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MR. ERIC WEBER
LANDAU ASSOCIATES
950 PACIFIC AVENUE, SUITE 515
TACOMA, WA 98402

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MR. ERIC WEBER
LANDAU ASSOCIATES
950 PACIFIC AVENUE, SUITE 515
TACOMA, WA 98402

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DEPARTMENT OF ECOLOGY
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CERTIFIED MAIL
7006 3450 0001 6754 0413

April 19, 2008

Mr. Eric Weber
Landau Associates
950 Pacific Avenue, Suite 515
Tacoma, WA 98402

Re: Further Action Determination under WAC 173-340-515(5) for the following Hazardous Waste Site:

- Name: City of Tacoma 35th Street Landfill
- Address: 35th Street and Pacific Avenue, Tacoma
- Facility/Site No.: 5774537
- VCP No.: SW0938

Dear Mr. Weber:

Thank you for submitting your independent remedial action report for the City of Tacoma 35th Street Landfill facility (Site) for review by the State of Washington Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP). Ecology appreciates your initiative in pursuing this administrative option for cleaning up hazardous waste sites under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

This letter constitutes an advisory opinion regarding whether further remedial action is necessary at the Site to meet the substantive requirements of MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC. Ecology is providing this advisory opinion under the specific authority of RCW 70.105D.030(1)(i) and WAC 173-340-515(5).

This opinion does not resolve a person's liability to the state under MTCA or protect a person from contribution claims by third parties for matters addressed by the opinion. The state does not have the authority to settle with any person potentially liable under MTCA except in accordance with RCW 70.105D.040(4). The opinion is advisory only and not binding on Ecology.

Ecology's Toxics Cleanup Program has reviewed the following information regarding the Site:

1. Applied Geotechnology Inc., **Preliminary Report, Phase 2 Environmental Assessment, South 37th Street and Pacific Avenue, Tacoma, Washington,** May 30, 1990.

2. Tacoma Refuse Utility, **Final Report, Environmental Site Assessment, 35th Street Landfill,** April 1992.

3. Tacoma Pierce County Health Department, **Initial Investigation Field Report, ERTS # S541074, Parcel #2084140040, County: Pierce,** August 05, 2005.

4. Landau Associates, **35th Street Landfill, Additional Methane, Surface Water, and Soil Data,** March 11, 2008.

The documents listed above will be kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Appointments can be made by calling the SWRO resource contact at (360) 407-6365.

The Site is defined by the extent of contamination caused by the following release(s):

- Petroleum hydrocarbons and metals in soil and surface water.
- Methane source materials in soil and methane as soil vapor.

The Site is more particularly described in Enclosure A to this letter, which includes a detailed Site diagram. The description of the Site is based solely on the information contained in the documents listed above.

Based on a review of the independent remedial action report and supporting documentation listed above, **Ecology has determined that the independent remedial action(s) performed at the Site are not sufficient to meet the substantive requirements contained in MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing any of the contamination at the Site.** Therefore, pursuant to WAC 173-340-515(5), Ecology is issuing this opinion that **further remedial action is necessary** at the Site under MTCA.

Various studies, including an Environmental Site Assessment (ESA) conducted by the City of Tacoma in 1991, have detected constituents in the soil and in run-off surface water down-gradient of the site. Sampling for the ESA included total petroleum hydrocarbon (TPH), metals, and volatile organic compounds (VOCs), with most results below detection levels or MTCA cleanup levels. Samples were analyzed at the City Technical Support Laboratory. Nine test pits were dug to depths ranging from 12 to 15 feet below ground surface (ft bgs), and soil samples were collected from five of the pits at various depths. Concentrations of 21.7 milligrams per kilogram (mg/kg) and 228 mg/kg arsenic were obtained above the MTCA cleanup level of 20 mg/kg at two locations. TPH in soil ranged from 500 to 1330 mg/kg. Observations recorded in the field notes for the test pits also indicated diesel odors and indications of street sweepings. Hand-written notes in the Tacoma-Pierce County Health Department (TPCHD) file indicated that sample splits were obtained by TPCHD personnel and analyzed for TPH which was detected in two soil samples at concentrations of 84,000 mg/kg and 3,800 mg/kg. Both TPCHD analyses exceed the old MTCA TPH diesel-range soil cleanup level of 200 mg/kg and the amended MTCA cleanup level (amended February 2001) of 2,000 mg/kg. It is not certain whether the TPH was gasoline-range, diesel-range, or oil-range TPH (or representative of the full range).

Two water samples were collected at the northern end of the fill following a 24-hour rain event and submitted for analysis of TPH, metals, and VOCs. The samples were collected from the end of a culvert pipe that extends below the fill and terminates below the 34th Street Bridge, and a run-off stream at the base of the fill. The TPH results were 25.6 milligrams per liter (mg/l), and 32.0 mg/l. Xylene was detected in the culvert sample at 8.5 micrograms per liter (ug/l) and erroneously attributed to 1,1,1-trichloroethane in the ESA report. Arsenic, chromium, copper, and zinc were also detected at relatively low levels (for possible surface water cleanup levels) in the surface water samples. The highest concentration of arsenic detected was 13 ug/l, chromium was 7 ug/l, copper was 18 ug/l, and zinc was 42 ug/l. Lead was also detected in the run-off stream at 39 ug/l. At the time of the ESA, the MTCA ground-water cleanup levels for arsenic, chromium, and lead were 5 ug/l, 50 ug/l, and 5 ug/l, respectively. Presently, the ground-water cleanup levels for these constituents are 5 ug/l, 50 ug/l, and 15 ug/l, respectively. It is not clear whether the run-off samples reflect run-off from the surface of the fill or water from the base of the fill that is perched on the glacial materials underlying the fill.

Soil and surface water samples have been collected over time since the ESA. However, sampling has been inconsistent and locations of sample collection are not reproducible. The investigative work conducted by the City is not considered adequate to characterize the site. The annual sampling provides little information about the extent of contamination or about the overall constituency of the buried waste. Sampling methodology and quality assurance are unknown for most of the samples collected. Because of the potential impact of TPH,

metals, and residual organic materials (that may contribute to methane gas production in the buried waste), additional characterization should be required.

A substantive requirement of MTCA is to conduct "sufficient investigations to characterize the distribution of hazardous substances present at the site, and threat to human health and the environment." [WAC 173-340-350] The contamination that defines the "site" may go onto the right-of-way and onto adjacent properties, as well as beneath buildings. Presently, the site, apparently, is restricted to the area shown in Figure 2 and does not extend beneath the residences adjacent the site. However, the site includes:

- Petroleum hydrocarbons and metals in soil and surface water.
- Methane source materials in soil and methane as soil vapor.

This characterization does not meet the substantive requirements of MTCA. Sufficient soil and ground-water samples have not been collected to determine the full extent of contamination present throughout the site. Those areas identified that are contaminated with petroleum hydrocarbons on and adjacent to the "affected property" should be sampled to determine the areal and vertical distribution of contamination in the soils, and, if necessary, ground water. Enough samples need to be collected to be certain that contamination is isolated and is not affecting adjacent properties.

Soil vapor should be characterized to determine whether methane is contributing volatiles to the living areas of the houses. This can be done as part of the initial characterization or following remediation of the soil contamination. It is possible to evaluate risk by measuring indoor air quality directly or soil gas measurements can be obtained that could be plugged into a model or used directly with a vapor attenuation factor to estimate indoor air concentrations.

Once the full extent of contamination has been determined, it will be necessary to develop a feasibility study, based on the information obtained in the characterization effort. This feasibility study should include all practicable methods of treatment in addressing the site cleanup.

Areas of contamination should be remediated, and then sampled to determine that all contamination had been removed or treated in these areas. Analytical reporting limits should be less than the MTCA soil cleanup levels. A figure or figures need to be included with the documentation to illustrate where samples are collected. A work plan should be generated prior to further characterization or remediation work being conducted. It is not necessary for Ecology to provide comments on the work plan before work can be

conducted. However, for Ecology to provide an opinion as to whether the planned work will meet the substantive requirements of MTCA, it would be necessary to review a work plan. Otherwise "persons conducting remedial actions do so at their own risk, and may be required to take additional remedial actions if the department determines such actions are necessary." [WAC 173-340-515(3)]

Any cleanup action selected for a site must meet some minimum requirements. These requirements include, but are not limited to, the following:

- ***Compliance with Cleanup Standards. If a cleanup alternative does not comply with cleanup standards, the alternative is considered an "interim action" and not a "cleanup action."***

- ***Compliance with Applicable State and Federal Laws. Cleanup levels and actions must comply with existing state or federal laws.***

- ***Protecting Human Health and the Environment. The cleanup action selected must either reduce or remove (destroy) the contamination, restoring the site to cleanup levels, or contain the contamination in such a way that will minimize future exposure of humans and/or ecological receptors. Cleanup action alternatives that achieve cleanup levels at the applicable points of compliance and comply with applicable state and federal laws are presumed to be protective of human health and the environment.***

- ***Providing for Compliance Monitoring. The cleanup action selected must provide for monitoring to verify that the cleanup action achieves cleanup or other performance standards and that the cleanup action remains effective over time.***

- ***Using Permanent Solutions to the Maximum Extent Practicable. Permanent solutions (cleanup actions) are actions in which cleanup standards can be met without further action being required, such as monitoring or institutional controls. To select the most practicable permanent solution from among those cleanup action alternatives that are protective of human health and the environment requires conducting a disproportionate cost analysis. This analysis compares costs and benefits of alternatives and selecting the alternative whose incremental costs are not disproportionate to the incremental***

benefits. The comparison is quantitative, but is often qualitative and requires best professional judgment.

- ***Providing for a Reasonable Restoration Time Frame. Some cleanup methods, such as natural attenuation, can take years to restore a site, depending on the contaminants. When evaluating alternative methods of cleanup, the time it takes to restore the site will need to be considered. MTCA has certain criteria that need to be applied when evaluating restoration time frame.***

Because contamination is present in the soil and potentially in the ground water and/or in the soil vapor that could be considered part of the Site, the feasibility study should address this contamination. Should it be determined that a permanent cleanup action cannot be implemented, a disproportionate cost analysis shall be applied. The analysis shall compare costs and benefits of the cleanup action alternatives evaluated in the feasibility study. The costs and benefits to be compared and the disproportionate cost analysis are described in MTCA WAC 173-340-360(3)(e) and (f). It may also be necessary to determine whether a cleanup action provides for a reasonable restoration time frame as described in WAC 173-340-360(4). Any contamination that will be left in place on the property and/or within the right-of-way will require an environmental covenant that will be placed there by the person "who has been named as a potentially liable person or who has not been named as a potentially liable person by the department but meets the criteria in RCW 70.105D.040 for being named a potentially liable person." The covenant shall be executed by the property owner and recorded with the register of deeds for the county in which the site is located. Therefore, it is important to determine full extent of contamination and responsibilities for filing an environmental covenant if contamination is to remain, either in the soil and/or the ground water within the property. A final no-further-action (NFA) letter will not be issued until the entire "Site" has been addressed.

All sampling data shall be submitted to Ecology according to the requirements of WAC 173-340-840(5), in printed form and in electronic form capable of being transferred into the Department's data management system. Electronic data submittal requirements are provided at http://www.ecy.wa.gov/eim/.

Please note that this opinion is based solely on the information contained in the documents listed above. Therefore, if any of the information contained in those documents is materially false or misleading, then this opinion will automatically be rendered null and void.

The state, Ecology, and its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Again, Ecology appreciates your initiative in conducting independent remedial action and requesting technical consultation under the VCP. As the cleanup of the Site progresses, you may request additional consultative services under the VCP, including assistance in identifying applicable regulatory requirements and opinions regarding whether remedial actions proposed for or performed at the Site meet those requirements.

If you have any questions regarding this opinion, please contact me at (360) 407-6267.

Sincerely,

Charles S. Cline
SWRO Toxics Cleanup Program

CSC/ksc:City of Tacoma 35th Street Landfill FA 2008

Enclosures: Enclosure A: (text + 5 figures)
Enclosure B: Initial Investigation Field Report, August 5, 2005

Cc: Mr. John O'Loughlin, City of Tacoma
Ms. Sharon Bell, Tacoma-Pierce County Health Dept.
Mr. John Wright, Tacoma-Pierce County Health Dept.
Scott Rose, Ecology

ENCLOSURE A

The site is an approximate 5-acre parcel of land, which over a 30-year period has been filled with various construction spoils and street sweepings. The site is bordered on the west by Pacific Avenue, on the north by the 34th Street Bridge, on the east by "A" Street, and on the south by a vacant parcel at 35th Street. Apparently, the site is encompassed by Pierce County Parcels #2084140040, 2084140050, 2085130060, and 2085130070, and may impact Parcels #2085140040, and 2085140070 (see Figure 3). The site is situated within the City of Tacoma boundaries, Pierce County, Washington State. The surrounding area is mostly residential. Figures 1 and 2 show the approximate location, and site configuration, respectively.

The 35th Street Landfill site is located within what had been a natural ravine that drained into Commencement Bay. The underlying soil consists of glacially derived sand and silty sand. The southern limits of the ravine are uncertain, but extended at least as far as South 38th Street at one time. The ravine is now filled at the southern end, with the fill now extending to an area between South 34th Street Bridge and South 35th Street. The 35th Street Landfill Site was used by the City of Tacoma to dump waste materials from the early 1960's through 1992. The construction debris originated, primarily, from the Interstate-5, Interstate-705, and Highway 7 extensions, Tacoma Public Utilities construction projects, and various large private construction projects. Reported materials dumped included waste concrete, asphalt, other inert materials, street sweepings, and vactor waste (catch basin cleanings). The Tacoma-Pierce County Health Department (TPCHD) state that the street sweepings and vactor waste were placed primarily at the northern end of the fill. Interviews with area residents confirm that organic materials were disposed at the site. Apparently, cleanings from catch basins were dumped at the site from 1985 until 1990. The Environmental Site Assessment (ESA) conducted by the City of Tacoma indicates that most of the organic materials were disposed at the eastern edge at "A" Street and 35th Street, which conflicts with TPCHD.

In November 1990, organic vapors (methane) were detected in shallow probes at the site. This prompted the TPCHD to request an environmental investigation of the site. City of Tacoma Public Works Department personnel conducted a site assessment that addressed gas generation, surface-water contamination potential, and characterized the soil material comprising the fill. TPCHD also expressed concerns about site stability. City personnel determined that a three-to-one slope for the site would be needed to address this concern. In 1991, the City of Tacoma regraded the fill to provide better stability, covered the site with topsoil, and hydro seeded. Figure 4 shows a photograph of the fill area as it looked in 1990.

Various studies, including the ESA conducted by the City of Tacoma in 1991, have detected constituents in the soil and in run-off surface water down-gradient of the site. Sampling for the ESA included total petroleum hydrocarbon (TPH), metals, and volatile organic compounds (VOCs), with most results below detection levels or MTCA cleanup levels. Samples were analyzed at the City Technical Support Laboratory. Nine test pits were dug to depths ranging from 12 to 15 feet below ground surface (ft bgs), and soil samples were collected from five of the pits at various depths. Figure 5 is the figure from the ESA that shows the locations of the test pits. Concentrations of 21.7 milligrams per kilogram (mg/kg) and 228 mg/kg arsenic were obtained above the MTCA cleanup level of 20 mg/kg at two locations. TPH in soil ranged from 500 to 1330 mg/kg. Observations recorded in the field notes for the test pits also indicated diesel odors and indications of street sweepings. Hand-written notes in the TPCHD file indicated that sample splits were obtained by TPCHD personnel and analyzed for TPH which was detected in two soil samples at concentrations of 84,000 mg/kg and 3,800 mg/kg. Both TPCHD analyses exceed the old MTCA TPH diesel-range soil cleanup level of 200 mg/kg and the amended MTCA cleanup level (amended February 2001) of 2,000 mg/kg. It is not certain whether the TPH was gasoline-range, diesel-range, or oil-range TPH (or representative of the full range).

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are unknown for most of the samples collected. Because of the potential impact of TPH, metals, and residual organic materials (that may contribute to methane gas production in the buried waste), additional characterization should be required. Further, it is the understanding of Ecology that this area is proposed for a land swap by the City of Tacoma and that development may include condominiums.

Google Maps

FIGURE 1

Y:\Projects\094042\010\Fig2.mxd 3/7/2008

LANDAU ASSOCIATES

35th Street Landfill Site
Tacoma, Washington

Historic Sampling Locations
1991 Environmental
Site Assessment

Figure
2

City of Tacoma

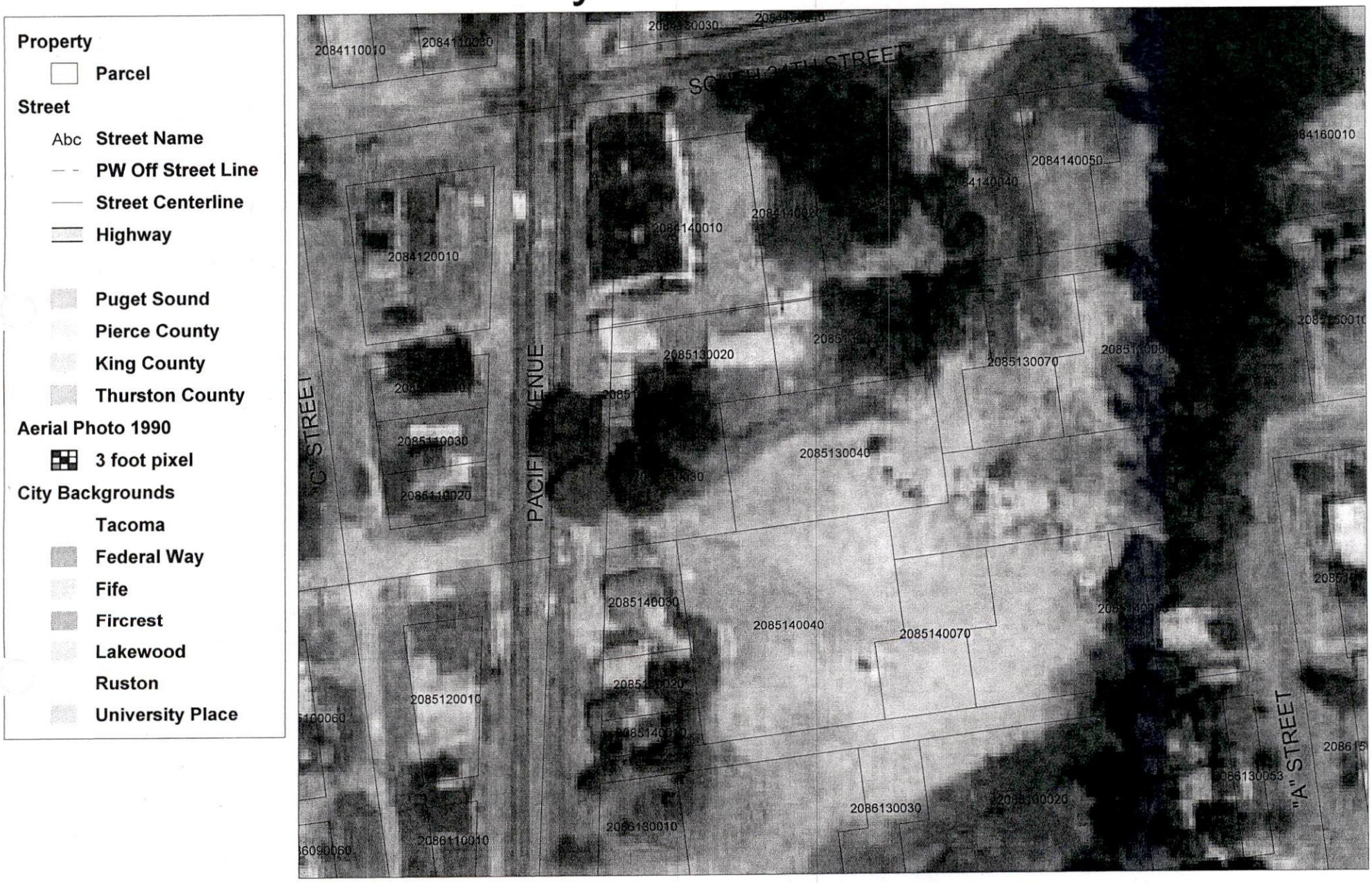

FIGURE 3

Thursday, April 10, 2008 4:51 PM

City of Tacoma

http://govME.org/map

Street

- Abc Street Name
- PW Off Street Line
- Street Centerline
- Highway

- Puget Sound
- Pierce County
- King County
- Thurston County

Aerial Photo 1990

- 3 foot pixel

City Backgrounds

- Tacoma
- Federal Way
- Fife
- Fircrest
- Lakewood
- Ruston
- University Place

SCALE 1 : 2,609

200 0 200 400 600

FEET

FIGURE 4

Thursday, April 10, 2008 4:56 PM

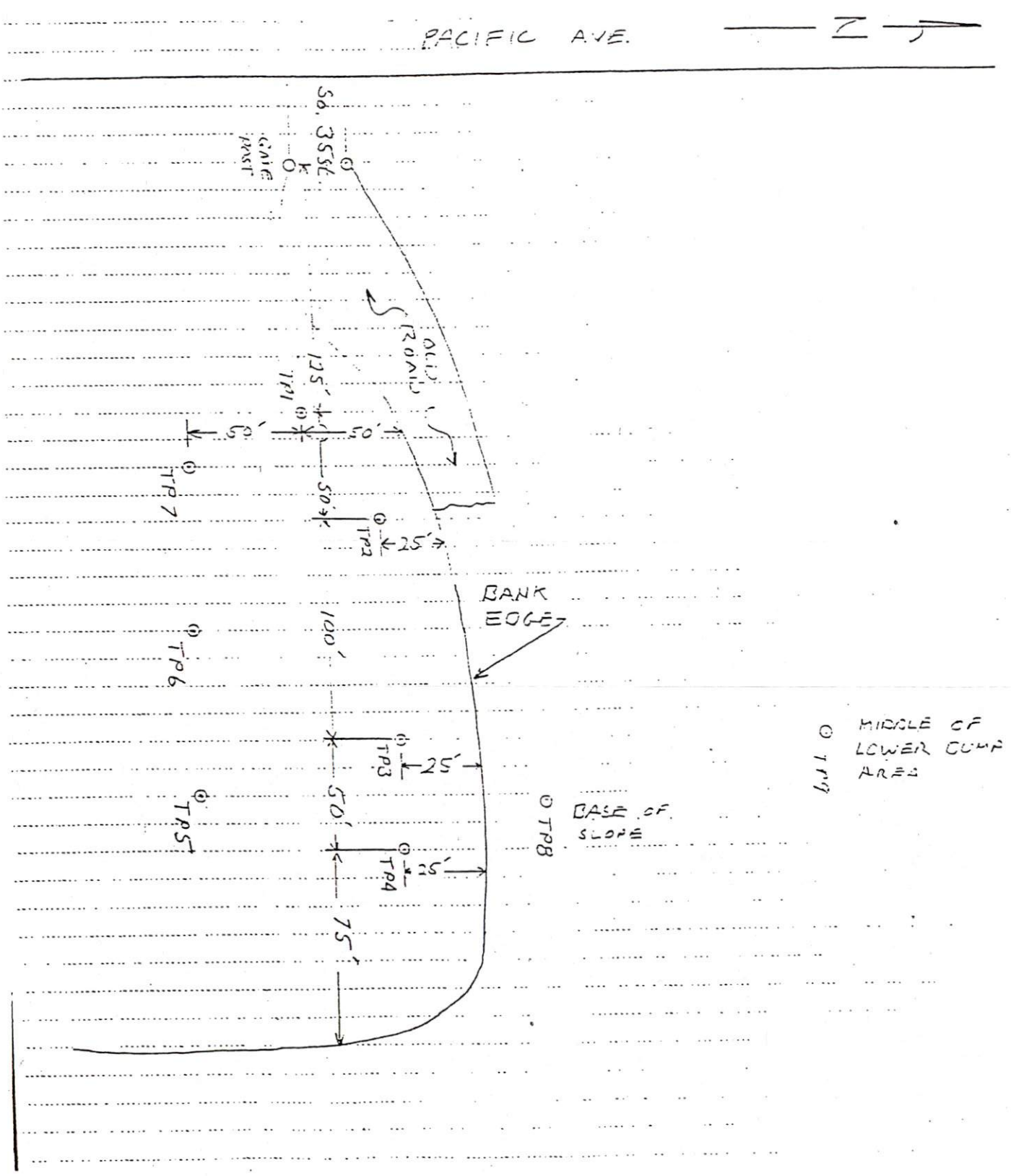

FIGURE 5 TEST PIT LOCATION 35TH STREET GULCH

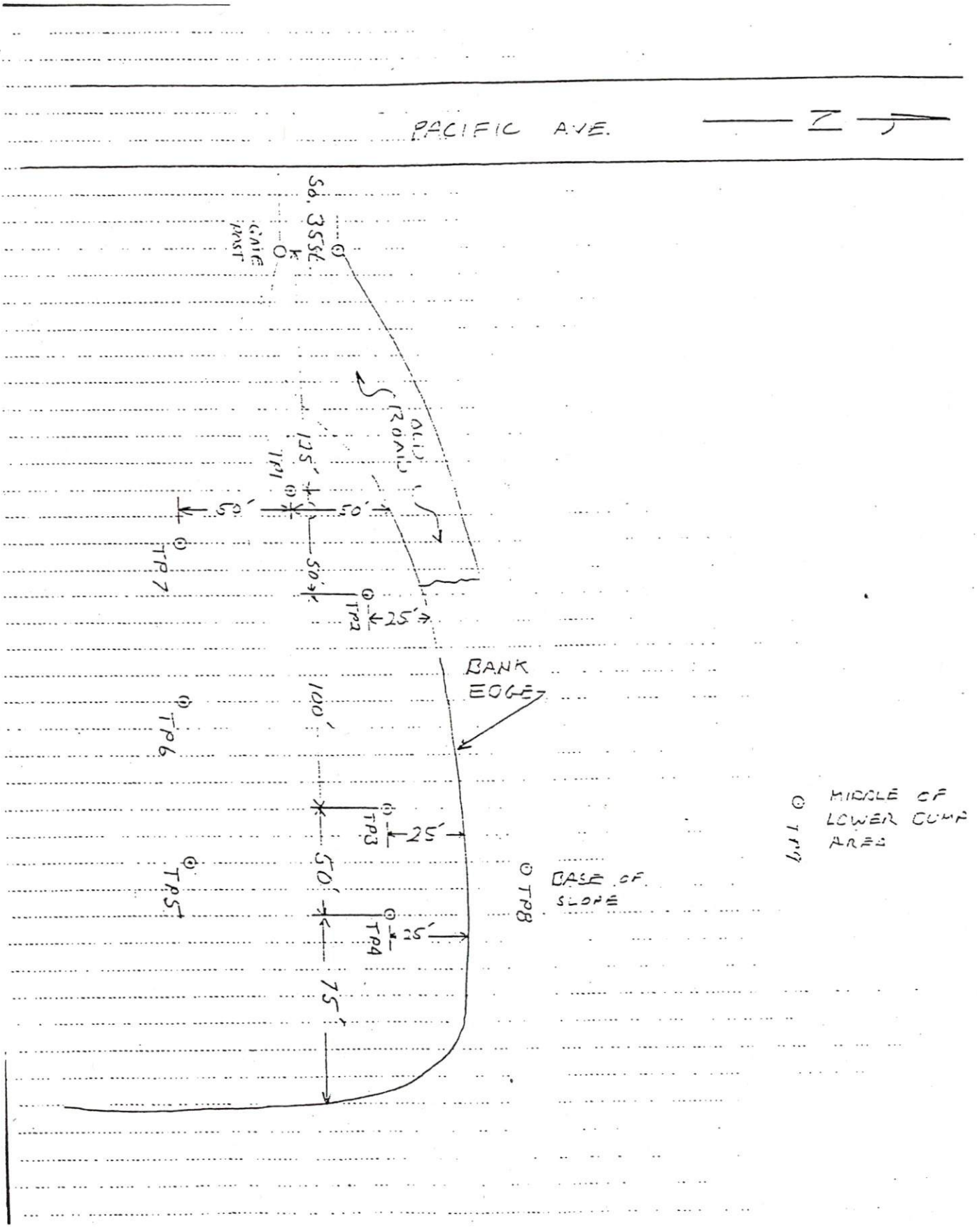

FIGURE 5 TEST PIT LOCATION 35TH STREET GULCH

FIGURE 5