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INTERIM STATUS CLOSURE PLAN
Western Blower Property

Northwest EnviroService Inc.
1700 Airport Way South Facility
Seattle, Washington

FILE COPY

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1.0 Introduction

This interim status closure plan has been prepared to describe the activities that will be undertaken to close the Resource Conservation and Recovery Act (RCRA) interim status hazardous waste management units at the Northwest EnviroService (NWES) treatment and storage facility, located at 1700 Airport Way South in Seattle, Washington (Figure 1). The site occupies 1.3 acres and is bordered by South Atlantic Street to the north, South Holgate Street to the south, Interstate I-5 to the east, and Airport Way South to the west. The NWES facility's EPA and Washington State Department of Ecology (Ecology) Identification Number is WAD 058367152.

In particular, this closure plan addresses the closure of that portion of the NWES facility referred to as the Western Blower Property. This property comprises approximately 1/3 of the total NWES facility.

The NWES facility provided treatment of industrial, commercial, and residential wastes for the Pacific Northwest, Alaska, and the Western United States. Three major categories of wastes were treated at the NWES facility: 1)Wastewater, 2) Used oil and oily wastes, and 3) Hazardous wastes (including corrosives, solvents, caustics, stabilized solids with metals and organic constituents from wastewater sludges and paint and related wastes, antifreeze, and other wastes including pesticides).

1.1 RCRA Interim Status Units Closure

The NWES facility (facility) is arranged into 12 management and operational areas as shown in Figure 2. The Western Blower Property does not contain any RCRA regulated units but it does contain operational areas which are ancillary to the operation of RCRA regulated units on the adjacent parcel of the NWES facility. The Western Blower Property encompasses a container load/unload area, administrative warehouse buildings, and a dangerous waste exempt recycling area.

The management and operational areas associated with the Western Blower Property are described below:

- **Area 11 - Solids Energy Recovery Program Area**. This area does not contain any RCRA interim status units. It formerly was the location of the dangerous waste exempt recycling area for paint wastes. Figure 2 shows the location and layout of Area 11.
- **Area 12 - Administration Building and Stores Building**. This area is used for receiving containerized wastes from transporters. The location and layout of Area 12 are shown on Figure 2.

The entire facility is paved with concrete or asphalt. A network of sumps provide secondary containment to all NWES interim status units. These sumps drain to the facility's wastewater treatment system. These sumps are designed to prevent releases to the environment and have

106099.03.ZZ • Site Vicinity Map • 9/23/96 • DK

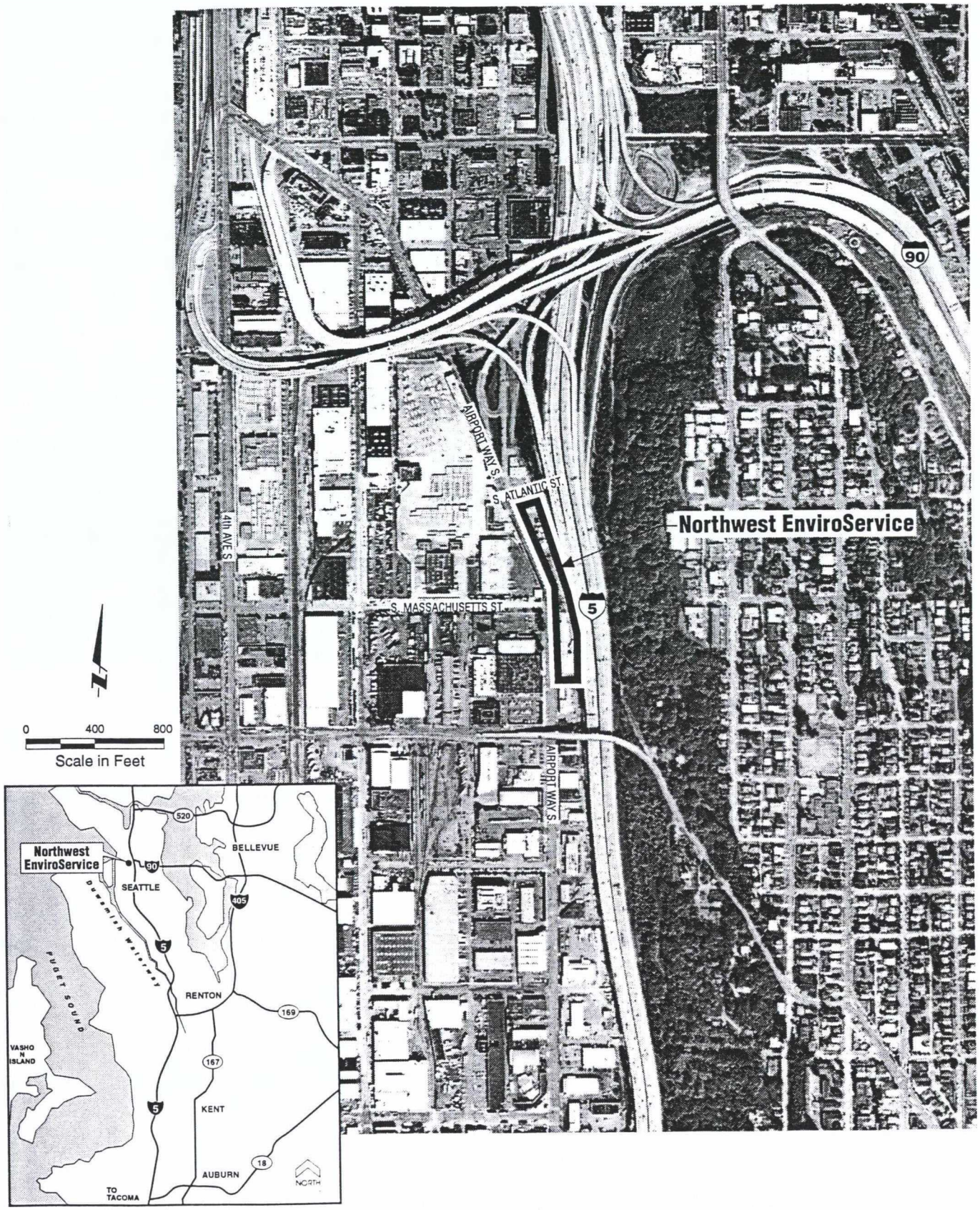

Figure 1

Location of Northwest EnviroService Treatment and Storage Facility

106099.03 1-2 Operation Area / gfa /9-13-96

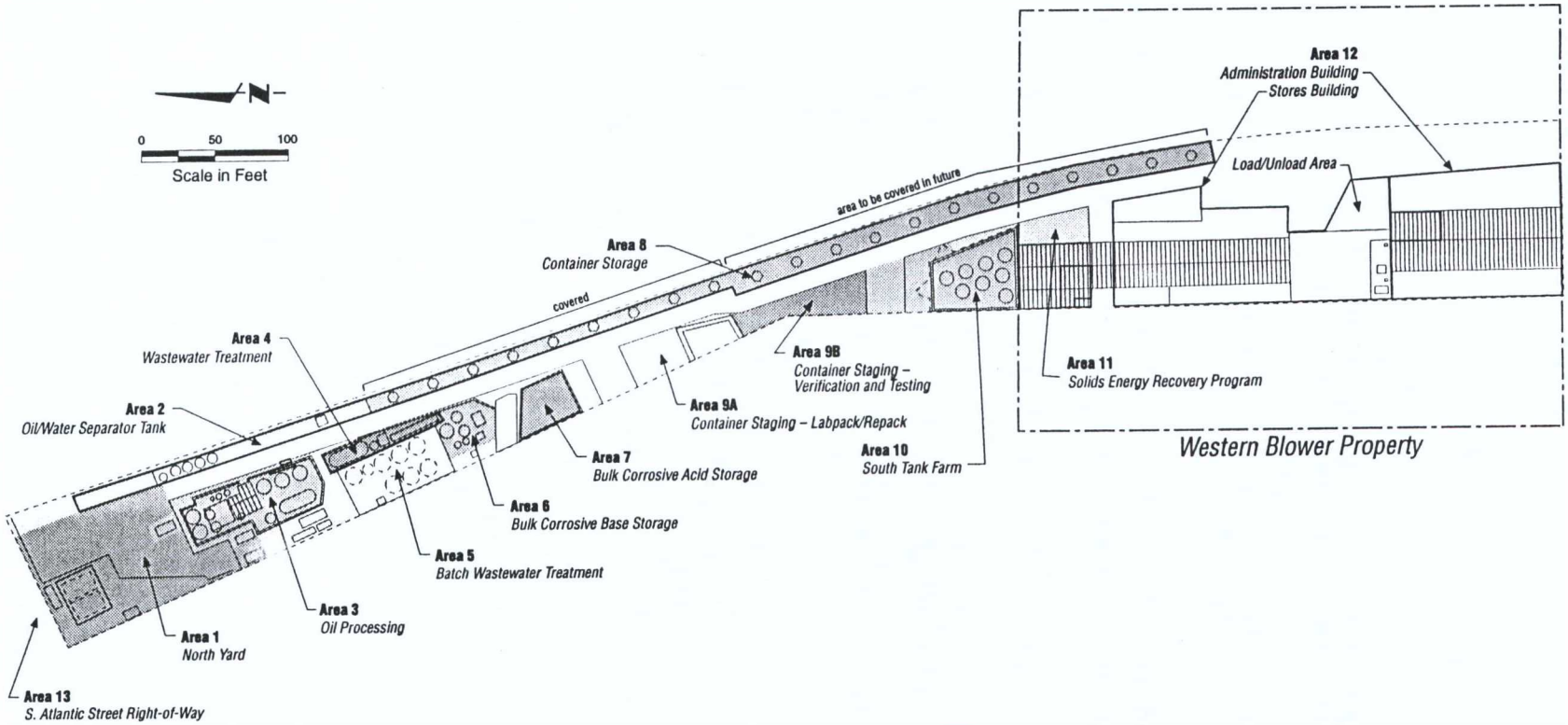

Figure 2
Facility Operational Areas

secondary containment features that meet the requirements of WAC 173-303-640-(4)(b) through (f). The facility is fenced and staffed over two shifts, which extend from 6 a.m. to 2 a.m. During the 4 hours that the facility is not staffed, it is monitored by a security guard.

1.2 General Closure Schedule and Activities

The NWES Western Blower Property will undergo final RCRA interim status closure in 1995. The facility property will be converted to nonhazardous waste operations. Most equipment and structures will remain on the property. Closure activities will begin within 45 days of the last receipt of hazardous waste in accordance with WAC 173-303-400 and 40 CFR 265.113.

NWES intends to clean close the ancillary areas in Areas 11 and 12. For units undergoing clean closure, no hazardous wastes or constituents will remain in or about the regulated units at completion. This interim status closure plan contains information necessary to undertake clean closure, including methods that will be used to:

- Remove waste inventory
- Decontaminate regulated units and related equipment
- Dispose of contaminated materials
- Perform the necessary sampling to certify completion of the closure process

The closure performance standards and decontamination activities described in this closure plan are intended to apply only to wastes subject to the requirements of WAC 173-303 and 40 CFR 265. Closure activities for Toxic Substances Control Act (TSCA) wastes subject to 40 CFR 761 have been completed per an approved TSCA closure plan. Certification of TSCA closure was submitted in February 1996 to U.S. Environmental Protection Agency (EPA) Region 10 TSCA branch representatives.

Closure activities will be monitored by an independent registered professional engineer (P.E.) to certify that, in his or her professional judgment, closure was accomplished in accordance with the specifications or standards presented in the approved closure plan. The independent P.E.'s certification will be submitted to all applicable regulatory agencies as part of NWES's certification of closure, in accordance with WAC 173-303-400 and 40 CFR 265.115. Documentation supporting the engineer's certification will be maintained at the NWES facility until NWES has been released from its financial assurance requirements for closure.

1.3 Amendment of the Closure Plan

If changes become necessary, this closure plan will be amended according to the requirements of WAC 173-303-400 and 40 CFR 265.112. NWES must submit a request for an amended closure plan under the following conditions:

- Changes that will affect the closure plan are made in operating plans, the regulated units, or facility design.

- The expected year of closure is changed.
- Unexpected events that affect the closure plan occur during closure.

Copies of this closure plan and any amendments to it will be maintained at the NWES offices at 54 South Dawson St., Seattle, WA 98108, until closure is completed and NWES is released from its financial assurance obligations.

2.0 Maximum Waste Inventory

The hazardous waste management units to be closed are listed by area in Table 1. Table 1 also summarizes the unit dimensions, maximum storage capacity, and type of material handled. The capacities of the sumps and tanks that are not subject to RCRA regulation are not included in the maximum waste inventory.

Table 1
Hazardous Waste Management Unit Descriptions

Area	Unit Description	Dimensions [a]	Construction Material	Maximum Capacity (gal)	Type of Waste Handled
11	No units	N/A	N/A	N/A	N/A
12	Container load/ unload area	W = 35' L = 45'	Concrete	80 55-gallon drums, 4,400 gallons total[b]	Containerized wastes

[a] H=height; W=width; L=length; t=thickness; D=diameter.

[b] Containers may include a combination of other DOT-approved containers in addition to 55-gallon drums. However, the maximum volume will not exceed 4,400 gallons.

3.0 Closure Performance Standards

3.1 General Performance Standards

Clean Closure Standards

Clean closure of the dangerous waste ancillary areas on the Western Blower Property is designed to:

- Eliminate, minimize, or control, to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous waste constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or atmosphere
- Minimize the need for further maintenance and post-closure care
- Return the land to the appearance and use of surrounding land areas to the degree possible, given the nature of facility operations and considering plans for future land use at the time of closure

In general, these goals will be accomplished by removing dangerous waste containers, decontaminating tanks, containers and bases containing or contaminated with dangerous wastes or dangerous waste residues from the NWES facility.

3.2 Specific Performance Standards

Clean Closure Standards

Upon completion of the clean closure, there will be no hazardous waste residues remaining in the units. Closure includes:

- Comparing analytical results from the concrete and soil samples to the approved cleanup levels. The levels of dangerous wastes or dangerous waste constituents or residues will not exceed health-based Method B soil cleanup limits as established by the Model Toxics Control Act Cleanup Regulations (MTCA) (WAC 173-340) and as adopted by the Dangerous Waste Regulations (WAC 173-303-610(3)). If health-based limits do not exist or there is insufficient toxicity data to calculate a health-based limit, the background level or the PQL (whichever is greater) will be used as the constituent-specific performance standard. In either case after comparison is made to the numerical standard, the significance of any exceedances will be reviewed based on chemical type.

NWES has been directed by Ecology to analyze closure samples for the 222 constituents listed in 40 CFR 264 Appendix IX in order to demonstrate a clean closure. To establish performance standards consistent with the Dangerous Waste Regulations, Table 2 lists all the Appendix IX compounds. Table 2 also notes which compounds have corresponding MTCA Method B soil

cleanup levels that can be calculated and those Appendix IX compounds for which a corresponding MTCA Method B soil cleanup level cannot be calculated.

An investigation of the 55 Appendix IX compounds without defined MTCA soil cleanup levels was conducted by NWES to determine which may have been handled at this facility and should be included in the closure sample analysis. Four were identified as materials that may have been handled at the facility and therefore should be included. This investigation included a review of the facility waste profile records, discussions with the NWES waste profile preparation staff, and additional facility knowledge. The remaining 51 Appendix IX compounds are not known to have been handled at the facility and are not included in the closure analysis. These compounds are noted in Table 2.

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
1	1-naphthalamine	134-32-7	See Note [a]
2	2-acetylaminofluorene; 2-aaf	53-96-3	N/C
3	2-naphthylamine	91-59-8	N/C
4	2-picoline	109-06-8	N/C
5	4,4'-ddd	72-54-8	4.00E+03
6	4-aminobiphenyl	92-67-1	N/C
7	4-nitroquinoline 1-oxide	56-57-5	N/C
8	acenaphthene	83-32-9	4.80E+06
9	acenaphthylene	208-96-8	N/C
10	acetone	67-64-1	8.00E+06
11	acetonitrile	75-05-8	4.80E+05
12	acetophenone	98-86-2	8.00E+06
13	acrolein	107-02-8	1.60E+06
14	acrylonitrile	107-13-1	1.85E+03
15	aldrin	309-00-2	5.88E+01
16	allyl chloride	107-05-1	4.00E+06
17	alpha,alpha-dimethylphenethylamine	122-09-8	N/C
18	aniline	62-53-3	1.75E+05
19	anthracene	120-12-7	2.40E+07
20	antimony	7440-36-0	3.20E+04
21	aramite	140-57-8	4.00E+04
22	arsenic	7440-38-2	1.43E+03
23	barium	7440-39-3	5.60E+06
24	benzene	71-43-2	3.45E+04
25	benzo(a)anthracene	56-55-3	1.37E+03
26	benzo(a)pyrene	50-32-8	1.37E+02
27	benzo(b)fluoranthene	205-99-2	1.37E+03
28	benzo(g,h,i)perylene	191-24-2	N/C
29	benzo(k)fluoranthene	207-08-9	1.37E+04
30	benzyl alcohol	100-51-6	2.40E+07
31	beryllium	7440-41-7	2.33E+02
32	beta-chloronaphthalene	91-58-7	6.40E+06
33	bis(2-chloroethoxy)methane	111-91-1	N/C
34	bis(2-chloroethyl)ether	111-44-4	9.09E+02
35	bis(2-ethylhexyl)phthalate	117-81-7	7.14E+04

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
36	bromodichloromethane	75-27-4	1.61E+04
37	bromoform	75-25-2	1.27E+05
38	bromomethane	74-83-9	1.12E+05
39	bromophenylphenylether, 4-	101-55-3	N/C
40	butylbenzyl phthalate, n-	85-68-7	1.60E+07
41	cadmium	7440-43-9	1.64E+02
42	carbon disulfide	75-15-0	8.00E+06
43	carbon tetrachloride	56-23-5	7.69E+03
44	chlordane	57-74-9	7.69E+02
45	chloro-1,3-butadiene, 2-	126-99-8	1.60E+06
46	chloro-m-cresol, p-	59-50-7	N/C
47	chloroaniline, 4-	106-47-8	3.20E+05
48	chlorobenzene	108-90-7	1.60E+06
49	chlorobenzilate	510-15-6	3.70E+03
50	chloroform	67-66-3	1.64E+05
51	chloromethane	74-87-3	7.69E+04
52	chlorophenol, 2-	95-57-8	4.00E+05
53	chlorophenyl phenyl ether, 4-	7005-72-3	N/C
54	chromium (trivalent)	16065-83-1	8.00E+07
55	chrysene	218-01-9	1.37E+05
56	cobalt	(Total)	See Note [a]
57	copper	7440-50-8	2.96E+06
58	cyanide	57-12-5	1.60E+06
59	dde, 4,4'-	72-55-9	2.94E+03
60	ddt, 4,4'-	50-29-3	2.94E+03
61	di-n-butyl-phthalate	84-74-2	8.00E+06
62	di-n-octyl-phthalate	117-84-0	1.60E+06
63	diallate	2303-16-4	1.64E+04
64	dibenz(a,h)anthracene	53-70-3	1.37E+02
65	dibenzofuran	132-64-9	3.20E+05
66	dibromo-3-chloropropane, 1,2-	96-12-8	7.14E+02
67	dibromochloromethane	124-48-1	1.19E+04
68	dibromoethane, 1,2-	106-93-4	1.18E+01
69	dichlorobenzene, 1,2-	95-50-1	7.20E+06
70	dichlorobenzene, 1,3-	541-73-1	7.12E+06

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
71	dichlorobenzene, 1,4-	106-46-7	4.17E+04
72	dichlorobenzidine, 3,3-	91-94-1	2.22E+03
73	dichlorodifluoromethane	75-71-8	1.60E+07
74	dichloroethane, 1,1-	75-34-3	8.00E+06
75	dichloroethane, 1,2-	107-06-2	1.10E+04
76	dichloroethene, 1,1-	75-35-4	1.67E+03
77	dichloroethene, trans-1,2-	156-60-5	1.60E+06
78	dichlorophenol, 2,4-	120-83-2	2.40E+05
79	dichlorophenol, 2,6-	87-65-0	N/C
80	dichlorophenoxyacetic acid, 2,4-	94-75-7	8.00E+05
81	dichloropropane, 1,2-	78-87-5	1.47E+04
82	dichloropropene, cis-1,3	10061-01-5	N/C
83	dichloropropene, trans-1,3	10061-02-6	N/C
84	dieldrin	60-57-1	6.25E+01
85	diethylphthalate	84-66-2	6.40E+07
86	dimethoate	60-51-5	1.60E+04
87	dimethylbenz(a)anthracene, 7,12-	57-97-6	N/C
88	dimethylbenzide, 3,3'-	119-93-7	1.09E+02
89	dimethylphenol, 2,4-	105-67-9	1.60E+06
90	dimethylphthalate	131-11-3	8.00E+08
91	dinitro-2-methylphenol, 4,6-	534-52-1	N/C
92	dinitrobenzene, 1,3-	99-65-0	8.00E+03
93	dinitrophenol, 2,4-	51-28-5	1.60E+05
94	dinitrotoluene, 2,4-	121-14-2	1.47E+03
95	dinitrotoluene, 2,6-	606-20-2	1.47E+03
96	dinoseb	88-85-7	8.00E+04
97	dioxane, 1,4-	123-91-1	9.09E+04
98	dioxin (2,3,7,8-TCDD)	1746-01-6	6.67E-03
99	diphenylamine, n,n-	122-39-4	2.00E+06
100	disulfoton	298-04-4	3.20E+03
101	endosulfan i	959-98-8	4.80E+05
102	endosulfan ii	33213-65-9	N/C
103	endosulfan sulfate	1031-07-8	See Note [a]
104	endrin	72-20-8	2.40E+04
105	endrin aldehyde	7421-93-4	N/C

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
106	ethyl chloride	75-00-3	N/C
107	ethyl methacrylate	97-63-2	7.20E+06
108	ethyl methanesulfonate	62-50-0	N/C
109	ethylbenzene	100-41-4	8.00E+06
110	famphur	52-85-7	N/C
111	fluoranthene	206-44-0	3.20E+06
112	fluorene	86-73-7	3.20E+06
113	heptachlor	76-44-8	2.22E+02
114	heptachlor epoxide	1024-57-3	1.10E+02
115	hexachlorobenzene	118-74-1	6.25E+02
116	hexachlorobutadiene	87-68-3	1.28E+04
117	hexachlorocyclohexane, alpha-	319-84-6	1.59E+02
118	hexachlorocyclohexane, beta-	319-85-7	5.56E+02
119	hexachlorocyclohexane, delta-	319-86-8	N/C
120	hexachlorocyclopentadiene	77-47-4	5.60E+05
121	hexachloroethane	67-72-1	7.14E+04
122	hexachlorophene	70-30-4	2.40E+04
123	hexachloropropene	1888-71-7	N/C
124	hexanone, 2-	591-78-6	N/C
125	indeno(1,2,3-cd)pyrene	193-39-5	1.37E+03
126	isobutyl alcohol	78-83-1	2.40E+07
127	isodrin	465-73-6	N/C
128	isophorone	78-59-1	1.05E+06
129	isosafrole	120-58-1	N/C
130	kepone	143-50-0	N/C
131	lead	7439-92-1	2.50E+05
132	lindane	58-89-9	7.69E+02
133	mercury	7439-97-6	2.40E+04
134	methacrylonitrile	126-98-7	8.00E+03
135	methapyrilene	91-80-5	N/C
136	methoxychlor	72-43-5	4.00E+05
137	methyl ethyl ketone	78-93-3	4.80E+07
138	methyl iodide; iodomethane	74-88-4	N/C
139	methyl methacrylate	80-62-6	6.40E+06
140	methyl methanesulfonate	66-27-3	N/C

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
141	methyl parathion	298-00-0	2.00E+04
142	methyl-2-pentanone, 4-	108-10-1	4.00E+06
143	methyl-5-nitroaniline, 2-	99-55-8	3.03E+04
144	methylaniline, 2-	95-53-4	4.17E+03
145	methylcholanthracene, 3-	56-49-5	N/C
146	methylene bromide	74-95-3	8.00E+05
147	methylene chloride	75-09-2	1.33E+05
148	methylnaphthalene, 2-	91-57-6	N/C
149	methylphenol, 2-	95-48-7	4.00E+06
150	methylphenol, 3-	108-39-4	4.00E+06
151	methylphenol, 4-	106-44-5	4.00E+05
152	n-nitrosomorpholine	59-89-2	N/C
153	n-nitrosopiperidine	100-75-4	N/C
154	naphthalene	91-20-3	3.20E+06
155	naphthoquinone, 1,4-	130-15-4	N/C
156	nickel (soluble salts)	7440-02-0	1.60E+06
157	nitroaniline, m-	99-09-2	N/C
158	nitroaniline, o-	88-74-4	N/C
159	nitroaniline, p-	100-01-6	N/C
160	nitrobenzene	98-95-3	4.00E+04
161	nitrophenol, 2-	88-75-5	N/C
162	nitrophenol, p-	100-02-7	6.40E+05
163	nitroso-di-n-butylamine, n-	924-16-3	1.85E+02
164	nitroso-di-n-propylamine, n-	621-64-7	1.43E+02
165	nitrosodiethylamine, n-	55-18-5	6.67E+00
166	nitrosodimethylamine, n-	62-75-9	1.96E+01
167	nitrosodiphenylamine, n-	86-30-6	2.04E+05
168	nitrosomethylethylamine, n-	10595-95-6	4.55E+01
169	nitrosopyrrolidine, n-	930-55-2	4.76E+02
170	o,o,o-triethyl phosphorothioate	126-68-1	N/C
171	o,o-diethyl o-2-pyrazinyl phosphorothioate; thionazi	297-97-2	N/C
172	oxybis (1-chloropropane), 2,2'-	108-60-1	1.43E+01
173	p-(dimethylamino) azobenzene	60-11-7	N/C
174	parathion	56-38-2	4.80E+05
175	pentachlorobenzene	608-93-5	6.40E+04

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
176	pentachloroethane	76-01-7	N/C
177	pentachloronitrobenzene	82-68-8	3.85E+03
178	pentachlorophenol	87-86-5	8.33E+03
179	phenacetin	62-44-2	N/C
180	phenanthrene	85-01-8	N/C
181	phenol	108-95-2	4.80E+07
182	phenylenediamine, p-	106-50-3	1.52E+07
183	phorate	298-02-2	1.60E+04
184	polychlorinated biphenyls; pcbs	1336-36-3	refer to Arochlors
185	polychlorinated dibenzo-p-dioxins; pcdds		see dioxin
186	polychlorinated dibenzofurans; pcdfs		see dibenzofuran
187	pronamide	23950-58-5	6.00E+06
188	propionitrile	107-12-0	N/C
189	pyrene	129-00-0	2.40E+06
190	pyridine	110-86-1	8.00E+04
191	safrole	94-59-7	N/C
192	selenium	7782-49-2	4.00E+05
193	silver	7440-22-4	4.00E+05
194	styrene	100-42-5	4.05E+02
195	sulfide	18496-25-8	See Note [a]
196	tetrachlorobenzene, 1,2,4,5-	95-94-3	2.40E+04
197	tetrachloroethane, 1,1,1,2-	630-20-6	3.85E+04
198	tetrachloroethane, 1,1,2,2-	79-34-5	5.00E+03
199	tetrachloroethene	127-18-4	1.96E+04
200	tetrachlorophenol, 2,3,4,6-	58-90-2	2.40E+06
201	tetraethyl dithiopyrophosphate	3689-24-5	4.00E+04
202	thallium (soluble salts)	7440-28-0	5.60E+03
203	tin	7440-31-5	4.80E+07
204	toluene	108-88-3	1.60E+07
205	toxaphene	8001-35-2	9.09E+02
206	trans-1,4-dichloro-2-butene	110-57-6	N/C
207	trichlorobenzene, 1,2,4-	120-82-1	8.00E+05
208	trichloroethane, 1,1,1-	71-55-6	7.20E+06
209	trichloroethane, 1,1,2-	79-00-5	1.75E+04
210	trichloroethene	79-01-6	9.09E+04

Table 2
Appendix IX Compounds to be Analyzed

	Chemical Name	CAS No.	MTCA Method B Soil Cleanup Levels (µg/kg)
211	trichlorofluoromethane	75-69-4	2.40E+07
212	trichlorophenol, 2,4,5-	95-95-4	8.00E+06
213	trichlorophenol, 2,4,6-	88-06-2	9.09E+04
214	trichlorophenoxy acetic acid, 2,4,5-	93-76-5	8.00E+05
215	trichlorophenoxy)propionic acid, 2(2,4,5-	93-72-1	6.40E+05
216	trichloropropane, 1,2,3-	96-18-4	4.80E+05
217	trinitrobenzene, 1,3,5-	99-35-4	4.00E+03
218	vanadium	7440-62-2	5.60E+05
219	vinyl acetate	108-05-4	8.00E+07
220	vinyl chloride	75-01-4	5.26E+02
221	xylene, mixture	1330-20-7	1.60E+08
222	zinc	7440-66-6	2.40E+07

[a] Indicates compound was handled by NWES but MTCA Method B soil cleanup level cannot be calculated. This compound will be included in the closure sample analysis.

N/C = indicates compound was not handled by NWES and there is insufficient toxicity data available to calculate MTCA Method B soil cleanup level.

4.0 Description of Closure Activities

4.1 General Sequence and for Closure Activities

The Western Blower Property will undergo final RCRA interim status closure in 1995. Final closure of the regulated units will constitute acceptance by Ecology of the closure operations conducted at the seven regulated unit areas and the two container staging areas.

The closure schedule for the NWES facility is presented in Figure 3. The closure will be completed within 180 days if the plan is approved within 90 days of receipt by Ecology. Closure activities are divided into four major steps:

1. Remove existing inventory, including drums and small containers staged in Area 12, and the contents of the tank in Area 11.

2. Decontaminate bulk tank emptied in Step 1 and remove equipment. (Equipment removal may involve shipping equipment to a scrap dealer or an appropriate disposal site, selling it for industrial purposes, or storing it in another location onsite.) Equipment for which the future facility owner/operator has negotiated to be left onsite will remain.

3. Decontaminate all surfaces, containment structures, and sumps in Areas 11 and 12.

4. Sample cleaned areas to verify the performance standard, as described in this closure plan and the sampling and analysis plan (SAP) which is included as Appendix A. Repeat Step 3 if necessary.

Use of NWES's wastewater treatment equipment will facilitate disposal of rinsates and decontamination residues by discharging them to King County Department of Metropolitan Services (Metro) as long as these effluents comply with NWES's wastewater discharge permit (Permit No. 7124). Solid residues will be stabilized in the waste stabilization tanks (Area 1) for offsite disposal to an approved treatment, storage, or disposal facility (TSDF).

4.2 Waste Inventory Removal Procedure

Container Wastes

The inventory removal procedures for containers will apply to Area 12. Within 90 days after receiving the final volume of dangerous waste at the NWES facility, container wastes will be removed and transported to an authorized offsite TSDF. Problem waste streams will be detailed on a case-by-case basis. Inspections of all regulated units, including the container storage areas, will continue until the P.E. certification of facility closure has been accepted by Ecology. The method of transportation and the TSDF will be the same or similar to those used during the

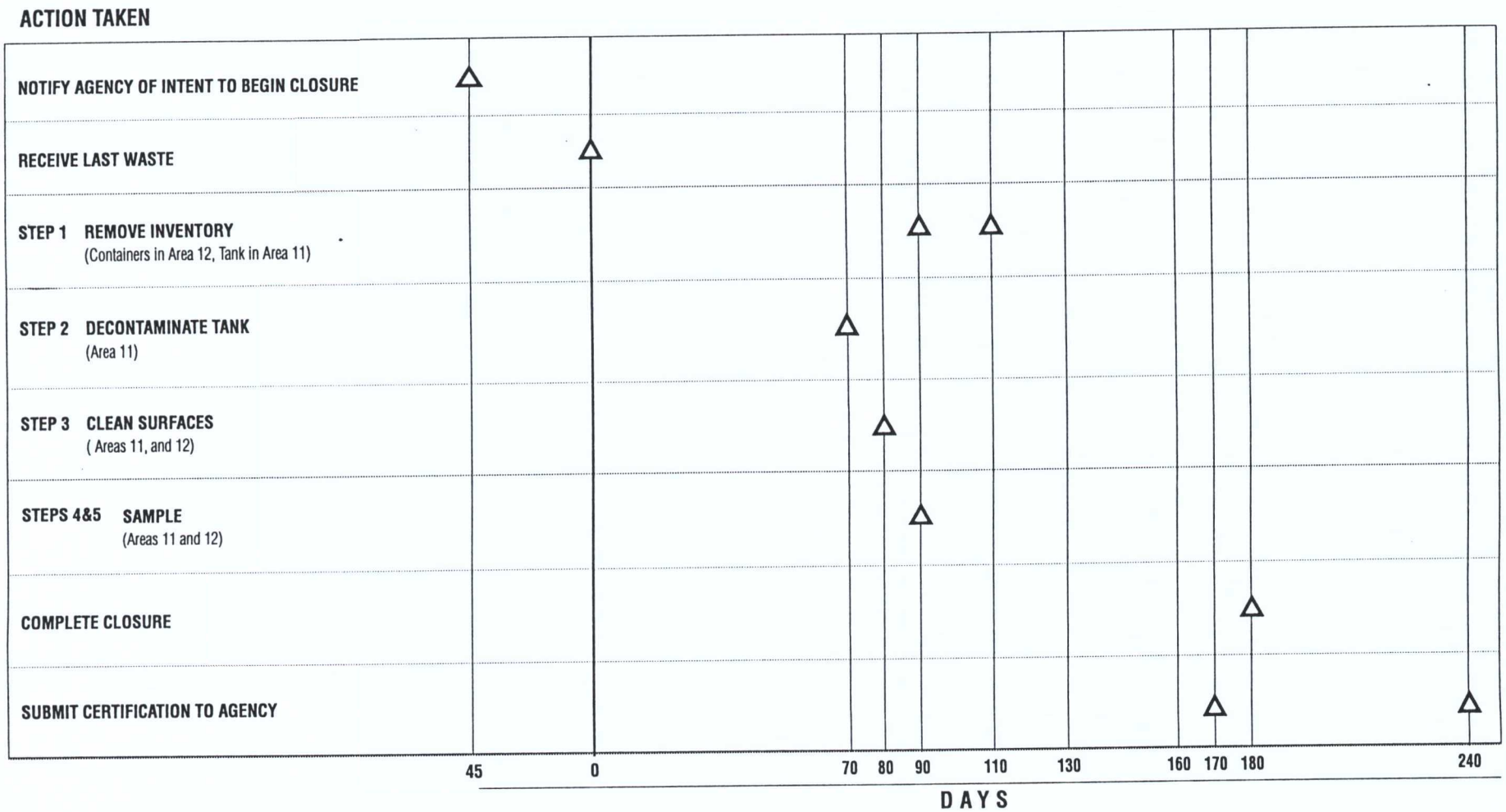

Figure 3
Facility Closure Schedule

normal operation of the facility. Containers will be packaged, labeled, and manifested for shipment according to the same in-plant procedures used during the normal facility operation.

Prior to shipment, all containers will be inspected for leakage. If any containers are found to be leaking, the waste will be transferred to non-leaking containers. Any equipment or clothing that comes into contact with the waste will be decontaminated or disposed of at an authorized TSDF.

Tank Wastes

The inventory removal procedures for tank contents apply to Area 11. Within 110 days after the final volume of dangerous waste is received at the NWES facility, tank contents will be treated, removed, transported, and disposed of to one of the following facilities as appropriate:

- An authorized TSDF for hazardous residues
- An approved Washington State Minimum Functional Standards (MFS) solid waste landfill
- Metro's publicly-owned treatment works (POTW) under the requirements of NWES's wastewater discharge permit No. 7124 for wastewater

Similarly, decontamination residues will be appropriately disposed of based on their waste characteristics and corresponding disposal requirements appropriate for the nature and quality of the waste stream.

4.3 General Decontamination Procedures

Concrete Areas

Decontamination of concrete surfaces, berms, sumps, and any other equipment or structures potentially affected by hazardous constituents will be implemented. Special attention is directed to any surfaces that were in direct contact with dangerous wastes or their residues. NWES will decontaminate concrete surfaces according to the standards as specified in 40 CFR 268.45. The concrete or sump surface first will be inspected for cracks or gaps that have not been previously sealed. Any cracks will be noted in the field log, and those capable of transmitting decontamination fluids to the underlying soil will be sealed with a water-resistant seal. Next, the surface will be cleaned using high-pressure steam or water sprays with detergents. All rinsate will be collected and tested prior to release into the NWES wastewater treatment system or a TSDF, whichever is appropriate.

Procedures will be undertaken to verify that the decontamination is complete per Ecology's *Guidance for Clean Closure of Dangerous Waste Facilities* (August 1994). These procedures are described in the SAP (Appendix A).

Tanks

After the tanks have been emptied, they will be decontaminated. NWES will decontaminate the tanks following the treatment standard prescribed for debris and specified in 40 CFR 268.45. Tanks, pumps, and piping will be triple-rinsed using high-pressure steam or water sprays with detergents. All decontamination solutions will be tested prior to discharge into the NWES wastewater treatment system or a TSDF, whichever is appropriate.

There are three types of tanks at the NWES facility: carbon steel, stainless steel, and polyethylene (see Table 3). Each tank surface will be decontaminated in a manner that is appropriate for the material and tank contents. Once tank surfaces have been treated using one of the technologies in 40 CFR 268.45 and no longer exhibit a characteristic of hazardous waste they will not need to be managed in a RCRA Subtitle C facility. Tanks intended for reuse either onsite or offsite will be similarly decontaminated. However, the future owner/tenant will be given the opportunity to review the analytical results and request additional tests. NWES will consider implementing these request accordingly. Depending on market conditions, the cleaned tanks will be sold either as scrap metal or sold for exclusive industrial use.

Table 3
Tank Decontamination Procedures

Tank Type	Procedures
Carbon steel, polyethylene, stainless steel, or concrete storage tank (oily wastewaters)	1. Hot-water and steam-spray with rotating ball
	2. Wash with TSP, alkaline surfactant (anionic, pH 11.0 or above) or "Believe"
	3. Rinse with hot water
Carbon steel, polyethylene, stainless steel, or concrete wastewater tank (corrosive liquids, wastewaters)	1. Pressure wash with water to remove suspended solids
	2. Pressure wash with ammoniating or sodium/citric acid solution (pH 5.0) or "Believe"

Sequence of Decontamination Activities

The sequence for decontamination of equipment and structures, including tanks and concrete surfaces, is as follows:

1. Before the start of closure activities for a given area, all surfaces will be visually inspected for cracks that have not been previously sealed and other openings through which possible previous spills or closure cleaning solutions and rinsates could reach underlying soils. Tanks will be inspected for leaks and drippages, both current and historical. Documentation of any cracks, openings, or leaks observed during closure will be maintained with other closure records. During the visual inspection, any stains that might suggest the presence of contaminants will also be noted. If cracks or openings are encountered, they will be sealed with a sealant that is resistant to water and the cleaning solutions that will be used during decontamination.

2. Following the visual inspection, equipment used to operate and close each area will be identified. Types of equipment that are periodically or routinely used by NWES for waste transport and handling and equipment expected to be used during the closure process are listed in Table 4.

Table 4
Equipment List

Trucks (including vacuum trucks)	Pumps
Forklifts	Pump connections
Safety equipment	Valve connections
Ladders	Transfer lines
Tools	Piping
Jackhammers	Containerized waste compactor
Drilling equipment	Decontamination equipment (brushes, buckets, etc.)
Hand augers	Steam-cleaning equipment
Sampling equipment	High-pressure wash equipment
Hoses	

Any equipment that had been used for dangerous waste handling but is not required for closure (such as forklifts, hand trucks, and shovels) will be decontaminated with hot water using a high-pressure hose, steam cleaning, and detergent solutions. This equipment will be decontaminated in Area 5. Wastewaters and rinsates will be discharged to the onsite wastewater treatment system and tested before final discharge to the POTW.

3. Each surface area that shows visual signs of past spillage will undergo a preliminary cleaning at least 1 foot in all directions beyond visual evidence of the visually

contaminated area. A heavy-duty cleaning solution will be applied to the surface area with a stiff broom, scrub brush, or similar tool. Washwaters and rinsates generated during this process will be discharged into the onsite wastewater treatment system and tested before final discharge to the POTW.

4. The concrete floors, lower wall portions, ramps, and loading dock will be washed and then decontaminated by steam cleaning. These areas will be washed twice with a detergent cleaning solution of trisodium phosphate (TSP) and then steam rinsed with plain water. Washwaters and rinsate will be discharged to the onsite wastewater treatment system and tested before final discharge to the POTW.

   Prior to any steam cleaning of open surfaces, plastic sheeting or other moisture barrier will be placed around the outside perimeter of the work area to contain possible overspray. The plastic sheeting or other barrier will be disposed of as solid waste following decontamination.

5. Containment sumps will be decontaminated following decontamination of adjacent surfaces. The containment sumps will be decontaminated by steam cleaning with a detergent cleaning solution of TSP. Washwaters and rinsate will be discharged to the onsite wastewater treatment system and tested before final discharge to the POTW.

6. Equipment used in sampling during closure activities will also be decontaminated according to the procedures outlined in the closure plan and the SAP. Portable equipment decontamination will be performed in Area 5.

If closure performance standards cannot be met using steam cleaning and pressure washing, extraction technologies provided in 40 CFR 268.45 will be used to remove the outer most layer (0.6 cm) of the concrete surface in question. A shot blasting or spalling process is one approach that will be considered. A chemical extraction process will be used on non-concrete tank surfaces.

If abrasion or chemical methods are also unsuccessful in meeting the performance standards, concrete, metal, and polyethylene surfaces from the facility will be removed and disposed of properly. The concrete surfaces will be broken into manageable-sized pieces using an impact hammer, pug mill, or other equipment. Metal and polyethylene will be cut and dismantled as necessary. Steel reinforcing rods imbedded in the concrete will be cut as necessary. The rubble and associated soils will be removed using a backhoe or other excavation equipment. This debris will be loaded and hauled to an approved offsite TSDF following proper manifesting and transportation labeling requirements. Trucks will be lined and covered prior to leaving the site to prevent release of materials en route. Any necessary notification of or approvals from local health jurisdictions will be made or obtained prior to transport.

Decontamination Solutions

During the decontamination of structures and equipment associated with the NWES facility, a combination of cleaning solutions and decontamination techniques that have the capability of removing a variety of possible waste constituents will be used. Selection of an appropriate solution will be based on the item to be decontaminated, the past use and spill history of the area to be decontaminated, and the known or suspected level of contamination. A list of the solutions expected to be used for decontamination are presented in Table 5.

Table 5
Typical Heavy-Duty Decontamination Solutions

Tetrasodium ethylenediamine tetraacetate	1 to 2 percent
Sodium tripolyphosphate	1 to 3 percent
Trisodium phosphate (TSP) (anhydrous)	1 to 3 percent
"Solar"[a] TE (or similar product)	5 to 20 percent
"Solar"[a] NP (or similar product)	0.5 to 5 percent
Ethylene glycol monobutyl ether	3 to 8 percent
"Solar"[a] S-2552	1 to 5 percent
"Believe" [b]	5 to 20 percent
Water	Balance

[a] Swift & Company
[b] SL Johnson and Son

Each constituent in the formulation has a specific function:

- Tetrasodium ethylenediamine tetraacetate is a chelant, which dissolves transition metal compounds including lead, nickel, copper, and mercury, so that they can be removed from the equipment.

- Sodium tripolyphosphate and TSP help prevent the precipitation of calcium and magnesium from the alkaline solution and act as buffers in the alkaline pH range.

- The remaining constituents, "Solar" products and ethylene glycol monobutyl ether, act as surfactants and organic coupling agents to emulsify and stabilize solvents, oils, and other organics. Such solutions are typically diluted with water in the ratio of 1:10 to 1:25.

The standard industrial washing solution that will be used is TSP. This material is commonly used in industrial cleaning applications and is typically mixed at a ratio of 1 pound per every 10 gallons of water. The solution can be sprayed at room temperature with a pressure washer or

at high temperatures with a steam cleaner. If found to be necessary to accomplish decontamination, a heavy-duty cleaning solution will be selected from available commercial products or formulated specifically for use at the facility.

5.0 Performance Standard Verification

This section addresses the sampling and analyses that will be conducted for closure performance standard verification. The detailed approach, rationale and description of field procedures are presented in the field sampling and analysis plan (SAP) (Appendix A). The SAP describes the specific methodologies to be used in collecting and analyzing samples from the facility. It also includes descriptions of the QA/QC measures to be used during sampling. The SAP will be used in conjunction with a site health and safety plan.

5.1 Sampling Objectives

The objective of the sampling and analysis plan is to collect data after decontamination is complete, that can be used to assess whether the facility surfaces in a given management area contain residual contamination at levels that exceed the closure performance standards. Based on this assessment, decisions will be made on appropriate methods for managing the closed facility or closure debris and whether additional actions are appropriate.

5.2 Selection of Sampling Sites

Section A2 of the SAP provides the approach to be used for the selection of sample locations and the quantity of samples to be collected during closure.

5.3 Sampling and Analysis Procedures

It is anticipated that the following media will be sampled during onsite closure:

- Washwater and rinsate generated during decontamination activities
- Concrete surfaces and containment sumps
- Soils

The sampling and analysis procedures and material disposition for these items are discussed individually in the following subsections. A summary of media disposition procedures is presented in Table 6.

Washwater and Rinsate Generated During Decontamination Activities

Washwater and rinsate generated during decontamination activities will be collected and tested. Fluids from different decontamination areas will not be mixed until the analytical results have been evaluated and they indicate that it is appropriate to do so.

Table 6 Contaminated Media Disposition		
Sampled Media or Material	**Analysis Result**	**Action**
Washwater and rinsate solutions	See "Action"	Solutions will be analyzed for parameters necessary to assess the capability for treatment in onsite wastewater treatment system and subsequent discharge to the Metro POTW under a permit variance. Otherwise, solutions will be managed as dangerous waste; treated or disposed at an offsite TSDF
Concrete surfaces, asphalt, soil	Exceeds CPS [a] - Designated DW - Non-DW	Material will be managed as dangerous waste; treated or disposed in an offsite permitted TSDF. Material will be treated or disposed in a sanitary landfill following the preparation of a disposal plan and receipt of health department approval.

[a] Closure performance standard (CPS): depending on waste constituent, CPS will be health-based (MTCA), background, or PQL; refer to Section 4.0.

Note: Media contaminated with listed wastes are subject to land disposal restrictions (40 CFR 268) and associated management requirements.

DW: Dangerous Waste
PQL: Practical Quantitation Level
TSDF: Treatment, Storage, and Disposal Facility

Concrete Surfaces and Containment Sumps

The concrete surfaces of containment sumps, load/unload areas, and tank storage areas will be sampled according to the SAP. Concrete sampling will be accomplished by collecting chips from the surface to a depth of 1/2 inch of the structure or by collecting a core sample per the SAP.

Soils

Random and biased soil samples will be collected from several of the facility areas per the SAP. Soil samples will be obtained from the point where the concrete and soil interface.

5.4 Comparison of Analytical Results to Closure Performance Standard

For concrete surfaces, containment sumps, and other surfaces, the results of post decontamination sampling and analysis will be used to determine whether the closure performance standards described have been met. If analysis results of a containment system indicate that contaminant levels are below the closure performance standards, no additional decontamination will be conducted.

5.5 Quality Assurance/Quality Control

All data submitted to Ecology will be generated by an accredited analytical laboratory in accordance with SW-846 and/or CLP requirements. The SAP addresses the necessary QA/QC activities associated with closure. They include the following:

- Project description
- Project organization and responsibilities
- QA objectives for measurement
- Sampling procedures
- Sample custody
- Calibration procedures
- Analytical procedures
- Data reduction, validation, and reporting
- Internal quality control
- Performance and systems audits
- Preventive maintenance
- Data precision, accuracy, and completeness
- Corrective actions

5.6 Analytical Methods

Samples will be analyzed by one or more Ecology-certified laboratories using Ecology- and EPA-approved methods to determine whether performance standards have been met. The types of dangerous wastes handled at the NWES facility include:

- Acids
- Caustics
- Solvents
- Paints
- Metal-finishing solutions
- Petroleum products

The parameters of concern and associated analytical methods for these wastes are summarized in Table A-3 of Appendix A. The parameters of concern are also listed in Table 2 of this closure plan.

6.0 Inspections

Closure activities will be reviewed by an independent registered P.E. to assess whether they have been conducted in accordance with this plan. The key closure activities warranting inspection are described in Table 7.

If the P.E.'s observations indicate that closure is not being conducted in accordance with the approved closure plan, suggestions to bring the activities into accordance with the plan will be made. The observations will provide the basis for the engineer's certification of closure.

Table 7
Key Closure Activities Warranting Inspection

Closure Step	Inspection Intervals	Activity
1. Inventory removal	Initial inspection Final inspection	• First day wastes removed • When all containers are gone
2. Bulk tank decontamination	Initial inspection Intermediate inspection Final inspection	• First day tanks rinsed • Day rinsate sampled • Review of analytical data
3. Surface cleaning	Initial inspection Intermediate inspection Final inspection	• First day surfaces cleaned • Day rinsate sampled • Review of analytical data
4. Sampling	Initial inspection Intermediate inspections Final inspection	• First day of sampling • Day rinsate sampled • First day concrete sampled • Review of analytical data

7.0 Certification of Closure

Within 60 days of completion of final closure, a representative of NWES will submit a certification signed by an authorized NWES representative and the P.E. that states that the dangerous waste container and tank storage and treatment facility has been closed in accordance with this closure plan. Documentation supporting the P.E.'s certification will be maintained on file at the facility and will be furnished to the regulatory agencies upon request until NWES is released from the financial assurance requirements for closure.

8.0 Notice in Deed

NWES is a storage and treatment facility only. No intentional disposal has occurred onsite. For the clean closure of the Western Blower Property NWES is not required to submit a notice in deed.

9.0 Post Closure Care Requirements

No post-closure care for the Western Blower Property is anticipated by NWES as they are proceeding with clean closure.

10.0 Financial Requirements

10.1 Facility Closure Cost Estimate

A cost estimate has been prepared for the closure activities described in this interim status closure plan. Table 8 presents an estimated cost for the elements required to close the portion of the NWES facility known as the Western Blower Property. This is an order-of-magnitude cost estimate. As defined by the American Association of Cost Engineers, this is an estimate produced without the aid of detailed engineering data and is projected to have an accuracy of +50 percent to -30 percent. Therefore, a contingency of 10 percent has been added to this estimated cost.

10.2 Financial Assurance

NWES has selected a letter of credit as its financial assurance for closure of the facility. A signed copy of the financial assurance documentation will be sent to Ecology by certified mail after final approval of the closure plan.

Table 8
Closure Cost Estimate

Task	Quantity	Unit	Unit Price	Total
RCRA Interim Status Tanks				
1. Removal of final waste inventory based on maximum storage tank quantities and Drum storage				
• Completed prior to closure.				$0
2. Decontamination of processing tanks, piping, pumps and liners.				
a. Washing labor	2	hours	$35	$70
b. Disposal of wash water - 1 tank @ 500 gallons/tank=	200	gallons	$0.75	$150
c. Disposal cost of spill control pillows (2 drums since piping is minimal)	1	lump sum	$200	$200
Cost of new drums	1	lump sum	$50	$50
d. Dismantling of 1 tank	4	hours	$35	$140
Subtotal of RCRA Interim Status Tanks				**$610**
Containers - Staging and Loading Dock				
1. Removal of Final Waste Inventory				
• Completed prior to closure.				$0
2. Labor to Load Flatbed at NWES				
• Completed prior to closure.				$0
3. Disposal of Decontamination Water				
a. Labor	8	hours	$35	$280
b. Disposal of wash water	200	gallons	$0.25	$50
Subtotal of Containers				**$330**
Decontamination of Equipment				
1. Rental of Steam Cleaner	1	days	$75	$75
2. Disposal of Decontamination Residues (Previously figured into volumes generated)	0		$0	$0
Subtotal of Decontamination of Equipment				**$75**
Soil Sampling and Analysis				
1. Labor to Pull Representative Samples	40	hours	$55	$2,200
2. Analysis Costs - Appendix 1X	7	per	$3,500	$24,500
Subtotal of Soil Sampling and Analysis				**$26,700**
Closure Certification				
1. Labor (professional engineer)	8	hours	$85	$680
Subtotal of Closure Certification				**$680**
SUBTOTAL				
1. Subtotal				$28,395
2. Plus 10% Contingencies				$2,840
3. Supervision by NWES Personnel - 120 days closure period	40	hours	$17.50	$700
TOTAL CLOSURE COST				**$31,935**

Appendix A
Field Sampling and Analysis Plan in Support of Closure for the NWES Western Blower Property

Revision #2—July 24, 1995

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A1. Introduction

During RCRA interim status closure of the Northwest EnviroService (NWES) Airport Way facility, portions of the facility will proceed through the Washington State Department of Ecology (Ecology) clean closure process. Samples need to be collected to assure closure is completed accordingly. For clean closure, samples need to be collected from the affected media to show that the closure performance standard has been met.

For clean closure, as defined in Section 3 of the Closure Plan, NWES proposes to meet the Method B soil cleanup levels established under MTCA (WAC 173-340) for environmental media, which are based on the protection of human health and the environment. These cleanup levels have been adopted by the Dangerous Waste Regulations. If no health-based limit exists or insufficient toxicity data are available to calculate a health-based limit, the background level or the PQL (whichever is greater) will be used.

A2. Sampling Approach and Rationale

A2.1 Summary

The closure plan requires that samples be collected during closure. The sample analysis results will be compared to the performance standards to verify that clean closure has been achieved. This section summarizes the basis for developing the closure sampling approach. As discussed in the closure plan, materials to be sampled during closure include the following:

- Washwater and rinsate generated during closure decontamination activities
- Concrete surfaces and containment sumps
- Soils

The collection of samples for washwater rinsate will follow systematic, random grab sampling procedures. These sampling procedures are described in Section A3.

Two approaches will be used to collect concrete and soil samples: random samples distributed over a systematic grid and biased samples where there is obvious evidence of contamination (e.g., staining). A summary of these sampling approaches is presented in Sections A2.2 and A2.3. Sampling procedures are described in Section A3.

A2.2 Sampling Approach and Sample Size

A2.2.1 Washwaters

Because the volume of washwater rinsate generated during closure cannot be accurately estimated, a sampling strategy based on systematic, random sampling will be conducted at the time of closure. Rinse waters and decontamination fluids will be accumulated by process area before they are discharged to Metro. Grab samples from drums will be composited. No more than ten drums will be composited at a time. Grab samples from tanker trucks will not be composited. The results will be compared to Metro's discharge limits before discharge to the facility. The precise numbers and locations of samples will depend upon the number of rinsate drums at the time of closure. These numbers and locations will be documented in the field logbook.

A2.2.2 Concrete Surfaces

Concrete chips will be collected from the loading dock in Area 12.

A2.2.3 Subsurface Soils

Randomly selected soil samples will be collected from several of NWES' operation areas. Random soil sampling will follow a nonparametric approach that permits probabilistic conclusions.

This generates a sample size (n) of three samples per process area. The number of samples collected within an area is independent of the area's size, and the maximum concentration encountered is the value compared to the performance standard to assess closure status.

In order to achieve even spatial distribution within an area, sampling locations will be spaced systematically using a random starting point and an evenly spaced interval. The grid spacing is based on:

$$Grid\ spacing = \sqrt{(\frac{A}{n})}$$

where:

A = surface area
n = sample size

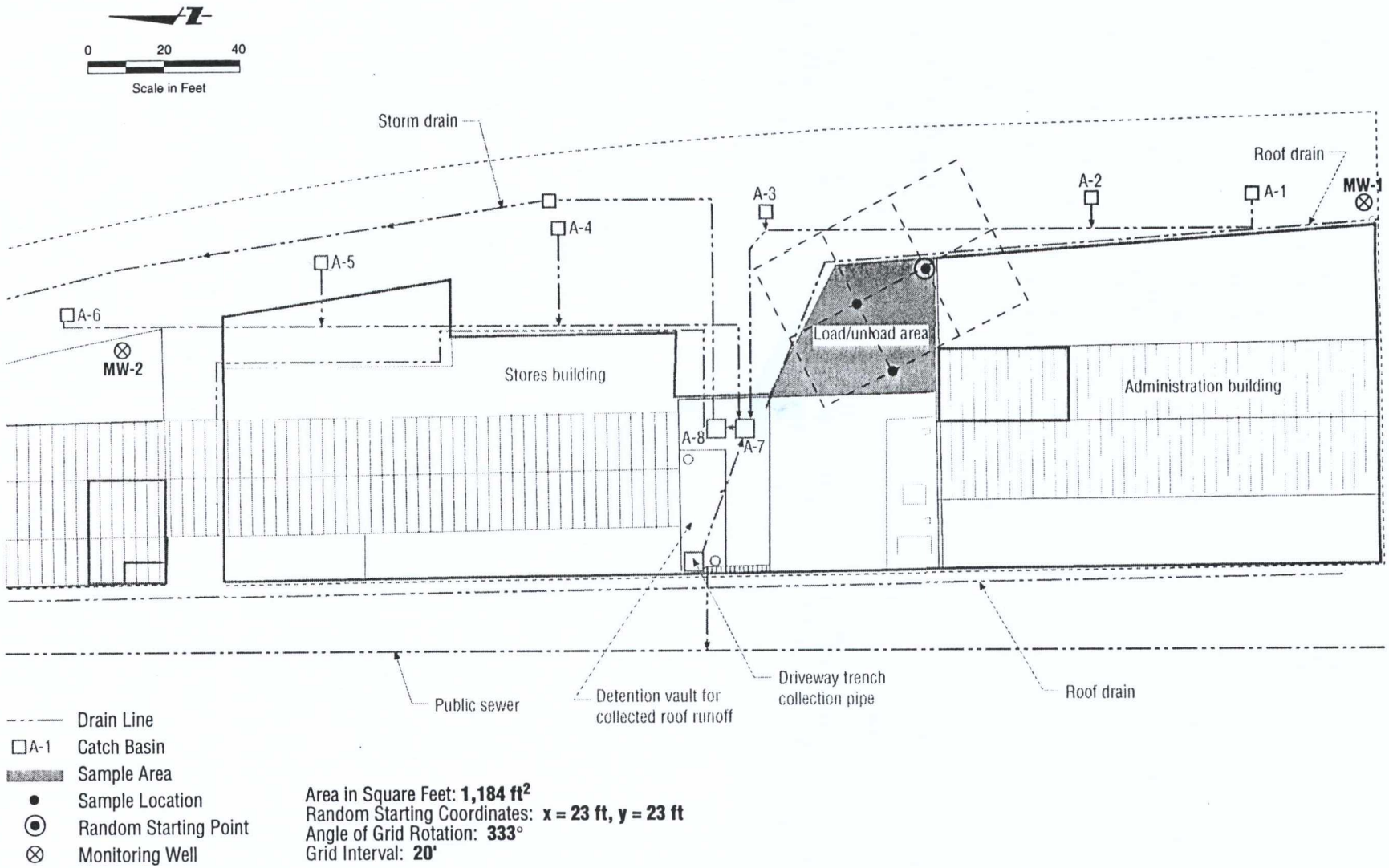
A2.3 Biased Sampling Approach

Several sumps and other process areas have been selected as biased sampling locations. Visual observations, staff knowledge and a review of past repair records maintained during the operating life of the facility were used to select biased sampling locations. A summary of the visual concrete inspection will be included in the field logbook.

Figure A-1 shows each area with the designated sample locations. Table A-1 presents the proposed chemical analyses for each area by sample media.

A2.4 Interpretation of Sampling Results

The decisions regarding the presence or absence of contamination at the NWES facility will be based on comparison of the analytical results with the performance standards for clean closure. If all samples meet the performance standard criteria for each constituent, the surface or the underlying area will be considered clean. If sample analysis results indicate the presence of subsurface contamination above the performance standard, additional analyses may be required to define the spatial extent and location of contamination and to establish a basis for cleanup during closure.



Area in Square Feet: **1,184 ft²**
Random Starting Coordinates: **x = 23 ft, y = 23 ft**
Angle of Grid Rotation: **333°**
Grid Interval: **20'**

Figure A-1

Area 12 – Administration and Stores Buildings Area Sample Locations
Area 11 – Solids Energy Recovery Program Area Sample Locations

Table A-1 Summary of Sampling and Analysis				
11	Decontamination water	1 grab sample per 10 drums or 1 grab sample per tank or 1 per tanker truck	Parameters per METRO discharge permit	SW-846: 8240, 8270, 8080, 6010/7000, 9010, 9030, 8140, 8150
	Soil	2 samples	Appendix IX constituents	
12	Decontamination water	1 grab sample per 10 drums or 1 grab sample per tank or 1 per tanker truck	Parameters per METRO discharge permit	SW-846: 8240, 8270, 8080, 6010/7000, 9010, 9030, 8150, 8140
	Soil Concrete	2 samples 2 samples	Appendix IX constituents	

A3. Sampling Procedures

This section describes the procedures that NWES and contractor field personnel will use to conduct sampling, decontaminate sampling tools, label and package samples and maintain sampling records. Washwater, rinsate, and concrete sampling procedures are detailed in the following subsections and summarized in Table A-2.

A3.1 Washwater and Rinsate Generated During Decontamination

Washwater and rinsate generated during closure decontamination activities will be collected in drums or possibly in a tanker truck. Samples will be collected per the procedures outlined in Table A-1 and analyzed by the NWES laboratory, which is certified by Ecology for the required Metro discharge parameters. Fluids from different sources will not be mixed until the analytical results have been received and evaluated by NWES. After the washwater is tested, it will be discharged to NWES's wastewater treatment plant for discharge to Metro or will be sent offsite for appropriate disposal.

All drums containing washwater and rinsate generated during decontamination will be labeled with the following information:

- Process area
- Source
- Date generated
- Percent solids/liquids

Drums will be marked "hold for analysis" pending laboratory analysis. Tanker trucks will be sampled before they are emptied.

A3.2 Concrete Surfaces and Containment Sumps

Samples of concrete surfaces, including containment and sump systems, will be collected after they are decontaminated. Sampling will be accomplished by collecting concrete chips from the base of the structure to a depth of 0.6 cm. The samples to be analyzed will pass through a No. 4 sieve. In some cases, as noted in Table A-1, a core sample through the concrete will need to be collected.

Table A-2
Washwater Rinsate, and Concrete Sampling Procedures

Media	Sampling Procedure
Decontamination washwater and rinsate	1. Positively identify the drum in question as a washwater or rinsate drum. Under no circumstances should any **unmarked** drums be opened by sampling personnel. 2. Carefully remove the drum bung. Splash and eye protection should be worn by sampling personnel. 3. Collect a representative sample of the drum contents using a drum thief. 4. Replace drum bung.
Concrete surfaces, sumps, and other structures	1. Select an area at the base of the concrete structure that appears to be stained. If no stained area is present, select a representative portion of the structure. 2. Collect concrete chips from the selected area using a ballpeen hammer and a cold chisel. 3. Break the concrete chips down to a size that will pass through a No. 4 sieve (3/16 inch) using the hammer and chisel. 4. Collect concrete chips into an 8-ounce glass jar with a Teflon-lined lid.
Subsurface Soil	1. Remove the concrete above the sample point by coring. 2. Use a stainless steel spoon to collect soil at the concrete/soil interface. 3. Collect the sample into an 8-ounce glass jar with a Teflon-lined lid.

A3.3 Subsurface Soils

The soil underlying several facility areas will be sampled to determine whether contamination has been caused by facility operations. Soils will be sampled through the hole bored in the overlying concrete. Soil samples will be obtained from the point where the concrete and soil interface.

If soils are removed as part of a cleanup operation, verification samples will be collected and analyzed to verify that residual chemical constituents in soils remaining after excavation are below the cleanup performance standard. Samples will be collected around the side walls and bottom of the excavation if possible. If the area is inaccessible, samples will be collected directly from the equipment excavation the soil (the bucket will be steam-cleaned before initial sampling).

A3.4 Sampling Tool Decontamination

All sampling tools that come in contact with sampling media, either for identification or verification sampling, will be properly decontaminated prior to use at the facility and between sampling locations or depth intervals. Hand tools will be decontaminated per the following minimum decontamination procedural steps:

1. Liquinox and tap-water wash
2. Tap-water rinse
3. Distilled/deionized water rinse
4. Isopropyl alcohol rinse
5. Distilled/deionized water rinse

If hand tools will not be used immediately, they will be wrapped in aluminum foil to prevent contamination until the time of use. Any drilling equipment used for sampling will be steam-cleaned before drilling begins and between drilling at each sample station.

If the analytical results indicate that performance standards have not been met as determined by NWES, a decision will be made either to decontaminate again using the same method or a more aggressive method (see Section 4.3 of the closure plan) or to cease the decontamination process and properly dispose of the material as summarized in Table 6 of the closure plan.

A3.5 Sample Containers, Preservation, and Holding Times

Table A-3 in Section A4, Methods of Analysis, presents the sample containers, preservation requirements, and holding times.

A3.6 Documentation and Field Observation

A3.6.1 Sample Identification and Labeling

All samples will be appropriately labeled for identification and tracking. Sample labels will be completed using waterproof-ink pens and affixed to containers at the time of sampling. The sample designation number will include identifiers that facilitate sample tracking. The sample designation number will contain, at a minimum, the following identifiers.

- A__ = Area (number)
- Sample media:
  - W = washwater
  - C = concrete
  - S = soil
- Sample number (three digits beginning with 001)

For example, the first concrete sample collected in Area 12 would be designated as A12-C-001.

Additional information included on the sample label will be the date and time the sample was collected, the analytical parameter(s), and the name(s) of personnel collecting the sample.

A3.6.2 Field Logbooks

The sampling team leader will maintain a field logbook that contains all information pertinent to the field sampling plan. The logbook will include at a minimum:

- Project name
- Project number
- Personnel
- Weather conditions
- Equipment calibration and decontamination
- Health and safety monitoring
- Photograph log (if photographs are taken)
- Sample data
  - Process area and location of sample
  - Date of sample collection
  - Time of sample collection
  - Type of samples taken
  - Sample identification numbers

- Sampling method
- Personnel decontamination procedures

All members of the field team will use the notebook, make entries in ink, then initial and date each page.

A3.6.3 Corrections to Documentation

Unless prohibited by weather conditions, all entries in field and laboratory notebooks will be written in waterproof ink. No accountable serialized documents will be destroyed or thrown away, even when they are illegible or contain inaccuracies that require a replacement document. When an error is made on an accountable document, the person who made the error will make the correction by crossing a line through the error and entering the correct information. The erroneous information should not be obliterated. Any subsequent error discovered on an accountable document should be corrected by the person who made the entry. All corrections will be initialed and dated.

A3.6.4 Sample Chain of Custody and Shipment

The management of samples collected in the field involves specific procedures that must be followed to ensure field sample integrity and custody. The possession of samples must be traceable from the time they are collected through the time they are analyzed by the contract laboratory.

The chain of custody of a sample is defined by the following criteria:

- The sample is in a person's possession, or is in his/her view after being in his/her possession.

- The sample was in a person's possession and was locked up or transferred to a designated secure area by him/her.

Each time the samples change hands, both the sender and receiver will sign and date a chain-of-custody form and specify which item(s) has changed hands. When a sample shipment is sent to the laboratory, the top signature copy is enclosed in plastic with the sample documentation and secured to the inside of the sample shipment containers. The second copy of the chain-of-custody form will be retained in the project files. A chain-of-custody record will be completed for each shipping container.

The following information is included on the chain-of-custody form:

- Sample number
- Signature of sampler

- Date and time of collection
- Project name and number
- Type of sample
- Number and type of container
- Inclusive dates of possession
- Signature of receiver

In addition to the labels, seals, and chain-of-custody form, other sample tracking components include the field logbook, sample request sheet, sample shipment receipt, and laboratory logbook. Before packaging samples, field personnel will make certain that the exterior of the sample container is clean and that the sample label is legible.

A3.6.5 Sample Packaging

The sample packaging and shipping containers will be assembled and packed to meet the following requirements:

- There will be no release of materials to the environment.

- Inner containers that are breakable must be packaged to prevent breakage and leakage. Completed packages must be capable of withstanding a 4-foot drop on solid concrete in the position most likely to cause damage. The cushioning and absorbent material must not be reactive with the sample contents.

The packaging procedures will be in compliance with all U.S. Department of Transportation and commercial carrier regulations. Only waterproof ice chests or coolers will be considered acceptable shipping containers.

Samples for shipment will be packed using the following procedure:

- Seal the drain plug in the cooler.

- Place vermiculite or Styrofoam peanuts in the bottom of the container.

- Wrap glass bottles with bubble wrap or Styrofoam wrapping; place them inside Ziploc-type plastic bags and then place them in the cooler.

- Add ice in double-bagged Ziploc-type plastic bags.

- Fill with vermiculite, Styrofoam peanuts, or bubble wrap.

- Place the shipping list chain-of-custody form in a plastic bag attached to the inside of the cooler lid.

- Attach two chain-of-custody seals (front and back of container) so that the seals must be broken if the cooler is opened.

- Place the name and address of the receiving laboratory in a position clearly visible on the outside of the cooler.

- Secure the lid with fiber tape.

All shipments for analysis will be transported directly to the laboratory or shipped to the laboratory via overnight courier. In either case, the laboratory will be notified immediately when samples are shipped.

A3.7 Field Quality Assurance/Quality Control Samples

Samples will be placed in new sample bottles supplied by the laboratory contracted to do the analyses. The samples will be placed in a cooler immediately after collection and maintained at approximately 4°C with ice.

Three types of field QA/QC samples are collected to document the accuracy and representativeness of the sample aliquots: field duplicate samples, equipment blank samples, and trip blank samples.

A3.7.1 Field Duplicate Samples

Field duplicate samples will be collected at a minimum of 10 percent of the sampling locations for each analytical method, including at least one sample per method. A field duplicate is obtained by collecting an additional set of bottle aliquots, at the same time, and with the same procedures as those used to collect the original sample. Field duplicate samples will be identified with the sample location number designation. For example, a field duplicate of the sample mentioned in Section A3.6.1, Sample Identification and Labeling, would be A12-C-002.

A3.7.2 Equipment Blank Samples

Equipment blank samples are organic-free water aliquots that are placed in contact with non-dedicated sampling equipment (e.g., split-spoons) after the equipment has been decontaminated using the proper decontamination procedures outlined in the sampling plan. The results from these samples are used to evaluate the integrity of the decontamination process, and to alert the field manager of possible cross-contamination of samples. A minimum of one equipment blank sample per day will be collected where non-dedicated sampling equipment is used. Equipment blanks will be identified with a letter designation with a sample location number, e.g., A12-C-003-EB. The sample location number will be the last location where the piece of equipment was used.

A3.7.3 Trip Blank Samples

Trip blank samples are also organic-free aliquots used to evaluate possible cross-contamination of samples that may occur at any time during the sample bottle handling history. The trip blank usually originates at the contract laboratory and accompanies delivery of the sample bottles to the facility. Trip blank bottles and sample analyses are usually limited to 40-ml VOAs and volatile organic analyses. Usually, one trip blank is sent for each sampling event conducted. The trip blank will be identified with the sample number A12-W-100.

A4. Methods of Analysis

For each process area at the facility undergoing RCRA interim status closure, the parameters of concern have been identified by Ecology as those constituents identified in 40 CFR 264 Appendix IX. These parameters serve as the basis for assigning analytical laboratory procedures.

For each parameter group, analytical methods are selected in accordance with Ecology's sampling and testing method requirements (WAC 173-303-110) and EPA's laboratory manual, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846). Table A-3 provides a summary of the sample handling requirements based on the analytical methods.

Table A-3
Sample Parameters, Analytical Methods, Containers, Sample Preservation, and Holding Times

Sample Parameter	EPA Method	Container	Preservation	Holding Time
Appendix IX Analyses				
Volatile Organics	8240 (SW-846)	One 4-ounce glass Teflon-lined lid	4°C	14 days
Semivolatile Organics	8250 or 8270 (SW-846)	One 8-ounce glass Teflon-lined lid	4°C	7 days for extraction, 40 days after for analysis
Metals	6010 (SW-846)		4°C	6 months Hg, 28 days CN, 14 days
Chlorinated pesticides/PCBs	8080 (SW-846)	One 4-ounce glass Teflon-lined lid	4°C	14 days until extraction 40 days after for analysis
Total Cyanide	9010 (SW-846)	One 8-ounce glass Teflon-lined lid	4°C	NA
Organophosphorus Pesticides	8140	One 4-ounce glass Teflon-lined lid	4°C	14 days until extraction 40 days after for analysis
Chlorinated Herbicides	8150	One 4-ounce glass Teflon-lined lid	4°C	14 days until extraction 40 days after for analysis
Sulfide	9030	One 4-ounce plastic	4°C	NA
Other Analyses				
Total Petroleum and Fuel Hydrocarbons (TPH)	WTPH 418.1[a] WTPH-D WTPH-G		4°C	1 month

[a] Ecology - required and recommended analyses for petroleum substances (April 1992).

A5. Management of Sampling-Derived Waste

Disposable materials generated during the sampling activities (Tyvek, booties, gloves, etc.) will be handled in a manner consistent with the protocols set forth by NWES personnel. The contents should be labeled on the side of the drum and stored onsite. They will be stored onsite for a period of less than 90 days in designated waste accumulation areas. Handling, shipment, and disposal will be commensurate with the analysis results and WAC 173-303 requirements.

Drums will be marked "hold for analysis" if laboratory analysis is being performed. They will be stored onsite for less than 90 days in designated waste accumulation areas. Handling, shipment, and disposal will be commensurate with the analysis results and WAC 173-303 requirements as well as with any protocol set forth by NWES personnel.

A6. References

U.S. Environmental Protection Agency. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* USEPA SW-846, Third Edition. 1986.

U.S. Environmental Protection Agency. *Statistical Methods for Evaluating the Attainment of Superfund Cleanup Standards.* Volume 1, Soils and Solids Media. 1988.

Conover, W. J. *Practical Nonparametric Statistics*, 2nd edition. New York: John Wiley & Sons. 1980.