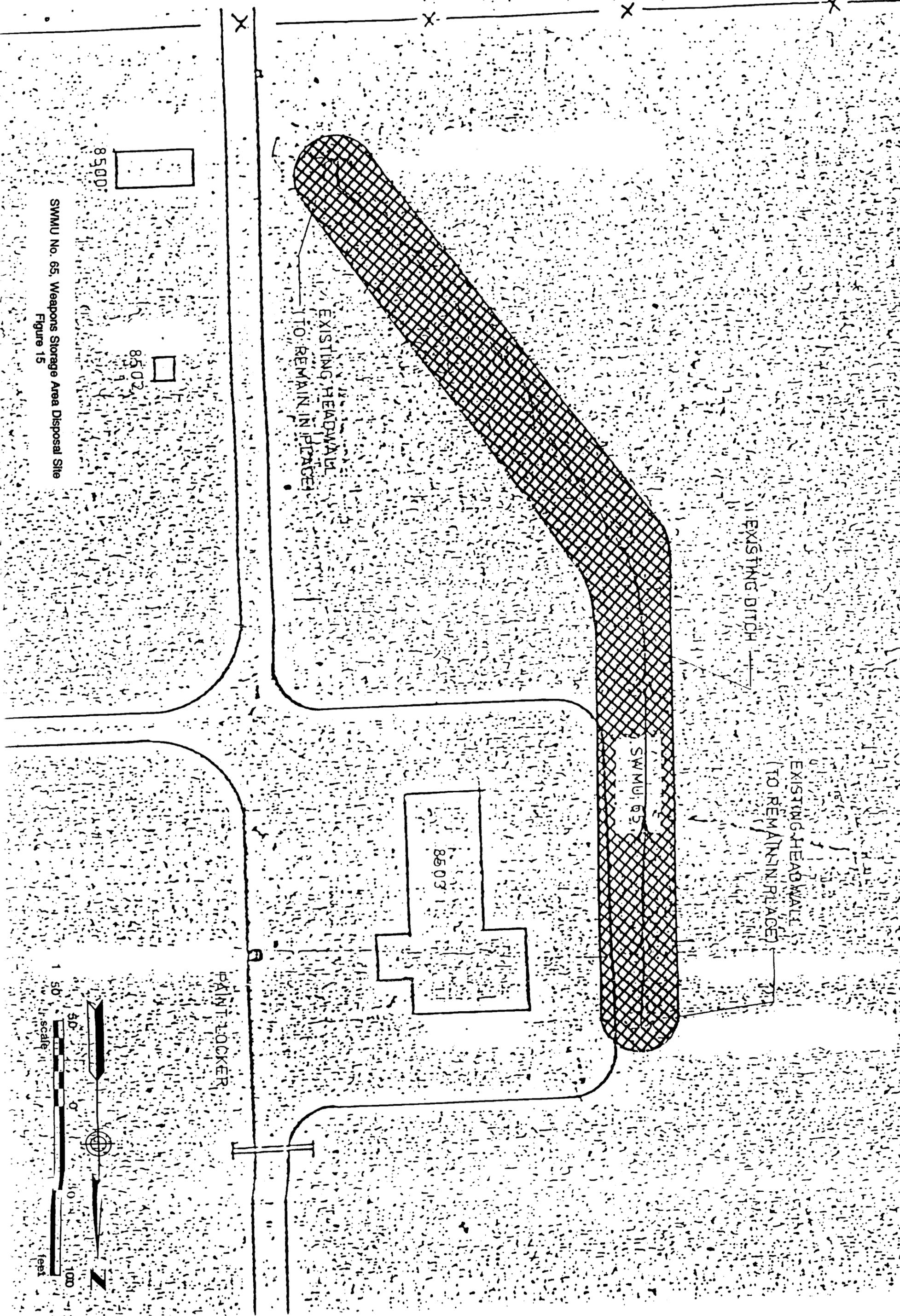


The Weapons Storage Area (WSA) is located about 6 miles west of Carswell AFB, just north of White Settlement Road. The facility is on 247 acres of fee-owned land and is surrounded by an additional 264 acres of easement. The area consists of unimproved pasture heavily grazed by beef cattle and of natural oak woodlands populated by white-tail deer and coyotes. The site is located between two forks of Live Oak Creek, which flows east to the discharge point of Lake Worth. The facility was constructed in 1956 and includes two munitions inspections shops, sixteen ordnance storage buildings, one entry-control building, an emergency power plant, an explosive ordnance disposal range, a radioactive waste disposal facility, a water storage tank and two water wells. It has been reported that small quantities of waste cleaners and solvents have been disposed of on the ground behind the inspection shop. Quantities were estimated to be five to ten gallons per year.

Eight shallow hand-augered borings were drilled around the inspection shop. A sandy clay with variable amounts of fine to coarse sand and limestone gravel was encountered. An indurated layer, probably limestone, was encountered at shallow depths. The site is located on the outcrop of the Fredericksburg and Washita Groups. The Paluxy sand is at the surface where the limestone has been eroded. The potable water well at the site is screened in the Paluxy aquifer and the Twin Mountains Formation.

The eight borings were drilled in order to determine the impact of the suspected disposal of waste cleaners and solvents in the shop area. Twelve samples were analyzed for volatile and semi-volatile organic compounds. Benzene was detected in only one sample at the site. The concentration was 1.2 ug/Kg and the potential emissions of benzene from the site can be considered insignificant. Toluene was detected in several soil samples in concentrations ranging from 2.8 ug/Kg to 49 ug/Kg. Toluene is not a potential carcinogen and the potential emissions can be considered insignificant.

Previous studies found that the ground water from the potable supply well contained total radium (8.5 pCi/L) in excess of Federal Standards for drinking water (5.0 pCi/L). In addition, analysis of soil west of the Inspection Shop revealed the presence of TCE (range from none detected to 0.0619 mg/Kg). Field studies at the site should be considered complete and it is recommended that the feasibility study be completed for the occurrence of TCE in the shallow soil. A remedial action plan will be submitted at a later date.



SWMU No. 65, Weapons Storage Area Disposal Site
Figure 15

SWMU No. 68, POL Tank Farm.

SWMU No. 68 is located adjacent to Knight's Lake Road, near the base main gate. The site consists of three aboveground tanks. Three additional aboveground tanks were formerly located at this site, but have been dismantled. During the early 1960s, fuels were discovered in the ground in this area, and also downgradient from the site in the direction of the former base gasoline station. The underground leaking POL pipes were reportedly located and replaced. No additional loss of POL to the ground is suspected to have occurred in this area since 1965. At the same time, a french drain system was installed downgradient from this area to collect fuels in the ground. The french drain discharged through the oil/water separator at SWMU No. 64. The french drain system is still continuing to collect POL as evidenced by the results of the SWMU No. 64 investigation.

Five boreholes for upper zone monitor wells were drilled in and around the tank farm area. The upper zone of the POL Tank Farm area typically consists of approximately ten feet of gray to tan clay, followed by another five to ten feet of sand and gravel. The clay frequently emitted a hydrocarbon odor during drilling. The sand is gray, tan to brown, or pink in color, and is generally fine-grained. Gravel ranges from pea size to pebbles over an inch in diameter. The depth of the Goodland Limestone beneath the POL Tank Farm ranges from 16 to over 20 feet below the land surface. The depth of water at the site varies from approximately 9.5 feet to 16 feet. The water surface slopes primarily to the southeast across the site, towards Farmers Branch.

The results of the soil gas survey conducted at the POL Tank Farm and the pipeline/truck loading area east of the tanks indicate that some areas are underlain by hydrocarbon vapor plumes. Using 1,000 ppm organic compound concentration as a criterion for delineating contamination, the results show that two soil vapor plumes exist at the site. The largest plume encompasses an area approximately 100 feet wide and 300 feet long in the vicinity of Tanks 1156 and 1157. The smaller plume envelops a circular area with a diameter of approximately 125 feet located east of the site and adjacent to Building 1213.

Soil samples from the five monitor wells were collected during drilling and analyzed for petroleum hydrocarbons, volatile organic compounds, and lead. The soil at the site was analyzed for lead concentration and all samples were well within normal ranges of heavy metal concentrations. The presence of petroleum hydrocarbons was confirmed at three borings with values ranging from 240 mg/Kg to 8900 mg/Kg. Soil analysis found low levels of benzene at two wells and toluene at three wells. Methylene chloride was detected at four wells.

Samples of ground water were collected from the five wells and analyzed⁷⁵ for water quality indicators, heavy metals, petroleum hydrocarbons, purgeable halocarbons, purgeable aromatics, and extractable priority pollutants. The total dissolved solids (TDS) at the site ranged from 450 mg/L to 980 mg/L. With the exception of TDS, none of the water quality indicators exceeded recommended limits. Several heavy metals detected in ground water at the site exceeded federal guidelines. Arsenic, lead, barium, cadmium, and chromium exceeded MCLs at all five wells sampled. Concentrations of these metals were 0.13 ug/mL for arsenic, 0.56 ug/mL for lead, 2.2 ug/mL for barium, 0.031 ug/mL for cadmium and 0.56 ug/mL for chromium. MCLGs were exceeded by iron and manganese during both sampling events at all five wells. Selenium was detected at all five wells during the ICP metal screen but was not verified with additional testing. Sodium was the only metal concentration that increased at each well between sampling events. Petroleum hydrocarbons were encountered in the vicinity of the POL Tank Farm in water samples taken from four wells in Round 1 and three wells in Round 2. Water collected from one well in Round 2 contained 0.20 ug/L of trichloroethene and vinyl chloride was detected in both rounds in another well. Although the values are below MCLs, they are above the MCLGs for these contaminants. MCLs for benzene were exceeded in the first sampling rounds at two wells. Benzene, however, was not detected at either of these locations in the second sampling round. Other detections of purgeable aromatics during the second round included ethylbenzene, toluene and m- and p-xylenes. Analyses of extractable priority pollutants were only performed on water from one well. The compounds found were at low levels and appeared to be decreasing slightly in concentration between sampling rounds.

The soil chemistry data reviewed indicated that petroleum hydrocarbons are the principal contaminant. The pattern of contamination in soil resembles the occurrence of ground water contaminants. Drilling in the unsaturated portion of the upper zone deposits generally did not yield materials with visible contamination, suggesting localized sources of contamination and migration of contamination in the ground water.

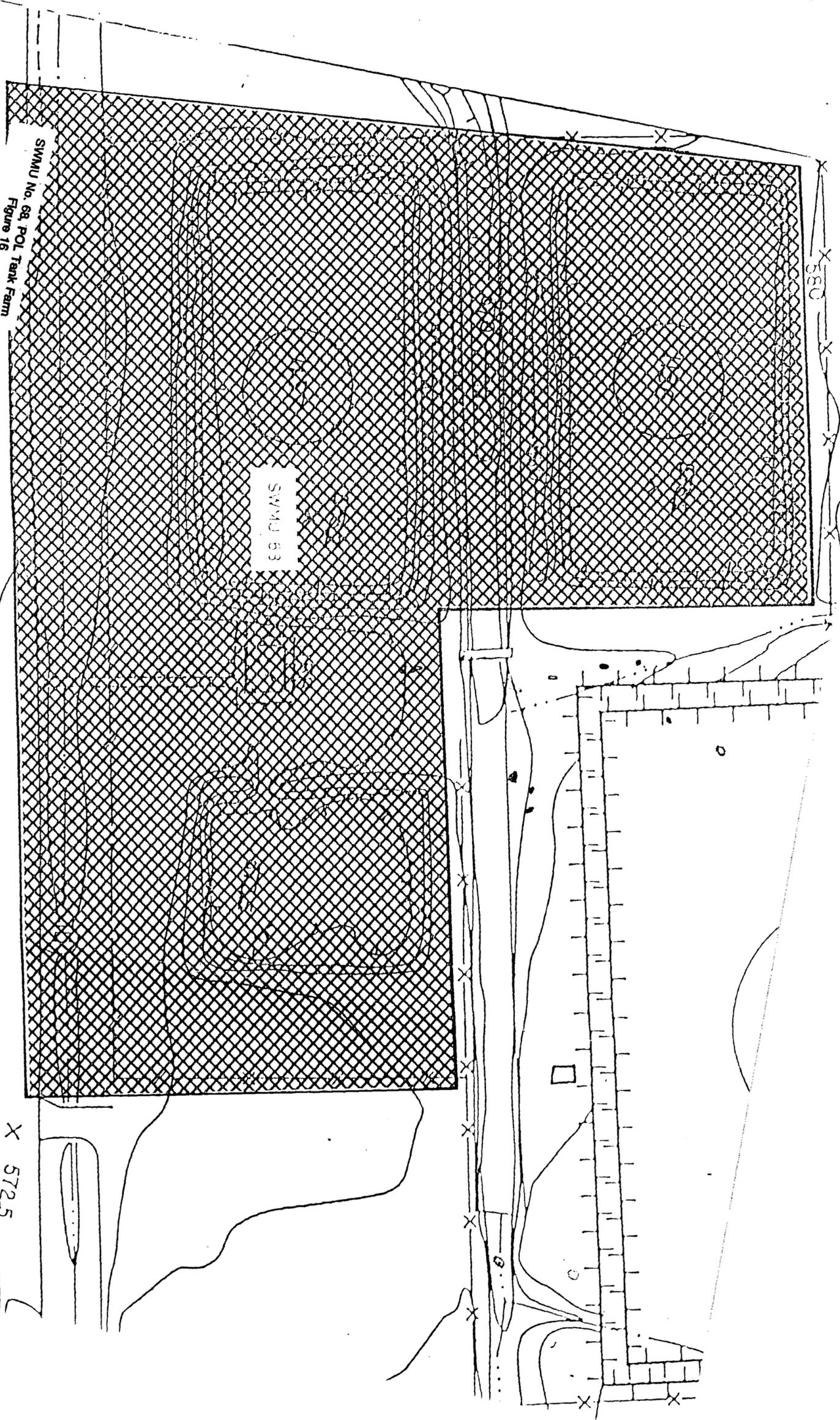
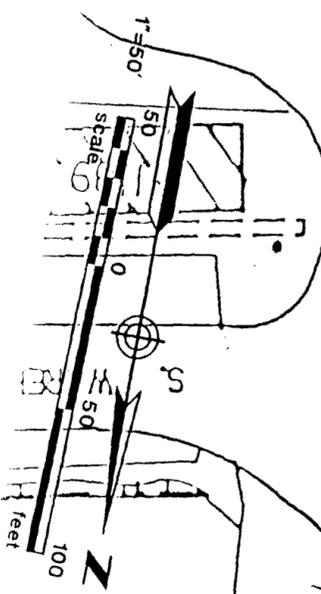
Four additional wells are recommended to complete the definition of the extent of contamination at the site and in addition to the new wells, continue to monitor the existing wells. All monitor wells at the site should be sampled and the ground water analyzed for purgeable aromatic compounds, petroleum hydrocarbons, metals and general water quality parameters. A preliminary remedial action plan will be submitted at a later date.

SWMU No. 68, POL Tank Farm
Figure 16

SWMU 63

X 580

X 572.5



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ADMINISTRATIVE RECORD

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