FINAL REPORT

ENVIRONMENTAL SITE ASSESSMENT
35TH STREET LANDFILL

Prepared For:

Street Maintenance Division
Tacoma Public Works Department

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APRIL 1992

FINAL REPORT

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to present the findings from a site investigation performed on a landfill known as the 35th Street Gulch and to make recommendations for corrective action to be taken at this site.

1.2 SITE DESCRIPTION

The site is an approximate 5-acre parcel of land, which over the past 30 years has been filled with various construction spoils. The site is bordered to the west by Pacific Avenue from 35th Street to 34th Street and to the east by 'A' Street. The south border is a vacant parcel at 35th Street. The north boundary of the fill extends no further than the 34th Street Bridge. It is situated in a primarily residential area (Figure 1).

1.3 BACKGROUND

Prior to becoming a fill, the site was part of a natural ravine which drained into Commencement Bay. Its underlying soil consists of glacially derived sand and silty sand. The ravine was almost entirely filled by 1965 from waste soil and construction debris, comprised mostly of dirt with some concrete and brick. The construction debris originated from the I-5, I-705 and Highway 7 extensions, Tacoma Public Utilities construction projects, and various large private construction projects.

Additionally, material from the Street Maintenance Division of the City, such as street sweepings, leaves and catch basin cleanings, have been disposed at the site since 1985. This material was dumped primarily at the northern extremes of the fill.

The fill site did not require a solid waste permit (WAC 173-304) overseen by the Tacoma-Pierce County Health Department (TPCHD), because of the inert wastes and clean materials disposed at the site. Also, a significant portion of the site was filled before these types of waste came under the regulatory purview of the TPCHD.

In November 1990, organic vapors (methane) were detected in shallow probes at the site. This prompted TPCHD to request an environmental investigation of the site. City of Tacoma Public Works Department personnel conducted a site assessment addressing gas generation, surface water contamination potential and to characterize the soil material comprising the fill.

An immediate concern expressed by TPCHD was site stability, the potential for the fill material to slough and destroy property or injure persons. City personnel concluded contouring a three to one slope of the site in October of 1991. Topsoil was placed on the final contours and the entire slope hydroseeded. Trees have also been planted. With the final grading completed, site stability has been achieved.

2.0 PRELIMINARY SITE INVESTIGATION

2.1 Site History

The investigation began with a historic review of the site. A series of aerial photographs were utilized, as well as interviews with City employees and persons whose residence juxtapose the site. Photographs and interviews are located in Appendix A.

A photo taken of the site in 1946 (Photograph 1) depicts the ravine as it was prior to filling. The presence of trees demonstrates the absence of activity on the property prior to filling. Photograph 2, taken in 1969, shows the entire ravine cleared of its vegetation. Property south of Harrison Street is shown to be filled.

Dickson Construction purchased the property immediately south of the City fill site in 1973. Dickson Construction used their land to dump debris from sewer construction, road construction and demolition wastes (Photograph 3). Dickson stated in an interview that approximately half of the fill material dumped was from the construction of I-705. Dickson also stated no organic material was dumped. Test pits dug by City personnel on the Dickson property indicated the debris to be free of organic material. It consisted mostly of steel reinforced concrete and dirt. Dickson was employed to perform several City projects and had been given permission to dump inert debris from sewer and road projects on his property. Photograph 4 shows the extent of the debris Dickson had dumped by 1985. The City instructed Dickson to discontinue dumping when it was discovered some of Dickson's debris had been disposed of on City property.

City dumping activities extended the fill as it appears in Photograph 5, taken in 1989. Interviews with area residents and individuals responsible for dumping indicate organic debris was dumped at the site. One resident witnessed sand and paper. The paper was more than likely the result of cleaning sewer catch basins or street sweepings. Cleanings from catch basins were dumped at the site from 1985 until 1990. Street Maintenance was responsible for these activities. Interviews with Kent Metcalf and Dave Molm, Street Maintenance employees, indicate the catch basin cleanings consisted mostly of sand, paper and leaves. Mr. Metcalf and Mr. Molm indicated these organic materials were disposed primarily at the eastern most edge of the site, at 'A' Street and 35th Street. All interviews are located in Appendix A. Included with the interviews is a report on catch basin cleanings. The catch basins appear to have contributed most of the organic debris dumped at the 35th Street Gulch. The catch basin report also approximates the amount of debris.

2.2 Surrounding Properties

The property Dickson Construction owned was utilized only for the dumping of construction debris and no organic material as mentioned above.

South of the Dickson site is now situated a City Light Substation. This land was also part of the ravine where the subject site resides. Interviews have indicated dumping of organic materials did occur at this location several years ago when Puget Sound Hospital owned the property. A site assessment performed by Applied Geotechnology Inc. (AGI) stated the land surrounding the light station, formerly owned by Puget Sound Hospital, contained levels of contaminants below Model Toxics Control Act (MTCA) standards.

The remaining properties surrounding the site are residential or vacant parcels of land. There are no locations in the vicinity of the site listed on the EPA Region X Superfund Site List or Department of Ecology's Site Register Toxics Cleanup Program.

3.0 PHASE II SITE INVESTIGATION

3.1 Scope of Work

A series of tests were performed to assess the environmental condition of the site (Table 1). Surface water, soil and air samples were collected by City personnel. Test pits (TP1-TP9, Figure 2) were dug using a backhoe. Each excavation attempted to reach 12-15 feet in depth. Seven pits (TP1-TP7) were dug along the upper circumference of the fill site, approximately 50 feet from the exposed edge; one horizontal pit (TP8) was dug into the lower interface with the natural contour (Figure 2 and Figure 3); and one test pit (TP9) was dug on the lower bench of the fill site (Figure 2 and Figure 4). Preliminary observations of test pits were recorded (Appendix B).

Test parameters were based on knowledge of the types of wastes disposed at this site. Analysis for pesticides, halogenated hydrocarbons and polychlorinated biphenyls (PCB) did not occur. There is no evidence that these compounds were contained in any of the materials disposed at the site. For example, wastes from the Tacoma Public Works Garden Center were never disposed on this property. Chlorinated solvents are not an inherent component of street sweepings. And, waste disposed at this site would not realistically have come in contact with electrical cooling fluids.

3.2 SURFACE WATER SAMPLING METHODS AND TEST RESULTS

Samples were collected following a period of at least 24 hours of continuous precipitation (Appendix B). Preliminary conductivity measurements were performed at four locations. Three conductivity measurements were taken from run-off streams at the base of the fill and one from an 18" culvert pipe on the lower bench near TP9. The flow rate of the water sampled from the culvert was 25 gallons per minute (gpm). Conductivity was measured with a HACH Model 44600 Conductivity/TSD Meter (calibrated prior to use). The run-off measurements were 0.057 millisemens (ms), 0.068 ms and 0.088 ms respectively. The conductivity of water flowing from the culvert pipe measured 0.184 ms (Table 2). Surface water grab samples were collected from areas with the two highest measurements: the culvert pipe (Figure 5) and the 0.088 ms run-off stream (Figure 6). These two locations are represented by SW1 and SW2 on Figure 7.

500 ml of surface water was collected at each location (SW1 and SW2). The samples were then analyzed for total petroleum hydrocarbons (TPH) using EPA Method 418.1. SW1 contained 25.6 mg/l TPH and SW2 contained 32.0 mg/l TPH (Table 3). A field blank, which was carried by person collecting samples, contained 3.1 mg/l TPH.

Surface water was also analyzed for priority pollutant metals: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc. A one liter cube of surface water was collected from each location and analyzed for all metals except mercury. Water analyzed for mercury was collected in 500 ml glass jars from each location. EPA Method 200 was the protocol for metals analysis. Results of the metals analysis are located in Table 4.

Surface water grab samples were collected for purgeable analysis. Two VOA bottle volumes were collected from SW1 and SW2. The samples were analyzed using a modified version of EPA Methods 601 and 602. All analytes were below detection limits except 1,1,1 trichloroethane, which was present in sample number 0405910307 (SW1) at 8.5 parts per billion (ppb). Results of purgeable analysis are located in Appendix C, Purgeable Report. 200ug/L MTCA cleanup Level

Surface water analysis was conducted by the City Technical Support Laboratory. Sampling containers were also provided by the Technical Support Laboratory. A Chain of Custody Record is located in Appendix C, as well as the original results of all analyses conducted.

3.3 SOIL SAMPLING METHODS AND TEST RESULTS

Soil samples were collected from test pits 1, 2, 3, 4 and 9 (Figure 2). The soil was analyzed for TPH, metals and volatile organics. A TCLP was also performed on two samples (TP2 and TP3).

Two grab samples were collected from each test pit, one 40 ml VOA bottle for purgeables and one 1-liter cubetainer for metals and TPH were utilized. TPH in soil samples ranged form 500 mg/kg to 1330 mg/kg (Table 3). A duplicate sample was taken from TP4 as a quality assurance measure. Soils were analyzed for TPH using a modified version of EPA Method 418.1.

Soil was analyzed for priority pollutant metals using method SW 846. Soils were tested for the presence of antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc. Results are located in Table 4.

Soil samples were analyzed for volatile organics. Soils were analyzed using a modified version of SW 846. All samples contained levels below detection limits (Appendix C, Purgeable Report).

A TCLP was performed on samples taken from test pits 2 and 3. Soils were analyzed for arsenic, chromium and lead (Table 5). Levels for the three metals tested were all below 5.0 mg/l in both locations (TP2 and TP3).

Soil Analysis was conducted by the City Technical Support Laboratory. Sampling containers were also provided by the Technical Support Laboratory. A Chain of Custody Record is located in Appendix C, as well as the original result of all analyses conducted.

3.4 AIR SAMPLING METHODS AND TEST RESULTS

Preliminary air monitoring was conducted during test pit excavation. The excavated material was measured for the presence of organic vapors using a Model OVA128 Century Organic Vapor Analyzer. Organic vapors ranged from 300-700 ppm for upper test pits and 100 ppm for lower test pits.

Gas probes were installed in test pits 1, 2, 3 and 4 (Figure 2). The gas probes consisted of 20 feet of 4-inch Schedule 40 PVC pipe, perforated the last three feet of the inserted end. A 1/2-inch Schedule 80 PVC pipe was inserted in the 4-inch pipe. The 1/2-inch pipe was fitted with a labcock valve and surrounded by pea gravel (Figure 8).

Measurements were then made on air immediately above the gas probes using the Model OVA128 Century Organic Vapor Analyzer. This field test indicated the presence of up to 50% organic vapor at TP2 and TP3. These two locations were then selected to obtain air samples for laboratory analysis.

A tetlar bag was used to collect a timed measure volume of air from TP2 gas probe and analyzed for light weight hydrocarbons and any other identifiable organic vapors at large concentrations. The sample contained 52% methane with no other major organic vapors present. Benzene, ethylbenzene, toluene and xylene were not present at levels greater than 100 ppm (Table 6).

Charcoal tube samples were collected from gas probes at TP2 and TP3. To avoid saturating charcoal tubes, two samples were collected: one short duration (15 min.) from TP3 gas probe and one long duration (60 min.) from TP2 gas probe. Both short and long duration samples tested negatively for diesel. Other than the presence of light hydrocarbons, only toluene was detected: 0.8 mg/m$_3$ from short duration and 2.3 mg/m$_3$ from long duration (Table 6).

Air samples were analyzed by AMTEST. AMTEST also provided all collecting equipment (i.e. pumps, air bags, charcoal tubes). A Chain of Custody Record is located in Appendix C. Original results are also located in Appendix C.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

The results of all tests performed were evaluated relative to the Department of Ecology's Model Toxics Control Act (MTCA) Cleanup Regulation (Chapter 173-340 WAC).

Acceptable concentrations of contaminants on sites evaluated are based on the current use and potential future use. Three levels can be established: Method A, B or C.

Method A levels pertain to those areas which are residential or will become residential. Method B levels are established for sites which are industrial or potentially will be industrial. Method C levels are established for sites which are neither residential or industrial. Development plans for the 35th Street Gulch include a pedestrian walkway with additional landscaping. Although residential development is not anticipated in the future, the site cleanup levels were based on Method A levels, which is the most strict of the three.

4.2 SURFACE WATER

Surface water cleanup levels are to be based on State and Federal standards, which have yet to be established. MTCA cleanup levels for surface water are based on the standards for the receiving body of water. The southern most end of City Waterway is the receiving body of water for surface water generated at the 35th Street Gulch. City Waterway is also the receiving body of water for street storm drains surrounding the site.

The results of the surface water analyses were evaluated by Sewer Utility officials. 35th Street Gulch results were compared to street storm drain samples collected from other locations throughout the City.

Sewer Utility indicated TPH levels in surface water samples taken from SW1 and SW2 are consistent with TPH levels from samples collected at or near street storm drains. The levels of petroleum hydrocarbons in surface water will decline as the soil naturally bioremediates itself.

Surface water from street storm drains generally contain relatively high levels of metals. The levels of arsenic in one 35th Street Gulch surface water sample is consistent with these storm drains. In parts of North Tacoma, arsenic levels are higher than those obtained from surface water samples collected on-site.

Purgeable analysis indicated only one contaminant (1,1,1 trichloroethane) above detection limits (5.0 ppb) (see Purgeable Report, Appendix C). The levels of 1,1,1 trichloroethane (8.5 ppb) are lower than MTCA potential drinking water standards (200 ppb). Potential drinking water are much more stringent than MTCA Method A surface waste standards.

4.2.1 Surface Water Cleanup Recommendations

No cleanup activity is proposed to be taken with regard to surface water. This decision is based on the future use of the site and the lack of significant levels of contaminants which would pose harm to marine life in the receiving body of water.

4.3 SOIL

Soil samples indicated the presence of TPH above MTCA Method A cleanup levels (Table 7). However, air samples did not reveal the presence of petroleum hydrocarbons. The petroleum hydrocarbons appear to be fixed in the soil and neither the environment nor humans are at risk.

Metals were also evaluated using MTCA Method A cleanup levels. With the exception of one sample (TP9), levels for metals are in compliance with MTCA. Test pit 9 tested high for the presence of arsenic (228.0 mg/kg). The high concentration is more than likely the result of street sweepings. Street sweepings often contain extremely high concentrations of metals. In particular, arsenic concentrations in street sweepings collected from North Tacoma have far exceeded 228.0 mg/kg.

A TCLP was also performed. Soil samples from test pits 2 and 3 were analyzed for arsenic, chromium and lead. Both samples had concentrations below State Dangerous Waste (Chapter 173-303 WAC) levels of 5.0 mg/l.

The purgeable analysis of soils also indicated concentrations below cleanup levels (Appendix C, Purgeable Report).

4.3.1 Soil Cleanup Recommendations

The TPH in the soils will biologically be treated in a natural condition. Aerobic and anaerobic processes will lower the TPH levels over time. This recommendation is based on the current and proposed use of the land.

To ensure bioremediation is successful, the following measures will be taken:

- Annual surface water sampling with analysis for TPH.
- Annual collection of surface soil with analysis for TPH.

4.4 AIR

Low levels of toluene (2.3 mg/m$_3$ and 0,8 mg/m$_3$) and the presence of methane (52%) represent the only detectable concentrations on-site.

In the preliminary investigation it was determined some organic debris from catch basin cleanings had been deposited at the 35th Street Gulch. The detection of methane is in the approximate area where this organic debris had been disposed (interview with Metcalf and Molm, Appendix A).

4.4.1 Air Quality Recommendations

The amount of organic debris believed to have been disposed at the 35th Street Gulch should decompose entirely with the next ten years. No methane gas has been detected in probes at the fill boundary.

The following measures will be taken to monitor methane on-site:

- Annual methane monitoring of the site using barhole punch/gas field meter methodology.
- Annual monitoring of surrounding properties for methane migration.

4.5 ADDITIONAL RECOMMENDATION

The City of Tacoma will report any and all data on the continued progress of the 35th Street Gulch to the Tacoma-Pierce County Health Department.

(W0074S)

FIGURES

FIGURE 1. CITY OF TACOM

35th STREET GULCH

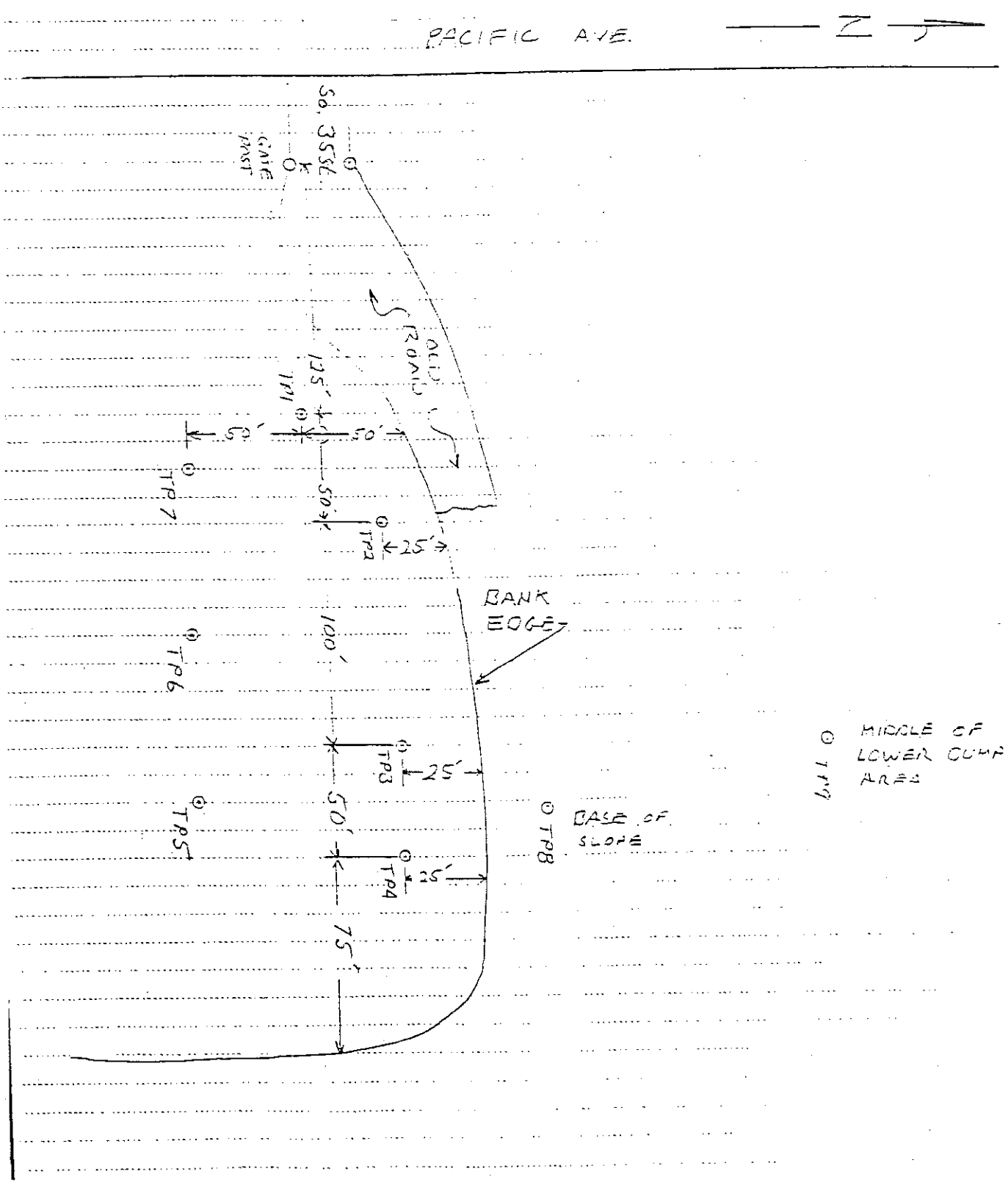

FIGURE 2 TEST PIT LOCATION 35TH STREET GULCH

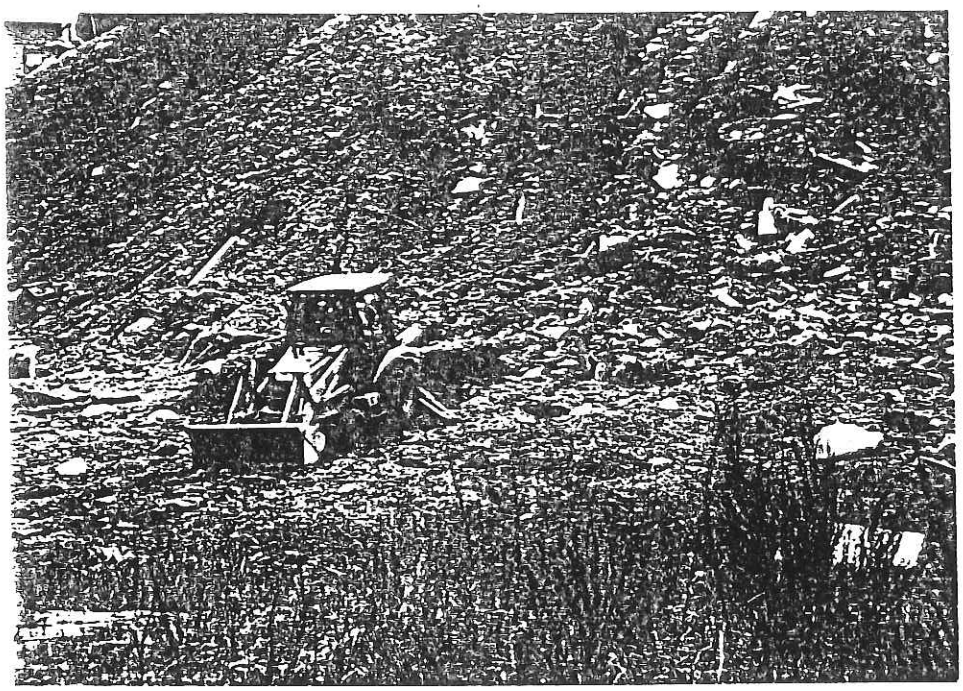

FIGURE 3 TP8 DUG INTO LOWER FACE OF THE FILL

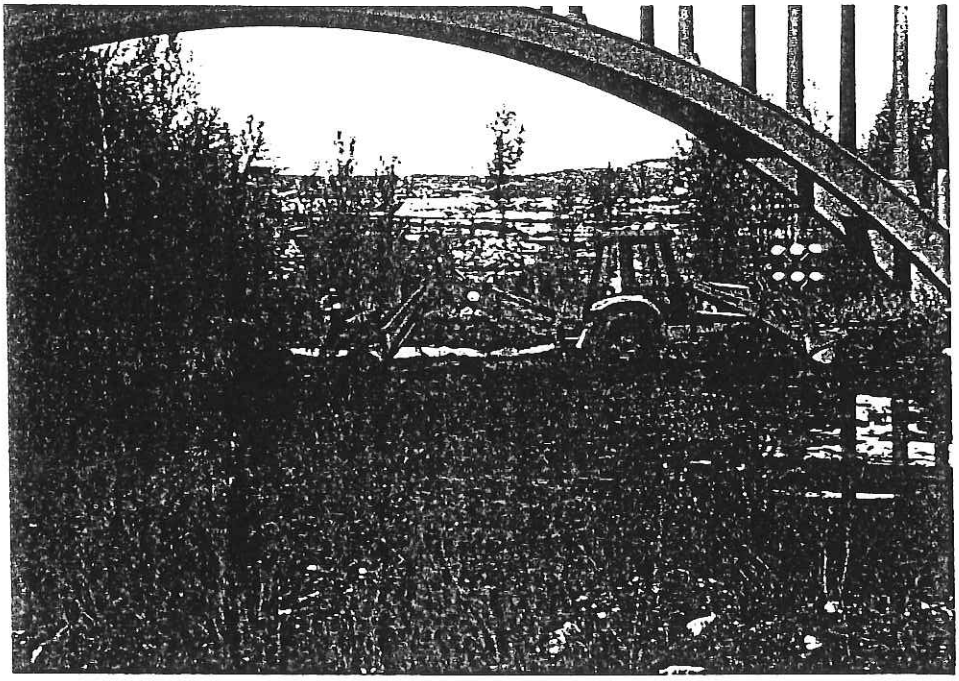

FIGURE 4 TP9 DUG INTO LOWER BENCH BELOW 34TH STREET BRIDGE

FIGURE 5 SW1 CULVERT PIPE WHICH RUNS NORTH & SOUTH BELOW THE FILL

FIGURE 6 RUNOFF STREAM (SW2) WHICH MEASURED 0.088MS

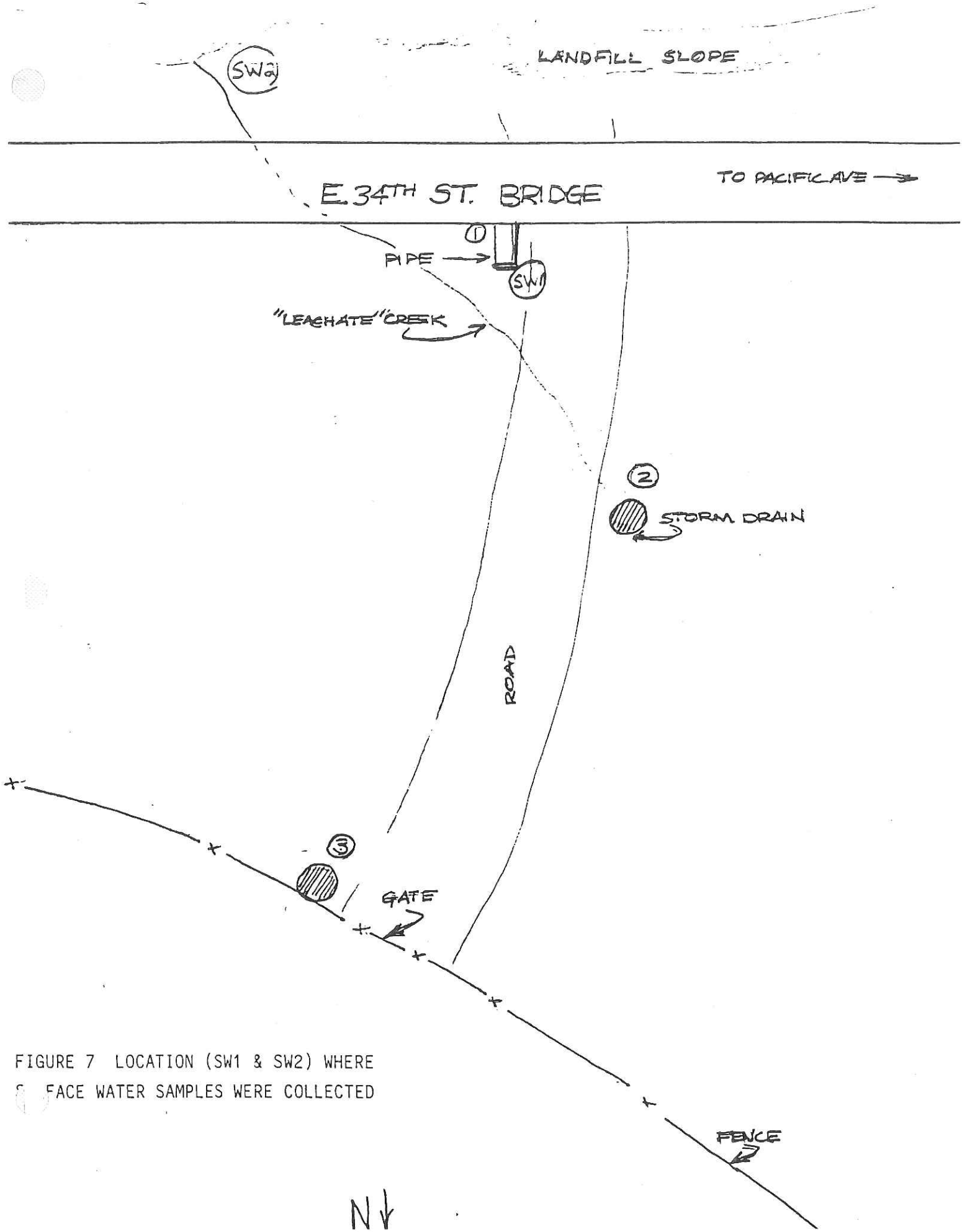

FIGURE 7 LOCATION (SW1 & SW2) WHERE SURFACE WATER SAMPLES WERE COLLECTED

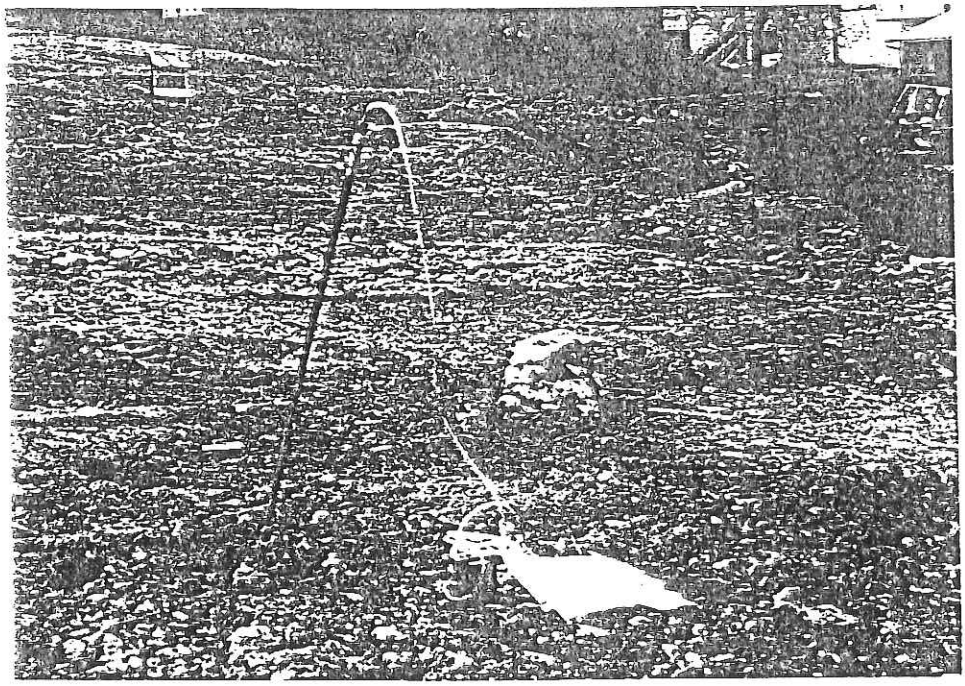

FIGURE 8. AIR BAG SAMPLE COLLECTED FROM GAS PROBE AT TP2.

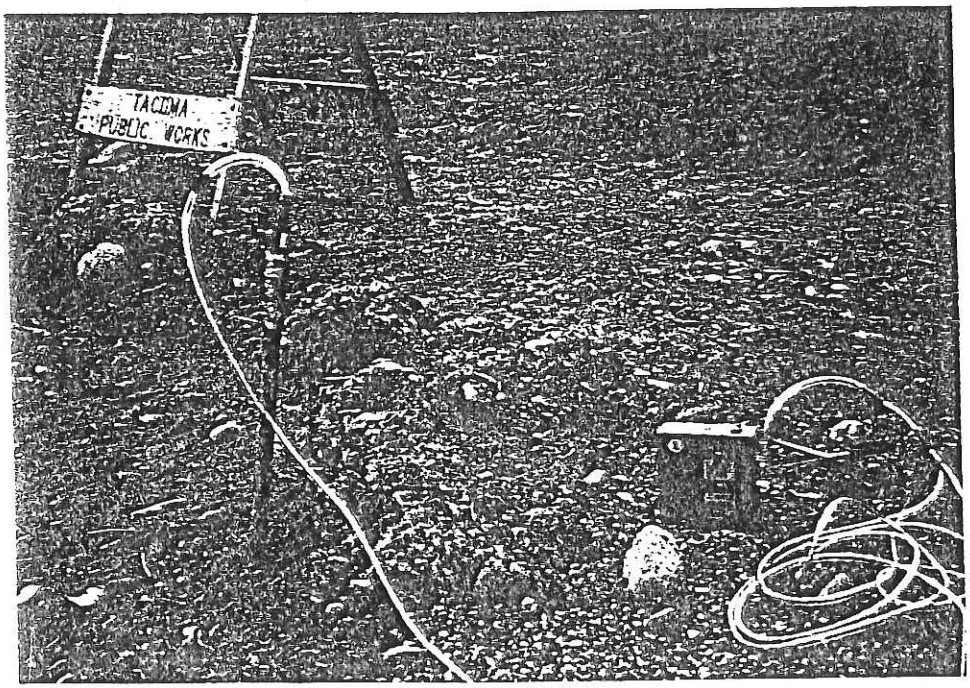

FIGURE 9 CHARCOAL TUBE SAMPLES FROM GAS PROBE AT TP3

TABLES

TABLE 1. Selected Chemical Analysis for Surface Water, Soil and Air Samples.

Matrix & Lab ID No.	Location [A]	ANALYSES PERFORMED: TPH	Priority Pollutant Metals	Purgeables	TCLP	Hydrocarbons In Air
Field Blank	--	X	X	X		
Surface Water 0405910307	SW1	X	X	X		
Surface Water 0405910308	SW2	X	X	X		
Soil 0405910309	TP1	X	X	X		
Soil 0405910310	TP2	X	X	X	X	
Soil 0405910311	TP3	X	X	X	X	
Soil 0405910312	TP4	X	X	X		
Soil 0405910313	TP4 [B]	X	X	X		
Soil 0405910314	TP9	X	X	X		
Air 108038	TP2 [C]	--	--	--		X
Air 108039	TP2 [D]	--	--	--		X
Air 108040	TP3	--	--	--		X

A Refer to Figure 2
B 0405910313 was a duplicate sample.
C Short sampling duration.
D Long sampling duration.

(W0090S)

TABLE 2. Surface Water Conductivity as Measured by a HACH Model 44600 Conductivity/TSD Meter with a Flow Rate of 25 gpm.

Source	Meter Readings in Millisemens (ms)
Runoff	.057
Runoff	.068
Runoff	.088
Culvert Pipe	.184

(W0090S)

TABLE 3. Analyses for Total Petroleum Hydrocarbons (TPH) in Surface Water and Soil Samples.

Matrix & Lab ID No.	Location	TPH mg/l or mg/kg (1)
Field Blank	--	3.1
Surface Water 0405910307	SW1	25.6
Surface Water 0405910308	SW2	32.0
Soil 0405910309	TP1	1140
Soil 0405910310	TP2	500
Soil 0405910311	TP3	1330
Soil 0405910312	TP4	780
Soil 0405910313	TP4 (2)	750
Soil 0405910314	TP9	1300

(1) Mg/kg on a dry weight basis = mg/l = parts per million.
(2) Duplicate sample.

(W0090S)

TABLE 4. Analysis for Priority Pollutant Metals on Surface Water and Soil Samples.

Matrix & Lab ID No.	Location	ANALYTE (Parts per Million) 1 Sb	2 As	3 Be	4 Cd	5 Cr	6 Cu	7 Pb	8 Hg	9 Ni	10 Se	11 Ag	12 Tl	13 Zn
Field Blank	--	<0.001	<0.001	0.001	<0.001	<0.005	0.029	<0.005	<0.0002	<0.001	<0.005	0.002	0.001	0.013
Surface Water 0405910307	SW1	<0.001	0.013	<0.001	<0.001	<0.005	0.017	<0.005	<0.0002	<0.001	<0.005	0.001	<0.001	0.017
Surface Water 0405910308	SW2	<0.001	<0.001	<0.001	<0.001	0.007	0.018	0.039	<0.0002	<0.001	<0.50	<0.001	<0.001	0.042
Soil 0405910309	TP1	8.81	4.76	0.16	0.26	37.01	20.19	37.25	0.034	34.68	<0.50	<0.10	<1.00	118.60
Soil 0405910310	TP2	<1.00	6.25	0.20	0.48	51.56	16.10	108.30	0.184	35.08	<0.50	2.50	<1.00	89.80
Soil 0405910311	TP3	4.00	21.70	0.16	0.30	27.20	30.60	162.70	0.028	25.26	<0.50	<0.10	<1.00	142.90
Soil 0405910312	TP4	<1.00	5.55	0.13	0.07	19.95	2.97	53.20	0.035	19.50	<0.50	<0.10	<1.00	33.65
Soil 0405910313	TP4	<1.00	5.82	0.23	0.13	43.60	8.71	48.00	0.035	34.10	<0.50	<0.10	<1.00	61.79
Soil 0405910314	TP9	<1.00	**228.00**	0.28	0.34	22.50	12.04	26.50	0.036	31.30	<0.50	1.14	<1.00	56.21

(W0090S)

TABLE 5. Toxicity Characteristics Leaching Procedure (TCLP) Analysis on Soil Samples TP2 and TP3.

Matrix & Lab ID No.	Location	ANALYTE (mg/l) Arsenic	Chromium	Lead
Soil 0405910310	TP2	< 5.0	< 5.0	< 5.0
Soil 0405910311	TP3	< 5.0	< 5.0	< 5.0

(W0090S)

TABLE 6. Selected Chemical Analyses for Air Bag and Charcoal Tube Samples.

Matrix & Lab ID No.	Location	Methane	ANALYTE				
			Benzene	Ethylbenzene	Toluene	Xylene	Diesel
Air Bag 108038	TP2	52%	< 100 ppm	< 100 ppm	< 100 ppm	< 100 ppm	--
Charcoal Tube 108039	TP2	--	--	--	2.3 mg/m3	--	0.00 mg/m3
Charcoal Tube 108040	TP3	--	--	--	0.8 mg/m3	--	0.00 mg/m3

(W0090S)

TABLE 7. MTCA Method A Cleanup Levels For Soils.

Hazardous Substance	Cleanup Level
Arsenic	20.0 mg/kg
Benzene	0.5 mg/kg
Cadmium	2.0 mg/kg
Chromium	100.0 mg/kg
Ethylbenzene	20.0 mg/kg
Ethylene dibromide	0.001 mg/kg
Lead	250.0 mg/kg
Mercury (inorganic)	1.0 mg/kg
PAHs (carcinogenic)	1.0 mg/kg
Tetrachloroethylene	0.5 mg/kg
Toluene	40.0 mg/kg
TPH (diesel)	200.0 mg/kg
TPH (other)	200.0 mg/kg
1,1,1 Trichloroethane	20.0 mg/kg
Trichloroethylene	0.5 mg/kg
Xylenes	20.0 mg/kg

(W0090S)

APPENDIX

A

WALKER & ASSOCIATES, INC.
PHOTOGRAMMETRIC ENGINEERS
12652 INTERURBAN AVE. S.
SEATTLE, WA 98168

Negative Number C-46 61
Date Photographed 1946
Approx Scale of Print 1"=200'

PHOTOGRAPH 1. CITY OF
35th STREET GULCH

PHOTOGRAPH 2. CITY OF T
35th STREET GULCH

WALKER & ASSOCIATES, INC.
PHOTOGRAMMETRIC ENGINEERS
12652 INTERURBAN AVE. S.
SEATTLE, WA 98168

Negative Number PT-69 18-5

Date Photographed 3-25-69

Approx Scale of Print 1"=200'

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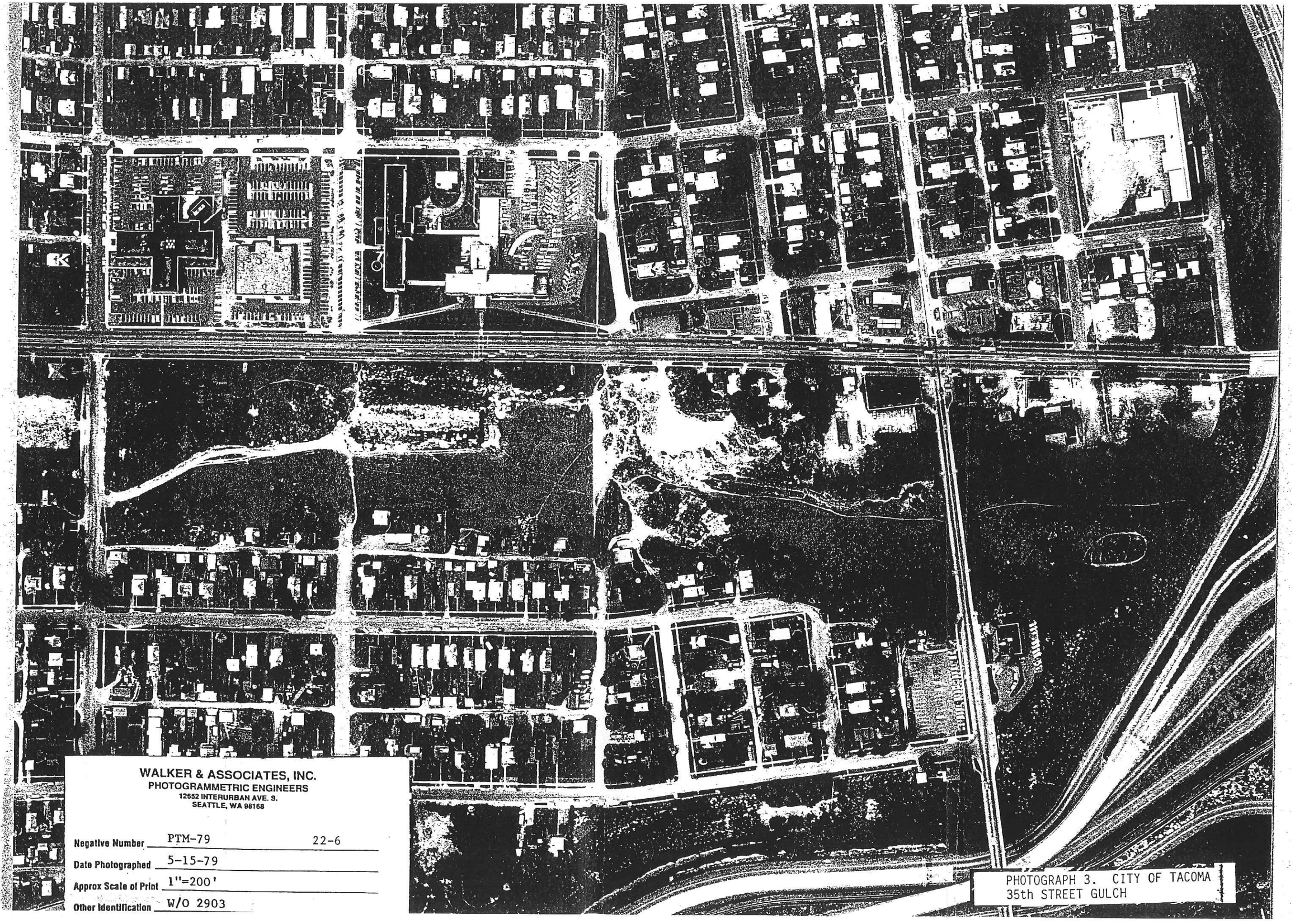

WALKER & ASSOCIATES, INC.
PHOTOGRAMMETRIC ENGINEERS
12652 INTERURBAN AVE. S.
SEATTLE, WA 98168

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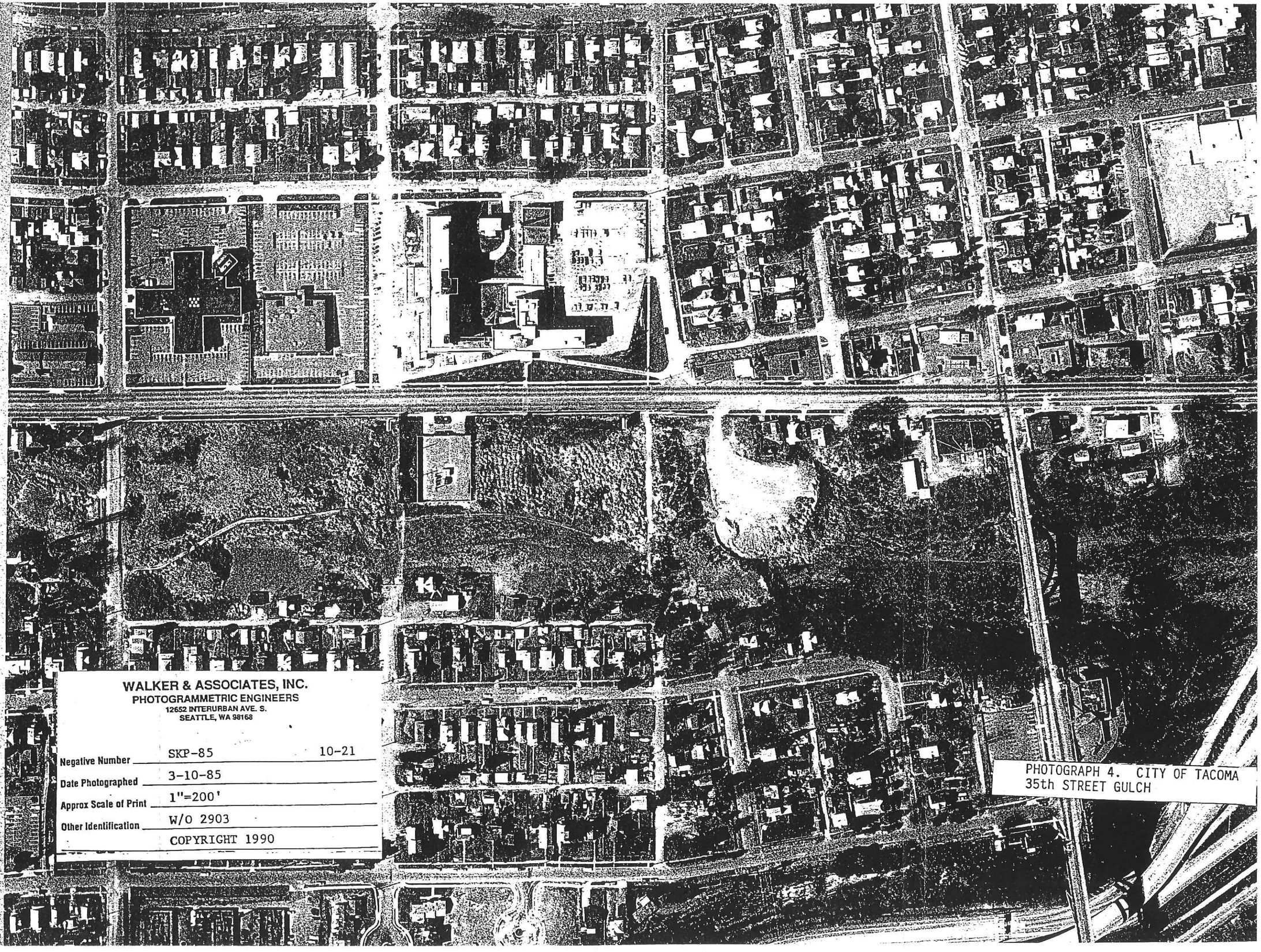
PHOTOGRAPH 3. CITY OF TACOMA
35th STREET GULCH



WALKER & ASSOCIATES, INC.
PHOTOGRAMMETRIC ENGINEERS
12652 INTERURBAN AVE. S.
SEATTLE, WA 98168

Negative Number	SKP-85 10-21
Date Photographed	3-10-85
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Other Identification	W/O 2903
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PHOTOGRAPH 4. CITY OF TACOMA
35th STREET GULCH

WALKER & ASSOCIATES, INC.
PHOTOGRAMMETRIC ENGINEERS
12652 INTERURBAN AVE. S.
SEATTLE, WA 98168

Negative Number PS-89 12-40
Date Photographed 9-10-89
Approx Scale of Print 1"=300'
Other Identification W/O 2903

PHOTOGRAPH 5. CITY OF TACOMA
35th STREET GULCH

INTERVIEWS

4-9-91 – Phone conversation with Mr. Bill Dickson, owner of Dickson Lige Construction.

Bill Dickson purchased three lots on the east side of Pacific Avenue, north of Harrison Street, on April 23, 1973. The address of this property is 3515 Pacific Avenue South.

Dickson Construction dumped material in the gulch between Harrison and South 35th Streets. This was with the permission of Public Works Director R. M. Button. This dumping stopped in October 1987, when Dennis Crumbley, Chief of Street Maintenance, directed Dickson Construction to cease dumping on City property.

The material that Dickson dumped was from sewer and road construction projects. This consisted of bricks, concrete, asphalt, concrete and clay pipe, and excavated soil and base material. Dickson was very careful not to dump wood. Bill Dickson believes that about half the fill in this area is from the construction of Interstate 705 between I-5 and downtown Tacoma. Material from this project consisted of concrete footings from buildings and bridges and soil excavation.

Most of the material that Dickson dumped was from City projects. No other companies were allowed to dump while Dickson was in control.

Bill Dickson stated that the gulch property between Harrison and South 37th Street was owned by the State. This area was filled with excavated material from the construction of I-5 and the Highway 7 spur. The main contractor during this work was Northwest Construction, who is no longer in business. During construction of Highway 7, scrapers would collect soil and drive down East 38th Street and into the gulch to dump. Bill believes that the fill in this area is mostly clean dirt and concrete.

The property across Pacific Avenue from the hospital was purchased from the State by the owners of the hospital. The hospital allowed many different companies to dump. Bill believe that during this time a lot of garbage was dumped.

Once Dickson stopped dumping on the City property in 1987, the City allowed contractor's working on City projects to dump in this area. Bill could only comment on material that Tucci Construction dumped. He felt that it was mostly waste from sewer projects that contained very little wood scraps.

4-9-91 -- Phone conversation with Mrs. Cruser, 3510 East A Street, 475-6493.

The Cruser's have lived in the house for 22 years. When they moved in, the gulch started at Harrison Street. She remembers only dirt and concrete being dumped up to the time that the City started dumping. When the City started dumping, the material contained a lot of paper. There would be many seagulls flying around after the City trucks dumped. Mrs. Cruser remembers the trucks dumping off the upper edge of the fill. She said it was quite ugly to look at.

Mrs. Cruser stated that all the residents around the gulch are new people or renters.

4-9-91 -- Mike Juetten

Mike did not really know what went in the dump.

Mike was not aware of any contractors working on City jobs dumping here.

4-9-91 -- Dean Pitsch, Street Maintenance Division Manager, 272-2529

Mr. Pitsch retired 10 years ago and was not involved in any dumping at this site. He said that Dennis Crumbley shut Dickson down because he was dumping in the City right-of-way.

4-9-91 -- Phone conversation with Mike Wootan, Senior Supervisor, Street Maintenance Division.

The City started dumping in the South 35th right-of-way in 1984. Street sweepings along with sewer and water break-out material made up most of the fill.

In 1986, Tucci Construction built the road to the base of the fill. This road was constructed with material removed from the large sewer job on Pacific Avenue. This material consisted of excavated earth, sewer pipe, concrete, asphalt and base material. Street Maintenance paved this road with asphalt.

From 1987 to 1989, City departments dumped at the base of the fill. In 1989, dumping ceased at the base and material was then dumped over the upper edge of the fill.

In December 1990, the dump was closed.

In 1987, Dennis Crumbley closed down Dickson because Dickson was dumping material in the South 35th Street right-of-way.

Mike stated that there may have been a few instances when contractors working on City jobs were allowed to dump here.

4-18-91 -- Conversation with Kent Turnipseed.

Kent thought that the high reading of combustible gas was from street sweepings, leaves and catch basin cleanings.

4-22-91 -- Conversation with Bill Iyall.

Bill Iyall stated that most of the trucks collecting fall leaves did not dump at 35th and Pacific. Only trucks with leaves and a lot of street sweepings (sand paper) dumped at 35th.

Bill also stated that MC-800 asphalt produced at the City plant is cut with naptha. Some of this asphalt was dumped at 35th and Pacific.

4-30-91 -- Conversation with long time Street Maintenance employees; Ken Metcalf and Dave Molm.

Crews dumped material off the edge of the fill for the last two years. Most dumping took place on the northeast edge in an attempt to fill over the City right-of-way on the east side of the gulch at East A and 35th Street. Ken and Dave believed that this area would contain the greatest amount of leaves and street sweepings in the landfill. In the fall, street sweepers dumped three to eight loads per day consisting mostly of leaves. Dump trucks, which usually dumped leaves from fall clean-up in the parks, would sometimes dump at 35th if they were running late. These trucks can haul five and ten cubic yards.

Dave Molm stated that the material that really smelled like methane gas came from the Sewer Department's catch basins and the ditch cleaners.

Ken and Dave thought that dumping took place over the past five years. The depth of material dumped at the lower area is about ten feet deep.

Exact dates and volumes were not known.

Cleaning of storm catch basins and disposal of debris extracted from basins has in the past been largely accomplished on a requested (either by residents or other crews) basis. Debris was deposited at several locations throughout the City depending on where they were cleaning. Most of those areas were around East 'T' and Wright Streets, Veterans Memorial Park on Highline Road, East 29th and 'R' and an area across the street from the Central Wastewater Treatment Plant.

For the past two years, catch basins have been cleaned and inspected by area (a copy of area map is posted in the Maintenance Supervisor's office) and debris has been deposited in the 35th and Pacific Avenue dump site and across the street from the Central Wastewater Treatment Plant. With the recent closure of the Pacific Avenue dump site, debris was dumped primarily at the Tacoma Landfill. The following is a summation of the past five years' activities:

Year	Approx. # of CB's Cleaned	Approx. Amount of Debris
1985	1,390	231.6 cubic yards
1986	1,445	240.8 cubic yards
1987	2,105	350.8 cubic yards
1988	2,470	411.6 cubic yards
1989	3,322	553.6 cubic yards

(W0077S)

APPENDIX

B

APPENDIX B

TEST PIT PRELIMINARY OBSERVATIONS

TP1: Soil; loamy clay, rocky in sections. Asphalt and concrete scraps. Wood scraps less than 1% except for an area at 8 feet deep which contained 20% wood. Sniffed soil from depth of 10 feet. Well installed full depth, 10 to 11 feet deep. 4/4/91

TP2: Soil, loamy clay, sandy. Very small amount of construction debris. Odor of something burned (ashes). Vein of leaves at 6 feet deep. Well installed full depth, 10 to 11 feet deep. 4/4/91

TP3: Soil; sand and rock, very uniform. No leaves or garbage. Top 1 foot, asphalt cold mix. Top 3 feet, construction debris with very small amount of wood. Diesel smell in soil, high reading at 8 feet deep. Well installed full depth, 12 feet deep. 4/4/91

TP4: Soil; sand-clay and gravel. Asphalt and concrete chunks. No wood. Some street sweepings at 2 feet deep. Small amount of leaves at 5 feet deep. Excavation appeared to be mostly road break-out material. Well installed full depth, 12 feet deep. 4/5/91

TP5: Excavation material consists of concrete, gravel and rebar. Bricks, clay and gravel from 8 to 10 feet deep. Excavated to 10 feet deep. No well. 4/5/91

TP6: Not excavated.

TP7: Soil; loamy clay. Concrete chunks and bricks. A few pieces of wood. Excavated to 10 to 11 feet deep. No well. 4/5/91

TP8: Soil; sand and silt. Vein of grass and roots at 3 feet deep. A small amount of asphalt chunks and wood debris. Soil was too muddy to excavated below 8 feet deep. No well. 4/5/91

TP9: Asphalt pieces, water pipe, garbage, wood and one can of spaghetti. Soil; sandy loam, rocky in places. Leaves at various levels. Candy wrapper found marked "use before 11/88". No well. 4/5/91

(W0097S)

APPENDIX B

DOCUMENTATION OF PRECIPITATION

Record rain triggers few slides, floods

By Susan Gordon and Brian Harrah
The News Tribune

When it rained, it poured. And poured and poured.

The seemingly endless downpour that drenched Western Washington on Wednesday and Thursday set a record for the most rainfall in a 24-hour period in the month of April, the National Weather Service said Thursday.

And it's possible the total rainfall this week could set a new precipitation mark for the entire month at Seattle-Tacoma International Airport.

In a 24-hour period ending at 4 p.m. Thursday, 2.88 inches of new rain fell at Sea-Tac, shattering the precipitation mark of 1.85 inches set in 1965, Bauck said. During the same period, 3.21 inches fell at Olympia; 2.95 inches at McChord Air Force Base in Tacoma; and 2.53 inches at Ocean Shores.

So far this month, as of 7 p.m. Thursday, 3.91 inches of rain have fallen at Sea-Tac, said weather service meteorologist Bruce Bauck.

The rainfall record for the entire month of April, established in 1978, is 4.19 inches, he said.

Urban flood and small stream warnings were issued by the weather service Thursday.

The heavy rain triggered landslides along several roadways Thursday evening, but most blocked streets should be cleared by early today, county road officials said.

A 150-foot mudslide slung trees and debris across Jovita Boulevard between 114th Avenue East and the West Valley Highway, a worker at the Pierce County road shop in Puyallup said.

The stretch of road was to be closed through Thursday night, he added.

Slides also closed Canyon Road between Pioneer Way and 72nd Street East; Old Military Road between 122nd Street East and Washington 162; and East Valley highway near the 3200 block.

A mudslide also occurred in the 4900 block of Marine View Drive, a Tacoma fire official said. The road was blocked late Thursday, but crews may have it cleared today.

Fire Department to complain of swamped basements. However, there were no serious flooding problems reported, he said.

Bill Lokey of Pierce County's Emergency Management Office said workers distributed sand bags and fielded numerous calls from residents beginning about 6 p.m.

Water seeped into six homes in the Danbridge Model Home complex in University Place, but residents did not have to be evacuated, he said.

Volunteers were sandbagging Fennel Creek near McMillan late Thursday to keep the rising waters from a nearby home, he added.

Floodwaters submerged parts of a mobile home and trailer park in Spring Valley, just off Washington 99 near the Pierce-King county line. Runoff began pooling about 2:30 p.m. Thursday.

"I've got about four feet of water at my place," said Doreen McDonald, a park resident, later in the evening.

The emergency office was expected to be staffed through the night, Lokey said.

Western Washington rivers rose but were expected to stay within their banks, as cooler than normal temperatures prevented a potentially dangerous thawing of mountain snows. The freezing level was at 4,000 feet about midday Thursday and was expected to drop to 3,500 feet, weather service specialist Martin Thompson said.

"Basically it's just rainfall, not snowmelt," he said. "If we had warm temperatures in the mountains, we would have problems. We don't have problems."

The deluge can be blamed on a broad frontal system of moist air which moved through the region from the Oregon Coast on Wednesday afternoon and stalled over Western Washington, Bauck said.

But there is a rainbow amid all the foul-weather news: The downpour should slacken today.

The forecast today calls for showers and partial clearing with cooler than normal temperatures — upper 40s to low 50s — and gusty winds. Another weather system bringing more rain is expected to arrive late Sunday or early

APPENDIX

C

CITY OF TACOMA
Technical Support Laboratory
2201 Portland Avenue
Tacoma Washington 98421
(206) 591-5588

TO: Doug Pierce
Public Works/Utility Services

FROM: Martin K. Collamore
USTS Laboratory Supervisor

DATE: July 30, 1991

SUBJECT: 35th Street Gulch Fill

On April 5, 1991, two water and seven soil samples were delivered to the Technical Support Laboratory for analysis. Analysis requested appears on the attached chain of custody. Volatile results have been previously submitted to you. The remaining results are attached.

Samples TP#4 and TP#4B are listed on the chain of custody as duplicates. Several detected metals had high relative percent differences. The analytical QC appeared normal. As these were rocky soil samples, it is likely that the inhomogeneity caused the high RPDs.

Martin K. Collamore
USTS Laboratory Supervisor

City of Tacoma

Public Works—Utility Services
Sewer Utility Division

Chain of Custody Record

Project No.	Project Name
	35th St Dump

Samplers (Signature): Douglas A Reese

	Sta. No.	Date	Time	Comp.	Grab	Station Location 04059103	No. of Containers	① TPH	② Metals	③ Purgables				Remarks
17	SW#1	4/4/91	10AM		X	18" culvert below 35th St	5	X	X	X				① TPH in Soils - Modified 8015
18	SW#2	4/4/91	1020A		X	Runoff below 35th St	5	X	X	X				TPH in Water - 418.1
19	TP#1	4/4/91	1P		X	upper bench NW of 35th	2	X	X	X				
20	TP#2	4/4/91	2P		X	upper bench NW of 35th	2	X	X	X				② Metals - Priority Pollutant List
21	TP#3	4/4/91	330P		X	upper bench NW of 35th St	2	X	X	X				
2	TP4	4/5/91	11A		X	upper bench of 35th St	2	X	X	X				③ Liquid Samples - BETX
3	TP#3	4/5/91	11A		X	11 duplicates	2	X	X	X				Solid Samples - All 1 Volatiles
4	TP5	4/5/91	1A		X	Lower Bench	2	X	X	X				
7		4/3/91			X	Field Blank	2 Rinsed	X	X④					④ Field Blank for Mercury was lost - container leaked

Relinquished By (Signature)	Date	Time	Received By (Signature)	Relinquished By (Signature)	Date	Time	Received By (Signature)
[signature]	4/5/91	1315	Rich Norberg 4-5-91 1731				
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	

Project PI d or O 5 8 (12/

35th Street Gulch Fill (parts per million)

	Location				
Metal	SW#1	SW#2	TP#1	TP#2	TP#3
Antimony	<0.001	<0.001	8.81	<1.00	4.00
Arsenic	0.013	<0.001	4.76	6.25	21.70
Beryllium	<0.001	<0.001	0.16	0.20	0.16
Cadmium	<0.001	<0.001	0.26	0.48	0.30
Chromium	<0.005	0.007	37.01	51.56	27.20
Copper	0.017	0.018	20.19	16.10	30.60
Lead	<0.005	0.039	37.25	108.30	162.70
Mercury	<0.0002	<0.0002	0.034	0.184	0.028
Nickel	<0.001	<0.001	34.68	35.08	25.26
Selenium	<0.005	<0.005	<0.50	<0.50	<0.50
Silver	0.001	<0.001	<0.10	2.50	<0.10
Thallium	<0.001	<0.001	<1.00	<1.00	<1.00
Zinc	0.017	0.042	118.60	89.80	142.90

	Location			
Metal	TP#4	TP#4B	TP#5	Field Blank
Antimony	<1.00	<1.00	<1.00	<0.001
Arsenic	5.55	5.82	228.00	<0.001
Beryllium	0.13	0.23	0.28	0.001
Cadmium	0.07	0.13	0.34	<0.0010
Chromium	19.95	43.60	22.05	<0.0050
Copper	2.97	8.71	12.04	0.029
Lead	53.20	48.60	26.50	<0.005
Mercury	0.035	0.035	0.036	<0.0002
Nickel	19.50	34.10	31.30	<0.001
Selenium	<0.50	<0.50	<0.50	<0.005
Silver	<0.10	<0.10	1.14	0.002
Thallium	<1.00	<1.00	<1.00	<0.001
Zinc	33.65	61.79	56.21	0.013

CITY OF TACOMA

INTER-DEPARTMENTAL COMMUNICATION

TO: Richard Norberg, USTS Senior Laboratory Analyst

FROM: William Essmeier , USTS Laboratory Analyst.

SUBJECT: TPH on soil and water from 35th Street Dump

DATE: April 15, 1991

On 03/19/91, three water samples and five sediment samples were collected by Doug Pierce and brought to the lab. The results for TPH are listed below in mg/L or mg/Kg (on a dry wt basis).

SAMPLE IDNUM#	TPH mg/L	
Field Blank	3.1	} organics
Water #1 0405910307	25.6	
Water #2 0405910308	32.0	

SAMPLE IDNUM#	% SOLIDS	TPH mg/Kg
TP1 0405910309	86.6	1140
TP2 0405910310	83.3	500
TP3 0405910311	85.1	1330
TP4 0405910312	89.0	780
TP4DUP 0405910313	89.7	750
TP5 0405910314	85.1	1300

William J. Essmeier

TO: Marty Collamore, USTS Lab Supervisor

FROM: Karen Crockett, USTS Senior Lab Analyst

DATE: August 14, 1991

SUBJECT: TCLP Analysis on 34th Street Landfill

The results of the TCLP analysis on two test pits are as follows, in mg/L :

Date Extracted: 08/01/91

Laboratory I.D. : Sample Location:	0405910310 Test Pit #2	0405910311 Test Pit #3
Arsenic	<5.0	<5.0
Chromium	<5.0	<5.0
Lead	<5.0	<5.0

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th Street Landfill SW#1
SAMPLE #: 0405910307
DATE RECEIVED: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/11/91

Analyte:	DILUTION	DILUTION	DILUTION 1:1(neat)	REPORT PPB
Bromodichloromethane			<.40	
1,3-Dichlorobenzene			<.40	
1,4-Dichlorobenzene			<.40	
1,2-Dichlorobenzene			<.40	
1,1-Dichloroethene			<.20	
Dibromochloromethane			<.60	
Cis-1,2-Dichloroethene			<.20	
Trans-1,2-Dichloroethene			<.20	
Methylene Chloride			<1.0	
Vinyl Chloride			<.80	
Bromoform			<3.5	
Carbon Tetrachloride			<.20	
Chloroform			<.20	
1,1-Dichloroethane			<.20	
1,1,2-Trichloroethane			<.40	
Trichloroethene			<.20	
Ethylbenzene			<.20	
1,2,-Dichloroethane			<.40	
Cis-1,3-Dichloropropene			<.80	
Trans-1,3-Dichloropropene			<.40	
Tetrachloroethene			<.20	
1,1,1-Trichloroethane			<.20	
Xylenes			8.5	8.5
Benzene			<.20	
Chlorobenzene			<.20	
1,2-Dichloropropane			<.20	
1,1,2,2-Tetrachloroethane			<3.5	
Toluene			<.20	

Comments: None.

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th Street Landfill SW#2
SAMPLE #: 0405910308
DATE RECEIVED: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/11/91

Analyte:	DILUTION	DILUTION	DILUTION 1:1(neat)	REPORT PPB
Bromodichloromethane			<.40	
1,3-Dichlorobenzene			<.40	
1,4-Dichlorobenzene			<.40	
1,2-Dichlorobenzene			<.40	
1,1-Dichloroethene			<.20	
Dibromochloromethane			<.60	
Cis-1,2-Dichloroethene			<.20	
Trans-1,2-Dichloroethene			<.20	
Methylene Chloride			<1.0	
Vinyl Chloride			<.80	
Bromoform			<3.5	
Carbon Tetrachloride			<.20	
Chloroform			<.20	
1,1-Dichloroethane			<.20	
1,1,2-Trichloroethane			<.40	
Trichloroethene			<.20	
Ethylbenzene			<.20	
1,2,-Dichloroethane			<.40	
Cis-1,3-Dichloropropene			<.80	
Trans-1,3-Dichloropropene			<.40	
Tetrachloroethene			<.20	
1,1,1-Trichloroethane			<.20	
Xylenes			<.20	
Benzene			<.20	
Chlorobenzene			<.20	
1,2-Dichloropropane			<.20	
1,1,2,2-Tetrachloroethane			<3.5	
Toluene			<.20	

Comments: None.

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th St Landfill TP1
SAMPLE #: 0405910309
DATE TAKEN: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/11/91

ANALYTE:		Grams Wet 1.29 % Solids 86.61 Grams Dry 1.12 DRY	REPORT ug/Kg
Bromodichloromethane	<	5.4	
1,3-Dichlorobenzene	<	5.4	
1,4-Dichlorobenzene	<	5.4	
1,2-Dichlorobenzene	<	5.4	
1,1-Dichloroethene	<	2.7	
Dibromochloromethane	<	8.1	
Cis-1,2-Dichloroethene	<	2.7	
Trans-1,2-Dichloroethene	<	2.7	
Methylene Chloride	<	13.4	
Vinyl Chloride	<	10.7	
Bromoform	<	46.5	
Carbon Tetrachloride	<	2.7	
Chloroform	<	2.7	
1,1-Dichloroethane	<	2.7	
1,1,2-Trichloroethane	<	5.4	
Trichloroethene	<	2.7	
Ethylbenzene	<	2.7	
1,2-Dichloroethane	<	5.4	
Cis-1,3-Dichloropropene	<	10.7	
Trans-1,3-Dichloropropene	<	5.4	
Tetrachloroethene	<	2.7	
1,1,1-Trichloroethane	<	2.7	
Xylenes	<	2.7	
Benzene	<	2.7	
Chlorobenzene	<	2.7	
1,2-Dichloropropane	<	2.7	
1,1,2,2-Tetrachloroethane	<	46.5	
Toluene	<	2.7	

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th ST Landfill TP2
SAMPLE #: 0405910310
DATE TAKEN: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/12/91

ANALYTE:		Grams Wet 1.29 % Solids 83.30 Grams Dry 1.07 DRY	REPORT ug/Kg
Bromodichloromethane	<	5.6	
1,3-Dichlorobenzene	<	5.6	
1,4-Dichlorobenzene	<	5.6	
1,2-Dichlorobenzene	<	5.6	
1,1-Dichloroethene	<	2.8	
Dibromochloromethane	<	8.4	
Cis-1,2-Dichloroethene	<	2.8	
Trans-1,2-Dichloroethene	<	2.8	
Methylene Chloride	<	14.0	
Vinyl Chloride	<	11.2	
Bromoform	<	48.4	
Carbon Tetrachloride	<	2.8	
Chloroform	<	2.8	
1,1-Dichloroethane	<	2.8	
1,1,2-Trichloroethane	<	5.6	
Trichloroethene	<	2.8	
Ethylbenzene	<	2.8	
1,2-Dichloroethane	<	5.6	
Cis-1,3-Dichloropropene	<	11.2	
Trans-1,3-Dichloropropene	<	5.6	
Tetrachloroethene	<	2.8	
1,1,1-Trichloroethane	<	2.8	
Xylenes	<	2.8	
Benzene	<	2.8	
Chlorobenzene	<	2.8	
1,2-Dichloropropane	<	2.8	
1,1,2,2-Tetrachloroethane	<	48.4	
Toluene	<	2.8	

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th St Landfill TP3
SAMPLE #: 0405910311
DATE TAKEN: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/12/91

ANALYTE:		Grams Wet 1.14 % Solids 85.12 Grams Dry .97 DRY	REPORT ug/Kg
Bromodichloromethane	<	6.2	
1,3-Dichlorobenzene	<	6.2	
1,4-Dichlorobenzene	<	6.2	
1,2-Dichlorobenzene	<	6.2	
1,1-Dichloroethene	<	3.1	
Dibromochloromethane	<	9.3	
Cis-1,2-Dichloroethene	<	3.1	
Trans-1,2-Dichloroethene	<	3.1	
Methylene Chloride	<	15.5	
Vinyl Chloride	<	12.4	
Bromoform	<	53.6	
Carbon Tetrachloride	<	3.1	
Chloroform	<	3.1	
1,1-Dichloroethane	<	3.1	
1,1,2-Trichloroethane	<	6.2	
Trichloroethene	<	3.1	
Ethylbenzene	<	3.1	
1,2-Dichloroethane	<	6.2	
Cis-1,3-Dichloropropene	<	12.4	
Trans-1,3-Dichloropropene	<	6.2	
Tetrachloroethene	<	3.1	
1,1,1-Trichloroethane	<	3.1	
Xylenes	<	3.1	
Benzene	<	3.1	
Chlorobenzene	<	3.1	
1,2-Dichloropropane	<	3.1	
1,1,2,2-Tetrachloroethane	<	53.6	
Toluene	<	3.1	

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th ST Landfill TP4
SAMPLE #: 0405910312
DATE TAKEN: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/12/91

ANALYTE:		Grams Wet 1.15 % Solids 88.48 Grams Dry 1.02 DRY	REPORT ug/Kg
Bromodichloromethane	<	5.9	
1,3-Dichlorobenzene	<	5.9	
1,4-Dichlorobenzene	<	5.9	
1,2-Dichlorobenzene	<	5.9	
1,1-Dichloroethene	<	2.9	
Dibromochloromethane	<	8.8	
Cis-1,2-Dichloroethene	<	2.9	
Trans-1,2-Dichloroethene	<	2.9	
Methylene Chloride	<	14.7	
Vinyl Chloride	<	11.8	
Bromoform	<	51.1	
Carbon Tetrachloride	<	2.9	
Chloroform	<	2.9	
1,1-Dichloroethane	<	2.9	
1,1,2-Trichloroethane	<	5.9	
Trichloroethene	<	2.9	
Ethylbenzene	<	2.9	
1,2-Dichloroethane	<	5.9	
Cis-1,3-Dichloropropene	<	11.8	
Trans-1,3-Dichloropropene	<	5.9	
Tetrachloroethene	<	2.9	
1,1,1-Trichloroethane	<	2.9	
Xylenes	<	2.9	
Benzene	<	2.9	
Chlorobenzene	<	2.9	
1,2-Dichloropropane	<	2.9	
1,1,2,2-Tetrachloroethane	<	51.1	
Toluene	<	2.9	

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th ST Landfill TP4B
SAMPLE #: 0405910313
DATE TAKEN: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/12/91

ANALYTE:		Grams Wet 1.43 % Solids 89.67 Grams Dry 1.28 DRY	REPORT ug/Kg
Bromodichloromethane	<	4.7	
1,3-Dichlorobenzene	<	4.7	
1,4-Dichlorobenzene	<	4.7	
1,2-Dichlorobenzene	<	4.7	
1,1-Dichloroethene	<	2.3	
Dibromochloromethane	<	7.0	
Cis-1,2-Dichloroethene	<	2.3	
Trans-1,2-Dichloroethene	<	2.3	
Methylene Chloride	<	11.7	
Vinyl Chloride	<	9.4	
Bromoform	<	40.6	
Carbon Tetrachloride	<	2.3	
Chloroform	<	2.3	
1,1-Dichloroethane	<	2.3	
1,1,2-Trichloroethane	<	4.7	
Trichloroethene	<	2.3	
Ethylbenzene	<	2.3	
1,2-Dichloroethane	<	4.7	
Cis-1,3-Dichloropropene	<	9.4	
Trans-1,3-Dichloropropene	<	4.7	
Tetrachloroethene	<	2.3	
1,1,1-Trichloroethane	<	2.3	
Xylenes	<	2.3	
Benzene	<	2.3	
Chlorobenzene	<	2.3	
1,2-Dichloropropane	<	2.3	
1,1,2,2-Tetrachloroethane	<	40.6	
Toluene	<	2.3	

CITY OF TACOMA
PURGEABLES REPORT

SAMPLE ID: 34th ST Landfill TP5
SAMPLE #: 0405910314
DATE TAKEN: 04/05/91

ANALYST: John O'Loughlin
DATE ANALYZED: 04/12/91

ANALYTE:		Grams Wet: 1.14 % Solids: 85.04 Grams Dry: .97 DRY	REPORT ug/Kg
Bromodichloromethane	<	6.2	
1,3-Dichlorobenzene	<	6.2	
1,4-Dichlorobenzene	<	6.2	
1,2-Dichlorobenzene	<	6.2	
1,1-Dichloroethene	<	3.1	
Dibromochloromethane	<	9.3	
Cis-1,2-Dichloroethene	<	3.1	
Trans-1,2-Dichloroethene	<	3.1	
Methylene Chloride	<	15.5	
Vinyl Chloride	<	12.4	
Bromoform	<	53.6	
Carbon Tetrachloride	<	3.1	
Chloroform	<	3.1	
1,1-Dichloroethane	<	3.1	
1,1,2-Trichloroethane	<	6.2	
Trichloroethene	<	3.1	
Ethylbenzene	<	3.1	
1,2-Dichloroethane	<	6.2	
Cis-1,3-Dichloropropene	<	12.4	
Trans-1,3-Dichloropropene	<	6.2	
Tetrachloroethene	<	3.1	
1,1,1-Trichloroethane	<	3.1	
Xylenes	<	3.1	
Benzene	<	3.1	
Chlorobenzene	<	3.1	
1,2-Dichloropropane	<	3.1	
1,1,2,2-Tetrachloroethane	<	53.6	
Toluene	<	3.1	

AMTEST

AmTest Inc.

Professional
Analytical
Services

14603 N.E. 87th St.
Redmond, WA
98052

Fax: 206 883 3495

Tel: 206 885 1664

ANALYSIS REPORT

CLIENT: City of Tacoma

DATE RECEIVED: 04/16/91

REPORT TO: Doug Pierce
Refuse Utility
3510 South Mullen
Tacoma, WA 98404

DATE REPORTED: 04/30/91

On April 16, 1991, three samples were submitted to Am Test Inc. by City of Tacoma. Two charcoal tube samples were submitted to be analyzed for various hydrocarbons and diesel. A Tedlar air bag was submitted to be analyzed for lightweight hydrocarbons, and any other identifiable organic vapors at large concentrations. The following is a summary of those results.

Laboratory Sample No.	108038
Client Identification	Air Bag Sample

The sample contained 52% methane with no other major organic vapors present. Benzene, ethylbenzene, toluene, and xylene were not present at levels greater than 100 ppm.

Laboratory Sample No.	108039
Client Identification	2nd Gas Probe to East

Other than the presence of lightweight hydrocarbons, only Toluene was detected at 2.3 mg/m^3. No Diesel was detected.

Laboratory Sample No.	108040
Client Identification	3rd Gas Probe to East

Other than the presence of lightweight hydrocarbons, only Toluene was detected at 0.8 mg/m^3. No Diesel was detected.

REPORTED BY _____ For
James Smith

91-L-685

City of Tacoma

Public Works—Utility Services
Sewer Utility Division

Chain of Custody Record

Project No.

Project Name: 35th St Gulch Fill site Invest

Samplers (Signature):

Sta. No.	Date	Time	Comp.	Grab	Station Location	No. of Containers	Remarks
2	4/15/91	1250		X	2nd gas probe to East	2	AIR analysis - Charcoal tubes
2	4/15/91	3P		X	2nd gas probe to East	2	AIR analysis " "
3	4/15/91	3P		X	3rd gas probe to East	1	AIR bag sample

Relinquished By (Signature)	Date	Time	Received By (Signature)
(7430)	4/16	11:00	
Relinquished By (Signature)	Date	Time	Received By (Signature)
Relinquished By (Signature)	Date	Time	Received For Laboratory By (Signature)

Relinquished By (Signature)	Date	Time	Received By (Signature)
Relinquished By (Signature)	Date	Time	Received By (Signature)

Date	Time	Remarks

8 (12/