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HISTORIC LAND USE SURVEY OF THE TACOMA TIDEFLATS

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JANUARY 1982

State of Washington
John Spellman
Governor

WDOE 82-4

Department of Ecology
Donald W. Moos
Director

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12.3-000004

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Prepared for

WASHINGTON STATE DEPARTMENT OF ECOLOGY

January 1982
07927-003-05

Dames & Moore

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Olympia, Washington 98504

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SUMMARY

One hundred and seventeen sites were identified as areas where past waste disposal practices may be posing a water pollution problem (Table 2 in Methodology Section). Further investigation into the waste practices of the 117 sites was undertaken and 49 target sites were identified (Table 4).

There are still more informational sources that have not been contacted due to time and funding constraints. Not all of the 117 sites were studied in detail for the same reasons. Sources that were not contacted during this investigation and that may have information on the disposal of industrial wastes in the tideflat are listed in Appendix A.

Obtaining supplemental information may be difficult. First, representatives of a few industries were reluctant to answer questions that focused on their waste disposal practices. Second, industries generally do not have accurate records of their waste disposal practices prior to 1970.

The tideflat area has been highly industrialized for over 40 years. The accepted methods for the disposal of waste materials have changed during this time. In the late 1950s the Washington Pollution Control Commission required some industries to cease dumping their wastes in the waterways and to dispose of wastes in lagoons, holding ponds located on their property, or on land. Subsequent study has revealed that this method was not effective. Today the effects of dumping the waste material on land are evident; runoff and ground water conveys chemicals in dumped materials to the waterways. One central legal issue that must be resolved is the responsibility and liability of industries for damages resulting from disposal of material in accordance with Pollution Control Commissions specifications.

The resolution of this issue may well determine whether industries continue to cooperate with environmental agencies by volunteering information on past operational and waste disposal procedures.

Efforts were made in this survey to better define the chemicals likely to occur at the sites studied. The data base used in this study provided only limited information for this effort. In many cases no one really knew what was being discarded as solid or liquid wastes. In other cases records were not kept or made as to the known materials discarded. Limited information on the chemicals involved are provided where the data base had appropriate input.

Further study including core and water sampling is necessary to determine what chemicals are in the soil, how far they have penetrated into the surface, and how they are entering the ground and surface water regime. The target sites identified in this study constitute potential worst-case scenarios, and should provide the priority subjects of future study efforts.

INTRODUCTION

Commencement Bay and the Tacoma tideflat area have been a major harbor and industrial area since the 1910s. During this time the area has been intensively used by several hundred commercial and industrial enterprises.

Until the 1950s and the advent of the Washington State Pollution Control Commission, there were limited regulations and enforcement governing the disposal of waste material on land or in water. A major problem in the past was the lack of knowledge of the environmental ramifications of these waste disposal practices. As a result, there was uncontrolled disposal of liquid and solid waste materials in Commencement Bay, including the waterways and the tideflat area.

The effects of the uncontrolled dumping in the water and on the land gradually took its toll. (b) (6) a long-time area resident, (personal communication) reported that the Hylebos Waterway was clean until the late 1920s, and that fish and crab were plentiful in the waterway. During the 1930s the quality of the water deteriorated and fish and crab became scarce. (b) (6) said the water remained contaminated ("foul") until the mid-1940s. He attributed the deterioration of the water quality to Hooker Chemical, Schaffer Box,* and other wood-product industries discharging their waste by-products into the Hylebos. The waste from Schaffer Box was high in sulfides. From 1940 to 1945, the water quality improved. (b) (6) felt this may be due to the fact that Hylebos discharging company(s) began sending their wastes off the Todd Shipbuilders pier located on the Blair Waterway. From 1945 through the 1970s, Hooker Chemical's material was shipped by barge and deposited in the deep disposal site located near the center of Commencement Bay about 1,500 yards southwest of Browns Point. Also, Schaffer Box ceased operation sometime during the mid-1930s.

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*See Site No. 114 for location.

By 1950, the water quality of the Hylebos Waterway had deteriorated again. The State of Washington Pollution Control Commission (1950) reported that the variety and quantity of bottom organisms varied with the degree of pollution. Fewer organisms were observed in the more polluted areas. Four areas were observed to have few or no organisms present. They were (1) the area near the ASARCO smelter in Ruston, (2) the area near the City of Tacoma sewer outfalls, (3) the 21st Street or landward end of the City Waterway, and (4) the turning basin of the Hylebos Waterway. The turning basin extended to Pennwalt Corporation at this time. It should be noted in this past period that the Hylebos Waterway received the effluent from all of the industries located on Lincoln Avenue via the Lincoln Ditch. Note that Blair Waterway did not exist to its present length in this prior time period. During the 1950s, herring fish kills in the Hylebos Waterway were commonplace in the spring months.

With the advent of regulations preventing the discharging of some waste materials directly into the waterways, the problem was transferred from the water to the land (Neilson, personal communication). Many of the waste materials were then deposited in landfills, on unoccupied parcels of land, and the land adjacent to the waste producer.

The accumulation of years of waste materials being discharged in the tideflats sediments, used as landfills, is evident in stormwater runoff from the area. As stormwater percolates through or runs off the soil, it dissolves soil-bound contaminants, which consist of high concentrations of metals and chlorinated organics.

This contaminated water can eventually reach the ground water or the waterways and contribute to the pollution. Also of note is the fact that sewer hookups to the tideflats were not made until about 1975 and many septic tanks and drainfields still exist as sewer hookup was not mandatory.

METHODOLOGY

The methodology employed was designed to provide a historical perspective of the effects of urbanization and industrialization on the Commencement Bay environment. Interviews of four Washington State Department of Ecology (DOE) staff (Jim Oberlander, Darryl Anderson, Frank Monahan, and Greg Cloud) were conducted to become familiar with industries that are in the area today. These staff members provided names, locations, and brief history of industries located in the tideflat area that (1) have contributed to the pollution problem in the past, (2) are presently contributing to the pollution problem in Commencement Bay and waterways. As a result of this review, 109 sites were identified.

Dames & Moore summarized the information gathered during the interview process. The summary of this information is presented in the Results section. Major contacts are referenced.

Each site was assigned an identification number (1 through 109) and the location was mapped on a 1979 aerial photograph of the Tacoma tideflat area. A folder was created for each site and information on each site was filed as it was gathered. This system continued for each subsequent site that was identified.

The next step in developing the historic perspective was to interview representatives from other federal, state, and local agencies and past inspectors for the DOE and Washington Water Pollution Control Commission. A list of all persons contacted (agency representatives and others) can be found in Table 1.

It should be noted that all interviews conducted for this study were informal. The interviewee was asked to recall information about specific industries (particularly those known to contribute contaminants to the environment), that were located in the tidelands during periods of development. Three aerial photographs (from 1946, 1968, and 1979) were used to assist the interviewees in recalling the nature of industries

TABLE 1

LIST OF INDIVIDUALS/ORGANIZATIONS CONTACTED

Abercrombie, Will	DOE
(b) (6)	Citizen
Bannister, Leroy	Reichhold Chemical Co.
Barnard, Edmond	City of Tacoma Garbage Man, retired
Brackett, Gary	Tacoma-Pierce County Chamber of Commerce
Burlington Northern Railroad	
Burley, Mark	Simon & Sons
Cabodi, Al	U.S. Oil and Refining
Cascade Pole	
Custom Iron	
Dean, Dennis	Beltline Railroad
Evans, Ric	Victor Lyon Realty
Farmer, Merwin	Ultra-Poly, Inc.
Fenske, Fred	DOE
Fleischer, Burt	Allied Chemical
Grosz, James	Stauffer Chemical
Guizzetti, Joe	Buffelen Woodworking
Hickson, Don	City of Tacoma Solid Waste Division
Hileman, Jim	EPA
Hurlburt, Kathy	Crown Zellerbach
Hayden, C.H.	Allied Chemical
Kewing, Al	Puget Sound Trucking
Kittrell, Bill	Port of Tacoma
Knudsen, Jim	DOE
Kucinski, Gary	Port of Tacoma
Lamkin, Floyd	Floyd Equipment Co., Inc.
Larsen, Bill	City of Tacoma Solid Waste Division
Laursen, Al	Pierce County Health Department
Manley, Harry	Retired, Foss Tugs
Manlove, Jim	Reichold Chemical Co.
Mauritzen, Orv	Architectural Woods, Inc.
May, Frank	U.S. Gypsum
McMann, Gravin	Georgia Pacific

TABLE 1 (Continued)

(b) (6)	Citizen
Neilson, Lyman	EPA
Oberlander, Jim, Darryl Anderson, Greg Cloud, Frank Monahan	DOE
Palko, Mike	DOE
Peterson, Beth	Kaiser Aluminum
Peterson, Shelly	S.V. Chemical
Pierce, Doug	Pierce County Health Dept.
Pierce, Rick	DOE
Ravel, D.	Pennwalt Corp.
Raymond, Bob	American Plywood Assoc.
Richards, Caritha	Superlon, Inc.
Rink, Dave	Jones Chemical
Robbinson, Ron	DOE
Sakala, Dave	Bonneville Power Authority
Sehmiel, Paul	Kaiser Aluminum
Springer, Stan	DOE
Superlon	
Tacoma Chamber of Commerce	
Taft, Wesley	Whitacre Engineers, Inc.
Thompson, Neil	EPA
Walker, Bob	Reichold Chemical Co.
Williams, Pat	Dunlap Towing and Log Sort Yard
Wood, Dean	Department of Fisheries
Woods, S.W.	U.S. Gypsum
Woodworth, John and Si McDaniel	Woodworth and Company, Inc.
Wolheter, Virgil	
Yoshamaka, Masato	Georgia Pacific

present. When a representative from an industry was interviewed the questions were directed toward that particular industry; i.e., (1) when did they locate in the area, (2) what raw products were used and how were they stored prior to use, (3) what products were manufactured, and (4) what waste by-products were produced and how were they disposed.

An additional 8 sites were identified through this second interview process, bringing the total number of sites to 117 (Table 2, Figure 1)*. All information was then analyzed and summarized. Based on this synthesis, 31 sites were selected for additional study, based on the nature of waste material deposited and the potential for associated hazard to the ecology of the area (Table 3).

Sites targeted for additional study were selected in a subjective manner, if:

1. The site was often mentioned by interviewees and was consistently referred to as a high concern area (e.g., Sites 23, 46, and 63).
2. The site contained a lagoon where waste by-products known to be hazardous, such as phenolic resins or pentachlorophenol, were disposed (e.g., Sites 1, 46, 103).

If a site was not included in the list, it should not necessarily be regarded as stable or non-significant. Most of the 117 sites still potentially pose some threat to the environment. However, due to time and money constraints, this investigation was not able to focus on all of the sites.

The interview process continued, focusing on the 33 target sites in Table 3. During the cycle, representatives of private industry and individuals were interviewed, with an emphasis on methods of waste disposal.

Information from these interviews was combined with the information obtained earlier. The data for all 117 sites were analyzed and the list of target sites was refined and expanded to 49 sites (Table 4). The same technique used to compile the first list was used during this revision process.

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*Figure 1 is a fold-out located in the back of this publication.

TABLE 2

LIST OF 117 SITES IDENTIFIED IN THIS STUDY

Identification Number	Owner	Liquid Effluent Permits
1	Airo Services	
2	Vacant Lot	
3	Sound Oil and Refining	NPDES
4	Cascade Timber	
5	Don Oline	
6	General Metals of Tacoma, Inc.	
7	Vacant Lot	
8	Woodworth and Company, Inc.	
9	Jones Chemical	WDP
10	Hylebos Boat Haven, Knapp Boat Builders, Marine Technical Services	
11	Tacoma Boat Building	
12	Barney Coski	
13	Pedersen Oil	
14	B&L Trucking	
15	Wasser and Winters	
16	Louisiana Pacific	
17	Weyerhaeuser Company	
18	Dunlap Towing	
19 & 20	Pennwalt Corporation	NPDES
21	Petroleum Reclaiming	
22	Kaiser Aluminum and Chemical Corporation	NPDES
23 & 24	Murray Pacific	
25	U.S. Gypsum	
26	Buffelen Woodworking	NPDES
27	Western Farmers Association	
28	Joseph Simon & Son	
29	Tacoma City Light Power Plant	
30	Philadelphis Quartz	
31	Don Oline	

TABLE 2 (Continued)

Identification Number	Owner	Liquid Effluent Permits
32	Chemical Processors, Inc.	WDP
33	Lilyblad	
34	Vance Lift Truck	
35	Fletcher Oil	
36	Hooker Chemical Company	NPDES
37	Zeidell Marine Corporation	NPDES
38	Todd Chemical	
39	Sea-Tac Alaska Shipbuilding Corporation	
40	Continental Lime	
41	J.A. Jones Construction Company	
42	West Coast Orient	
43	Bonneville Power Administration	
44	Buckeye Service Corporation	
45	Murray Pacific	
46	Reichhold Chemical, Inc.	NPDES
47	Stauffer Chemical Company	NPDES
48	U.S. Oil and Refining	NPDES
49	Lilyblad	NPDES
50	Concrete Technology	NPDES
51	Fairliner Boat	
52	Port Terminal Cargo Van	
53	Washington Stevedoring Company	
54	United Grain	
55	Pacific Northwest Terminal	
56	Port of Tacoma Bauxite Alumina Shipping	
57	Port of Tacoma Cargo Vans	
58	Barthel Chemical Company	
59	Rheem Manufacture Company	
60	Woodlam, Inc.	
61	Georgia Pacific	NPDES
62	Purex Corporation	NPDES

TABLE 2 (Continued)

Identification Number	Owner	Liquid Effluent Permits
63	Abandoned City of Tacoma Solid Waste Dump	
64	S.V. Chemical	
65	Certain-Teed	
66	Allied Chemical	
67	Darling Delaware	
68	Milwaukee Railyard	
68a	Beltline Railroad	
69	Federal Meats	
70	Floyds Equipment Company	
71	Husky Truck Stop	
72	Wrecking Yard	
73	International Harvester	
74	Crosby & Overton	
75	Vacant Lot	
76	Seco	
77	Port of Tacoma	
78	Port of Tacoma Executive Offices	
79	Milwaukee Railroad	
80 & 81	St. Regis	NPDES
82	American Plywood Association	
83	St. Regis Door Plant	
84	Pacific Fabrications, Inc.	
85	Vacant Lot	
86	Foss Launch and Tug	
87	Peterson Boats	
88	Puget Sound Plywood	NPDES
89	Superior Oil	
90	Phillips Oil	
91	Union Oil	NPDES
92	Mobil Oil	NPDES
93	Shell Oil	NPDES

TABLE 2 (Continued)

Identification Number	Owner	Liquid Effluent Permits
94	Penoco Oil	
95	Fick Foundry	NPDES
96	Wheeler Osgood Waterway	
97	Hygrade Foods	NPDES
98	Joseph Simon & Son	
99	Standard Oil	
100	General Metals of Tacoma, Inc.	
101	Sewage Treatment Plant No. 1	
102	Martinac Shipbuilding Corporation	
103	Burlington Northern Railroad	
104	American Plating Co., Inc.	WDP
105	Dual 96-Inch Storm Drain	
106	Harmon Cabinets	
107	North Pacific Plywood, Inc.	NPDES
108	Scofield Co., Inc.	NPDES
109	Consumer Central Heating	
110	Paxport Mills	
111	Vacant Lot	
112	Vacant Lot	
113	Puget Sound Trucking	
114	Brazier Lumber	
115	Lindal Cedar Homes, Inc.	
116	Superlon Plastics Co., Inc.	
117	Acme Foundry	

TABLE 3

PARCELS OF LAND IDENTIFIED AS TARGET SITES

Identification Number	Owner	Address
1	Airo Services	4110 East 11th
3	Sound Oil	2628 Marine View Drive
18	Dunlap Towing	3009 Taylor Way
19 & 20	Pennwalt Corporation	2901 Taylor Way
22	Kaiser Aluminum	3400 Taylor Way
23	Murray Pacific	3002 Taylor Way
26	Buffelen	1901 Taylor Way
31	Don Oline Site	Taylor Way between East 11th and Lincoln
36	Hooker Chemical and all sites admitted to dumping	605 Alexander Avenue
43	Bonneville Power Administration	Taylor Way
46	Reichhold Chemicals, Inc.	2340 Taylor Way
47	Stauffer Chemical Co.	2545 Lincoln Avenue
48	U.S. Oil	3001 Marshall Avenue
55	Pacific Northwest Terminal	551 Port of Tacoma Road
57	Port of Tacoma - Cascade Pole	802 Port of Tacoma Road
60	Woodlam, Inc.	1476 Thorne Road
61	Pacific Resin	1754 Thorne Road
63	City of Tacoma Solid Waste (abandoned)	
64	S.V. Chemical	1918 Milwaukee Road
66	Allied Chemical	1410 Thorne Road
68	Beltline RR Carwash	2801 East-West Road
75	vacant Lot	Along Puyallup River
76 & 67	Seco, Darling Delaware, Pacific Auto Wrecking	SW corner of Lincoln and Marc
83	St. Regis Door Plant	1216 St. Paul Street
98	Simon and Sons	2202 River Road

TABLE 3 (Continued)

Identification Number	Owner	Address
100	General Metals Dumping (nonferrous materials)	1919 Portland Avenue
103	Burlington Northern Railroad Carwashing	East 21st Street
107	North Pacific Plywood	1549 Dock Street
111	Area used as a dump (idenified by Robbinson)	SW corner Taylor Way and Lincoln
113	Puget Sound Trucking	2114 Marshall Avenue
114	Braizer Lumber	Taylor Way

TABLE 4

REVISED LIST OF TARGET SITES

Identification Number	Owner	Address
1	Airo Services	4110 East 11th
3	Sound Oil	2628 Marine View Drive
5	Don Oline	Along Hylebos Waterway, north of General Metals
12	Barney Coski	
18	Dunlap Towing	3009 Taylor Way
19 & 20	Pennwalt Corporation	2901 Taylor Way
22	Kaiser Aluminum	3400 Taylor Way
23	Murray Pacific	3002 Taylor Way
26	Buffelen	1901 Taylor Way
28	Joseph Simon & Sons	1601 Taylor Way
31	Don Oline Site	Taylor Way between East 11th and Lincoln
32	Chemical Processors, Inc.	1701 Alexander Avenue
33	Lilyblad	Alexander Avenue
36	Hooker Chemical and all sites admitted to dumping	605 Alexander Avenue
37	Zidell Marine Corp.	401 Alexander Avenue
43	Bonneville Power Administration	Taylor Way
46	Reichhold Chemicals, Inc.	2340 Taylor Way
47	Stauffer Chemical Co.	2545 Lincoln Avenue
48	U.S. Oil	3001 Marshall Avenue
49	Lilyblad	2244 Port of Tacoma Road
52	Port Terminal	Terminal 4
55	Pacific Northwest Terminal	551 Port of Tacoma Road
57	Port of Tacoma - Cascade Pole	802 Port of Tacoma Road
61	Pacific Resin	1754 Thorne Road
63	City of Tacoma Solid Waste (abandoned)	
64	S.V. Chemical	1918 Milwaukee Road

TABLE 4 (Continued)

Identification Number	Owner	Address
68	Milwaukee Railroad Car Wash	1100 Milwaukee Road
68a	Beltline Railroad	2801 East-West Road
75	Vacant Lot	Along Puyallup River
76 & 67	Seco, Darling Delaware, Pacific Auto Wrecking	SW corner of Lincoln and Marc
79	Milwaukee Rail Yard	
80 & 81	St. Regis	801 Portland Avenue
83	St. Regis Door Plant	1216 St. Paul Street
88	Puget Sound Plywood	1221 Portland Avenue
98	Simon and Sons	2202 River Road
99	Standard Oil	East J Street
100	General Metals Dumping (nonferrous materials)	1919 Portland Avenue
103	Burlington Northern Railroad (car washing facility)	East 21st Street
107	North Pacific Plywood	1549 Dock Street
111	Vacant Lot	Lincoln Avenue (between Alexander and Taylor)
112	Vacant Lot	Area between 2216 Taylor Way and 2240 Taylor Way
113	Puget Sound Trucking	2114 Marshall Avenue
114	Braizer Lumber	1501 Taylor Way
115	Lindal Cedar Homes	2000 Taylor Way
116	Superlon	2116 Taylor Way
117	Acme Foundry	2240 Taylor Way

RESULTS*

This section presents a brief synopsis of the information collected for all 117 sites. The persons listed as contacts contributed information about the parcel of land via an interview or telephone conversation. A copy of the notes (including notes from interviews and telephone conversations) inscribed by the interviewer were delivered to DOE in a file.

Throughout the site discussions, mention is made at some sites of solid and liquid materials being discharged intentionally or accidently on or off site. Depending on the physical and chemical state of the discharged material and the condition of the receiving ground, these materials (with rainfall or other water assistance) can move across the disposal site or into the ground. Some materials were used as landfill. The materials or soluble components of these wastes may then enter surface water or shallow ground water where they potentially can cause problems to man and the environment.

The reader will note a disparity in the information at some sites. This may be both due to the lack of information or due to the lack of sufficient time to evaluate all sites equally. In some cases the past ownership may be incomplete since formal ownership records were not sought in this study. The recollections of persons interviewed may also be a source of error. More contacts could be made and to assist DOE, the unpublished file provided to DOE includes a list of additional contacts (Appendix A).

The following sites are discussed in the numerical order of Table 2. All sites selected as preliminary target sites and final target sites (Tables 3 and 4) are discussed. All final target sites selected are coded with a double asterisk after the site number.

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*Note: Discussion follows on page 70.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
1**	Airo Services	Don Oline Bay Chemical Co. Bay Smelting Co. Camp Mfg. Co.	4110 E. 11th Street Tacoma

Bay Chemical and Camp Mfg. Co. were both owned by Mr. Richard Camp. During the early 1950s, Camp Mfg. Co. was involved in chrome plating. The wastes from this process consisted of acids, cyanide, and other compounds. It was reported that vats of chemicals were discharged periodically. Camp Mfg. Co. was replaced with the Bay Smelting Co. and later Bay Chemical Co. Zinc sulphate was manufactured on this site and calcium chloride (procured from Hooker) was packaged for distribution. During this time, there was an impounding basin on site. Wastes from the zinc sulphate manufacturing process and from stationary tank car washing (formerly rail tank car) were disposed of in the basins. The bottom of the basin was coated with resins from tank car washings. Bay Chemical moved their zinc sulphate operation to eastern Washington in 1974. At that time, the calcium chloride packaging operation was sold to Crown Zellerbach and the property was sold to Don Oline. Today, they still package calcium chloride and lease the land from Airo Services.

In 1978, Airo Services bought the site. They clean tanks and ship bilges on site. The wastes are then taken to recyclers.

This parcel of land was included on the list of target sites as a result of the activities of Bay Chemical.

Contacts: Hurlburt; Neilson; Jones, April 1951

Identification Number	Present Owner/ Lessee	Previous Owners	Address
2	Vacant Lot		Marine View Drive

The DOE staff noticed barrels containing oils and varnishes on the site. These materials came from a Foss tug. A few months ago the site was cleaned up.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
3**	Sound Oil and Refining		2628 Marine View Drive

The site where Sound Oil and Refining is located was filled with material from the Woodworth and Company, Inc. gravel pits (see Identification Number 8 below).

Periodically they "bottom off" or "water draw" the tanks to remove water that settles to the bottom of the tank. When this is done, the water and some crude spills to the ground. The water that is removed contains some impurities that are in the crude oil. These impurities vary from shipment to shipment and may be toxic.

This parcel of land was included on the list of target sites for two reasons. First, the soils may be permeated with contaminants resulting from the "bottoming off" process. The "tank bottoms" from leaded tanks and oil water separator sludge have been classified as a hazardous material by the EPA under RCRA. Second, it is not known where the filter cake was disposed.

Contacts: Taft, Fenske

Identification Number	Present Owner/ Lessee	Previous Owners	Address
4		Cascade Timber	

During the past 5 to 6 years ASARCO slag has been used as ballast in the log sort yard. This slag contains elevated concentrations of arsenic and heavy metals.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
5**	Don Oline		Marine View Drive

The area has been used as a dump site for General Metals waste including car interior "fluf" (see Identification Number 6 below) and is now covered with fill. A red line can be observed on the shoreline demarcating the soil layer that is contacting the waste material.

This parcel of land was included on the list of target sites as a result of the waste from General Metals that was deposited. Seepage from this material may be entering the Hylebos Waterway.

Contact: Libby S. Goldstein, Dames & Moore (personal observation)

Identification Number	Present Owner/ Lessee	Previous Owners	Address
6	General Metals of Tacoma, Inc.		1902 Marine View Drive

General Metals converts scrap material into cubes, pellets, or strips for shipment to Japan.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
7	Vacant Lot		Marine View Drive

This site has been used as collection center for waste oil.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
8	Woodworth and Company, Inc.		102 Norpoint Way N.E. Tacoma

This is currently the site of a sand and gravel quarry.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
9	Jones Chemical Company, Inc.	Woodworth and Company, Inc.	1919 Marine View Drive

Jones Chemical has repackaged chemicals for distribution at this site for the past 7 years. Previously, Woodworth and Company, Inc. operated a gravel pit on the site.

Contact: Rink

Identification Number	Present Owner/ Lessee	Previous Owners	Address
10	Hylebos Boat Haven (marina)		1940 Marine View Drive
	Knapp Boat Builders (shipbuilder)		1950 Marine View Drive
	Marine Technical Services (shipbuilder)		

The practice of land dumping has not been associated with these industries.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
11	Tacoma Boat Building		1840 Marine View Drive

Painting and stripping of boats occurs on this site since Tacoma Boat Building relocated to this site in the 1970s.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
12**	Barney Coski		

Mr. Coski collects a wide variety of materials and stores them at this site. DOE inspectors have observed car interiors, wood waste, 55-gallon drums, filter cake from U.S. Oil, DDT, and demolition waste. This site is supposed to be used for construction debris.

This parcel of land has been included on list of target sites.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
13	Pederson Oil	Hart Construction	1622 Marine View Drive

Pederson Oil is a new business. DOE inspectors have not noticed any waste disposal problems at this site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
14	B&L Trucking		1621 Marine View Drive

B&L Trucking has hauled waste materials from the production site(s) to a disposal site(s). The location of the disposal site(s) is not known.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
15	Wasser and Winters		1602 Marine View Drive

This is a log sort yard in which slag from ASARCO, Inc. was used as ballast. Elevated concentrations of arsenic have been observed in leachate from this site and is attributed to the slag. All log sort yards also have solid wate in the form of wood-debris as a by-product of log handling. The use or disposal of this material from all sort yards should be described for each site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
16	Louisiana Pacific		3701 Taylor Way

This is another log sort yard in which used slag is used for ballast. Elevated concentrations (up to 100 mg/l--soluble and insoluble) of arsenic seeping into the Hylebos Waterway have been attributed to log sort yards that use slag from ASARCO, Inc. as ballast.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
17	Weyerhaeuser Co.		3401 Taylor Way

This is one fo the few log sort yards in the tideflat area that is mostly paved. No problems were observed at this site at present. In prior times, before paving and runoff treatment, problems were reported at this site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
18**	Pennwalt Corp./ Dunlap Towing		3009 Taylor Way

Pennwalt Corporation owns this parcel of land and leases it out to Dunlap Towing, who operates a log sort yard on the site. Last year (1980), they stopped using slag from ASARCO, Inc. at the request of DOE.

They currently use another material when replacement ballast is needed. However, a substantial amount of ASARCO slag remains on the site.

This parcel of land was included on the list of target sites as a result of slag use here and proximity to other industries.

Contact: Ravel, Williams

Identification Number	Present Owner/ Lessee	Previous Owners	Address
19** & 20**	Pennwalt Corp.		2901 Taylor Way

Pennwalt Corporation began operations in 1929. Throughout Pennwalt's operations in the tideflats they have produced chlorine gas, caustic soda, hydrogen gas, and sodium chlorate. In the 1940s DDT was repackaged on this site, and Pennwalt manufactured sodium arsenite in the 1950s. In 1960, Endrin was also observed on site. Approved low-level radiation waste is located in Site 20.

Tests on the sludge produced during the salt purification process indicate that it was toxic to herring. As a result, Pennwalt began dumping the sludge in lagoons on their property in 1957. These lagoons may also contain waste from the sodium arsenite manufacturing operation. DOE inspectors reported that sodium arsenate is buried on this site. Pennwalt Corp. has experienced problems with liquids seeping from the lagoons and entering the Hylebos Waterway. As a result of these problems, this site was included on the list of target sites.

Contact: Neilson, Ravel

Identification Number	Present Owner/ Lessee	Previous Owners	Address
21	Petroleum Reclaiming	Tallow Rendering Plant	3003 Taylor Way

This investigation did not associate this parcel of land with any waste disposal problems.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
22**	Kaiser Aluminum and Chemical Corp.		3400 Taylor Way

Kaiser Aluminum was built in 1940. The area was a tideflat and under water during high tides. Fill material came from Woodworth and Co., Inc.

In 1959 the Washington Pollution Control Commission requested that Kaiser Aluminum remove all pot liners that were buried on the property. Cyanide and metals were leaching from the pot liners and entering the drainage ditches.

Kaiser Aluminum installed a wet scrubbing system as an air pollution control device in the late 1950s. The wet scrubbing process required that a lime slurry be added to the system every 15 days.

There also was a dump area on the south end of the property. All waste water and scrubbing water from the plant was discharged into the lagoon located southwest of the plant. This material is still located on the property.

This parcel of land is included on the list of target sites as a result of the cyanide, fluoride, and lime slurry deposited on land.

Contact: Neilson, Hileman, Thompson, B. Petersen, Fenske, Woodworth, Schmiel, EPA

Identification Number	Present Owner/ Lessee	Previous Owners	Address
23**	Port of Tacoma/ Murray Pacific Log Sort Yard	Ohio Ferro Alloys	3002 Taylor Way

Ohio Ferro Alloy was built in 1942. Initially the plant produced chrome and obtained the ore from New Guinea and the South Pacific islands. As procurement of the ore became more difficult, the plant began producing silica and ferrosilicate instead of chrome. The raw materials used in the production of silica and ferrosilicate were: white coarse rock, coal, and steel chips. The waste product from this process was a slag which had to be periodically blasted out of the furnace. The slag was deposited in low lands located behind the plant.

During its years of operation, the plant was known as being "dirty." There was no pollution control equipment, and the furnace was described as "a large chimney." Stockpiles of material on the site were also reported.

In 1972, the plant closed and the property was bought by the Port of Tacoma. Ohio Ferro Alloy was responsible for tearing down the buildings and cleaning up the site. It is presumed that the slag was used as fill material and covered over with dirt.

Today Murray Pacific operates a log sort yard on the site. Slag from ASARCO, Inc. was used as ballast.

There are many factors which may contribute to hazardous materials entering the waterways from this site. First, metal contaminants

may be leaching from the slag used as fill and entering the subsurface water. The source of steel used in the process also contained heavy metals and other impurities. During the smelting process, the trace metals became part of the slag.

Second, the Ohio Ferro Alloy plant did not use any air pollution control devices. As a result, the emissions from the boiler went up the chimney and entered the atmosphere. The heavier particles would settle out near the plant and thereby contaminate the soils near the plant. The EPA has classified the emission control dust from iron and steel production as hazardous (Federal Register 1980) under RCRA.

The third factor is the present use of slag from ASARCO, Inc. as ballast in the log sort yard. Under conditions observed in a log sort yard (low pH), the arsenic leaches out of the slag and enters the storm water runoff from the site.

As a result of these three factors, this parcel of land is included on the list of target sites.

Contact: Kittrell, Adams, Taft, Kucinski, Fenske, Farmer, Neilson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
24	Murray Pacific	Buffelen Woodworking	3502 Lincoln

A log sort yard is located on this property. Slag from ASARCO, Inc. has been used as ballast.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
25	U.S. Gypsum Co.	Mineral Fiber Producing Co. (1946-1949) Carbide Manufacturing (1943-1946)	2301 Taylor Way

The Carbide Manufacturing Company had a contract with Foss Tug to discharge the waste material from their carbide manufacturing process in Commencement Bay. The operations of the mineral fiber producing company located on this site between 1946 and 1949 were assumed to be similar to the operation of U.S. Gypsum. It is not known where their waste material was deposited. U.S. Gypsum deposited their waste material in landfills located outside of the study area. One of these landfills is located along Hylebos Creek. The raw products used in the operations of U.S. Gypsum are slag and a resin binder. The waste by-products produced at the plant included off-specification mineral fiber insulation and shot (unfiberized slag).

Identification Number	Present Owner/ Lessee	Previous Owners	Address
26**	Buffelen Woodworking		1901 Taylor Way

The Buffelen Woodworking Company was started in 1918 with a sawmill and a door factory. Buffelen began manufacturing plywood in the 1920s for use in the door factory. During World War II, the Buffelen Manufacturing Company began manufacturing plastic-faced overlaid plywood. The plant became cooperatively owned in 1955.

The waste product of prime concern during the last 40 years is the phenol-based glues used in the plywood manufacturing process. (Today "Plyophen," a phenol and formaldehyde-base glue, is used.) The name of the glue used in the 1940s, 1950s, and 1960s is not known.

A widespread practice of plywood industries was to dispose of the glues that collected in the glue sump onto sawdust piles. The sawdust was then used as either hog fuel or landfill material. If the glue-impregnated sawdust was used as landfill material, it may be a contributing source of phenols and formaldehyde entering the waterways.

This plant has its own well; one other well was abandoned. A ground water pump station also pumps to a ditch which goes to Blair Waterway.

It has been noted that phenolic resins and glues were dumped along the banks during the late 1960s.

This parcel of land has been included on the list of target sites.

Contact: Wood; Guizzetti; Larsen; Bannister;
Plywood Pioneers Assoc., 1960

Identification Number	Present Owner/ Lessee	Previous Owners	Address
27	Western Farmers Assoc.	Buffelen Mfg. Co.	1801 Taylor Way

The property was previously owned by Buffelen Mfg. Co. There does not appear to be a problem associated with this site, unless Buffelen used glue-impregnated sawdust as landfill.

In addition, small amounts of malathion are currently used on site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
28**	Joseph Simon & Son	Custom Iron Pacific Marine Industrial Chemical Co.	1601 Taylor Way

Pacific Marine Chemical Co. produced "noxious wastes." The chemical composition and disposal method of the waste materials is not known.

Custom Iron operated a steel fabrication shop on the site prior to Simon & Son. In 1981, Custom Iron sold the property to Joseph Simon & Sons.

As a result of the industrial practices of Custom Iron and Pacific Marine Industrial Chemical Co., this site has been included on the list of target sites.

Contact: Neilson, Custom Iron, Burley

Identification Number	Present Owner/ Lessee	Previous Owners	Address
29	Tacoma City Light Power Plant		1115 Taylor Way

The plant is not in use today. No past history at this site was explored.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
30	Philadelphia Quartz		1202 Taylor Way

Miscellaneous innocuous debris is dumped on site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
31**	Don Oline		

This site is owned by Mr. Don Oline and has been used by many industries as a disposal area (trucked in by Oline) for industrial waste products. The area was swampy and two ponds were located on the site. These ponds were filled in about 8 years ago (the fill material is not known). Hooker Chemical admitted to sludge disposal on this site. Acology Oil, then Puget Sound Industrial Petroleum (now Chempro--see Identification Number 32) may also have disposed of material on this site. In the 1950s, Mutual Fir Column discharged methymercuric phosphate waste from their sump into a shallow bog near their plant. This shallow bog is assumed to be this site. This parcel of land discharges both to Hylebos and Blair Waterways.

It is evident that this site has been used by many industries as an area to discharge industrial wastes. As a result, this parcel of land is included on the list of target sites.

Contact: Guizzetti, Robbinson, Taft, EPA, Neilson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
32**	Chemical Processors, Inc.	Puget Sound Industrial Petroleum Acology Oil Don Oline	1701 Alexander

Chempro has been at this site for 6 years. Plating wastes are produced here.

The waste disposal practices of Acology Oil are not known, although it has been reported that refuse oil (solvents, PCBs) were discharged on site. This parcel of land was included on the list of target sites.

Contact: Robbinson, Springer

Identification Number	Present Owner/ Lessee	Previous Owners	Address
33**	Lilyblad	Don Oline	

Lilyblad recently purchased this property from Don Oline. They are seeking to use the property as a tank farm for petroleum. Recently, an old dump was located on this site. The waste material was gray and located 1-1/2 feet below the surface. The origin or composition of this material is unknown. It may have come from Hooker Chemical, industries located on site 32 prior to Chempro, General Metals, or other industries located in the area during the 1950s, 1960s, or 1970s. This parcel of land was included on the list of target sites.

Contact: Abercrombie, Wood

Identification Number	Present Owner/ Lessee	Previous Owners	Address
34	Vance Lift Truck		3302 E. 11th

Vance Lift Truck has been known to collect waste oil from their equipment into an oil/water separator. The disposal methods are not known.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
35	Fletcher Oil		401 Alexander Avenue Building 331

Petroleum is stored in bulk amounts on this unpaved, unsealed site. There is some speculation that oil may be entering the ground water since many oil spills have occurred at the site.

Identification Number	Present Owner/ Leasee	Previous Owners	Address
36**	Hooker Chemical Company		605 Alexander Avenue

Hooker Chemical Co. began operations of this plant in 1929. This study was unable to gather information on the plant's operations prior to 1948. The following products were produced in 1948: sodium hydroxide, 110 tons per day (tpd); chlorine, 90 tpd; hydrogen, 2.7 tpd; muriatic acid, 3 tpd; trichlorethylene and tetrachlorethylene, 22 tpd; and hydrogenated oils, 24 tpd. In addition, the following wastes were produced: brine sludge, 2.5 tpd; caustic soda, 2 tpd; sulfuric acid and weak

hydrochloric acid, 0.75 tpd; calcium chloride, 10 tpd; calcium hydroxide (slurry from acetylene plant), 8 tpd; and miscellaneous wastes (small amounts of muriatic acid, crude oils, and boiler blowdown). These waste products were discharged from the plant into drain pipes or ditches and eventually entered the Hylebos Waterway. The lime slurry from the acetylene plant was deposited in a holding pond where it solidifed and dried. The sludge from the pond was then hauled away to the deep marine water site or land disposal sites. This process continued through the 1960s.

Presently, Hooker Chemical Co. only operates the chlorine production plant; the acetylene plant has been shut down.

During the past few years Hooker has taken the initiative to clean up waste products deposited on land. Hooker has identified five areas in the tideflats where they used to dump waste products. These sites are identified as 36a on Figure 1. Hooker has excavated 2,000 cubic yards of contaminated material on the plant site and replaced it with clean fill material.

This parcel of land and the areas identified as 36a have all been included on the list of target sites.

Contact: Neilson, Springer, Kucinski, Adams, Woodworth

Identification Number	Present Owner/ Lessee	Previous Owners	Address
37**	Zidell Marine Corporation	Zidell Ship Dismantling	401 Alexander Avenue

From the 1940s to the present, this area has been used as a shipyard. The Zidell Marine Corporation is currently located at this site.

Some excavation has taken place on the site during the past year. This excavation has uprooted a lot of debris that was buried. Car

bodies, airplane interiors, asbestos, tanks, and bunker fuel oil were exposed. As a result of all the material that has been buried on the site, the soil is highly suspected of being contaminated.

This parcel of land was included on the revised list of target sites because of the diverse materials that were buried on site.

Contact: Taft, Robbinson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
38	Todd Chemical		401 Alexander Avenue Building 361

Barrels of paint solvents were observed on this site. A thorough investigation of this industry was not done during this study. Actions are currently underway to clean up this site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
39	Sea-Tac Alaska Shipbuilding Corp.	Martinolich Shipbuilding	1112 Alexander Avenue

Today, sandblasting at Sea-Tac Alaska Shipbuilding Corporation is done with granulated slag from ASARCO, Inc. This investigation has not revealed evidence that the shipyard discharges waste materials in the Tacoma tideflat area.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
40	Continental Lime	Domtar Lime	1220 Alexander Avenue

Waste ponds are located on-site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
41	J.A. Jones Construction Co.		2330 Alexander Avenue

In the last 2 years, J.A. Jones Construction Company built a large graving dock. Large amounts of soil (fill material) were removed and deposited at this location and at various other locations in the Tacoma tideflat during this construction. The areas where this material was deposited are designated as Identification Number 41a on Figure 1.

J.A. Jones Construction Company lined the dock walls with crushed slag and the floor with bank-run rock. The slag can come from ASARCO, Inc.

Contact: ENR (September 24, 1981), R. Pierce, Dean, Kucinski, Abercrombie

Identification Number	Present Owner/ Lessee	Previous Owners	Address
42	West Coast Orient		Corner of Alexander Ave. and East-West Road

This is a log sort yard. Slag obtained from ASARCO, Inc. is used as ballast.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
43**	Bonneville Power Authority (BPA)		Port of Tacoma Road

The BPA built an elevated substation on this site in 1942. Prior to construction, this land was tideflat and under water during high tide. Fill was added to raise the level of the land 10-12 feet. Berms were built to keep the tide from washing the area away during construction. The berms still exist in some areas and create ponds during wet weather.

Piles of white material are in evidence in the vicinity of one of these ponds. This material and standing water on the material was tested for pH, sulfates, and carbonates. A slurry of 1:1 white material and water had a pH of 9.2. The water standing on the material had a pH of 12.0. No sulfates or carbonates were present.

The source of this material is not known. It could be from a variety of sources, including Kaiser, which may have dumped sludge from their wet scrubber in a swamp area in the 1950s.

This parcel of land has been included on the list of target sites.

Contact: Sakala, Abercrombie

Identification Number	Present Owner/ Lessee	Previous Owners	Address
44	Buckeye Service Corporation		2425 Port of Tacoma Road

Fuel for the Air Force is unloaded at this site. It is essentially a clean site with no associated waste disposal problem.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
45	Murray Pacific	Stauffer Chemical	2407 Port of Tacoma Road

Murray Pacific operates a log sort yard on this site. Slag from ASARCO, Inc. is used as ballast. Therefore, problems arising from arsenic leaching from the slag can be associated with this site.

In 1966 piles of material were observed on this site. The composition of the material is not known. Stauffer Chemical owned the property prior to Murray Pacific, but they did not utilize the area.

The present site was elevated by fill from Blair Waterway dredging.

Contact: Grosz, EPA

Identification Number	Present Owner/ Lessee	Previous Owners	Address
46**	Reichhold Chemical, Inc.		2340 Taylor Way

The plant located in the tideflat area in the late 1950s. During the 1960s and 1970s, Reichhold Chemical, Inc. manufacured resins, formaldehyde, pentachlorophenol, and phenols. Standard practice at this time was to pass the waste effluent from the acid neutralizing to the resin waste ponds. This would help to precipitate the resins and lower the concentration of phenols in the effluent. When the waste ponds filled with sediment, they were dredged and the spoils were stored on site. Piles of activated carbon saturated with phenols were also deposited in their dump area during the 1960s. The fate of the disposal site is unknown, because the representative from Reichhold Chemical, Inc. would not respond to questions. It is assumed that the majority of the spills were not cleaned up and that the dredge spoils are still on their property. Pentachlorophenol spills have occurred, and it was

also reported that a fine dust containing sodium pentachlorophenol was dispersed on site.

This information indicates that the soils around the Reichold Chemical plant may be contaminated with hazardous compounds (phenols, resins, and pentachlorophenol). As a result, this parcel of land was included on the list of target sites.

Contact: Robbinson, Springer, Manlove, Neilson, EPA, Walker

Identification Number	Present Owner/ Lessee	Previous Owners	Address
47**	Stauffer Chemical Co.	Rainier Steel	2545 Lincoln

Rainier Steel was located at this site until 1950. They smelted scrap iron and steel. The details of their operation are not known. In 1950, Stauffer Chemical Co. bought the land and began producing a fertilizer, "Superphosphate." Liquid aluminum sulphate was added to their production line in 1953. Today, they produce one product--aluminum sulphate.

There are three waste ponds on site. They were all dredged in 1973 and the spoils are stored on their site. Seepage from the site has been observed entering Blair Waterway by the DOE investigators.

This parcel of land has been included on the list of target sites as a result of the ponds and seeping materials.

Contact: Robbinson, Wood, Grosz

Identification Number	Present Owner/ Lessee	Previous Owners	Address
48**	U.S. Oil and Refining Co.		3001 E. Marshall Street

U.S. Oil and Refining Co. began their crude oil refining operations in the Tacoma tideflats site in 1957. The company's main products are gasoline and jet fuel. Many factors contribute to the status of this site. First, the western portion of their property is sitting on the old City of Tacoma dump (Identification Number. 63). Second, the visual evidence indicates that U.S. Oil and Refining used the northeast section of the property as a dump. The area is littered with 55-gallon drums and other waste objects. Third, the problem associated with tank bottoms and filter cake (see Sound Oil, Identification Number 3) would also pose a problem for U.S. Oil and Refining. This parcel of land was included on the list of target sites.

Contact: Cabodi, Woodworth, Fenske

Identification Number	Present Owner/ Lessee	Previous Owners	Address
49**	Lilyblad		2244 Port of Tacoma Road

Lilyblad recycles and reclaims solvents at this site. Presently, Lilyblad is under a DOE order for the illegal discharge and operation of an unpermitted solvents plant. Spills have occurred on site and they discharge to Blair Waterway via the Lincoln Ditch. This site was included on the list of target sites.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
50	Concrete Technology		1123 Port of Tacoma Road

Concrete Technology manufactures prestressed concrete beams. A large dry dock is on site which has a dewatering system.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
51	Fairliner Boat		2558 E. 11th Street

The site is currently used for boat building. A wide variety of chemicals are used in the process.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
52**	Port Terminal Cargo Van	Peterman Mfg. Harbor Lumber Co. Birchfield Boiler	Terminal 4 (2504 East 11th Street)

Little information was obtained about the business located on this site prior to the Port Terminal Cargo Van operations. Peterman Manufacturers produced plywood, using a steam process. The Birchfield Boiler Company was a steel manufacturer and produced boilers. These industries shut down during the late 1950s and early 1960s.

Since the Birchfield Boiler Company was operating without air pollution control devices, the emissions from their stack would disperse and settle. Particles would reach the ground and permeate the soils.

As a result, this parcel of land has been included on the list of target sites.

Contact: Adams, Brackett

Identification Number	Present Owner/ Lessee	Previous Owners	Address
53	Washington Stevedoring Co.		Terminal 4

No problem with waste disposal has been associated with this site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
54	United Grain		Port of Tacoma Road

United Grain uses a malathion spray on their grain.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
55**	Pacific Northwest Terminal		Port of Tacoma Road

The tallow rendering plant receives igypol (detergent) by ship and then sells it to the pulp mills. Many spills of this material have occurred while unloading it from the ships. Most of the spilled material was washed into the waterways. This parcel of land was included on the list of target sites.

Contact: Robbinson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
56	Port of Tacoma Bauxite Alumina Shipping		Port of Tacoma Road

When material leaks to the ground it is flushed into the waterways using fire hoses.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
57	Port of Tacoma Cargo Vans	Cascade Pole Co.	Port of Tacoma Road

Cascade Pole began operations in the tideflat area in 1936. Their first plant was located at this site.

During the 1960s, Cascade Pole Co. disposed of oil and sludges (low and high pH) on land. Copper salts, arsenic salts, creosote, and pentachlorophenol were the main materials used in the wood treating process and were most likely components of the sludge. It was reported that the bank was covered with a heavy black oil and creosote. This area was not paved during their operations. As a result, these compounds permeated the soil.

In 1974, Cascade Pole Co. moved to a new site along the Puyallup River. The Port of Tacoma bought the property and it is now used as a container storage area. The area is now paved, but contaminants may still be entering the waterways via seepage. This parcel of land was included on the list of target sites.

Contact: Kucinski, Cascade Pole, Neilson, Springer

Identification Number	Present Owner/ Lessee	Previous Owners	Address
58	Barthel Chemical Co.		2334 E. 11th

Barthel Chemical Co. was reported to have discharged acetone on this site prior to DOE action.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
59	Rheem Mfg. Co.		1702 Port of Tacoma Road

During the last 10 years paint wastes may have been discharged to the storm drain.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
60	Woodlam, Inc.		1476 Thorne Road

Woodlam manufactures laminated products. Phenol glues were once dumped out the back door of this facility. This site has not been included on the list of target sites due to a general lack of information concerning their operational procedures.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
61**	Georgia Pacific	Pacific Resins and Chemicals Hercules Chemical	1754 Thorne Road

Hercules Chemical, a producer of phenolformaldehyde resins and urea formaldehyde resins began operations in 1961. In 1970, Pacific Resins and Chemicals purchased the company from Hercules Chemical. The plant operations did not change when the ownership was transferred. About 6 months ago Georgia Pacific purchased the company.

There is evidence that leaching from the ponds does occur. The leachate contains phenolic wastes. Core samples revealed this compound 5 feet below the pond bottom. Georgia Pacific has not used the pond.

As a result of the resins leaching from the ponds, this parcel of land has been included on the list of target sites.

Contact: Robbinson, Yoshamaka, McMann

Identification Number	Present Owner/ Lessee	Previous Owners	Address
62	Purex Corporation		2001 Thorne Road

Before the sewer system was installed in the area, the drainage from the Purex plant probably went to the ditch system. The discharge waste contains a high concentration of chlorine.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
63**	Port of Tacoma	City of Tacoma Solid Waste Dump	

The City of Tacoma operated a solid waste dump on this site from the 1940s through the mid 1960s. Details of the dump's operation are sketchy. During the 1940s, the active portion of the dump was located along the Puyallup River. Every evening the material deposited was burned. All metal materials were salvaged and recycled.

As the area filled with solid waste, the active site gradually moved north and east toward the intersection of Marshall Avenue and Milwaukee Way. Fill material was needed in this area so burning was terminated. The land fill extends to the western portion of U.S. Oil and includes the fire training station. The solid waste extends down 8-10 feet in this area.

No charge was assessed when material was disposed of at this site. Most of the material deposited came from the households in Tacoma. Since no charge was assessed, it is assumed that industries also deposited materials here. It is known that Hooker Chemical disposed of material near the intersection of Milwaukee Way and Marshall Avenue.

The City of Tacoma officially closed the dump in the 1960s and moved to their present site (3510 S. Mullen). Aerial photographs from an EPA study show that the area was used as a dumping area even though the city was no longer maintaining the site.

This area was included on the list of target sites.

Contact: Kucinski, Adams, Taft, EPA, Larsen, Hickson, Laurson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
64	S.V. Chemical (Chem West)	Universal Industries, Inc.	1918 Milwaukee Road

In 1980, Chem West purchased S.V. Chemical from Universal Industries, Inc. and retained the tradename S.V. Chemicals.

S.V. Chemicals originally moved to this site in the late 1960s. They manufacture soaps, detergents, degreasers, and chemicals for swimming pools.

Three months ago, S.V. Chemicals connected to the city sewer system. All industrial wastes now go to the sewage treatment plant. Prior to this improvement the industrial wastes went to the ditches (Lincoln) and the domestic waste went to a septic tank. This parcel of land was included on the list of target sites.

Contact: S. Peterson, Abercrombie,

Identification Number	Present Owner/ Lessee	Previous Owners	Address
65	Certain-Teed		1718 Thorne Road

There has been some spillage of waste on site. Periodically, materials containing (oil and phenol waste) are hauled away. The location of deposition is not known.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
66	Allied Chemical		1410 Thorne Road

The Allied Chemical plant was built in 1955 and has manufactured one product--aluminum sulfate. The effluent from the process goes to holding ponds. When a pond fills with sediment, it is covered with dirt. Three ponds have been covered, and a fourth pond is in use today. The wastes from this process do not pose an environmental hazard and have been declassified by RCRA. Bioassay tests performed on the solids in the ponds were observed to be nontoxic to rats and fish. Therefore, it was removed from the revised list of target sites.

Contact: Hayden, Robbinson, Fleischer

Identification Number	Present Owner/ Lessee	Previous Owners	Address
67**	Darling Delaware	Johnson Manufacturing	2041 Marc

Darling Delaware is a rendering plant. There are two treatment ponds on site containing organic material. The ponds drain to the sewer. Darling Delaware is on the site of the abandoned City of Tacoma solid waste landfill and, as such, is included on the list of target sites (see Identification Number 63).

Identification Number	Present Owner/ Lessee	Previous Owners	Address
68**	Milwaukee Railyard		1100 Milwaukee Road

During the history of the railyard, many spills of compounds occurred on site, including oil and other compounds transported by rail. Spills were not cleaned up, and the materials were allowed to seep into the ground.

The railroad also cleaned out their rail cars. It was reported that during the late 1950s the material was dumped on site and allowed to disperse into the soil and seep into the waterways. In 1960, the railroad was required to collect copper sulfite and other toxic materials dry and dispose of them on land. Runoff from this site enters the Milwaukee Waterway.

This evaluation of the site indicates that the soils at this site are possibly permeated with toxic compounds. Recently, there has been some grading and the tracks were pulled up. This may have resulted in covering the permeated soils with a thin layer of dirt or exposing the contaminated soils to the environment.

This parcel of land was included on the list of target sites.

Contact: Neilson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
68a**	Beltline Railroad		2801 East-West Road

Beltline uses this site as a switching yard for railroad cars. Beltline has never cleaned out railroad cars at this site. However, frequent spills and leakage up to the present time were reported by DOE. This site was retained on the list of target sites.

Contact: Dean

Identification Number	Present Owner/ Lessee	Previous Owners	Address
69	Federal Meats		Corner of Milwaukee Way and Pacific Highway

Site 69 is the site of an abandoned slaughtering and meat packaging house. It was reported that when Federal Meats was in operation, carcasses and other animal remains were dumped in the Puyallup River and along its banks. Floor and blood wastes were discharged by pipe from the site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
70	Floyds Equipment Co.		2208 Pacific Highway

Floyd Lamkin, owner of this parcel, said they buy equipment from industries (e.g., American Surplus) that are going out of business. Transformers have been included in equipment purchased by Floyds Equipment Company.

Contact: Lamkin

Identification Number	Present Owner/ Lessee	Previous Owners	Address
71	Husky's Truck Stop		1501 33rd St. E.

Spills have occurred at this site due to oil/fuel from trucks as well as fuel transfers.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
72	Wrecking Yard		

The surface drainage from this site enters the Blair Waterway.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
73	International Harvester		2312 Milwaukee Way

Trucks are maintained and steam cleaned on this site. They operate a separator with a drainfield.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
74	Crosby and Overton		2320-1/2 Milwaukee Way

Tanks and bilges are cleaned on-site with some storage on-site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
75**	Vacant Lot		

Woodwaste has been observed on this site, which is also part of the abandoned City of Tacoma solid waste landfill (see Identification Number 63).

Identification Number	Present Owner/ Lessee	Previous Owners	Address
76**	Seco		1614 Lincoln Avenue

Equipment is steam cleaned on this site. Some oil has been observed seeping from the area. This site is located on the abandoned City of Tacoma landfill and, therefore, is included on the list of target sites (see Identification Number 63).

Identification Number	Present Owner/ Lessee	Previous Owners	Address
77	Port of Tacoma		

Slag from ASARCO, Inc. was used as riprap along the banks.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
78	Offices for Port of Tacoma	Aero Jet Tacoma Boat	132 Sitcum

Tacoma Boat Builders were located at this site until their operations were destroyed by a fire. Tacoma Boat then moved to their new site on Marine View Drive (see Identification Number 11).

Aero Jet then moved their operation to the site. When the Port of Tacoma moved its office to this site, the site had been cleaned up and paved.

Contact: Kittrell, Kucinski,

Identification Number	Present Owner/ Lessee	Previous Owners	Address
79**	Milwaukee Railroad		

Many soild and liquid spills have occurred on this area. The content of the spills is not known. Since many of these spills may have involved potentially hazardous chemicals, it has been included on the list of target sites.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
80**	St. Regis	St. Paul Lumber Co.	801 Portland Avenue

The pulp process at this site produces turpentines, green liquor, and solid material. The green liquor is high in sodium sulfides. Algecides are also used in very small amounts in the manufacture of

paper. The method of disposing of these waste materials during the 1940s, 1950s, and 1960s is not known. The material likely was dumped into the waterway or river in some past periods.

Contact: Fenske, Wood

Identification Number	Present Owner/ Lessee	Previous Owners	Address
81**	St. Regis (Sawmill)	St. Paul Lumber Co.	1221 Portland

A debarker and log storage yard are located on this site. The major waste product is sawdust. This waste product may have been used as landfill material in the tideflat area. There is photographic and documentary evidence that St. Regis and its predecessors slowly filled in the basin of the St. Paul Waterway with dredged sand over a boggy bottom, slash, and sawdust. The waterway extends to 11th Street in the 1946 aerial photograph. Today, the waterway is approximately half the size it was in 1946. The precise composition of the fill material is not known. If sawdust from the sawmill used as fill material, it may have been impregnated with glues. It was a common practice to dispose of the glues from the glue sump on the sawdust piles. For these reasons, this parcel of land has been included on the revised list of target sites.

Prior to 1975-76, this mill had a permatox (anti-stain, fungicide) diptank on site.

Contact: Fenske, Wood, Adams

Identification Number	Present Owner/ Lessee	Previous Owners	Address
82	American Plywood Association		Canal Street

This site is used to study the long-term effects of how plywood coated with various paints and preservatives withstand the elements. All of the samples are painted in the laboratory and are transported to this site, where they are mounted and exposed to weather conditions.

Contact: Raymond

Identification Number	Present Owner/ Lessee	Previous Owners	Address
83**	St. Regis Door Plant Woodworth Contractors		733 East 11th Street 1220 East D Street

Glues used in the door manufacture plant are taken to a disposal site. The exact location of this site is not known. The glues from the sump may have been deposited on land prior to being hauled away. Therefore, this parcel of land was included on the list of target sites because of the glues used.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
84	Pacific Fabricators Inc.		747 Middle Waterway

Pacific Fabricators, Inc. constructs pre-fab vacation cabins and modular homes.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
85	Vacant Lot		Middle Waterway

Substantial amounts of wood waste are located on this site.

Contact: Wood

Identification Number	Present Owner/ Lessee	Previous Owners	Address
86	Foss Launch and Tug		225 East F

Foss repairs old barges at this site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
87	Peterson Boats	Foss Tug	223 East F Street

Peterson Boat manufactures/repairs boats on this site. Granulated slag from ASARCO, Inc. is used as sandblasting material and is stored on site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
88**	Puget Sound Plywood		230 East F Street

Puget Sound Plywood stores glues and resins on-site. It is not known where the glue from the glue sump was discharged. It was also reported that phenols were spilled on the ground on this site. This parcel of land was included on the list of target sites.

Contact: Neilson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
89	Superior Oil		250 East D Street

Discharge from the on-site boiler may have been spilled on the ground.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
90	Phillips Oil		
91	Union Oil		516 East D Street
92	Mobile Oil		520 East D Street
93	Shell Oil		
94	Penoco Oil	ARCO	

Fuel storage tanks have been located here since the 1940s. Many fuel spills have occurred on this site. Oil residue resulting from tank cleaning may have been discharge on the site. Pooled oil exists on the water table below the tank farms. Obvious signs of soil contamination are noted by the oil sheen on City Waterway adjacent to these bulk plants.

Contact: Adams

Identification Number	Present Owner/ Lessee	Previous Owners	Address
95	Fick Foundry		435 East 11th Street

Fick Foundry's processes result in the production of many types of slag as by-product. In the past, this slag was deposited along the banks of the City Waterway as fill.

Contact: Adams

Identification Number	Present Owner/ Lessee	Previous Owners	Address
96	Wheeler Osgood Waterway		

Wheeler Osgood Waterway constitutes the receiving water for industries in the area.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
97	Hygrade Foods		1623 East J Street

Hygrade Foods' waste effluent is rich in organic material and was discharged into the Wheeler Osgood Waterway. They use some chemical in their feed. Rodenticides are used on-site; however, the handling practices of the rodenticides is not known. They presently place their liquid wastes to the sewer after running the material through a pretreatment system.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
98**	Joseph Simon & Sons	Not Known	2202 River Road

During the 1940s and 1950s, a coal gasification plant was located on this site. A waste product from the industry was deposited in holding ponds. These ponds are still visible on the property today and may be a source of polyaromatic hydrocarbons (PAHs) into the waterways. This parcel of land has been included on the list of target sites.

Contact: Adams, Taft, Woodworth, EPA

Identification Number	Present Owner/ Lessee	Previous Owners	Address
99**	Standard Oil		East J Street

Numerous oil spills have occurred on this site. The method used to disperse the oil was to dig holes in the sand, facilitating its seepage into underlying soils. As a result of the numerous oil spills and the dispersal method, this parcel of land was included on the list of target sites.

Contact: Adams

Identification Number	Present Owner/ Lessee	Previous Owners	Address
100**	General Metals of Tacoma, Inc.		1919 Portland Avenue

Nonferrous materials from automobiles and railroad cars are stored on this site. This parcel of land was included on the list of target sites.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
101	Sewage Treatment Plant No. 1 (STP1)		

STP1 treats sewage from the Tacoma Central Business District, Nalley Valley, and the Tacoma tideflat area. As a result, STP1 receives substantial industrial wastes. The types of chemicals and the concentration of the chemicals in the wastewater effluent is presented in Table 5. Trace contaminants are present in the sludge, which is dewatered south of the plant and then trucked off-site.

In the past, sewer bypasses have gone into the Lincoln Avenue ditch.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
102	Martinac Shipbuilding Corp.		401 East 15th

Martinac Shipbuilding Corp. manufactures tuna boats. Paint, solvents, and sandblasting material (granulated slag from ASARCO, Inc.) might enter City Waterway from this industry.

TABLE 5

DETECTABLE PRIORITY TOXIC CHEMICALS IN THE WASTEWATER EFFLUENT DURING PERIODS OF WET AND DRY WEATHER FLOWS FOR TACOMA CENTRAL WASTEWATER TREATMENT PLANT (S.T.P. NO. 1)[a]

Constituent	Lower Detection Limit (μg/l)	Sample Concentration Dry Weather Flow (μg/l)	Sample Concentration Wet Weather Flow (μg/l)
Metals			
Arsenic	2.50	6.00	31.00
Cadmium	0.09	0.48	0.63
Chromium	2.00	11.25	8.65
Copper	0.55	22.20	39.80
Lead	0.05	0.83	0.59
Mercury	2.30	ND[b]	4.10
Zinc	5.50	110.00	305.00
Fibers			
Asbestos (Chrysotile)	1.4×10^6 fibers/l	7.2×10^6 fibers/l	
Organic Residues			
Anthracene		0.95	0.38
Azobenzene (from Diphenylhydrazine)		0.04	0.45
BIS (2-Chloroethoxy) methane		0.02	ND
BIS (2-Chloroisopropyl) ether		0.06	2.73
BIS (2-Ethylhexyl) Phthalate		0.92	ND
Chrysene		ND	3.47
Cresol		ND	5.73
Dibenzo (A,H) Anthracene		ND	0.29
1,2-Dichlorobenzene		2.95	14.24
1,3-Dichlorobenzene		0.02	0.44
1,4-Dichlorobenzene		0.74	ND
DI-N-Butylphthalate		1.54	ND
Fluorene		ND	6.88
Hexachlorobenzene		ND	6.95
Hexamethylbenzene		ND	18.40
Napthalene		0.21	ND
N-Nitrosodimethylamine		ND	10.50
N-Nitroso-DI-N-Propylamine		0.05	0.11
Pentachlorophenol		7.30	17.30
Phenanthrene		1.01	1.04
Phenol		ND	4.18
Pyrene		ND	11.81
Percent of Priority I toxic pollutants and pesticides detectable in effluent samples		28	34

(a) Data from: City of Tacoma (1979).
Note--These values are prior to dilution in the Puyallup River. Present EPA criteria for some of these constituents are discussed in Section 4.2.

(b) ND = Not detectable.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
103**	Burlington Northern Railroad. (RR car washing facility)		E. 21st Street

The residue of material washed out of the railroad cars was dredged in piles on the ground. The material was composed of everything transported by railroad cars, including grains, solvents, chemicals, and oil. Many spills and leaks have been reported at this site. The operation at this site was probably similar to the operation at the Milwaukee Railroad car cleaning, Identification Number 68. Therefore, this site was included on the list of target sites.

Contact: Neilson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
104	American Plating Co., Inc.	Puget Sound Plating	2110 East D Street

Both organizations have been under enforcement action by DOE for illegal discharge to the ground and waterways. Leaking barrels of plating waste are stored on site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
105	Dual 96" Storm Drain		Foot of the City Waterway

Storm drainage from the Nalley Valley and the area around I-5 north of 38th Street enters the City Waterway via these drains. Occasionally,

sewage has been observed coming through the pipe, and the effluent has a solvent odor.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
106	Harmon Cabinets		1933 Dock Street

There is no evidence that Harmon Cabinets has disposed waste materials on this site.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
107**	North Pacific Plywood, Inc.		1549 Dock Street

The disposal of glues and wood waste have been associated with this industry since the 1960s. During the 1960s the residual glue in the spreaders was deposited on land, although the exact location of deposition is not known. A common practice was to deposit the waste glue on sawdust piles. North Pacific Plywood, Inc. used the sawdust as hog fuel. They may have simultaneously eliminated the deposits of glue waste in the same manner. This practice of burning hog fuel was eliminated during the 1970s with the advent of air pollution controls. Glue wastes are now recycled as makeup material. Numerous spills have occurred on this site.

North Pacific Plywood, Inc. has been included on the list of target sites.

Contact: Neilson, Robbinson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
108	Scofield Co., Inc.		1543 Dock Street

Scofield Co., Inc. are supposed to recycle truck wash water but the system sometimes overflows.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
109	Consumer Central Heating (closed)		Dock Street

This was the steam generating heat plant for the City of Tacoma. More details need to be sought about this site's history.

Identification Number	Present Owner/ Lessee	Previous Owners	Address
110	Paxport Mills		300 Middle Waterway

Paxport Mills is a sawmill located along the banks of the Middle Waterway.

Contact: Wood

Identification Number	Present Owner/ Lessee	Previous Owners	Address
111**	Vacant Lot		Lincoln between Alexander and Taylor Avenues

The leachate from this site has an associated pH of 13. The leachate appears to originate behind a building on the site, and could be residue from the DuPont Chemical Company, a previous owner of the adjacent site (see Identification Number 116). This vacant parcel of land was included on the list of target sites due to the uncertain nature and origin of this leachate.

Contact: Robbinson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
112**	Vacant Lot		Area between 2116 Taylor Way and 2240 Taylor Way

Waste from U.S. Gypsum was reported to have been deposited on this site. This vacant lot was included on the list of target sites.

Contact: Robbinson

Identification Number	Present Owner/ Lessee	Previous Owners	Address
113**	Puget Sound Trucking	McDonald Crane Company Widing Transportation Everts Transportation	2114 Marshall Avenue

Puget Sound Trucking has been located at this site since 1978. Trucks are stored and maintained on this site.

McDonald Crane Co. was located at this site prior to Puget Sound Trucking. No information was gathered on the operation of McDonald Crane Co.

The Widing Transportation Co. hauled waste from Reichhold Chemical. The destination of this material is not known.

Everts Transportation was located on this site in 1963 prior to Widing Transportation. The company cleaned trucks containing glues, resins, and chemicals on this site. Two settling ponds are located on this site (one was in use while the other was dredged). The location of where the dredge spoils were deposited is not known. Both ponds were built on the site of the abandoned City of Tacoma landfill. The soil is very porous underneath the ponds.

The industries located on this site, particularly the Everts Transportation Co., saturated the soils with chemicals. The operations of Widing Transportation are not known, but they may have also deposited waste material on this site.

The chemicals that permeated the soils may be leaching into the subsurface ground water and into the waterways. As a result, this parcel of land was included on the list of target sites.

Contact: Robbinson, Neilson, Kewing, Manlove

Identification Number	Present Owner/ Lessee	Previous Owners	Address
114**	Brazier Lumber	Architectural Woods, Inc. Chemical Process Co. (late 1950s, early 1960s) Tacoma Powdered Metals (1950s) Schaffer Box and Pulp (1924-1932)	1501 Taylor Avenue

Today, the property is owned by Brazier Lumber and is used as a log sort yard. During the 1960s, Architectural Woods, Inc. and Chemical Processors leased the property from Eisenhower, Hunter, and Ramesdale.

Architectural Woods used the site as a warehouse. The waste from Chemical Process Co. went to a septic tank.

During the late 1940s and early 1950s, Tacoma Powdered Metals was located at this site. Their operational processes are not fully known, but they did produce powdered iron.

Prior to Tacoma Powdered Metals, Schaffer Box and Pulp was located on this site. Their black liquor from the sulfide process entered the Hylebos Waterway. This industry was a prime contributor to the contamination of the Hylebos Waterway during the early 1930s (see page 1 of this report).

This site was included on the list of target sites due to the diverse industries represented and the uncertain nature of their operations.

Contact: Robbinson, Adams, Taft, Brackett

Identification Number	Present Owner/ Lessee	Previous Owners	Address
115**	Lindal Cedar Homes, Inc.	Mutual Fir Column Co.	2000 Taylor Avenue

Lindal Cedar Homes, Inc. manufactures precut homes, cabins, commercial buildings, churches, motel units, and apartments. Lindal Cedar Homes moved to this site in 1970 or 1971.

Mutual Fir Column Co. was located on this site prior to Lindal Cedar homes. The waste by-products from this operation were collected in a sump and then pumped into a relatively large shallow bog. The area around the plant, particularly to the north and west, was a bog. In the late 1960s and 1970s the area was filled in. One of the waste by-products that was deposited in the lowland bogs was methymercuric phosphate. This parcel of land was included on the list of target sites.

Contact: Neilson, Brackett, Taft

Identification Number	Present Owner/ Lessee	Previous Owners	Address
116**	Superlon Plastics Co., Inc.	Justus Cedar Homes DuPont Chemical Co. Lattimer-Goodwin Chemical	2116 Taylor Avenue

Superlon Plastics Co., Inc. located on this site in 1967. Justus Cedar Homes was located on this site prior to Superlon, and DuPont Chemical was located on the site prior to Justus Cedar Homes. Very little information is known about the operations of the companies located on this site. It is assumed that DuPont Chemical Co. and Lattimer-Goodwin dumped their effluent into drainage ditches. This appears to have been the standard practice for industries located in the tideflat during the 1940s, 1950s, and 1960s. This parcel of land was included on the list of target sites.

Contact: Adams, Superlon

Identification Number	Present Owner/ Lessee	Previous Owners	Address
117**		Acme Foundry	2240 Taylor Avenue

In the late 1960s, this property went into receivership. Prior to this time, Acme Foundry was located on this site.

Presently a staining company has a month-to-month lease for the property. Acme Foundry produced steel, iron, and aluminum. Since some wastes from the steel and iron industries have been classified as hazardous by RCRA, this parcel of land has been included on the list of target sites.

Contact: Brackett, Evans

DISCUSSION

Analyzing the history of industries in the tideflat area and the nature of their contribution of contaminants to the environment was a difficult task. This may be attributed to many factors. First, industries do not appear to retain records on operations and associated procedures for more than 5 years. Second, management personnel at the larger companies often are assigned to the local office for a relatively short period of time. When they depart, they take with them the knowledge of the plant's operations. Third, the ownership of many properties change often. The present owners often have little (if any) knowledge of the operations processes, or waste disposal procedures associated with the previous tenant industries.

As a result of these three factors it was very difficult for the industries to verify information obtained from other sources; i.e., public agencies or private individuals. However, a substantial amount of information was obtained despite these restrictions, permitting the identification of target sites (Table 4).

Other sources adversely affecting the water quality in the waterways have not been addressed under the discussion of the 117 sites. These include: (1) where dredge spoils were deposited on land, (2) drainage ditches in the tideflats, (3) vacant parcels of land, (4) the Delin Street Railroad Tunnel, (5) drainage into the Hylebos Creek in Milton, (6) storm drainage from the Nalley Valley, (7) the City of Puyallup's abandoned landfill along the Puyallup River, and (8) areas where slag from ASARCO, Inc. has been deposited. These are discussed in detail below.

Information obtained during this investigation indicates that the water quality of the Hylebos Waterway began to deteriorate during the 1930s. During this period, chemicals dumped into the waterways ultimately settled to the bottom and became bound in the sediments. When the Hylebos Waterway was dredged in 1931, 1934, 1939, 1952, and 1958, the contaminated sediments were deposited on land and used as

fill material. Figure 2 shows the areas where the dredge spoils were deposited (Bob Perry, personal communication). This dredge material most likely contained waste from industries such as Hooker Chemical, Kaiser Aluminum, and Schaffer Box.

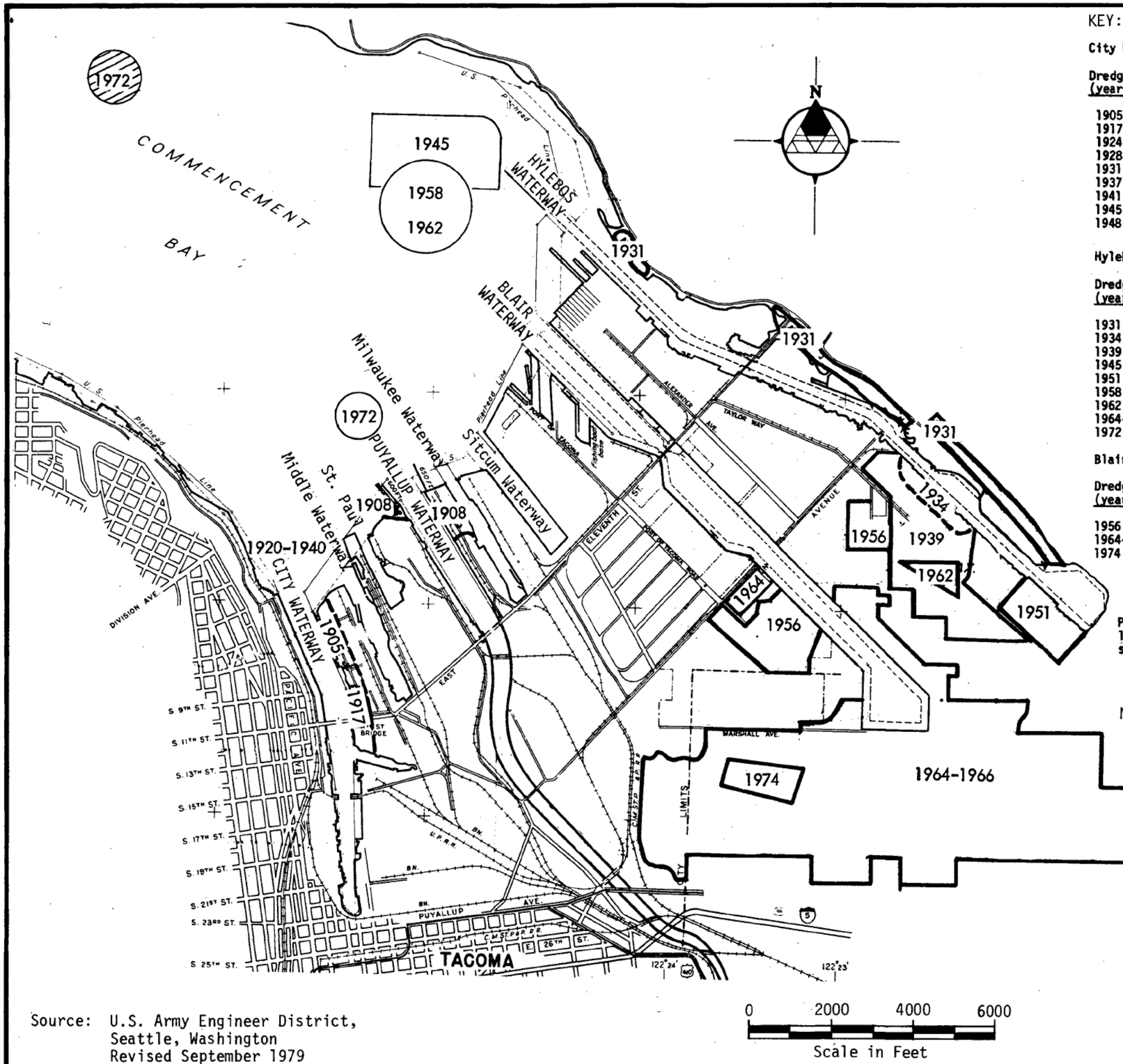
Until sewers were installed in the tideflats in the mid-1970s, most of the liquid waste discharged from an industry entered septic tanks or drainage ditches. Flows in the ditch eventually drained into the industrial waterways. Stormwater runoff through the ditches continue to convey contaminants leached from the bottom materials to the waterways.

The Union Pacific Railroad began building the Delin Street railroad tunnel prior to 1910. It was to form a link between the Nalley Valley and the intersection of Pacific Avenue and 15th Street. For reasons that are not clear (perhaps flooding in the tunnel), the partially finished tunnel was abandoned in 1910. The tunnel was filled with railroad ties and lumber and sealed. The area has settled and cave-ins may have occurred, providing some access to the tunnel (Murray Morgan, personal communcation and Will Abercrombie, personal communication). An EPA survey is currently underway to check rumors of illegal dumping into this tunnel area.

Waste material from U.S. Gypsum, General Metals, and wood waste from various wood industries were deposited along the banks of the Hylebos Creek in Milton in the early 1970s (Stan Springer, personal communication). Chemicals have since been leaching from the buried material and seeping into the creek.

Drainage from the Nalley Valley and runoff from Interstate 5 enters the City Waterway via the dual 96-inch drain pipes located at the landward end of the waterway (see the discussion of Site No. 105 above). This drainage conveys process chemicals and waste product to the marine environment of Commencement Bay.

The City of Puyallup operated a solid waste landfill located along the Puyallup River. Mr. Dean Wood (personal communication) suspected that industrial wastes may have been deposited at this site.



KEY:

City Waterway

Dredged (year)	Quantity (cubic yards)
1905	1,156,000
1917	36,000
1924	87,000
1928	12,000
1931	84,000
1937	72,000
1941	119,000
1945	36,000
1948	119,000

Hylebos Waterway

Dredged (year)	Quantity (cubic yards)
1931	645,000
1934	102,000
1939 (deepened & lengthened)	761,000
1945	46,000
1951	167,000
1958	17,000
1962 (widened)	376,000
1964-66 (lengthened)	1,778,000
1972	109,000

Blair Waterway

Dredged (year)	Quantity (cubic yards)
1956	662,000
1964-66 (enlarged)	6,207,000
1974	453,000 (included 3 ft advance maintenance)

Puyallup Waterway was dredged once in 1908 to 1910. Volume dredged was 1,811,600 cubic yards. Disposal is indicated on the map. Due to rapid shoaling of the river, the project was abandoned uncompleted.

Note: 1974

Indicates approximate Fill Boundary and year filled.

Tacoma Harbor Dredge Spoil Disposal Sites

0 2000 4000 6000

Scale in Feet

Source: U.S. Army Engineer District, Seattle, Washington Revised September 1979

Dames & Moore

Figure 2

Contaminants (arsenic and other metals) enter the water via leaching from ASARCO slag used for fill at numerous locations. One source of the arsenic leachate is from the log sort yards along several waterways. The acidic freshwater environment accelerates the arsenic leaching from the slag. Arsenic has been measured in concentrations (soluble and insoluble) as high as 100 mg/l in seep water near the log sort yards (Jim Hileman and Neil Thompson, personal communication). Even higher values have been measured entering the Blair Waterway from Murray Pacific yard. The areas that use slag from ASARCO, Inc. as ballast, riprap, or sand-blasting material are illustrated in Figure 1. Another source is fallout from air discharges from ASARCO.

This study has attempted to identify areas where waste materials were deposited during the last 40 years. However, the general lack of specific data on the industrial processes and disposal techniques utilized at various sites permits only conjecture and speculation on the nature and extent of localized contamination and associated transport via runoff and ground water flow.

Further research is required to accurately determine what chemicals and what concentration of chemicals are located on given sites and the extent to which they have absorbed into or been attenuated within the soil. For example, soil core and water samples should be taken and analyzed either systematically (i.e., grid-system), or randomly for a wide variety of chemicals. Where specific past practices and site activities indicate probable contaminants, it may be possible to trace identified constituents to likely sources. A well-designed sampling program should reveal what compounds are in the soil, as well as the extent to which they have permeated the soil and have been transported.

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APPENDIX A

ADDITIONAL CONTACTS

(b) (6)	Worked with Tacoma Chamber of Commerce (b) (6)	(M. Morgan)
	(b) (6)	(M. Morgan)
(b) (6)	Worked at Buffelen and knows the area (b) (6)	(J. Woodworth)
Jerry Harper	Now at Weyerhaeuser	(R. Robbinson)
Ron Lee	Permits section at EPA	(R. Robbinson)
(b) (6)	(b) (6)	(R. Robbinson)
Joe Beard	Cascade Pole	(S. Springer)
(b) (6)	Was an inspector for DOE (b) (6)	(F. Fenske)
Bob Lynch	Manager at St. Regis	(F. Fenske)
Jim Fredriksen	Burlington Northern	
(b) (6)	Plant Manager of Stauffer Chemical when opened. Now in Salt Lake City, Utah	(J. Grosz)
(b) (6)	Retired Office Manager with Stauffer Chemical	(J. Grosz)
(b) (6)	Worked in area (b) (6)	(P. Williams)
(b) (6)	Contractors	(M. Farmer)
	Retired Shipping Supervisor at Ohio-Ferro Alloy	(M. Farmer)
	Retired Assistant Supervisor at Ohio-Ferro Alloy	(M. Farmer)
Neil Padur	Safety Inspector for City of Tacoma	(S. Peterson)
Henry Foss	Owner of Foss Tug	(B. Larsen)
Murray Disposal		(S. Springer)
(b) (6)		(S. Springer)

George Unger	Pierce County Health Department	(Laurson)
(b) (6)	Worked with Port of Tacoma, Now with Port of Los Angeles	(G. Kucinski)
Bill Fjetland	Owner of B & L Trucking	(D. Pierce)
(b) (6)	(b) (6)	(W. Adams and Tahoma Audubon Society)
Bob Wallar	Puyallup Indian Nation	
Wayne Garrett	Works at Kaiser Aluminum	(D. Sakala)
	Real Estate Brokers that handle industrial properties in the Tacoma tideflat area	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WA 98101

TARGET SHEET

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Site Name: CBNSF

POSSIBLE WASTE DISPOSAL SITES

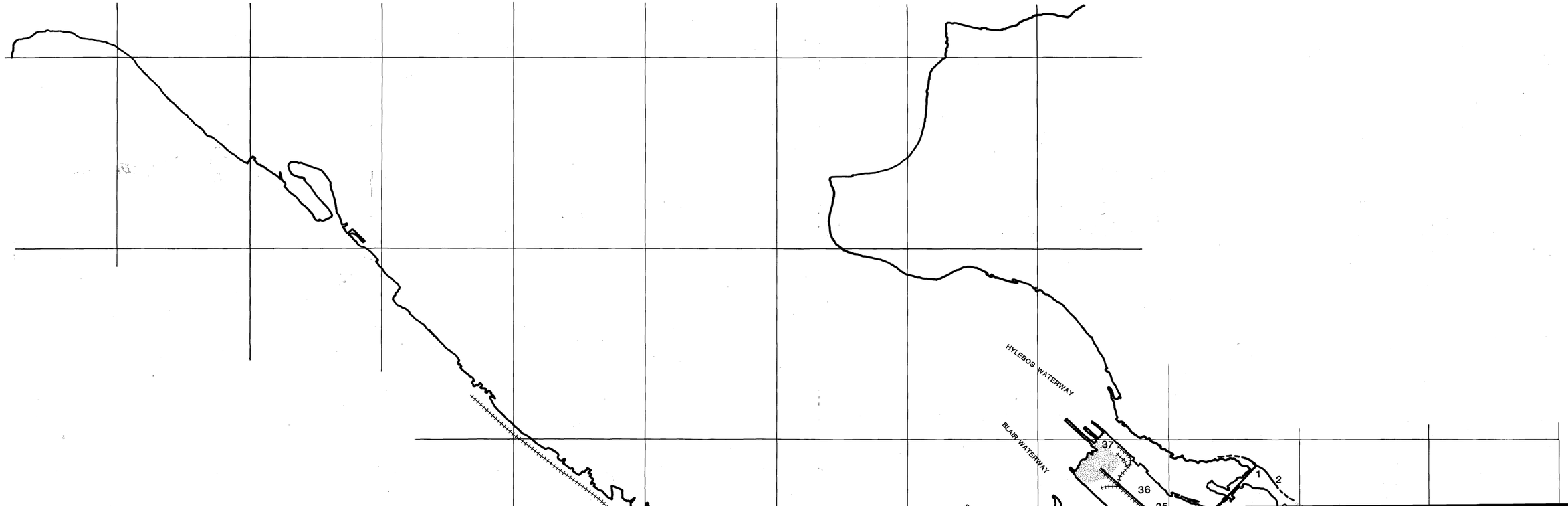
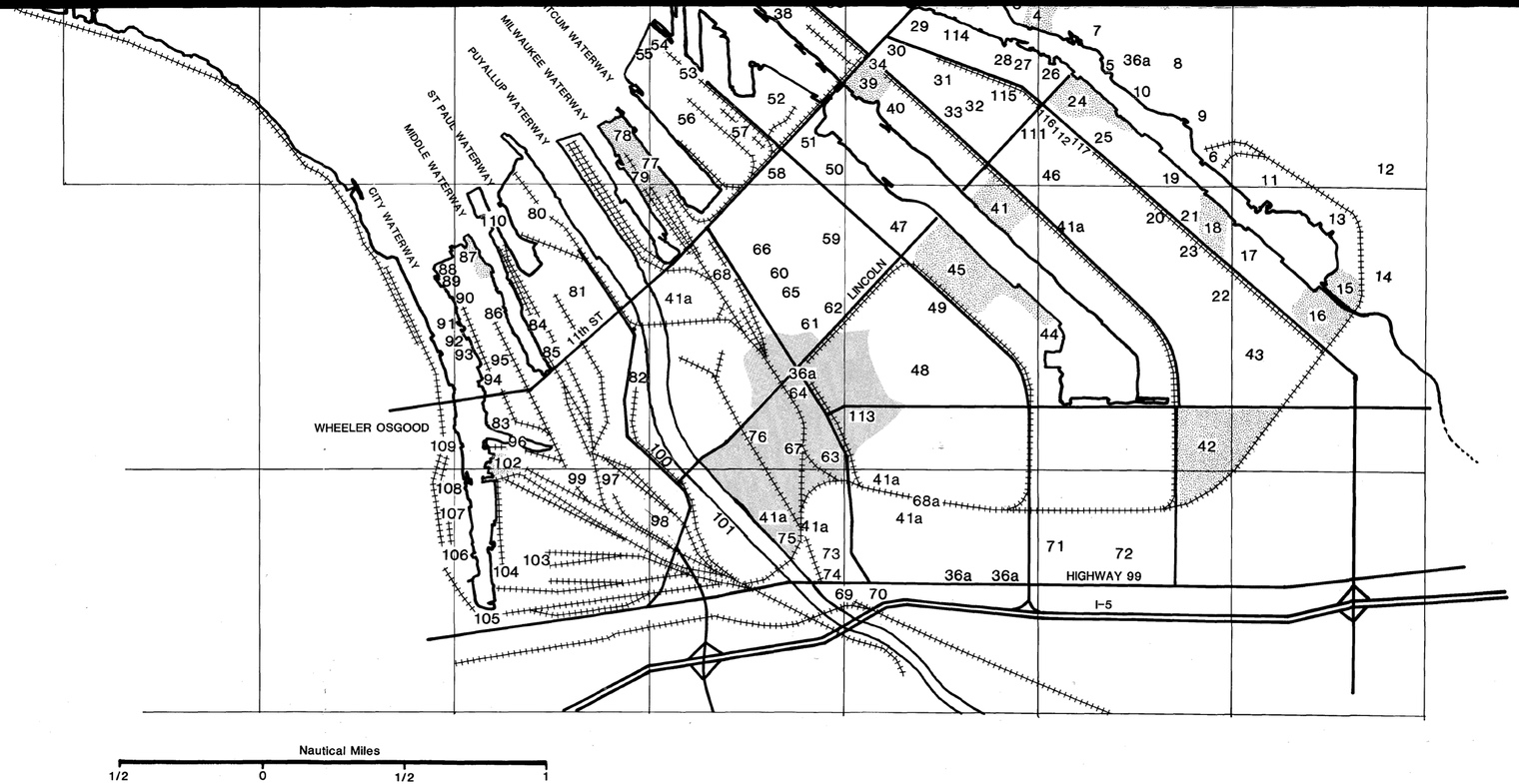

HYLEBOS WATERWAY
BLAIR WATERWAY
37
36
1
2

Figure 1

AREAS IDENTIFIED AS POSSIBLE WASTE DISPOSAL SITES IN THE TACOMA TIDEFLATS

KEY:

Slag from ASARCO, Inc.

Abandoned City of Tacoma Landfill