Part A

Application

Use the tab key to move from cell to cell in the electronic version of this form.
PLEASE ENTER INFORMATION ONLY IN UNSHADED AREAS.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application Part A Form

Date Received (Month Day Year)	Reviewed by:	Date:
	Approved by:	Date:

Please refer to instructions for completing this form.

I. This form is submitted to: (place an "X" in the appropriate box)

X	Request modification to a final status permit (commonly called a "Part B" permit)
	Request a change under interim status
	Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).
	Establish interim status because of the wastes newly regulated on: (Date)
	List waste codes:

II. EPA/State ID Number

WAD981769110

III. Name of Facility

Emerald Services, Inc.

IV. Facility Location (Physical address not P.O. Box or Route Number)

A. Street

1825 Alexander Avenue

City or Town	State	ZIP Code
Tacoma	WA	98421

County Code (if known)	County Name
	Pierce

B. Land Type	C. Geographic Location Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date Month Day Year
P	47 16 01 3	122 23 05	01 01 1987

V. Facility Mailing Address

Street or P.O. Box

1825 Alexander Avenue

City or Town	State	ZIP Code
Tacoma	WA	98421

Ecology is an equal opportunity employer

VI. Facility contact (Person to be contacted regarding waste activities at facility)	
Name (last)	**(first)**
Garman	Greg
Job Title	**Phone Number (area code and number)**
Facility Operations Manager	(253) 533-6080
Contact Address	
Street or P.O. Box	
1825 Alexander Avenue	
City or Town	**State** / **ZIP Code**
Tacoma	WA / 98421

VII. Facility Operator Information	
A. Name	**Phone Number (area code and number)**
Emerald Services, Inc. and Clean Harbors Environmental Services, Inc.	(206) 832 - 3200
Street or P.O. Box	
1825 Alexander Avenue	
City or Town	**State** / **ZIP Code**
Tacoma	WA / 98421

B. Operator Type	C. Does the name in VII.A reflect a proposed change in operator?			If yes, provide the scheduled date for the change: Month / Day / Year
P		X	Yes	07 09 2016
			No	

D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.		
		Yes
	X	No

VIII. Facility Owner Information	
A. Name	**Phone Number (area code and number)**
Emerald Services, Inc.	(206) 832 - 3200
Street or P.O. Box	
7343 East Marginal Way South	
City or Town	**State** / **ZIP Code**
Seattle	WA / 98108

B. Owner Type	C. Does the name in VII.A reflect a proposed change in owner?			If yes, provide the scheduled date for the change: Month / Day / Year
P			Yes	
		X	No	

IX. NAICS Codes (5/6 digit codes)													
A. First							**B. Second**						
5	6	2	1	1	2	Hazardous Waste Collection	5	6	2	2	1	1	Haz. Waste Treatment and Disposal
C. Third							**D. Fourth**						
5	6	2	9	1	0	Toxic Material Removal Contr.	5	6	2	9	2	0	Materials Recovery Facilities

X. Other Environmental Permits (see instructions)

A. Permit Type	B. Permit Number	C. Description
E	TAC-0131-2013	City of Tacoma Industrial Wastewater Discharge
E	WAR004123	WA Department of Ecology Industrial General Stormwater
P	10126	Puget Sound Clean Air Agency
E	2017-00101	WA Department of Ecology - Moderate Risk Waste Permit

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

See Attachment A

Corrective Actions Statement
There are no historical or on-going corrective actions taken at the site under the Dangerous Waste Rules, Model Toxics Control Act, or federal regulations.

While there has been no corrective action at the Emerald Services, Inc. (Emerald) site in terms of physical activity, Emerald has implemented a variety of corrective actions at the site in response to site activities as well as to minimize the need for formal corrective action in the future.

Prior to initiating activities at the site, Emerald conducted a thorough site investigation, including soil and groundwater sampling and analysis, to determine that the site was officially "clean." Since that time, Emerald has conducted regular groundwater monitoring of four routinely maintained wells on the site and provides regular reports to Ecology as required under the Corrective Action section of the current Part B Permit. At the time of application submittal, groundwater monitoring by Emerald is coordinated with surrounding businesses to assist Ecology in an area-wide groundwater contamination study.

In 2005, the Emerald facility was damaged from an explosion that occurred in the stormwater detention vault. The investigation that followed showed that a spill that had occurred in the stormwater management areas had ultimately reached the stormwater detention vault. The volume of spilled material that reached the vault was such that an explosive atmosphere was created, resulting in an explosion. In response to this event, Emerald implemented several corrective action measures. These included: improvements to operations with respect to stormwater management practices; retrofitting of an existing containment area to allow product storage according to the Washington State Department of Ecology Best Management Practices for Stormwater; installation of a sensor and alarm system in the stormwater detention vault to alert employees to dangerous atmospheres in the stormwater detention vault; and, improvements to the stormwater management catch basins and gate valves to ensure any spill volumes and their migration are minimized. Emerald continues to diligently track operations in the stormwater management areas to ensure a similar event does not occur in the future and stormwater is consistently managed according to the Washington State Department of Ecology Best Management Practices for Stormwater.

Emerald continues to be part of the RCRA facility investigation program directed by the Washington State Department of Ecology. While Emerald prefers to maintain its facilities in a state of continuous compliance, any items brought to Emerald's attention during investigations and regulatory inspections are corrected in a timely manner and appropriate longer-term, effective corrective action is implemented.

Use the tab key to move from cell to cell in the electronic version of this form.

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EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below): A facility has two storage tanks that hold 1200 gallons & 400 gallons respectively. There is also treatment in tanks at 20 gallons/hr. Finally, a one-quarter acre area that is two meters deep will undergo *in situ vitrification*

Section XII. Process Codes and Design Capacities								Section XIII. Other Process Codes								
Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
					1. Amount	2. Unit of Measure (enter code)							1. Amount	2. Unit of Measure (enter code)		
X	1	S	0	2	1,600	G	002	X	1	T	0	4	700	C	001	In situ vitrification
X	2	T	0	3	20	E	001									
X	3	T	0	4	700	C	001									
	1	S	0	1	40,810	G	742		1							
	2	S	0	2	143,966	G	17		2							
	3	T	0	1	37,090	E	10		3							
	4								4							
	5								5							
	6								6							
	7								7							
	8								8							
	9								9							
1	0							1	0							
1	1							1	1							
1	2							1	2							
1	3							1	3							
1	4							1	4							
1	5							1	5							
1	6							1	6							
1	7							1	7							
1	8							1	8							
1	9							1	9							
2	0							2	0							
2	1							2	1							
2	2							2	2							
2	3							2	3							
2	4							2	4							
2	5							2	5							

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XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number			A. Dangerous Waste No. (enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Processes									
									(1) Process Codes (enter)									(2) Process Description [If a code is not entered in D (1)]
X	1		D	0	0	2	400	P	S	0	1	T	0	1				
X	2		D	0	0	1	100	P	S	0	2	T	0	1				
X	3		D	0	0	2												Included with above
		1																See Attachment B
		2																
		3																
		4																
		5																
		6																
		7																
		8																
		9																
	1	0																
	1	1																
	1	2																
	1	3																
	1	4																
	1	5																
	1	6																
	1	7																
	1	8																
	1	9																
	2	0																
	2	1																
	2	2																
	2	3																
	2	4																
	2	5																

Use the tab key to move from cell to cell in the electronic version of this form.
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EPA/State ID Number	W	A										

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
				(1) Process Codes (enter)	(2) Process Description [If a code is not entered in D (1)]

XV. Map

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements. .

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

XVIII. Certifications

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Operator Matthew Sauvageau, Vice President, Compliance **Name and Official Title (type or print)**	**Signature**	**Date Signed** 7/31/17
Facility/Property Owner Matthew Sauvageau, Vice President, Compliance **Name and Official Title (type or print)**	**Signature**	**Date Signed** 7/31/17

XIX. Comments

Site Longitude 122 degrees 23 minutes 5 secs
Section XI. Nature of Business - refer to Attachment A
Section XIV. Description of Dangerous Wastes - refer to Attachment B

Part A

Application Section XI

Attachment A
Nature of Business

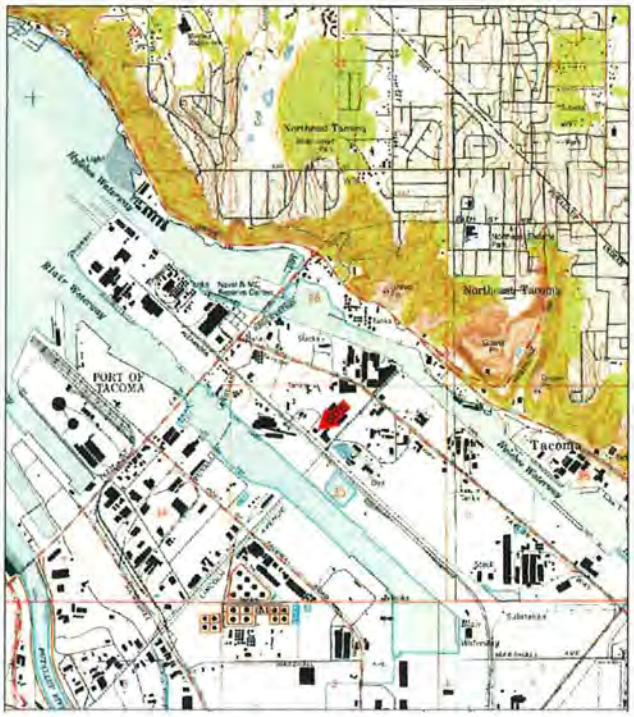
Emerald Services, Inc. Part A
Attachment A - Section XI - Nature of Business

Emerald Recycling, a division of Emerald Services, Inc. provides waste recycling services to customers located throughout Oregon, Washington, Idaho, Montana, Utah, Wyoming, and North Dakota. Recycled solvent and blended fuel products produced are marketed throughout the western United States and Alaska.

Emerald Services, Inc. (Emerald) conducts five dangerous waste process and storage operations at the Tacoma location: 1) thin film evaporation solvent recycling, 2) high boiler distillation solvent recycling, 3) glycol (antifreeze) recycling, 4) dangerous waste fuel blending and 5) dangerous waste storage. Additionally, Emerald conducts used oil re-refining at the Tacoma location. Waste and used oil recycling and recovery contributes to the regional waste management capacity of the region and helps generators reduce their operational costs.

The Emerald Services, Inc. - Tacoma facility is located in the industrial port area of Tacoma, Washington, on the north side of Alexander Avenue between the Hylebos and Blair Waterways (Figure A-1, below).

Figure A-1 General Vicinity Map



Emerald is primarily a recycling facility that receives materials from offsite generators and processes those materials for subsequent reuse, energy recovery, or storage. The processed materials are then shipped to customers or to off-site fuel blending facilities. Fuel blending operations are in accordance with WAC 173-303-120 and WAC 173-303-510, waste recycling is in accordance with WAC 173-303-120, and used oil re-refining is in accordance with WAC 173-303-515. The dangerous waste that is stored will be shipped to other Treatment, Storage, and Disposal facilities (TSDFs) for final disposal or treatment.

Emerald Services, Inc. Part A
Attachment A - Section XI - Nature of Business

Emerald holds a storage permit (WAD 981 769 110) to support its recycling, offsite energy recovery and dangerous waste storage activities. Materials received at the facility for recycling are usually placed into active recycling processes soon after receipt. However, dangerous wastes may be stored on-site before recycling, fuel blending processing and storage.

The following list includes some typical industries Emerald serves:

- Automotive repair
- Dry Cleaning
- Utilities
- Transportation facilities
- Educational Institutions
- Laboratories
- Health Care
- Military bases
- Food manufacturing
- Steel Industry
- Government agencies
- Electronic industry
- Boat building
- Metal cleaning and plating
- Packaging
- Paint Manufacturing
- Ink Manufacturing
- Petroleum Industry
- Painting contractors
- Airlines
- Plastics Manufacturing

Recycling Processes

Solvent recycling is performed in distillation units specifically designed for solvent recovery. Recoverable solvents are recycled, then packaged for re-sale. The recycled product is sold as is, or is blended with virgin or other recycled products to meet customer specifications.

Recycling recovers clean, reusable products from dangerous waste using distillation technology. Emerald's three recycling systems are low boiler, high boiler, and glycol distillation. These systems are described in the following narrative.

Low Boiler Distillation

The process is designed to distill solvents with boiling points up to 500°F. It uses an agitated thin-film evaporator consisting of ancillary pumps, piping, a vacuum vessel, vacuum pump, a feed tank, condenser, and receiving tanks, as shown in Figure A-2. Dangerous waste is fed from a feed tank to the thin-film evaporator on a continuous basis. The material is vacuum distilled using non-contact hot oil as a heat transfer media. The distilled product is condensed, sent to storage, and packaged for resale. Still bottoms generated by the process are recovered and sent to the fuel blending operations for further processing.

Figure A-2. Thin Film Evaporator

Distillation generates solvent laden process streams that exceed one percent (1%) total organic compound (TOC) content, including:

- Draw water and still water from distillation units, and
- Washout water from tanks.

This solvent laden water is temporarily placed in a container and either 1) reprocessed through the Thin-Film Evaporator to recover the solvent, 2) blended as a fuel if its heat content meets energy recovery requirements or 3) treated through carbon adsorption if authorized by the local Industrial wastewater pretreatment authority.

High Boiler Distillation

The process is a "pot still" designed to batch-distill solvents with boiling points of 300°F - 500°F (Figure A-3). Support systems consist of a feed tank, ancillary pumps, piping, condensers and product tanks. A fixed volume of dangerous waste is delivered to the pot from a feed tank, or directly from containers, depending on the quantity of material to be recycled.

Figure A-3. High Boiler Still

The pot is heated with a non-contact hot oil jacket. Distilled product is condensed, sent to tanks, and packaged for resale. Hazardous waste still bottoms and off-specification product generated by the process are sent to the fuel blending operations for further processing, or are sent offsite in containers to an appropriate permitted dangerous waste TSD facility. Emerald utilizes this unit for recycling of dangerous waste solvents as well as light ends from used oil re-refining.

Glycol Distillation

The process is designed to distill water/glycol antifreeze solutions at or near 325°F. It uses a heat-exchanger still with ancillary pumps, piping, a distillation vessel, fluid pumps, a feed tank, condenser, and receiving tanks, as shown in Figure A-4. Material is fed from a feed tank to the glycol still on a continuous basis. The material is distilled using steam heat transfer. The distilled product is condensed, sent to storage, treated with stabilization materials and packaged for resale. Still bottoms generated by the process are recoverable and sent to the fuel blending operations for further processing. Distillate is managed according to Emerald's Industrial Wastewater Pretreatment Permit.

Figure A-4. Glycol Still

Fuel Blending Process

Dangerous waste lacking recoverable solvent suitable for resale, and exhibiting heat content suitable for energy recovery, is blended to make fuels. Figure A-5 shows the fuel blending apparatus and transfer area. Fuels are transferred by double-walled piping to the fuel railcar by 1) the fuel blending feed pipe, 2) the Cascade Shredder, or 3) a vacuum tank truck. The choice of transfer method is determined by the physical state of the material. The blended fuels are sent to permitted offsite energy recovery TSD facilities. Dangerous wastes received from generators and waste generated by Emerald that meet the requirements for dangerous waste fuel burned for energy recovery are processed in the fuel blending operations. Materials are blended to specifications established by the destination TSD facility.

Figure A-5. Fuel Blending System

Used Oil Re-Refining

Emerald collects used oil throughout the Pacific Northwest for recycling at its facilities in Washington. Inbound used oil is tested at different stages in the acceptance process, and once acceptable results are received, the used oil is introduced into the re-refining process. The re-refining process begins with removal of water and other lighter molecular weight contaminants from the oil by "flashing" the oil at a high temperature combined with reduced atmospheric pressure (vacuum). Temperature and pressure within the system are then adjusted to create different products, including light ends, marine diesel oil, and asphalt flux. All emissions are routed to emissions control units permitted through the Puget Sound Clean Air Agency.

Wastewater Treatment Permit-by-Rule

Wastewater is generated on-site from rainfall entering containment areas, operator hand washing, rinsate from equipment cleaning, and wash water from drum cleaning. Contact stormwater is managed in accordance with Emerald's Industrial Wastewater Discharge Permit with the City of Tacoma. The remaining wastewater is accumulated on-site prior to off-site shipment to a suitably permitted industrial wastewater treatment facility.

10-Day Transfer Facility

Emerald operates a 10-day transfer facility for dangerous wastes subject to WAC 173-303-240(6). Transfer waste is checked at the loading dock, and containers are moved to destination-specific trailers.

Dangerous Waste Generated Onsite

Dangerous wastes are generated on-site by routine management and processing operations, including still bottoms, wastewater, filter debris, activated carbon, process residues, and floor sweepings. Wastes that meet fuel-blending specifications, such as still bottoms, can be pumped into railcars destined for energy recovery. If the waste does not meet fuel blend specifications, such as filter debris, spill/floor sweeping residue, and spent activated carbon, it is prepared for shipment to a permitted off-site TSD facility.

Universal Waste

Emerald manages Universal Waste, including batteries, mercury thermostats, and lamps under WAC 173-303-573.

Household Hazardous Waste

Emerald currently holds an MRW permit for household hazardous waste (HHW) management.

Emerald intends to manage onsite (at any given time) no more than 80 55-gallon drums of HHW process waste and 80 55-gallon drums of transfer waste, or some combination thereof – 160 drums total. HHW waste will be processed subject to the facility's Part B permit; and HHW transfer waste will be managed under DOT transfer facility rules.

Corrective Actions Statement

There are no historical or on-going corrective actions taken at the site under the Dangerous Waste Rules, Model Toxics Control Act, or federal regulations. The previous Permittee at the facility, Sol-Pro, Inc. completed a draft remedial investigation (RI) report in April 2000. Ecology approved the draft report as meeting the requirements for an RI in WAC 173-340-350 and the requirements of a RFI (RCRA Facility Investigation). When Emerald assumed ownership of the facility in May 2000, they became subject to the corrective action requirements of WAC 173-303-646 to address releases, and potential releases, of dangerous wastes, including dangerous waste constituents, to the soils or groundwater at the Facility. Based upon a review of the draft RI report and annual groundwater monitoring reports submitted by Emerald, Ecology determined that it was not necessary to continue with a feasibility study (FS) or cleanup action plan (CAP) for the facility.

Corrective action for the Emerald facility currently includes monitoring and reporting on groundwater. Contamination in groundwater, including benzene, diesel, and arsenic, found in monitoring wells at the facility appears to have migrated from neighboring properties. This groundwater contamination will be addressed under a separate order administered by Ecology's Toxics Cleanup Program. Under Emerald's Permit, Emerald must monitor groundwater at the facility under a work plan approved by Ecology. Emerald must also notify Ecology and perform corrective action on newly-identified releases of contamination.

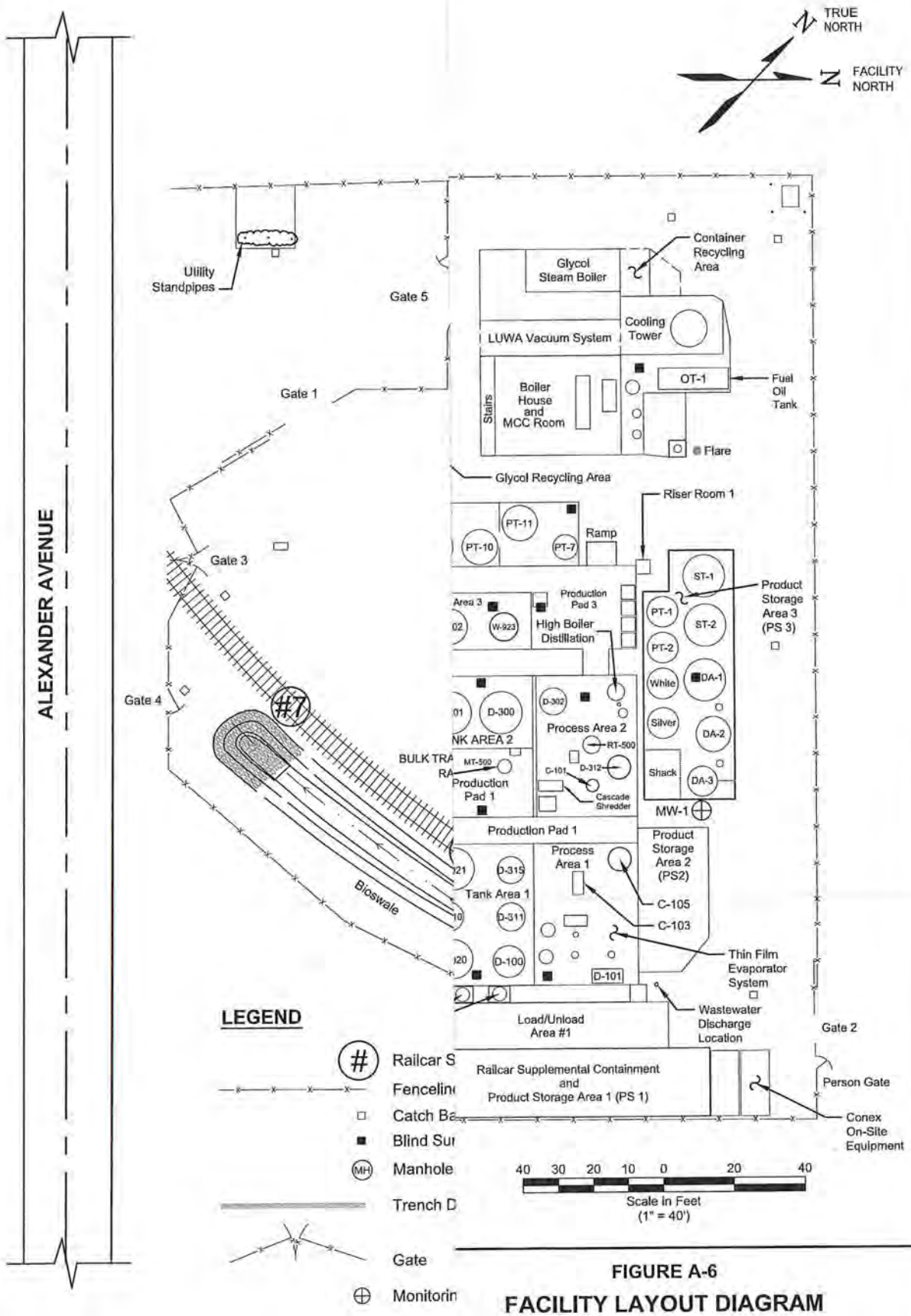


FIGURE A-6

FACILITY LAYOUT DIAGRAM

0:	FLD6	DATE:	Feb. 9, 2015	SCALE:	1"=40'

Part A

Application Section XIV

Attachment B
Description of Dangerous Waste

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

				EPA State ID # WAD981769110	
Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
1	D001	4,656,000	P	S01, SO2	Solvent recycling
2	D004				Included with above
3	D005				Included with above
4	D006				Included with above
5	D007				Included with above
6	D008				Included with above
7	D009				Included with above
8	D010				Included with above
9	D011				Included with above
10	D018				Included with above
11	D019				Included with above
12	D020				Included with above
13	D021				Included with above
14	D022				Included with above
15	D023				Included with above
16	D024				Included with above
17	D025				Included with above
18	D026				Included with above
19	D027				Included with above
20	D028				Included with above
21	D029				Included with above
22	D030				Included with above
23	D031				Included with above
24	D032				Included with above
25	D033				Included with above
26	D034				Included with above
27	D035				Included with above
28	D036				Included with above
29	D037				Included with above
30	D038				Included with above
31	D039				Included with above
32	D040				Included with above
33	D041				Included with above
34	D042				Included with above
35	D043				Included with above
36	F001				Included with above
37	F002				Included with above
38	F003				Included with above
39	F004				Included with above
40	F005				Included with above
41	K086				Included with above
42	K087				Included with above
43	K169				Included with above
44	K170				Included with above
45	U002				Included with above
46	U004				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
47	U019				Included with above
48	U031				Included with above
49	U037				Included with above
50	U051				Included with above
51	U052				Included with above
52	U056				Included with above
53	U057				Included with above
54	U080				Included with above
55	U140				Included with above
56	U159				Included with above
57	U161				Included with above
58	U165				Included with above
59	U210				Included with above
60	U220				Included with above
61	U227				Included with above
62	U228				Included with above
63	U239				Included with above
64	WT01				Included with above
65	WT02				Included with above
66	WP01				Included with above
67	WP02				Included with above
68	WP03				Included with above
69	D001	7,860,000	P	S01, SO2, TO1	Fuel Blending
70	D002				Included with above
71	D004				Included with above
72	D005				Included with above
73	D006				Included with above
74	D007				Included with above
75	D008				Included with above
76	D009				Included with above
77	D010				Included with above
78	D011				Included with above
79	D018				Included with above
80	D019				Included with above
81	D020				Included with above
82	D021				Included with above
83	D022				Included with above
84	D023				Included with above
85	D024				Included with above
86	D025				Included with above
87	D026				Included with above
88	D027				Included with above
89	D028				Included with above
90	D029				Included with above
91	D030				Included with above
92	D031				Included with above
93	D032				Included with above
94	D033				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
95	D034				Included with above
96	D035				Included with above
97	D036				Included with above
98	D037				Included with above
99	D038				Included with above
100	D039				Included with above
101	D040				Included with above
102	D041				Included with above
103	D042				Included with above
104	D043				Included with above
105	F001				Included with above
106	F002				Included with above
107	F003				Included with above
108	F004				Included with above
109	F005				Included with above
110	K086				Included with above
111	K087				Included with above
112	K169				Included with above
113	K170				Included with above
114	U002				Included with above
115	U003				Included with above
116	U004				Included with above
117	U019				Included with above
118	U031				Included with above
119	U037				Included with above
120	U051				Included with above
121	U052				Included with above
122	U056				Included with above
123	U057				Included with above
124	U080				Included with above
125	U108				Included with above
126	U112				Included with above
127	U117				Included with above
128	U118				Included with above
129	U140				Included with above
130	U159				Included with above
131	U161				Included with above
132	U165				Included with above
133	U196				Included with above
134	U210				Included with above
135	U220				Included with above
136	U227				Included with above
137	U228				Included with above
138	U239				Included with above
139	WT01				Included with above
140	WT02				Included with above
141	WP01				Included with above
142	WP02				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
143	WP03				Included with above
144	WPCB				Included with above
145	D008	11,952,000	P	S01, SO2	Glycol Recycling
146	D018				Included with above
147	WT01				Included with above
148	WT02				Included with above
149	D001	60,000	P	S01	Storage
150	D002				Included with above
151	D004				Included with above
152	D005				Included with above
153	D006				Included with above
154	D007				Included with above
155	D008				Included with above
156	D009				Included with above
157	D010				Included with above
158	D011				Included with above
159	D018				Included with above
160	D019				Included with above
161	D020				Included with above
162	D021				Included with above
163	D022				Included with above
164	D023				Included with above
165	D024				Included with above
166	D025				Included with above
167	D026				Included with above
168	D027				Included with above
169	D028				Included with above
170	D029				Included with above
171	D030				Included with above
172	D031				Included with above
173	D032				Included with above
174	D033				Included with above
175	D034				Included with above
176	D035				Included with above
177	D036				Included with above
178	D037				Included with above
179	D038				Included with above
180	D039				Included with above
181	D040				Included with above
182	D041				Included with above
183	D042				Included with above
184	D043				Included with above
185	F001				Included with above
186	F002				Included with above
187	F003				Included with above
188	F004				Included with above
189	F005				Included with above
190	F027				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
191	K086				Included with above
192	K087				Included with above
193	K169				Included with above
194	K170				Included with above
195	P001				Included with above
196	P002				Included with above
197	P003				Included with above
198	P006				Included with above
199	P007				Included with above
200	P008				Included with above
201	P010				Included with above
202	P011				Included with above
203	P012				Included with above
204	P014				Included with above
205	P015				Included with above
206	P016				Included with above
207	P017				Included with above
208	P018				Included with above
209	P022				Included with above
210	P023				Included with above
211	P024				Included with above
212	P027				Included with above
213	P028				Included with above
214	P036				Included with above
215	P038				Included with above
216	P041				Included with above
217	P046				Included with above
218	P048				Included with above
219	P056				Included with above
220	P057				Included with above
221	P058				Included with above
222	P062				Included with above
223	P065				Included with above
224	P067				Included with above
225	P069				Included with above
226	P072				Included with above
227	P075				Included with above
228	P076				Included with above
229	P077				Included with above
230	P078				Included with above
231	P081				Included with above
232	P082				Included with above
233	P084				Included with above
234	P085				Included with above
235	P087				Included with above
236	P088				Included with above
237	P092				Included with above
238	P093				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
239	P095				Included with above
240	P102				Included with above
241	P103				Included with above
242	P105				Included with above
243	P108				Included with above
244	P110				Included with above
245	P111				Included with above
246	P112				Included with above
247	P113				Included with above
248	P114				Included with above
249	P116				Included with above
250	P118				Included with above
251	P119				Included with above
252	P120				Included with above
253	P123				Included with above
254	P127				Included with above
255	P190				Included with above
256	P196				Included with above
257	P205				Included with above
258	U001				Included with above
259	U002				Included with above
260	U003				Included with above
261	U004				Included with above
262	U005				Included with above
263	U006				Included with above
264	U007				Included with above
265	U008				Included with above
266	U009				Included with above
267	U011				Included with above
268	U012				Included with above
269	U014				Included with above
270	U016				Included with above
271	U017				Included with above
272	U018				Included with above
273	U019				Included with above
274	U020				Included with above
275	U022				Included with above
276	U023				Included with above
277	U024				Included with above
278	U025				Included with above
279	U026				Included with above
280	U027				Included with above
281	U030				Included with above
282	U031				Included with above
283	U032				Included with above
284	U033				Included with above
285	U034				Included with above
286	U037				Included with above

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
287	U039				Included with above
288	U041				Included with above
289	U042				Included with above
290	U043				Included with above
291	U044				Included with above
292	U045				Included with above
293	U046				Included with above
294	U047				Included with above
295	U048				Included with above
296	U049				Included with above
297	U050				Included with above
298	U051				Included with above
299	U052				Included with above
300	U053				Included with above
301	U055				Included with above
302	U056				Included with above
303	U057				Included with above
304	U063				Included with above
305	U064				Included with above
306	U066				Included with above
307	U068				Included with above
308	U070				Included with above
309	U071				Included with above
310	U072				Included with above
311	U074				Included with above
312	U075				Included with above
313	U076				Included with above
314	U077				Included with above
315	U078				Included with above
316	U079				Included with above
317	U080				Included with above
318	U081				Included with above
319	U082				Included with above
320	U083				Included with above
321	U084				Included with above
322	U085				Included with above
323	U086				Included with above
324	U092				Included with above
325	U093				Included with above
326	U094				Included with above
327	U097				Included with above
328	U098				Included with above
329	U099				Included with above
330	U101				Included with above
331	U105				Included with above
332	U106				Included with above
333	U108				Included with above
334	U109				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
335	U110				Included with above
336	U111				Included with above
337	U112				Included with above
338	U113				Included with above
339	U114				Included with above
340	U115				Included with above
341	U116				Included with above
342	U117				Included with above
343	U118				Included with above
344	U119				Included with above
345	U120				Included with above
346	U121				Included with above
347	U122				Included with above
348	U123				Included with above
349	U124				Included with above
350	U125				Included with above
351	U126				Included with above
352	U127				Included with above
353	U131				Included with above
354	U133				Included with above
355	U134				Included with above
356	U136				Included with above
357	U137				Included with above
358	U140				Included with above
359	U144				Included with above
360	U145				Included with above
361	U146				Included with above
362	U147				Included with above
363	U148				Included with above
364	U149				Included with above
365	U151				Included with above
366	U152				Included with above
367	U153				Included with above
368	U154				Included with above
369	U156				Included with above
370	U158				Included with above
371	U159				Included with above
372	U161				Included with above
373	U162				Included with above
374	U164				Included with above
375	U165				Included with above
376	U166				Included with above
377	U167				Included with above
378	U168				Included with above
379	U169				Included with above
380	U170				Included with above
381	U171				Included with above
382	U172				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
383	U174				Included with above
384	U176				Included with above
385	U177				Included with above
386	U178				Included with above
387	U179				Included with above
388	U180				Included with above
389	U181				Included with above
390	U182				Included with above
391	U183				Included with above
392	U184				Included with above
393	U185				Included with above
394	U186				Included with above
395	U187				Included with above
396	U188				Included with above
397	U191				Included with above
398	U194				Included with above
399	U196				Included with above
400	U197				Included with above
401	U200				Included with above
402	U201				Included with above
403	U204				Included with above
404	U205				Included with above
405	U207				Included with above
406	U208				Included with above
407	U209				Included with above
408	U210				Included with above
409	U211				Included with above
410	U213				Included with above
411	U214				Included with above
412	U215				Included with above
413	U216				Included with above
414	U217				Included with above
415	U218				Included with above
416	U219				Included with above
417	U220				Included with above
418	U221				Included with above
419	U222				Included with above
420	U223				Included with above
421	U225				Included with above
422	U226				Included with above
423	U227				Included with above
424	U228				Included with above
425	U234				Included with above
426	U235				Included with above
427	U238				Included with above
428	U239				Included with above
429	U240				Included with above
430	U243				Included with above

Emerald Services, Inc, Part A
Attachment B - Section XIV - Description of Dangerous Waste

Line Number	Dangerous Waste Number	Estimated Annual Quantity of Waste	Unit of Measure	Processes	
				Process Codes	Process Description
431	U279				Included with above
432	U328				Included with above
433	U353				Included with above
434	U359				Included with above
435	U367				Included with above
436	U373				Included with above
437	U404				Included with above
438	WT01				Included with above
439	WT02				Included with above
440	WP01				Included with above
441	WP02				Included with above
442	WP03				Included with above
443	WPCB				Included with above

Part A

Application Section XVII

Attachment C
Photographs

Thin Film Evaporation

Shown below are Tanks D-100, D-101, C-100, C-801, and C802, which are located in Process Area 1 and Tank Area 1, and are part of the thin film evaporator process. Tank numbers included in parenthesis are the numbers that will be assigned to the tanks upon permitting for dangerous waste storage.

Photo 1. Tank D-100, November 2007

Photo 2. Tank D-101, November 2007

Photo 3. Tank C-100 (D-310), November 2007

Photos 4 and 5. Tank C-801 (D-311 - left) and Tank C-802 (D-315 - right), November 2007

The photos below show portions of the thin film evaporator operational areas.

Photo 6. Tank Area 1, November 2007

Photo 7. Process Area 1, November 2007

High Boiler Distillation

The high boiler distillation process takes place in Process Area 2 and includes tanks C-102 and D-800. Two photos of Process Area 2 and of each of the tanks are presented below. Tank numbers included in parenthesis are the numbers that will be assigned to the tanks upon permitting for dangerous waste storage.

Photo 8. Process Area 2 (looking south), November 2007

Photo 9. Process Area 2 (looking south), November 2007

Photos 10 and 11. Tank C-102 (D-312 - left) and Tank D-800 (D-302 - right), November 2007

Fuel Blending

The fuel blending system process consists of numerous tanks, which are shown below.

Photo 12. Tanks D-500 (right – D-300) and D-501 (left – D-301), November 2007

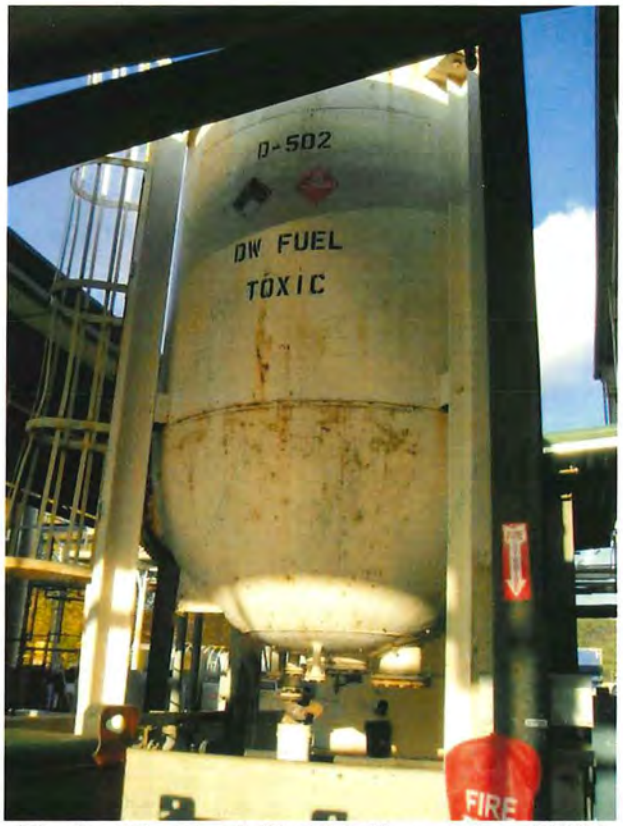


Photo 13. Tank D-502, November 2007

Photos 14 and 15. Tank MT-500 (left) and Tank RT-500 (right), November 2007

Photo 16. Cascade Shredder, November 2009

Shown below is the nitrogen tank that supplies inerting gas to the fuel blending process head spaces.

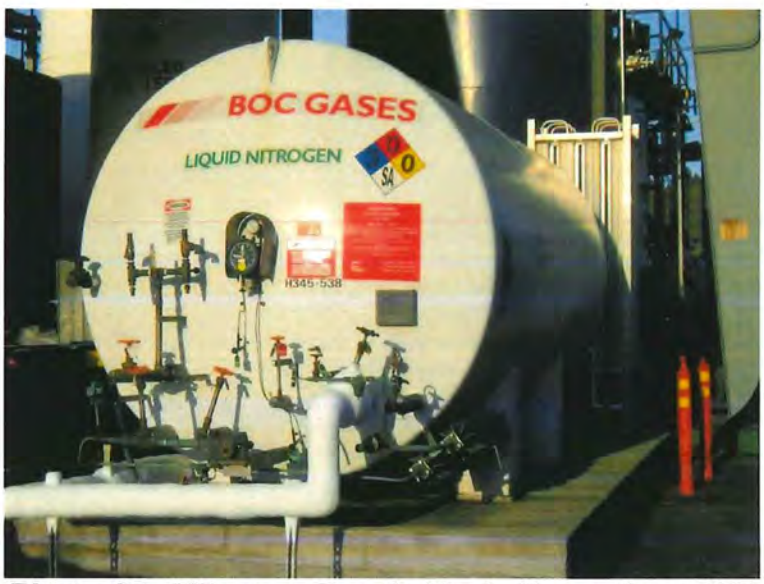


Photo 17. Nitrogen Supply Tank, November 2007

Flare

The flare is capable of reducing VOC emissions by greater than 95%.

Photo 18. Flare, November 2009

Railcar Building

Much of the dangerous waste blended fuel is transported off-site by railcar. The dangerous waste blended fuel is loaded into railcars at the location shown below on the east side of the facility.

Photo 19. Railcar Dangerous Waste Area, November 2007

Glycol Recycling System

The glycol recycling system is located in the northeast corner of the facility. Photographs of this area are presented below.

Photo 20. General Photograph of Glycol Recycling Containment Area (looking south), November 2007

Photo 21. Tank D-210 of Glycol Recycling System, November 2007

Photo 22. Glycol Recycling Area Facing North, November 2009

Photo 23. Glycol Cooling Unit to left and Transfer Pad beneath Truck, November 2007

Transfer Operations

Transfer operations off-load incoming waste from containers and bulk trailers and on-load finished product to outgoing railcars and containers. Transfer operations areas are shown in the photographs below.

Photo 24. 10-Day Transfer Facility Operation, November 2007

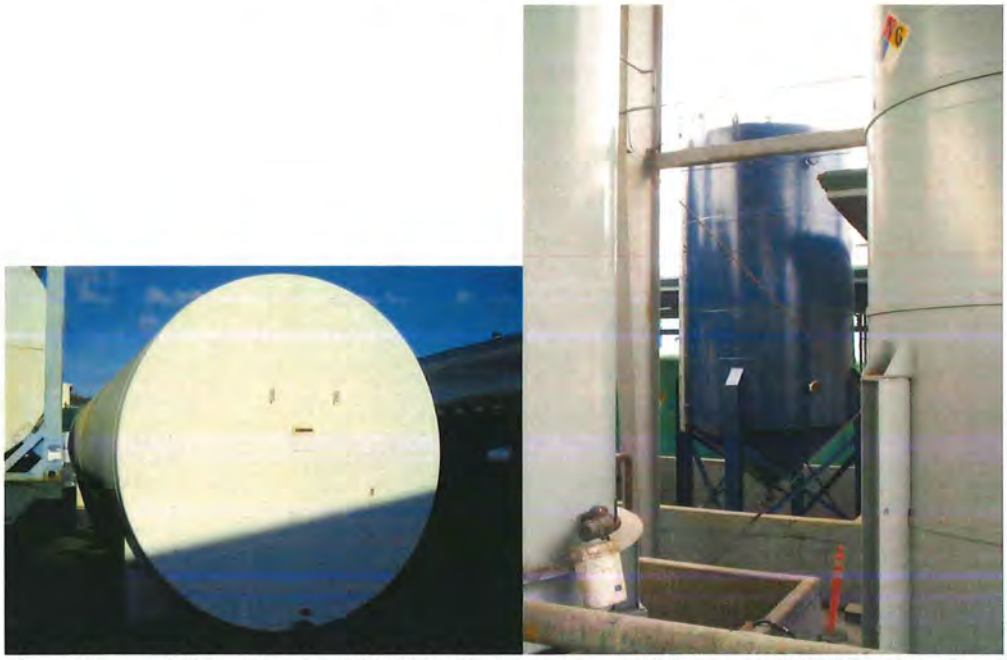
Photo 25. Railcar Product Transfer Operation, Railcar Spots 6 and 7, May 2013

Photo 26. Universal Waste Transfer Operation, November 2007

Wastewater Treatment

Three holdings tanks are used to store waste water while testing for permit requirements prior to discharge.

Photos 27 and 28. Tanks W-920 and W-921 (left to right), Wastewater Holding Tanks, November 2007



Photos 29 and 30. Tanks W-922, November 2007, and W-923, September 2009 (left to right) Wastewater Holding Tanks

Used Oil Re-Refining

Used oil is re-refined to produce asphalt, marine diesel oils, and light end petroleum distillates. Trucks and railcars are loaded and unloaded in the covered and contained used oil load/off-load area.

Photo 31. Used Oil Re-Refining Facility, November 2012

Photo 32. Used Oil Re-Refining Facility at Night with Process Tower (at left), October 2012

Photo 33. Used Oil Re-Refining Facility Load/Unload Area, May 2013

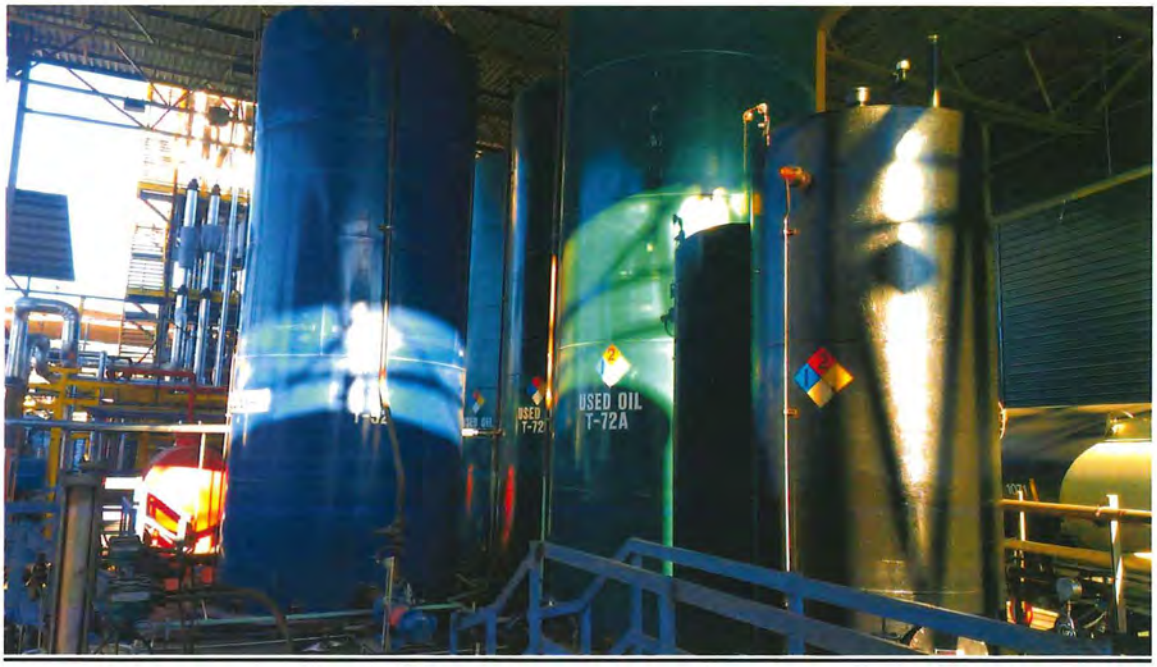


Photo 34. Used Oil Re-Refining Facility Screening Tanks and Oily Water Tank, February 2015

Photo 35. Used Oil Re-Refining Facility Screening Tanks

Photos 36 and 37. Used Oil Re-Refining Facility MCC and Control Rooms, May 2013

Miscellaneous Areas

Miscellaneous facility areas include product storage areas, dangerous waste storage areas, production pads, vacuum system utilities, the boiler, the laboratory, office, and bioswale. Photographs of these areas are presented below.

Product Storage

Photo 38. Product Storage Area PS-1, Containers, November 2007

Photo 39. Product Storage Area PS-2, September 2009

Photo 40. Used Oil Processing and De-Ashing Area PS-3, tanks, facing west. February 2015

Dangerous Waste Storage

Photo 41. Dangerous Waste Container Storage Area, November 2007

Photo 42. Dangerous Waste Container Storage Area, May 2013

Production Pads

Photo 43. Compactor on Production Pad 1, November 2009

Photo 44. Production Pad 2, November 2007

Photo 45. Production Pad 4, November 2007

Vacuum System Utilities

Photos 46 and 47. Tanks V-601 (left) and V-600 (right), November 2007

Boiler

Photo 48. Boiler for Solvent Recycling Systems, November 2007

Laboratory

Photo 49. Laboratory Screening Room, May 2013

Photo 50. Laboratory Instrument Room, May 2013

Photos 51, 52, 53. Laboratory Wet Lab, May 2013

Office

Photo 54 Facility Office, May 2013

Bioswale

Photo 55. Bioswale for Treating Stormwater, November 2007

Part B

Section B

Facility Description and General Provisions

needs updated to match mod #10 submittal

TABLE OF CONTENTS

B. FACILITY DESCRIPTION AND GENERAL PROVISIONS

B.1 General Description WAC 173-303-806(4)(a)(i).....1
B.1.a Facility Description 1
B.1.a(1) Facility Location, Ownership, and Management 1
B.1.a(2) Facility Dangerous Waste Categories Managed 2
B.1.a(3) Operations to Treat and/or Store Dangerous Wastes.....4
B.1.a(3)i Dangerous Waste Receipt.....4
B.1.a(3)ii Dangerous Waste Management Operations – Fuel Blending.....5
B.1.a(3)ii Dangerous Waste Management Operations – Recycling.....6
B.1.a(3)ii Dangerous Waste Management Operations – Storage.....7
B.1.a(3)iii Dangerous Waste Management Operations – Wastes Generated or Stored for Off-Site Shipment 7
B.1.a(3)iv Other Facility Operations Not Related to Dangerous Waste Storage or Recycling 9
Bulk Transfer.....9
10-Day Transfer Facility and Universal Waste Management.....10
Analytical Laboratory 10
Container Recycling Area.....11
Moderate Risk Waste 11
Boiler House 11
N_2 Pad 11
Maintenance Shop.....11
Main Office 12
Break Room.....12
Product Storage 12
B.1.a(4)i History and Location of Dangerous Waste Management Units.....12
B.1.a(4)ii Location of Dangerous Waste Management Units 14
B.2 Topographic Map WAC 173-303-806(4)(xviii).....15
B.3 Seismic Consideration WAC 173-303-806(4)(a) (xi).....15
B.4(a)Traffic Information WAC 173-303-806(4)(a)(x).....16
B.4(b)Facility Pavement, Surfacing, and Load Bearing Capacity.....18

TABLES

B-1 Facility Location Information 1
B-2 Dangerous Waste Categories Managed 2
B-3 Estimated Weekly Traffic Volumes – Current 17
B-4 Estimated Weekly Traffic Volumes – Proposed 17

Section B – Facility Description and General Provisions
List of Exhibits

Exhibit B-1: Property Legal Descriptions
Exhibit B-2: Estimated Surface Water Flow, Legal Description, Site Representation Map with Groundwater Flow, Site Representation Map
Exhibit B-3: Seismic Risk Zone

B. FACILITY DESCRIPTION AND GENERAL PROVISIONS

WAC 173-303-806(4)(a)(i), (x), (xi), and (xviii)

Emerald Services, Inc. is the legal owner of the facility and is a wholly-owned subsidiary of Safety-Kleen Systems, Inc., which is a wholly owned subsidiary of Clean Harbors, Inc., hereafter referred to as "Emerald." This section describes the Emerald facility and its operations. It also includes information regarding the facility's physical environment (topography and seismic risk zone), traffic flow, and proposed facility changes.

B.1 General Description WAC 173-303-806(4)(a)(i)

The following subsections provide a general facility description and construction schedule.

B.1.a Facility Description

B.1.a(1) Facility Location, Ownership, and Management

As shown in Figure B-1, General Vicinity Map, the Emerald facility is located between the Blair and Hylebos Waterways in an area known as the Commencement Bay Nearshore Tideflats. This area is a heavy industrial area. Figure B-2, Facility Location Map, provides more detailed location information, showing the Emerald facility located to the west of Lincoln Avenue, on Alexander Ave. Figure B-3, Facility Layout Diagram, includes details showing the location of specific management units at the Emerald facility. Table B-1, below summarizes the facility location information. A legal description of the site boundaries is provided in Exhibit B-1.

Table B-1
Facility Location Information

Name of Parent Company:	Safety-Kleen Systems, Inc.
Site Operator:	Emerald Services, Inc. and Clean Harbors Environmental Services, Inc.
Facility Address:	1825 Alexander Ave.
Telephone Number:	206-832-3200
County:	Pierce
State:	Washington
Latitude/Longitude	47°16'13" North and 122°23'05" West
Elevation:	Approximately 10 feet above mean sea level
EPA/Site Identification Number	WAD981769110

Prior to 2016, Emerald Services, Inc. was a privately held company, established in Seattle, Washington in 1999 when four pre-existing family-owned companies merged into one. In 2000, Emerald Services, Inc. purchased SolPro, and started doing business at the 1825 Alexander Ave. address as Emerald Recycling. In 2016, Emerald Services, Inc. was acquired by Safety-Kleen Systems, Inc. Safety-Kleen Systems, Inc. is the owner of Emerald Services, Inc.'s outstanding stock and Safety-Kleen is a wholly owned subsidiary of Clean Harbors. Clean Harbors systems are designed to provide centralized support to all Clean Harbors' subsidiaries and affiliates so every entity is using common information on common platforms. WIN and the Central Profile Group (CPG) are examples of these shared services used by all subsidiaries and affiliates, including Emerald Services, Inc.

The Director, Re-Refineryis responsible for overall facility operations and for ensuring the facility is operated in compliance with federal, state, and local regulations. Facility managers, supervisors, operations staff, laboratory staff, and administrative staff assist with regulatory compliance, daily operations, 10-day transfer operations, and laboratory operations. All on-site personnel ultimately report up to the Director, Re-Refinery. While on-site staff are responsible for ensuring day-to-day environmental compliance, additional environmental compliance support for the facility is provided by the Director of Environmental Compliance for Emerald Services, Inc.

Waste Category	Applicable Waste Codes*	Estimated Annual Quantity (tons)
	P075, P076, P077, P078, P081, P082, P084, P085, P087, P088, P092, P093, P102, P103, P105, P108, P110, P111, P112, P113, P114, P116, P118, P119, P120, P123, P127, P190, P196, P205, U001, U002, U003, U004, U005, U006, U007, U008, U009, U011, U012, U014, U016, U017, U018, U019, U020, U022, U023, U024, U025, U026, U027, U030, U031, U032, U033, U034, U037, U039, U041, U042, U043, U044, U045, U046, U047, U048, U049, U050, U051, U052, U053, U055, U056, U057, U063, U064, U065, U066, U068, U070, U071, U072, U074, U075, U076, U077, U078, U079, U080, U081, U082, U083, U084, U085, U086, U092, U093, U094, U097, U098, U099, U101, U105, U106, U108, U109, U110, U111, U112, U113, U114, U115, U116, U117, U118, U119, U120, U121, U122, U123, U124, U125, U126, U127, U131, U133, U134, U136, U137, U140, U144, U145, U146, U147, U148, U149, U151, U152, U153, U154, U156, U158, U159, U161, U162, U164, U165, U166, U167, U168, U169, U170, U171, U172, U174, U176, U177, U178, U179, U180, U181, U182, U183, U184, U185, U186, U187, U188, U191, U194, U196, U197, U200, U201, U204, U205, U207, U208, U209, U210, U211, U213, U214, U215, U216, U217, U218, U219, U220, U221, U222, U223, U225, U226, U227, U228, U234, U235, U238, U239, U240, U243, U279, U328, U353, U359, U367, U373, U404, WPCB, WT01, WT02, WP01, WP02, WP03	
** NOTE: All waste codes do not apply to all waste streams received. Rather, these are all of the waste codes that may be received from waste streams in this category.*		

B.1.a(3) Operations to Treat and/or Store Dangerous Wastes
B.1.a(3)i Dangerous Waste Receipt

Emerald receives the categories of waste streams outlined above from off-site generators. Prior to receipt at the Emerald facility, generators must submit generator information sufficient to complete a waste material profile sheet through the Clean Harbors Central Profiling

The Director, TSDF Operations, reports to the Senior Vice President, Facility Operations, for Clean Harbors Environmental Services, Inc. The Director, Environmental Compliance reports to the Vice President, Compliance for Clean Harbors Environmental Services. Support for waste transportation, personnel training, waste profiling, and waste tracking are provided by specialized groups within Clean Harbors Environmental Services and Safety-Kleen Systems, Inc.

B.1.a(2) Facility Dangerous Waste Categories Managed

The Emerald dangerous waste portion of the facility primarily conducts recycling, fuel blending, and dangerous waste storage operations. The dangerous waste categories managed are outlined in Table B-2, below.

Table B-2
Dangerous Waste Categories Managed

Waste Category	Applicable Waste Codes*	Estimated Annual Quantity (tons)
Solvent for Recycling	D001, F001-F005, D004-D011, D018-D043, K086, K087, K169, K170, U002, U004, U019, U031, U037, U051, U052, U056, U057, U080, U140, U159, U161, U165, U210, U220, U227, U228, U239, WT01, WT02, WP01, WP02, WP03	1,000
Glycol for Recycling	D004, D005, D006, D007, D008, D010, D011, D018, WT01, WT02	5,000
Fuel Blend Materials	D001, D002, F001-F005, F024, F025, F037, F038, D004-D011, D018-D043, K048, K049, K050, K051, K052, K086, K087, K169, K170, K171, K172, U002, U003, U004, U019, U031, U037, U051, U052, U056, U057, U080, U108, U112, U117, U118, U140, U159, U161, U165, U196, U210, U220, U227, U228, U239, WPCB, WT01, WT02, WP01, WP02, WP03	3,500
Storage Only	D001, D002, F001-F005, F024, F025, F027, F037, F038, D004-D011, D018-D043, K048, K049, K050, K051, K052, K086, K087, K169, K170, K171, K172, P001, P002, P003, P006, P007, P008, P010, P011, P012, P014, P015, P016, P017, P018, P022, P023, P024, P027, P028, P036, P038, P041, P046, P048, P056, P057, P058, P062, P065, P067, P069, P072,	1,000

Group (CPG)to characterize their waste stream. If generator information is insufficient for waste characterization purposes, the generator will be contacted to gather more information or a sample for additional analysis at a third party accredited laboratory will be requested. Samples may also be required for waste streams that appear to be suitable for recycling, or for waste streams that have constituents that appear to be incompatible with other waste streams that are managed by Emerald. The procedure for determining when samples would be required, and information regarding required testing, is outlined in the Waste Analysis Plan (WAP) section of this Application.

Containerized waste streams arrive at the facility in various DOT approved containers via trucks, flat beds, box vans, and semi-tractor trailers. Trained Emerald personnel inspect each load, verify the accuracy of the manifest, then off-load the shipment to the Loading Dock.

Containers are then moved from the Loading Dock to one of two production areas for check-in. Check-in is conducted per the requirements of the WAP and requires that a minimum number of samples be analyzed to verify that the waste stream received matches the description provided in the waste profile.

Emerald also receives waste streams in bulk form via vacuum trucks and tank trucks. These trucks are staged at Load/Unload Area 1 or 2 upon arrival at the facility. Trained personnel then verify the accuracy of the manifest, and visually inspect the load contents. A representative sample from the load is then taken to the laboratory for verification.

Once verified, waste streams are either recycled on-site, blended to create a homogeneous fuel, or stored on-site prior to off-site shipment to a permitted third-party TSDF for final disposal. Fuel blending operations are conducted in accordance with WAC 173-303- 510 and recycling operations are conducted in accordance with WAC 173-303-120. Waste streams received for storage only are segregated according to DOT hazard class, then placed in storage as required in WAC 173-303-630(9)(c) and according to segregation requirements outlined in 40 CFR 264 Appendix V. Figure B-4 outlines the sequence of dangerous waste operations occurring at the Emerald facility.

B.1.a(3)ii Dangerous Waste Management Operations – Fuel Blending

Fuel blending activities involve blending of waste streams to create a homogeneous fuel for energy recovery. Three processes make up the fuel blending system. These include the cascade shredder, the dispersion system, and the bulk liquid blending system. Each process is designed to manage waste streams of different viscosity. Detailed engineering, management practices, and process information are also provided in Section D of this Application. Figure D-1 illustrates equipment used for fuel blending.

The cascade shredder is designed to shred solid material prior to placement in the dispersion system. The cascade shredder consists of a hopper, shredder, and auger. Once shredded, the waste stream is transferred to the dispersion system, containers, or the bulk liquid fuel blending system. Examples of solid waste streams that would be shredded include solidified paints and resins, small containers of unused paints, and contaminated rags.

The dispersion system is capable of mixing shredded solids and other high viscosity waste streams with low viscosity waste streams to create a pumpable waste stream. This system consists of a hopper, chute, mix tank, blender, and associated ancillary equipment such as pumps, piping, and filters. Shredded solids and other high viscosity waste streams are introduced into the mix tank through the hopper and chute located above the tank. Other low viscosity waste streams are then introduced into the mix tank until the combination of waste streams is thoroughly blended into a homogeneous fuel. Emerald may also choose to not utilize the cascade shredder and dispersion system for management of waste streams with high solids content. In these cases, Emerald stores the containerized solids in the Dangerous Waste Container Storage area until outbound transportation and third-party disposal can be arranged.

The fuel blending system consists of a filter, blend pump, and associated ancillary equipment and piping. Waste streams are pumped from the truck or container through the filter, then blended using the blend pump. The blended fuel is then transferred directly to a railcar via double-wall overhead piping or to a dangerous waste storage tank. Railcars are loaded with dangerous waste fuels in railcar spots 1 and 2 of the railcar building. The railcar building is constructed

with concrete containment that begins at railcar spots 1 and 2, then extends through to the Railcar supplemental Containment and Product Storage area. The concrete at railcar spots 1 and 2 slopes to the supplemental containment area, which is capable of containing the volume that may be released from a full railcar. The concrete area immediately below railcar spots 1 and 2 contains blind sumps suitable for containing smaller spills.

All blended fuel is ultimately shipped off-site by either railcar or tanker truck, for energy recovery at a third-party permitted disposal facility.

B.1.a(3)ii Dangerous Waste Management Operations – Recycling

Recycling activities include those processes that entail recovery of clean, reusable solvent or glycol from waste streams using distillation technology. Emerald may accomplish this recycling utilizing one of three processes: glycol recycling, low boiler distillation, or thin film evaporation. Detailed engineering, management practices, and process information are provided in Section D of this Application.

The glycol recycling system is designed to distill glycols with a boiling point range of 350-400°F. It utilizes three separate distillation columns to separate glycols from waste in antifreeze. Support systems consist of storage tanks, feed tanks, filters, ancillary pumps, piping, condensers, heat exchangers, and product tanks. Waste antifreeze is pumped into a dangerous waste tank, then pumped through filters and two separate gravity separation tanks before it is fed into the distillation system. The antifreeze is then vacuum distilled using steam as the heat transfer media. The distilled product is then transferred to mix tanks, blended with appropriate inhibitor package and then packaged for resale.

The thin film evaporation system is designed to distill solvents with a boiling point range up to 300°F. It utilizes an agitated thin-film evaporator consisting of ancillary pumps, piping, a vacuum vessel, vacuum pump, a feed tank, condenser, and receiving tanks. Waste streams suitable for recycling are transferred from a feed tank to the thin film evaporator on a continuous basis while it is operating. The waste streams are vacuum distilled using non-contact hot oil as a heat transfer media. The distilled product is condensed, transferred to storage, and subsequently packaged for resale. It may also be

blended with other products on-site to meet specific customer requests.

The high boiler distillation system is designed to distill solvents with a boiling point range of up to 500°F. It utilizes a "pot still" equipped with advanced electronics and materials technology. This system includes a feed tank, ancillary pumps, piping, and condensers. Waste streams and used oil suitable for recycling are transferred to the pot still for recycling on a batch basis. Transfers may be made from a feed tank or directly from containers depending on the quantity to be recycled. The waste stream is vacuum distilled using non-contact hot oil as a heat transfer media. The distilled product is condensed, then transferred to product storage tanks or containers prior to blending with other products on-site, or it may be packaged directly for resale.

Recycled waste streams are routinely shipped to customers using Emerald Services, Inc. transportation. In some cases, Emerald or the generator may arrange for third party transportation. All shipments are made in accordance with DOT requirements.

B.1.a(3)ii Dangerous Waste Management Operations - Storage

Certain waste streams are received at the Emerald Tacoma facility for storage purposes only. These waste streams are offloaded and checked in per requirements of the facility Waste Analysis Plan. Upon accumulation of full truckload quantities of material, Emerald then ships the waste streams to permitted TSDFs for final disposal.

B.1.a(3)iii Dangerous Waste Management Operations – Wastes Generated or Stored for Off-Site Shipment

Emerald generates dangerous waste during its recycling and fuel blending operations. Waste streams from these processes include process waste water, tank still bottoms, filter debris, activated carbon, spill residues and absorbents, contaminated personal protective equipment, and other contaminated debris such as floor sweepings.

Process waste water is generated during equipment cleaning, drum rinsing, and boiler blow down operations. Distilled water is generated

during operation of the glycol recycling unit. This water is accumulated in water storage tanks on-site prior to transportation off-site and management by a permitted wastewater pre-treatment facility. Emerald also generates process waste water during maintenance and operation of the glycol recycling system.

During maintenance of the glycol unit, unusable glycol is cleaned out of the system in a series of water rinses. The first two glycol system rinses generally have adequate Btu value at the point of generation to be fuel blended for energy recovery. These rinses are transferred to the railcar following removal from the glycol recycling system. The remaining glycol system rinses are transferred to containers prior to transportation off-site and disposal by a third-party permitted disposal facility.

Contact stormwater that accumulates in Dangerous Waste Containment areas is managed under Emerald's Industrial Wastewater Discharge Permit with the City of Tacoma. Contact stormwater is accumulated into waste water storage tanks on-site (W-920, W-921, W-922, W-923, W-924, and W-925), and then tested. Water is discharged once testing shows that it meets all discharge parameters. Water that does not meet all discharge parameters is transported off-site for management at an appropriately permitted pretreatment facility.

Activated carbon from the glycol recycling unit is transferred to the rail car or stored on-site prior to shipment off-site for regeneration or energy recovery to a third-party permitted disposal facility. The remaining solid waste streams generated on-site are either incinerated, fuel blended, or landfilled depending on the contaminants present.

Emerald recycles containers that are in suitable condition by either sending the container off-site for reconditioning, rinsing the container for re-use, or ultimately crushing the container for metals recovery.

All waste streams received and generated on-site are tracked using the WIN (Waste Information Network) tracking system developed by Clean Harbors Environmental Services. Through WIN Emerald tracks the receipt and movement of dangerous waste on a continual basis from the initial receipt of each waste stream to the outbound shipment to a permitted TSD facility.

Manifests for wastes received are returned to the generator within 30 days of receipt. Emerald tracks outbound shipments of waste to ensure a signed manifest from the TSDF is received within 30 days of shipment. Should a waste not be received at the destination TSDF within 45 days, Emerald prepares the required exception report.

Certificates of Destruction for wastes received are provided to generators upon request, and are generated out of the WIN system. While the Emerald facility typically limits its tracking needs to time of waste stream receipt or on-site generation to time of waste stream shipment off-site, the WIN system has the ability to track waste streams from the time of pick-up at the generator site until shipment for final disposal. In cases where the permitted TSD facility is a Clean Harbors Environmental Services facility, Emerald has the ability to track waste streams until processing occurs at the final disposal facility.

WIN enables Emerald to maintain a running inventory of all dangerous waste in containers as well as in different tanks and process units on a daily basis. This system therefore ensures that Emerald can track all generator waste streams from "cradle to grave", satisfying the requirements of WAC 173-303-380. A summary of the current Emerald tracking system is provided in Figure B-5, Tracking Summary Flow Chart.

B.1.a(3)(iv) Other Facility Operations Not Related to Dangerous Waste Storage or Recycling

Used Oil Re-Refining

In 2012, Emerald's Tacoma facility completed a significant expansion to include used oil re-refining operations within the larger footprint of the Tacoma facility. With few exceptions, the re-refining operations are located within their own separate concrete secondary containment.

The used oil re-refining facility (VGO Plant) is capable of processing up to 15 million gallons of used oil annually. Inbound used oil must pass a series of initial screening tests that are outlined in Emerald's used oil acceptance protocol, prior to being off-loaded into facility screening tanks T72A, T72B, T72C, or T72D for further testing. Used oil consolidated into screening tanks is then analyzed for used oil

parameters including metals and PCBs. Once acceptable results are received, the contents of the receiving tank are then transferred to the feed tank, T71A, and re-refining of the used oil is initiated.

The first step of re-refining process is removal of water and other lighter molecular weight contaminants from the oil by "flashing" the oil at a high temperature combined with low atmospheric pressure. Temperature and pressure within the system are then adjusted to create different products. All emissions are routed to emissions control units permitted through the Puget Sound Clean Air Agency.

There are three main products that are produced from used oil re-refinery operations: light ends, marine diesel oil (MDO), and asphalt flux. Emerald either markets these products directly to customers or creates different customer-specific blends of these products. Specifications for products from the re-refinery vary based on market demand. Products from the used oil re-refinery operation are stored in Tanks T76A, T76B, T76C, T76D, T79, DA1, DA2, or DA3 prior to distribution.

Tank T-76D has two primary functions: as a product storage tank and as an industrial fuel blending tank. Industrial fuel blending consists of blending asphalt flux with de-ashed oil. For this activity, asphalt flux is transferred from Tank T-79 to Tank T76D. The asphalt flux is at a temperature of between 250°F and 375°F at the time of transfer. The de-ashed oil, supplied by the Emerald Tacoma used oil facility or the Emerald facility in Seattle, is then transferred from a truck or tank to Tank T-76D as Tank T-76D recirculates. The blending is conducted at atmospheric temperature and pressure, and only de-ashed oil with less than 2.5% water is used for this process due to safety concerns. Other specifications vary based on market demand and product availability.

In some cases, there is a demand for a light ends that are of a higher value than that normally produced within the re-refinery. When that is the case, Emerald utilizes one of the Part B Facility recycling units, the high boiler distillation unit, to distill the light ends into the higher value product. This creates a situation of regulatory dual-purposing of the high boiler distillation unit. In order to clearly separate the regulatory status during use of the unit for light ends recycling, Emerald conducts a partial "clean closure" of the unit before and after use of the unit for light ends recycling. High boiler distillation unit activities are outlined

in further detail in Section D of Emerald's Permit Application and tracked in the facility operating record.

Movement of the light ends from the used oil re-refinery to the high boiler distillation unit is conducted over areas that are not equipped with secondary containment, and Emerald mitigates that risk by requiring that two personnel attend all movement outside of secondary containment, that containers be strapped to the forklift, that all nearby catch basins be covered and that gate valves that drain into the stormwater vault are closed.

Product Storage Area 3 is utilized for product storage and a used oil process known as "de-ashing". Product storage consists of recycled antifreeze and products generated from the used oil re-refining operation, inclusive of light ends that have been recycled in the high boiler distillation unit. Depending on market demand for processed used oil with low ash content, de-ashing is conducted in this area on mixtures of used oil and asphalt flux in tanks DA-1, DA-2, and DA-3. De-ashing consists of a series of treatment steps that include acidification, heating, mixing, demulsification, and settling. Solids and wastewater are generated during the de-ashing process into tanks DAWW1 and DAS1, and are properly characterized prior to management off-site at an appropriately permitted third party facility.

Tanker trucks and railcars are used for transportation to and from the used oil re-refining facility. Inbound tanker trucks are staged over the load/off-load containment area while the load is undergoing initial screening. As noted in Bulk Rail Transfer, below, used oil railcars are primarily staged in spots 3, 4, or 5 for receipt. Spots 3, 4, and 5 have connections to the used oil re-refinery containment system. Inbound loads of used oil are transferred to screening tanks once acceptable test results are received from the laboratory. Outbound tanker trucks are staged over used oil re-refining facility secondary containment or Load/Unload Area 1 while loading is underway, and railcars are primarily staged at spots 3, 4, and 5.

Wastes generated from the used oil re-refinery include: oily PPE and debris, oily process water, contact water, used oil fractions that do not meet a product specification, and spent carbon that has been used for emissions control. Contact water is managed on-site as long as it meets conditions of Emerald's Industrial Wastewater Discharge Permit

with the City of Tacoma. All other wastes are shipped off-site for management at suitably permitted facilities.

Bulk Rail Transfer

Emerald conducts bulk transfers of used oil and products in railcar spots 3, 4, 5, 6, and 7. Railcar transfers related to the used oil re-refining facility primarily occur at railcar spots 3, 4, and 5. The railcar transfers occurring at railcar spots 6 and 7 are primarily used for transfers associated with other Emerald operations. Transfers in spots 6 and 7 may consist of oily water, recovered fuels, or other products for which transportation is being managed by Emerald. Emerald may also manage railcar transfers on behalf of customers that need access to a rail line for transportation of non-Emerald products.

10-Day Transfer Facility and Universal Waste Management

Emerald operates a 10-Day Transfer Facility at the site. Emerald also accumulates Universal Waste as a Large Quantity Handler of Universal Waste. Trucks containing Transfer Wastes and/or Universal Wastes are staged in the Transfer Facility and Universal Waste Management Area adjacent to the Loading Dock. The containers on the load are placed on the Loading Dock and segregated according to the intended disposal site. The containers are placed in the appropriate trailer and held until outbound transportation is arranged (within 10 days for transfer wastes and within one year for universal wastes). Emerald maintains storage within the transfer trailers according to segregation requirements outlined in 49 CFR 177.848.

Analytical Laboratory

The Analytical Laboratory is located in the Main Office Building. Emerald conducts verification analyses required in Emerald's facility Waste Analysis Plan in the Analytical Laboratory. Emerald also utilizes the Analytical Laboratory to conduct quality control analyses for used oil, products generated from the used oil re-refinery, recycled solvent and glycol product, and limited confirmation analyses.

Railcar Cleaning

Railcars contain residual solids that build up in the cars over time and must be removed. For Emerald-leased or owned railcars that

previously contained used oil and oily water, Emerald coordinates tank cleaning with Emerald's Tank Cleaning Division. Railcar cleaning is conducted at railcar spots 6 and 7. Waste generated from the tank cleaning process is containerized or pumped to tanker trucks, then properly designated prior to off-site shipment to a suitably permitted facility. Railcars that previously held dangerous waste are not cleaned at this location.

Container Recycling Area

Emerald operates a container recycling area where RCRA empty containers that previously held dangerous waste are rinsed for re-use. Containers managed in this area must be suitable for the operation (i.e., there must be no solids and the container residue must be easily removed with a water wash). The Container Recycling Area is constructed with a concrete floor and asphalt berm for containment. Rinse water from this operation is collected and treated according to requirements of Emerald's Industrial Wastewater Discharge Permit. Rinsed containers may be re-filled with Emerald product for distribution, or distributed to generators for hazardous waste accumulation.

Moderate Risk Waste

Emerald maintains a Solid Waste Permit with the Washington State Department of Ecology. Per the current requirements of the Permit, all moderate risk waste managed by Emerald must meet the criteria outlined in the Part B Permit. Moderate risk waste activities are conducted in all areas identified for dangerous waste management.

Control Room and Electrical Room– Used Oil Re-Refining

The Control Room and Electrical Room for the used oil re-refining facility are located within the Main Office building. Technology that is available in the Control Room allows used oil re-refining facility operations staff to monitor the conditions of the used oil re-refining facility continuously.

Boiler House

The boiler in the boiler house provides steam for operating the glycol recycling system.

N_2 Pad

The nitrogen tank located on the N_2 Pad contains liquid nitrogen. The liquid nitrogen is used to create an inert atmosphere in Emerald's dangerous waste processing and storage tanks.

Maintenance Shop

The maintenance shop provides storage space for operational supplies, production equipment, and maintenance tools and equipment.

Main Office

The main office consists of offices for site supervisors, management and administration, reception area, file room, restrooms, a full kitchen, and a conference room. The Analytical Laboratory is located in the same building, north of the main office areas.

Locker Room/Break Room

The Locker Room/Break Room contains a restroom/changing room for site operations personnel, lockers for operations personnel clothes and equipment, mailboxes for hourly staff, and a "break room" for breaks and meals.

Product Storage

Emerald manufactures a variety of solvents, recovered products from used oil re-refining, and antifreeze that are stored on-site prior to distribution to customers. Storage is conducted according to the Best Management Practices outlined in the Washington State Department of Ecology Stormwater Management Manual. Product storage may be conducted in tanks, totes, drums, or smaller containers. Product storage in tanks is primarily conducted in bulk product storage areas PS-2 and PS-3. However, dangerous waste tanks may also be used to store product depending on current production needs. Non-bulk product containers are stored in the Railcar Supplemental Containment and Product Storage Area. In the event that this area is at capacity, dangerous waste areas may be used for product storage as long as containment capacity volumes are not exceeded.

B.1.a (4)i History and Location of Dangerous Waste Management Units

Prior to Emerald's purchase of the facility, the site was operated as an exempt recycling facility as defined in WAC 173-303-120 and under Ecology Order Number DE 93HS-S172 issued on April 23, 1993. Sol-Pro, Inc. was the facility operator.

Ecology Order Number DE 93HS-S172 allowed SolPro, Inc. to blend dangerous waste fuels and prepare the blended processes material on-site for shipment. In accordance with WAC 173-303-120(4) waste streams received from off-site generators for recycling were placed into active recycling processes within 24-hours of receipt.

In a letter dated May 7, 1991, Ecology provided SolPro, Inc. with information and supplemental guidance concerning the format and content of siting criteria eligibility demonstration. Ecology indicated that the facility would be eligible for exemption from the state's newly adopted siting criteria under Ecology's recycling provisions if all of the requirements of WAC 173-303-282(b)(v) were met.

In April 1992, SolPro, Inc. submitted a Siting Criteria Exemption Eligibility Demonstration to Ecology. Subsequently, in a letter dated June 25, 1992, Ecology notified SolPro, Inc. that the facility met the requirements of WAC 173-303-282(2)(b)(v). Ecology therefore approved the request from SolPro, Inc. that they be exempt from the siting criteria demonstration requirements. Sol-Pro was issued the Part B Permit on May 23, 1999.

Shortly thereafter, Emerald Services, Inc. began negotiations to purchase the site and its operation. During that time, Emerald conducted extensive groundwater and soil monitoring of the site. The monitoring was performed in association with Ecology to ensure that the site Emerald was about to purchase would not be subject to subsequent clean-up action by Ecology.

In 2000 Emerald purchased the site and operation, and proceeded with many site improvements. An extensive stormwater management system was installed and all stormwater management areas were paved. The Loading Dock and Glycol Processing Area were also constructed. In 2006, Emerald expanded its glycol containment area and also added a product storage containment area. All other

dangerous waste management units were in place at the time Emerald purchased the facility in 2000. Please refer to Figure B-8 for the locations of all facility solid waste management units.

In addition to the Part B Permit for dangerous waste storage to support recycling, Emerald also holds the following environmental permits:

- PSCAA Registration #10126;
- City of Tacoma Industrial Wastewater Discharge Permit #001-795-805;
- Solid Waste Permit 2009-001 (Renewed Annually); and,
- Washington State Department of Ecology General Industrial Stormwater Permit

B.1.a(4)ii Location of Dangerous Waste Management Units

Dangerous waste is managed at the following locations at the Emerald facility:

- Loading dock
- Tanks and Tank Areas 1, 2, and 3
- Dangerous Waste Container Storage Area
- Production Pads 1, 2, 3, and 4
- Process Areas 1 and 2
- Glycol Processing Area
- Railcar Building
- Load/Unload Areas 1 and 2
- Containment Pan for Antifreeze Transfer

Figure B-3 provides specific locations of the various operations conducted at the Emerald facility.

B.1.b

Emerald requested a significant expansion in the April 2007 Notice of Intent submitted to the Washington State Department of Ecology. In the Notice of Intent, Emerald proposed to begin using several product storage tanks for storage of dangerous waste prior to recycling. This was intended to provide an initial increase in dangerous waste bulk storage capacity of 39,500 gallons. Emerald also proposed to replace

existing product storage tanks to larger volume tanks. The replacement of the smaller tanks with larger tanks would have resulted in an overall dangerous waste bulk storage capacity increase of 70,000 gallons.

To increase efficiency of drum management, Emerald proposed to permit three production areas as dangerous waste container storage areas. Permitting of these areas for dangerous waste container storage allowed Emerald to hold containers in their immediate processing areas for longer than 24 hours, and in many cases, eliminate the need for movement of drums to-and-from their storage area. The additional available storage capacity for containers based on this change was 16,610 gallons. The application was approved and the new Permit was issued. The use of existing product tanks for dangerous waste storage, and replacement of existing tanks with larger volume tanks will occur some time in the future based on market demand. Replacement of existing tanks with larger volume tanks has not occurred as of June 2017. Should Emerald determine that it would be beneficial to proceed with this expansion, Emerald will notify Ecology as soon as possible so permit modification activities can begin.

Details provided in the remaining sections of this Application, unless otherwise specified, refer to the volumes available once Emerald begins using existing product storage tanks as dangerous waste storage tanks and also begins using the product areas for dangerous waste container storage.

B.2 Topographic Map WAC 173-303-806(4)(xviii)

The Emerald facility is located in an industrial area of the Port of Tacoma between the Hylebos and Blair waterways. This area is commonly known as the "Commencement Bay Near-Shore Tideflats", or "Tacoma Tideflats." Exhibit B-1 provides a legal description of the facility location. A topographical map showing the Emerald facility is included as Exhibit B-2. The map shows the facility and a distance of 1,000 feet around at a scale of 1 inch equal to no more than 200 feet. The map shows surface water contours within the facility, 100-year flood plain information, surface waters in the immediate vicinity, surrounding land uses, a wind rose, orientation, and the legal

boundaries of the facility site. Other information as required under WAC 173-303-806(4)(a)(xviii) and 40 CFR 270.14(b)(19) is also included in Exhibit B-2.

B.3 Seismic Consideration WAC 173-303-806(4)(a) (xi)

Based on various USGS and other seismic activity sources, there are no known surface earthquake faults that have moved during Holocene time within 3,000 feet of the facility. The following references provide a Washington Department of Ecology reference concerning seismic risk in this area and a seismic map of Washington that includes the subject location.

- Ecology Document -Facility Oil Handling and Design Standards Rule, Guidance Manual: http://www.ecy.wa.gov/pubs/94195.pdf
- Seismic Map of Washington - Seismic Design Category Maps for Residential Construction in Washington: ftp://198.187.3.44/geology/hazards/hmgp/irc_seismic_design_category_maps/irc

Original facility structures were constructed in a manner consistent with the 1988 Uniform Building Code (UBC) requirements for a seismic risk zone of 3. Sol Pro conducted a tank support assessment in which tanks W921, D100, D101, RT500, D502, and D800 were evaluated for adequacy in accordance with the 1994 UBC for a seismic risk zone of 3. The Loading Dock was constructed according to design standards outlined in the 1997 UBC with City of Tacoma amendments for a seismic risk zone of 3. All other structural evaluations have been conducted per the appropriate UBC for a seismic risk zone of 3. Future tank installations and other construction activities will be completed according to the appropriate seismic construction standards.

B.4(a) Traffic Information WAC 173-303-806(4)(a)(x)

Traffic to and from the Emerald facility involves shipping and receiving of wastes, shipping of recycled products, receiving of virgin products for blending, and transfer of wastes. Visitors, vendors, suppliers, and facility support personnel also travel to and from the facility. Traffic

volumes vary on a day-to-day basis depending on scheduling and support needs of the facility.

The primary route to the facility is via Exit 137 on I-5 in Fife. Vehicles travel west on 54th Avenue East toward the Port of Tacoma. Beyond the intersection of U.S. Highway 509, 54th Avenue becomes Taylor Way. Vehicles follow Taylor Way before turning left onto Lincoln Avenue, then right on Alexander Avenue.

Wastes are transported to and from the facility using tank trucks, vacuum trucks, flat bed trucks, semi-tractor trailers, box vans, and railroad tank cars. Forklifts are used to move containers from trucks into either the active dangerous waste management areas of the facility, or to transfer trucks. Vehicles utilizing the facility may be commercial carriers of trucks owned by Emerald Services, Inc. Table B-3 below summarizes estimated weekly traffic volumes for transport vehicles:

Table B-3
Estimated Weekly Traffic Volumes - Current

Vehicle Type	Trips to Facility	Trips from Facility
Railroad tank cars	2	2
Vacuum trucks	4	1
Tank trucks	12	1
Flat bed trucks	1	1
Semi-tractor trailers	10	2
Box vans	15	3
Total	**44**	**10**

Table B-4
Estimated Weekly Traffic Volumes - Proposed

Vehicle Type	Trips to Facility	Trips from Facility
Railroad tank cars	4	4
Vacuum trucks	4	2
Tank trucks	16	4
Flat bed trucks	1	1
Semi-tractor trailers	12	4
Box vans	15	6
Total	**52**	**21**

All drivers and visitors to the facility are required to check in at the Main Office. Drivers and visitors are required to sign in, then obtain safety equipment as required. They are then directed to the appropriate area of the facility. Drivers and visitors who have not received Contingency Plan Training are accompanied by an Emerald facility employee while on-site. Emerald employees will assist drivers in properly locating their vehicle.

As shown in Figure B-6, all vehicles except rail cars enter and exit the facility from Alexander Ave. through Gate 1, located on the southwest site of the property. Gate 2 may also be used for bulk waste deliveries, but drivers must check in at the main office first. When leaving the facility, the driver or visitor will check-out, then proceed through Gate 1 located on Alexander Ave. Drivers who have delivered bulk waste may also leave the facility through Gate 2.

Railcars enter and exit the facility through Gate 3. There is one railroad spur that parallels the east fence line of the property. Emerald schedules all railcar movement in and out of the facility. Tacoma Rail, the local rail service for the area, performs all movement of the railcars and maintains security for Gate 3. Tacoma Rail personnel do not check-in or check-out during rail movement activities. Gate 4 remains locked at all times.

On-site traffic patterns and control features are shown in Figure B-6, Traffic Patterns and Control.

B.4(b) Facility Pavement, Surfacing, and Load Bearing Capacity

Figure B-7 shows the extent of the surface areas of the site covered by both asphalt and concrete. Dangerous waste management areas are constructed with concrete. All stormwater management and traffic areas are paved. All paving is "class B" asphalt mix with two lifts of 2" each for a total of 4" of compacted asphalt. Both the concrete dangerous waste management areas and the asphalt stormwater and traffic areas have demonstrated their ability to adequately manage the stress from weight and general use as there is minimal to no cracking after several years of heavy use.

Part B

Section B

Figures B-1 thru B-9

KEY:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)

TACOMA NORTH, WA
1957; REVISED 1994

POVERTY BAY, WA
1957; REVISED 1994

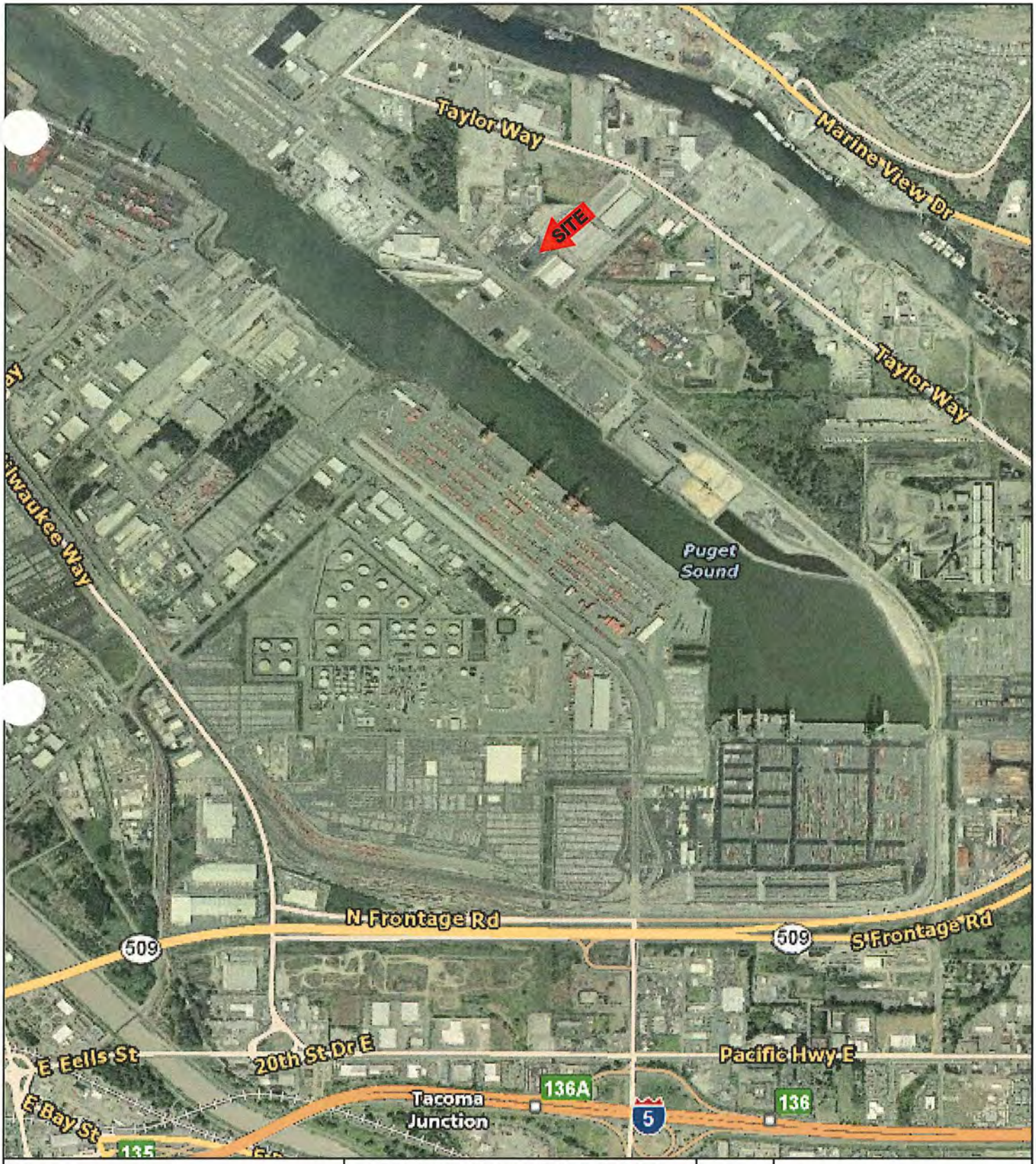
SCALE = 1:24,000

ENVIRONMENTAL PARTNERS INC
295 NE Gilman Boulevard, Suite 201
Issaquah, Washington 98027

FIGURE B-1

GENERAL VICINITY MAP

PROJECT	43507.3		
PREPARED FOR	EMERALD SERVICES, INC.		
LOCATION	1825 ALEXANDER AVENUE TACOMA, WASHINGTON		
SHEET 1 of 1	DRAWN BY MMH	REVIEWED BY JLD	DATE 09/28/09



KEY:

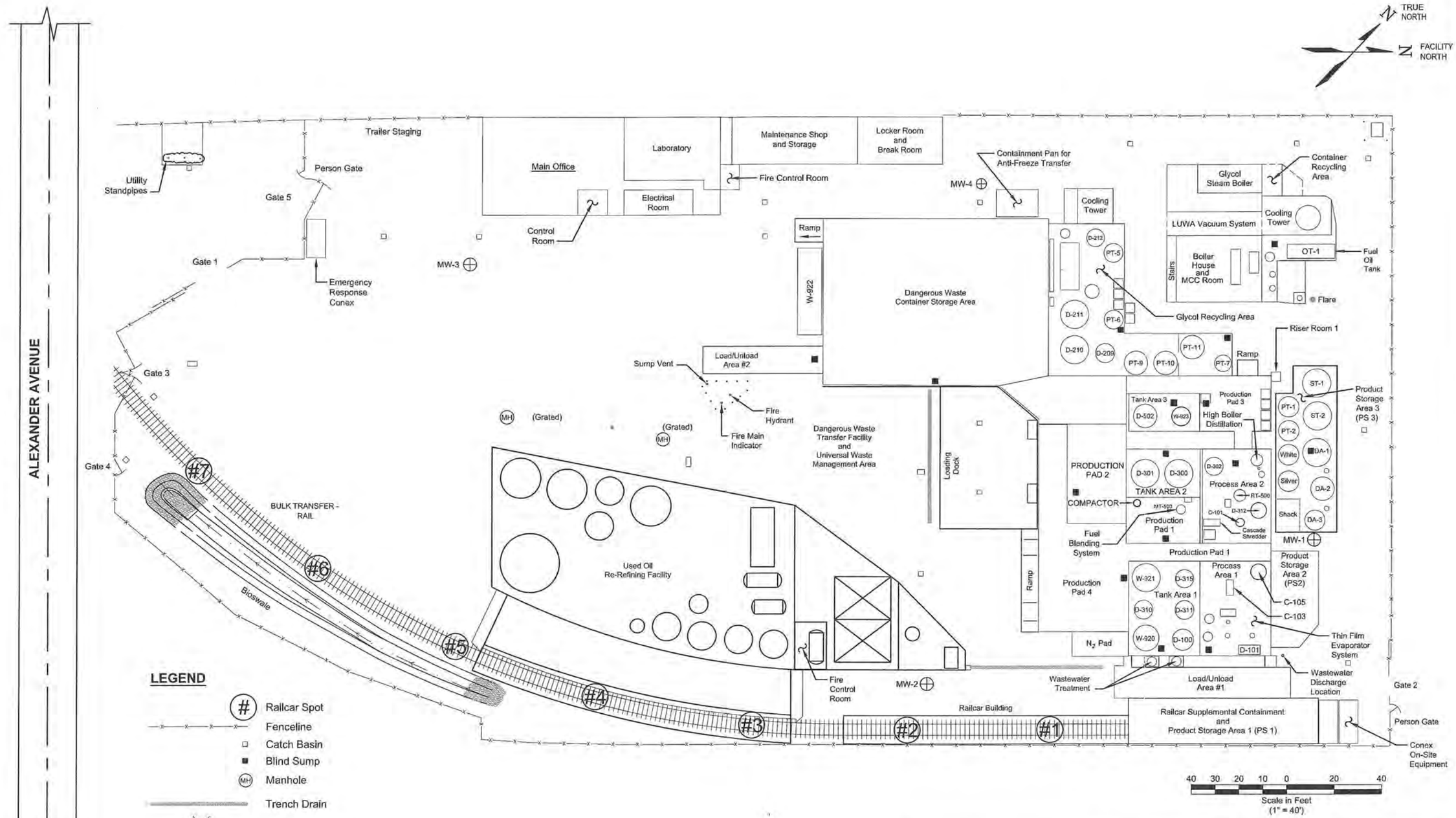
AERIAL SOURCE: MAPQUEST

ENVIRONMENTAL PARTNERS INC
295 NE Gilman Boulevard, Suite 201
Issaquah, Washington 98027

FIGURE B-2

FACILITY LOCATION MAP

PROJECT	43507.3		
PREPARED FOR	EMERALD SERVICES, INC.		
LOCATION	1825 ALEXANDER AVENUE TACOMA, WASHINGTON		
SHEET 1 of 1	DRAWN BY MMM	REVIEWED BY JD	DATE 09/28/09



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE B-3
FACILITY LAYOUT DIAGRAM

FILE NO:	FLD	DATE:	Feb. 9, 2015	SCALE:	1"=40'

FIGURE B-4 DANGEROUS WASTE MANAGEMENT OPERATIONS FLOW CHART

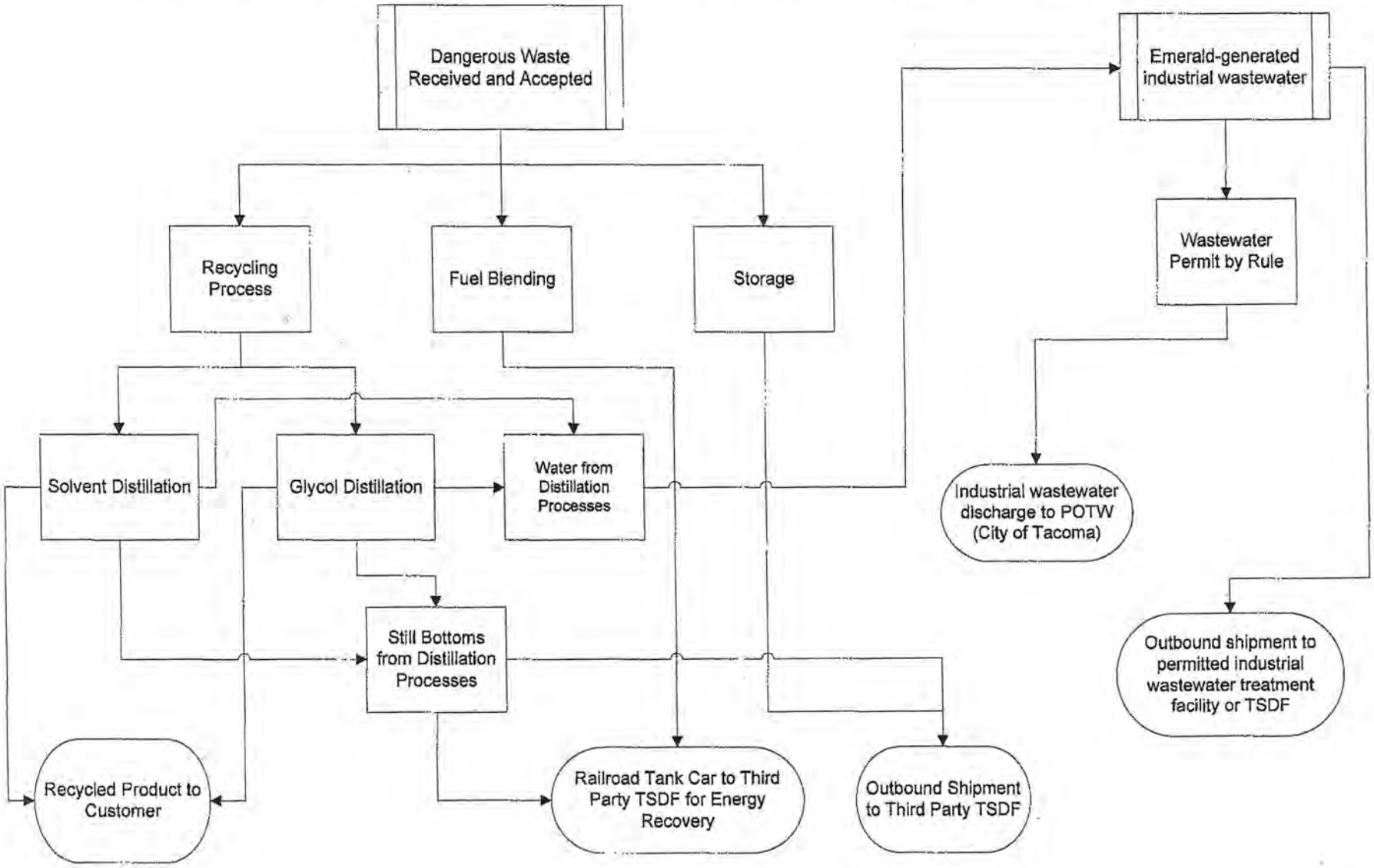
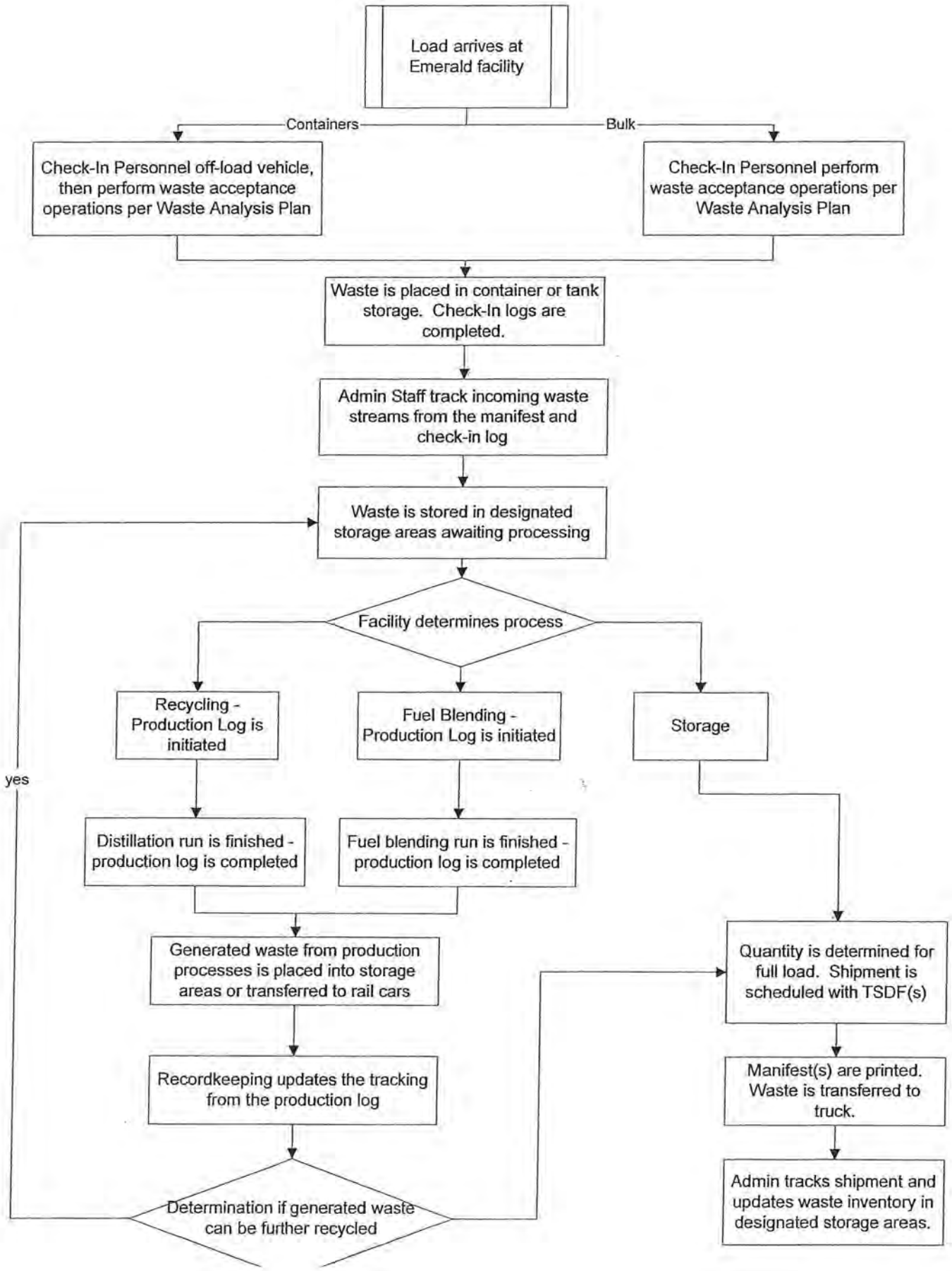
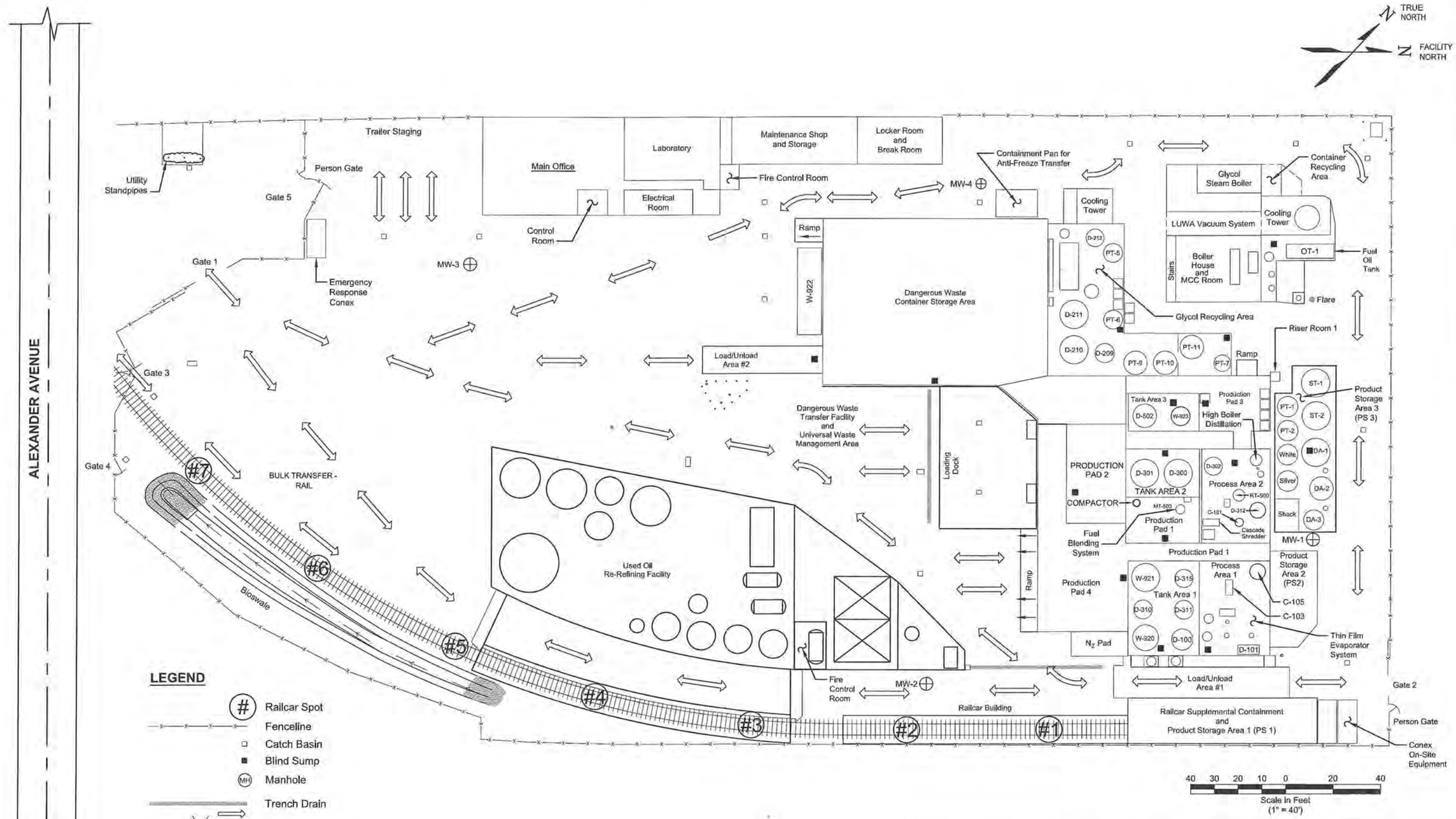


Figure B-5 - TRACKING SUMMARY FLOW CHART





Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE B-6
TRAFFIC PATTERN AND CONTROL

FILE NO:	PTPC	DATE:	Feb. 9, 2015	SCALE:	1"=40'

E: SITTS AND HILL ENGINEERS, INC.
PROJECT 9814, SHEET C3
"SITE GRADING AND STORM DRAINAGE"
NOVEMBER 17, 2000 (Rev. JUNE 4, 2001)

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE B–7

AREAS OF ASPHALT AND CONCRETE

FILE NO: ASPH	DATE: Sept. 22, 2009	SCALE: 1"=40'

TRUE NORTH

FACILITY NORTH

ALEXANDER AVENUE

Trailer Staging

Utility Standpipes

Person Gate

Gate 5

Gate 1

Emergency Response Conex

Gate 3

Gate 4

MW-3

MW-4

Containment Pan for Anti-Freeze Transfer

Ramp

W-922

Dangerous Waste Container Storage Area

Cooling Tower

Glycol Steam Boiler

Container Recycling Area

LUWA Vacuum System

Cooling Tower

Stairs

Boiler House and MCC Room

OT-1

Fuel Oil Tank

Flare

Glycol Recycling Area

Riser Room 1

Load/Unload Area #2

Sump Vent

Fire Hydrant

Fire Main Indicator

(MH) (Grated)

(MH) (Grated)

Dangerous Waste Transfer Facility and Universal Waste Management Area

Tank Area 3

Production Pad 3

High Boiler Distillation

Product Storage Area 3 (PS 3)

Loading Dock

PRODUCTION PAD 2

TANK AREA 2

COMPACTOR

Process Area 2

Production Pad 1

Fuel Blending System

Shack

MW-1

Ramp

Production Pad 4

Process Area 1

Tank Area 1

Product Storage Area 2 (PS2)

C-105

C-103

N_2 Pad

Thin Film Evaporator System

Wastewater Discharge Location

Wastewater Treatment

Load/Unload Area #1

Gate 2

Person Gate

Conex On-Site Equipment

Railcar Building

Railcar Supplemental Containment and Product Storage Area 1 (PS 1)

#1 #2 #3 #4 #5 #6 #7

BULK TRANSFER - RAIL

Bioswale

Used Oil Re-Refining Facility

Fire Control Room

MW-2

LEGEND

- Unit Boundary
- Railcar Spot
- Fenceline
- Catch Basin
- Blind Sump
- Manhole
- Trench Drain
- Gate
- Monitoring Well

40 30 20 10 0 20 40

Scale in Feet (1" = 40')

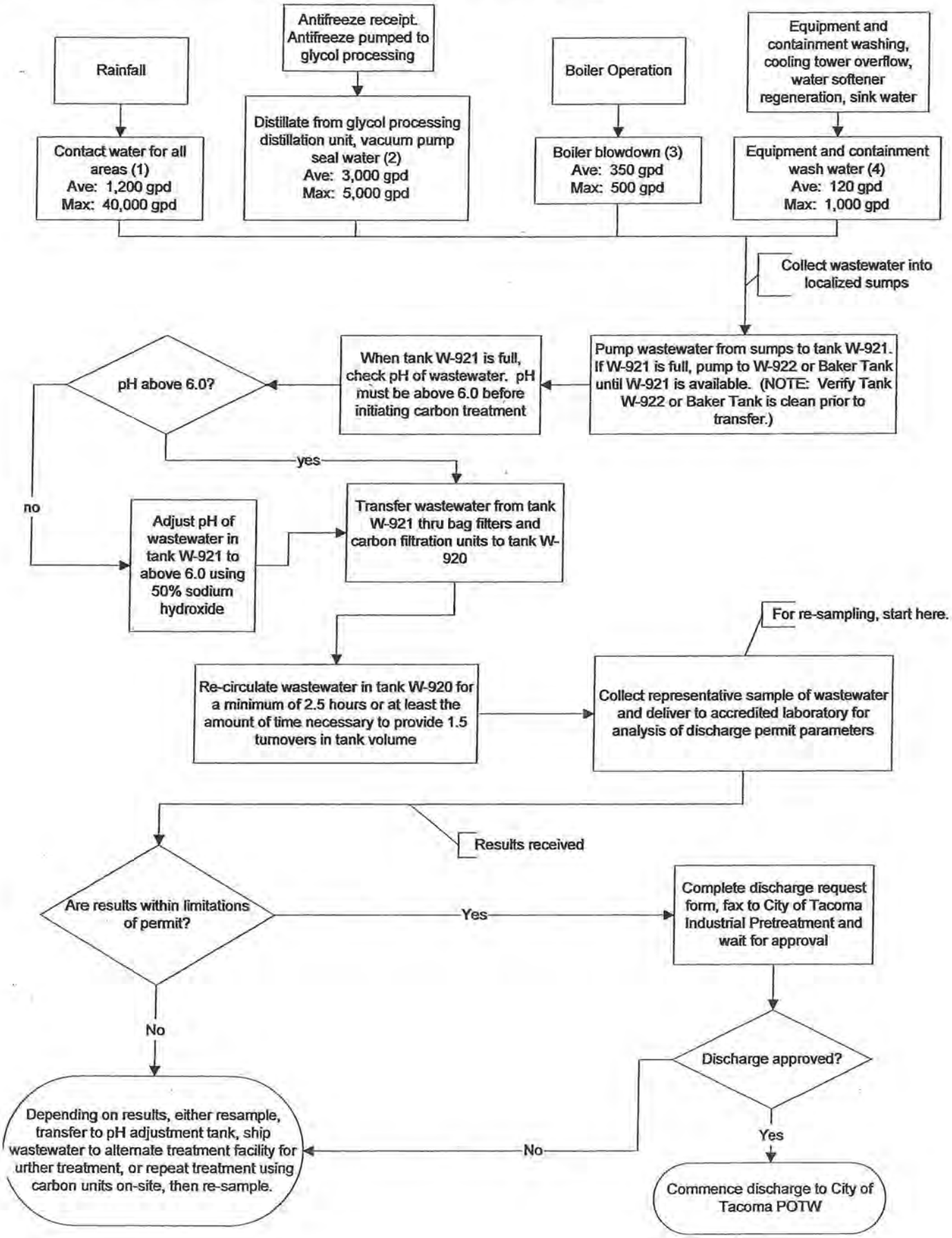
Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE B-8

SOLID WASTE MANAGEMENT UNITS

FILE NO: SWMUB-8	DATE: Feb. 23, 2015	SCALE: 1"=40'

Figure B-9 Emerald Recycling Wastewater Processing Flow Diagram



Part B

Section C

Waste Analysis Plan

TABLE OF CONTENTS

C. WASTE ANALYSIS PLAN

1. INTRODUCTION 1
2. WAP DEFINITIONS 7
3. WASTE ANALYSIS PROGRAM 9
   - 3.5 Waste Characterization and Profiling 10
   - 3.6. Confirmation Testing 13
   - 3.7. Confirmation and Profile Approval 14
   - 3.8. Verification 17
4. TESTING PARAMETERS AND RATIONALE FOR SELECTION 22
   - 4.2. Waste Characterization 22
   - 4.3. Verification Parameters Used and Rationale 23
     - 4.3.3. Primary Screening Analyses 23
     - 4.3.4. Secondary Screening Analyses 26
   - 4.4. Methods for Collecting Samples for Analyses 27
   - 4.5. Frequency of Analysis 28
   - 4.6. Discrepancy Resolution 29
5. QUALITY ASSURANCE PROGRAM 32
6. RECORDKEEPING AND WASTE TRACKING 35
7. WASTES GENERATED ON-SITE 37

TABLES

C-1 Typical Waste Streams and Designations 3
C-2 Process Limitations 5

Section C – Waste Analysis Plan
List of Appendices

Appendix I – Tables 1 thru 7
- Table 1, Acceptance Limits for Passing Verification Testing
- Table 2, Compounds with High Vapor Pressure
- Table 3, Verification Parameters and Rationale – Primary Screening Analyses
- Table 4, Verification Parameters and Rational – Secondary Screening Analyses
- Table 5, Parameters and Test Methods for Verification Analyses
- Table 6, Methods Used to Sample Regulated Wastes
- Table 7, Method for Selecting Containers to Undergo Verification Sampling

Appendix II – Quality Assurance and Quality Control Plan
Appendix III – Designating Dangerous Waste
Appendix IV – Forms
- Generator Site Audit Checklist
- Waste Profile Questionnaire
- CC Checklist
- LDR Notification Form

Appendix V – Flowcharts
- Profile Preparation
- Waste Off-Loading
- Verification
- Discrepancy Resolution

Appendix VI – Verification Sampling Frequency Exemptions

C. WASTE ANALYSIS PLAN

WAC 173-303-300(5) and (6), and WAC 173-303-806(4)(a)(ii)

1. INTRODUCTION

1.1. Emerald Services, Inc. (Emerald) was purchased by Safety-Kleen Systems, Inc. (Safety-Kleen) in 2016. Safety-Kleen is the owner of Emerald's outstanding stock and Safety–Kleen is a wholly owned subsidiary of Clean Harbors, Inc. (Clean Harbors). Clean Harbors systems are designed to provide centralized support to all Clean Harbors' subsidiaries and affiliates so every entity is using common information on common platforms. WIN and the Central Profile Group (discussed below) are examples of these shared services used by all subsidiaries and affiliates, including Emerald. The Emerald facility is located at 1825 Alexander Ave. in Tacoma Washington.

1.2. The facility's primary activities are recycling of solvents and antifreeze, fuel blending, and dangerous waste storage.

1.3. Emerald has developed this Waste Analysis Plan (WAP) to ensure proper waste management for all waste streams regulated as dangerous waste by the Washington State Department of Ecology (Ecology) that are received and managed at the Emerald facility. This WAP outlines policies, guidelines, and procedures for conducting sampling, analysis, profiling, and acceptance activities. Emerald will comply with requirements for waste analysis specified in this WAP for dangerous waste accepted and managed at the facility.

1.4. Household hazardous waste and small quantity generator wastes are managed under requirements of Emerald's Solid Waste Permit.

1.5. The following identifies the types of waste streams accepted at the Emerald facility, the characteristics of the waste streams, the physical and chemical analyses that will be performed on the waste streams, and the acceptance criteria.

1.6. All policies, guidelines, and procedures have been developed to ensure all dangerous waste accepted by Emerald is managed safely and in compliance with WAC 173-303 as well as other regulatory guidance and requirements of the Emerald's Part B Permit for Storage of Dangerous Waste. Specifically, this WAP addresses the following:

1.6.1. Information regarding types of waste streams accepted by Emerald;

1.6.2. Process limitations for facility equipment and storage;

1.6.3. The parameters for which waste streams are analyzed and the rationale for selecting these parameters (WAC 173-303-300(5)(a));
1.6.4. The laboratory analytical methods used (WAC 173-303-300(5)(b));
1.6.5. QA/QC protocol for ensuring all analytical procedures are functioning as intended;
1.6.6. The sampling methods used for obtaining representative samples (WAC 173-303-300(5)(c));
1.6.7. The frequency with which the initial analyses are reviewed or repeated (WAC 173-303-300(4), and WAC 173-303-300(5)(d));
1.6.8. Information and/or analyses required from generators for waste stream confirmation and characterization, and the criteria used to determine when generator-supplied information is acceptable (WAC 173-303-300(5)(e), and WAC 173-303-300(5)(g));
1.6.9. When confirmation samples are determined to be necessary, the procedures for confirming that waste streams can be safely managed at the Emerald facility and also that they match the description supplied by the generator (WAC 173-303-300(1) and (2)(a));
1.6.10. The procedures for verifying that wastes received match the corresponding description on the Profile and manifest (WAC 173-303-300(3)) and can be safely managed by Emerald;
1.6.11. The procedures for identifying and tracking the movement of waste streams (WAC 173-303-300(6));
1.6.12. The procedures for documenting analyses performed according to this WAP (WAC 173-303-300(2)(b) and (WAC 173-303-380(1)(c));
1.6.13. The procedures for properly managing discrepant waste streams (WAC 173-303-370(4) and (5)); and,
1.6.14. The frequency of analysis, analytical procedures, and sampling methods used for characterization of wastes generated onsite (WAC 173-303-300(5) and (6)).

1.7. The Emerald facility manages a variety of organic-based waste streams for recycling and fuel blending.
1.7.1. Typical waste streams that are fuel blended at the Emerald facility include contaminated oils, paints and paint related wastes, ink formulations, and other media or debris contaminated with these waste streams. All waste streams that are fuel blended must have sufficient Btu for energy recovery.

1.7.2. Organic solvents are recycled in the Emerald thin film evaporator or high boiler distillation unit. Glycol-based coolants (typically ethylene glycol) are recycled in the glycol recycling system.

1.8. Emerald also receives a limited variety of other waste streams for storage only. These include DOT class 3 and 4.1 flammable, DOT Class 6.1 poisons (packing group II or III only), DOT class 8 corrosives (both acid and caustic – subsidiary hazard class only with flammable as the primary hazard class), and Class 9 and state regulated waste streams with insufficient Btu for energy recovery. Storage-only activities are conducted with containers as well as in tanks.

1.9. The dangerous waste identification numbers for the wastes to be fuel blended, recycled, or stored at Emerald are listed in the Part A portion of this Permit application. Waste streams and waste stream designations are listed below in Table C-1, Typical Waste Streams and Designations. Only waste streams that have been characterized with waste codes listed in the Part A Permit application may be accepted for recycling, fuel blending, or storage at the Emerald facility.

Table C-1
Typical Waste Streams and Designations

Waste Stream Type	Possible Designations
Unused Commercial Chemical Products	U-listed
Contaminated petroleum oils and lubricants	Ignitable, F-listed source, characteristic for metals, semi-volatiles, or volatiles, other source codes.
Paint related waste	Ignitable, F-listed source, characteristic for metals, semi-volatiles, or volatiles.
Solvents and solvent-related waste	Ignitable, corrosive, F-listed source, characteristic for metals, semi-volatiles, or volatiles.
Ink formulations	Ignitable, F-listed source, characteristic for metals, semi-volatiles, or volatiles.
Other organic waste	Ignitable, F-listed source, characteristic for metals, semi-volatiles, or volatiles.
Glycol based waste	Characteristic for metals, benzene
DOT hazard class 3 flammable liquids with corrosive liquids as a subsidiary hazard class	Ignitable, F-listed source, semi-volatiles, volatiles, corrosive, characteristic for metals
DOT Class 6.1 poisons	U- or P-listed, characteristic for metals
Class 9 and state regulated waste streams with insufficient Btu for energy recovery	F-listed source, characteristic for metals, semi-volatiles, or volatiles, U- or P-listed (spill clean-up waste from spill of U- or P-listed waste streams)

1.10. Wastes will be accepted only from generators with a valid EPA identification number, small quantity generators as defined by WAC 173-303-070(8), and legitimate household hazardous waste generators.

1.10.1.1. In specific emergency situations, Emerald may accept dangerous wastes generated by generators who do not have a State/EPA identification number.

1.10.1.1.1. Emergency acceptance will require prior written authorization from Ecology, which may be by telecommunications (i.e., facsimiles) or email.

1.10.1.1.2. If written authorization, pursuant to 1.10.1.1.1 above, is not possible, and if delay of acceptance of such waste may result in harm to human health or the environment, Emerald may accept the wastes without prior authorization. In such cases Emerald will notify Ecology of the emergency situation within

twenty four (24) hours of the arrival of the waste at the facility.

1.10.1.2. All dangerous wastes will be managed only in areas authorized for dangerous waste management under the conditions of the dangerous waste permit.

1.10.1.3. Managing wastes including used oil, small quantity generator wastes and household hazardous waste at the facility will in no way hamper Emerald in meeting the requirements of this Permit, including performance standards in WAC 173-303-283, for any area or activity subject to this Permit.

1.11. Before receiving a waste from a particular off-site source, Emerald will inform the generator in writing that Emerald has the appropriate permits for and will accept the dangerous waste the generator is shipping as required by WAC 173-303-290(3). Emerald will keep a copy of this written notice as part of the operating record.

1.12. Emerald will notify Ecology in writing at least four (4) weeks in advance of the date Emerald expects to receive dangerous waste from a foreign source, as required by WAC 173-303-290(1). Notice of subsequent shipments of the same waste from the same foreign source in the same calendar year is not required.

1.13. There are other categories of waste streams that cannot be consolidated or stored at the Emerald facility. Under no circumstances will Emerald accept any of the following waste streams for management in the dangerous waste management areas of the facility:

- Explosives
- Radioactive source material
- Reactives
- Biological or infectious waste streams

1.14. To ensure waste streams are not blended or recycled with other waste streams that are incompatible, and also that Emerald conducts operations within process limitations, Emerald uses specific analytical techniques in combination with knowledge of industry procedures to identify at-risk waste streams. In addition to being listed in the Part A, waste streams that may be accepted must meet other limitations and requirements in the dangerous waste permit. Process limitations for the Emerald facility are outlined below in Table C-2, Process Limitations. Emerald will only receive wastes that meet the process limitations outlined in Table C-2.

Table C-2
Process Limitations[3]

Process Limitations					
Acceptance Parameters	**Solvent Recycling**	**Fuel Blending**	**Glycol Recycling**	**Tank Storage for Incineration**	**Container Storage Only**
Compatibility	Compatible	Compatible	Compatible	Compatible	Hazard classes must be compatible[4]. See Exhibit D-22 for compatibility information.
Flash Point	No Limit	No Limit	>140°F	No Limit	No Limit
Heat of Combustion (BTU)	No Limit	Btu meets minimum requirements for burner	Typical for glycol	No Limit	No Limit
pH	2> pH <12.5	Compatible[4]	2> pH <12.5	2 > pH < 12.5	Hazard classes must be compatible[4]. See Exhibit D-22 for compatibility information.
Specific Gravity	0.5-1.6	0.5-1.6	0.5-1.6	0.5-1.6	0.5-1.6
Physical description - state	Semisolid - slurry/liquid	Liquid/semi-solid/sludge/solid	Liquid	Liquid with <5% solids	Liquid/semi-solid/sludge/solid
Radiation Level	No more than 2X current daily background	No more than 2X current daily background	No more than 2X current daily background	No more than 2X current daily background	No more than 2X current daily background
psia	< 11.1 psia	< 11.1 psia	< 11.1 psia	<11.1 psia	No Limit
Reactivity	Non-reactive	Non-reactive	Non-reactive	Non-reactive	Non-reactive
Waste Codes[1]	D001, F001-F005, D004-D011, D018-D043, K086, K087, K169, K170, U002, U004, U019, U031, U037, U051, U052, U056, U057, U080, U140, U159, U161, U165, U210, U220, U227, U228, U239, WT01, WT02, WP01, WP02, WP03	D001, D002[4], F001-F005, F024, F025, F037, F038, D004-D011, D018-D043, K048, K049, K050, K051, K052, K086, K087, K169, K170, K171, K172, U002, U003, U004, U019, U031, U037, U051, U052, U056, U057, U080, U108, U112, U117, U118, U140, U154, U159, U161, U165, U196, U210, U220, U227, U228, U239, WPCB, WT01, WT02,	D004-D008, D010, D011, D018, WT01, WT02	D001, F001-F005, F024, F025, F037, F038, D004-D011[5], D018-D043, K048, K049, K050, K051, K052, K086, K087, K169, K170, K171, K172, U002, U003, U004, U019, U031, U037, U051, U052, U056, U057, U080, U108, U112, U117, U118, U140, U154, U159, U161, U165, U196, U210, U220, U227, U228, U239, WPCB, WT01, WT02, WP01,	D001, D002[4], F001-F005, F024, F025, F027, F037, F038, D004-D011, D018-D043, K048, K049, K050, K051, K052, K086, K087, K169, K170, K171, K172, P001, P002, P003, P006, P007, P008, P010, P011, P012, P014, P015, P016, P017, P018, P022, P023, P024, P027, P028, P036, P038, P041, P046, P048, P056, P057, P058, P062, P065, P067, P069, P072, P075, P076, P077, P078, P081, P082, P084, P085, P087, P088, P092, P093, P102, P103, P105, P108, P110, P111, P112, P113, P114, P116, P118, P119, P120, P123, P127, P190, P196, P205, U001, U002, U003, U004, U005, U006, U007, U008, U009, U011, U012, U014, U016, U017, U018, U019, U020, U022,

Process Limitations					
Acceptance Parameters	**Solvent Recycling**	**Fuel Blending**	**Glycol Recycling**	**Tank Storage for Incineration**	**Container Storage Only**
		WP01, WP02, WP03		WP02, WP03	U023, U024, U025, U026, U027, U030, U031, U032, U033, U034, U037, U039, U041, U042, U043, U044, U045, U046, U047, U048, U049, U050, U051, U052, U053, U055, U056, U057, U063, U064, U065, U066, U068, U070, U071, U072, U074, U075, U076, U077, U078, U079, U080, U081, U082, U083, U084, U085, U086, U092, U093, U094, U097, U098, U099, U101, U105, U106, U108, U109, U110, U111, U112, U113, U114, U115, U116, U117, U118, U119, U120, U121, U122, U123, U124, U125, U126, U127, U131, U133, U134, U136, U137, U140, U144, U145, U146, U147, U148, U149, U151, U152, U153, U154, U156, U158, U159, U161, U162, U164, U165, U166, U167, U168, U169, U170, U171, U172, U174, U176, U177, U178, U179, U180, U181, U182, U183, U184, U185, U186, U187, U188, U191, U194, U196, U197, U200, U201, U204, U205, U207, U208, U209, U210, U211, U213, U214, U215, U216, U217, U218, U219, U220, U221, U222, U223, U225, U226, U227, U228, U234, U235, U238, U239, U240, U243, U279, U328, U353, U359, U367, U373, U404, WPCB[2], WT01, WT02, WP01, WP02, WP03
Water Content	<90%	<75%	<90%	No Limit	No Limit
DOT Hazard Class	3, 9, exempt	3, 8[4], 9, exempt	9, exempt	3, 9, exempt	3, 4.1, 6.1 (PG II or III only), 8[4], 9, and exempt.

[1]U-listed waste streams may be fuel blended if spilled into a waste stream which has sufficient Btu for energy recovery.
[2] WPCB wastes managed separately on a case-by-case basis.
[3]These are overall process limits, and all waste profiles will be within these limits. However, these limits do not include detailed and specific permit restrictions that apply. These restrictions are specified elsewhere in the dangerous waste permit.
[4]D002 and DOT Hazard Class 8 wastes can be managed only if corrosive is the subsidiary hazard class and DOT hazard class 3 is the primary hazard class. This ensures any D002 waste accepted is compatible for storage with D001 wastes.
[5] Per WAC 173-303-140(2)(a) and 40 CFR 268.3(c)

2. WAP Definitions:

2.1. Central Profiling Group (CPG) – CPG consists of trained scientists and/or engineers with experience in hazardous waste, TSCA, DOT, other federal, state, and local regulations, and hazardous and non-hazardous waste determinations. CPG oversees the waste profile approval process for Emerald, and is managed by Clean Harbors Environmental Services (CHES).

2.2. Confirmation – Checking that the generator profile information is accurate and complete before approving the waste stream for shipment to the facility.

2.3. Confirmation Sample – A sample provided by the generator or taken by Emerald personnel to confirm the waste stream matches the generator information before a profile is completed and the first waste shipment of that waste stream is authorized.

2.4. Discrepancy Resolution – Obtaining adequate knowledge regarding a discrepant waste stream to ensure it is stored properly while awaiting appropriate corrective action. Appropriate corrective action includes: modification of existing profile, creation of new profile, and/or alternate transportation and disposal.

2.5. Ecology – The Washington State Department of Ecology.

2.6. Fingerprint (see verification) – The results of screening analysis that provide the key elements of the waste stream for comparison with the physical and chemical characteristics of the profile.

2.7. Full Characterization – Completing the profile using information from laboratory analysis with methods approved by WAC 173-303-110.

2.8. Knowledge – Sufficient information about a waste stream to reliably substitute for direct testing of the waste. To be sufficient and reliable, the "knowledge" used must provide information necessary to manage the waste stream in accordance with the requirements of WAC 173-303.

2.9. Multi-User Profile/CORE Profile – A document, containing information regarding a waste stream commonly found in industry that meets the information needs of the TSDF. The document includes sufficient information regarding the waste stream to account for variability in the waste stream, assign a management process, ship the waste stream according to applicable regulations, and ensure compliance with the Permit. Multi-User refers to the documents developed by Emerald, and

CORE refers to the documents developed by Safety-Kleen Systems, Inc.

2.10. Permit – The Emerald Services, Inc. Tacoma facility Permit for the Storage of Dangerous Waste.

2.11. Process Limitation – Has two components – physical/equipment, and treatment limits.

2.12. Profile - a detailed and comprehensive physical, chemical and regulatory description of a waste stream to assist the TSD in determining whether a waste can be safely managed in compliance with the Part B permit. Emerald is responsible for ensuring an adequate profile for waste streams they accept.

2.13. Profiling – The process of evaluating a waste stream for acceptance at the facility. Profiling includes gathering and compiling information from the generator, testing the waste stream if initial information is insufficient, and determining whether the waste stream can be safely managed as well as accepted under permit conditions.

2.14. QA/QC – Quality Assurance and Quality Control: Assurance that chemical analyses are precise and accurate (see SW-846).

2.15. Recertification – Generator certification of a WPQ and Emerald certification of the profile at a regular interval as required by the Permit.

2.16. Re-Profiling – Re-initiating the profiling process for a waste stream currently accepted by Emerald when the process or operation generating the waste changes (for example, generator feedstocks change), when there is a verification failure, or at a regular interval as required by the Permit.

2.17. Screening Analysis (see verification) – Provides a general identification of a waste stream to verify against the profile. Identifies characteristics needed for suitable management and hazard avoidance.

2.18. Verification – Procedures with criteria for determining waste received is the same as the waste described on the manifest and matches the profile. This may include: visual inspection, screening analysis, drum count, and fingerprinting.

2.19. Waste Shipment – Dangerous waste transferred from point A to point B by a single waste manifest or shipping paper.

2.20. Waste Stream – Dangerous waste from a single generator that is specific and unique to the waste generation process.

2.21. Waste Material Profile Sheet – A document usually filled out by the generator that meets the initial information needs of the TSDF including a detailed and comprehensive physical, chemical, and regulatory description of a waste stream to assist

Emerald in determining whether a waste can be safely managed in compliance with the Permit (see Appendix IV for sample Waste Material Profile Sheet form).

2.22. WIN – The CHES Waste Information Network (WIN). While WIN has many other functions, for purposes of this Waste Analysis Plan, WIN is a web-based application used to create and store waste profiles. The WIN system includes logic that prevents the submittal of an incomplete waste profile and also includes checks and balances to identify contradictory or missing information that would be required to competently evaluate each waste stream for acceptance into Emerald and the CHES network of facilities.

3. WASTE ANALYSIS PROGRAM

WAC 173-303-300

3.1. Proper characterization of each waste stream at the facility will ensure that the waste stream is assigned to an appropriate and compatible recycling, processing, or storage location and can be managed in compliance with the dangerous waste permit and dangerous waste regulations.

3.1.1. Emerald is responsible for obtaining sufficient and reliable information for every waste stream they approve for shipment.

3.1.2. Inaccurate or incomplete waste analysis information provided by the generating site is not a defense for noncompliance with the waste management requirements and conditions in the dangerous waste permit, Chapter 173-303 WAC, and the land disposal restrictions in 40 CFR Part 268, as incorporated into Chapter 173-303 WAC.

3.2. Technical Services and Sales Staff for CHES, Safety Kleen, or Emerald are responsible for collecting initial profile information from the generator. This process will involve information from one or more of the following activities:

3.2.1. Familiarity with the generator's processes and waste streams based on site visits, sampling data and analysis, or process information provided by the generator;

3.2.2. Documented studies of waste generated by generator's on-site processes; and/or,

3.2.3. Generator knowledge.

3.3. If information available from the generator is not adequate to prepare a profile, samples will be collected and analyzed to supplement information already provided by the generator. Analyses will be selected based on expected contaminants in the waste stream, and based on information provided in Section 3.2, above.

3.4. CPG ensures accurate and complete waste profiling prior to profile approval. To achieve this, CPG uses a variety of information. This information may include results from analysis by a laboratory accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program, generator knowledge of waste stream constituents and processes generating the waste stream, and/or product information (SDS, universal wastes, or typical waste streams for

the type of industry). Emerald will have an approved profile for every waste stream before it is accepted by the facility.

3.5. Once the initial information is obtained for profiling, Technical Services will determine if the waste stream matches a Multi-User or CORE profile. If so, the applicable Multi-User or CORE profile is selected for use. If the waste stream does not match a Multi-User or CORE profile, preparation of a Waste Material Profile Sheet (see sample form in Appendix IV) is initiated.

3.5.1. At the time of Waste Material Profile Sheet initiation, Technical Services or Sales (either CHES, Safety-Kleen, or Emerald) will review information provided by the generator regarding their waste stream and site, and may visit the site to evaluate the generator's processes and waste streams generated onsite. Technical Services or Sales staff may utilize a Site Audit Checklist to assist them in documenting this evaluation. At any time in the profile development process, should generator knowledge appear to be insufficient to prepare a Waste Material Profile Sheet, a confirmation sample will be requested from the generator.

3.5.1.1. Confirmation sample requests are typically made due to waste stream information that indicates that the waste stream may be suitable for recycling, that the Btu may be inadequate for fuel blending, or due to constituents that have historically shown incompatibility with other waste streams consolidated in Emerald tanks.

3.5.1.2. A confirmation sample is also required for other analyses when the additional analyses are needed to supplement generator information to provide sufficient and reliable information on the waste stream for its safe management and compliance with the permit.

3.6. Once a waste stream is received at the Emerald facility, verification analysis is conducted.

3.6.1. Verification analysis consists of a series of screening tests to ensure the waste stream received matches the description provided on the approved profile.

3.6.2. All verification analyses are conducted by the Emerald laboratory.

3.6.3. Waste streams which fail verification are placed in drum jail until the situation can be resolved in accordance with WAC 173-303 and Permit requirements.

3.7. Waste Characterization and Profiling
WAC 173-303-300(1) and (2)

3.7.1. Profiles are initiated by the generator or by a trained and authorized Technical Services Representative by entering information into the WIN profile system managed by CPG.

3.7.1.1. The WIN profile system is designed to gather all available information from generators regarding their waste stream, and is programmed with logic that ensures contradictory or missing information is identified and corrected prior to allowing the profile to be finalized.

3.7.1.2. Technical Services Staff use Ecology guidance (see Appendix III) for dangerous waste designation whenever assisting generators with Waste Material Profile Sheet completion and profiling of waste streams.

3.7.1.3. When laboratory analytical methods are required to designate a waste, Emerald and CPG will ensure that the test procedures listed as acceptable by WAC 173-303-110, or approved equivalent methods, are used.

3.7.2. Process information, product information (SDSs), and information regarding other products used or waste streams generated at the generator site are requested by Technical Services and/or CPG Staff as part of the WIN profile development process.

3.7.2.1. Process information is used to determine potential contaminants that may be present in the waste stream as well as to ensure accurate assignment of waste codes.

3.7.2.2. Product information is used to determine the primary constituents that are present in the waste stream.

3.7.2.3. Knowledge of other waste streams generated at the generator site assists CPG in determining any risks associated with waste stream acceptance, such as the potential for cyanide or biological contamination.

3.7.2.4. Information gathered from the generator during this initial profiling process is entered into WIN Web, and maintained as part of the profile and the facility operating record.

3.7.3 As initial information is entered into the Waste Material Profile Sheet, the WIN Web profiling system conducts a series of checks and balances to determine if the basic information entered into the form meets minimum criteria for proceeding with review. Checks and balances include, but are not limited to: ensuring that 100% of the wastes' constituents are accounted

for, that waste codes selected are consistent with the constituents listed, and that entries have been made in all required fields.

3.7.3.1 At a minimum, the information gathered from the generator, the generator site, and/or additional analyses through the confirmation process must be sufficient and reliable to account for all constituents of the waste stream, the process generating the waste stream, and any variability in constituent concentrations over time. Should the information be determined to be insufficient, additional information may consist of:

3.7.3.1.1 Analysis by a laboratory accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program,

3.7.3.1.2 Information from a site visit by sales staff from CHES, Safety-Kleen, or Emerald to further evaluate the waste stream for undeclared contaminants or potential variability, or

3.7.3.1.3 A request for a confirmation sample to determine suitability of the waste stream for management by Emerald.

3.7.4 All documentation used in profile preparation (including SDSs, laboratory analysis, other process information, and documentation of generator communications) are uploaded into the WIN profiling system as part of the profile.

3.7.5 Information tables are included in Appendix I of this WAP. Table 1 provides process limitation information for verification testing that must be met for each waste stream accepted for management at the Emerald facility.

3.7.5.1 Acceptable waste codes are included in Table C-2 of Section C of the Part B Permit Application.

3.7.6 Variability accounted for in a Waste Material Profile Sheet waste composition must be such that the waste stream will meet all Emerald process limitations at each end of the variability spectrum (i.e., a waste stream that lists 0-100% water and 0-100% solvent is written too broadly to assign a suitable process), while also allowing for reliable verification of the waste stream by Emerald.

3.7.7 Waste codes and proper shipping names for each profile will be determined on a worst-case basis; i.e., assuming

that all constituents and the most hazardous combination of constituents will be present each time the waste stream is shipped.

3.7.8 Multi-User Profiles/CORE Profiles are used for waste streams that have been well-characterized for a specific industry or type of process.

3.7.8.1 To use a Multi-User or CORE Profile, Emerald, CHES, or Safety-Kleen staff request process information, product information, and information regarding other products used on site.

3.7.8.2 If information provided is consistent with existing information used to establish a Multi-User or CORE Profile, Emerald staff will assign the Multi-User or CORE profile number in lieu of preparing a new Waste Material Profile Sheet form. Due to feedstock and process knowledge, there is typically no additional testing or SDS required.

3.7.8.3 At the time of submittal of this Permit Application, Emerald uses Multi-User and CORE Profiles for parts washer solvent, paint related material (i.e., assorted organic solvent thinners with residual paint), paint waste, chlorinated used oil, carburetor cleaning, empty aerosol cans, Emerald wash (paint gun wash solvent), and antifreeze. More Multi-User and CORE Profiles may be developed in the future if studies show that a waste stream's constituents have limited variability over time when generated at different locations using the same process.

3.7.9 For every waste stream, including those that rely on a Multi-User or CORE profile waste streams, Emerald conducts the confirmation process on generator information to ensure the waste steam is adequately characterized in order to develop a unique profile.

3.7.9.1 If this process confirms that information on the Waste Material Profile Sheet is adequate, then CPG personnel trained in waste characterization and the profile approval process approve the waste stream for management.

3.7.9.2 All information on the Waste Material Profile Sheet, additional information generated during the confirmation process, and the approval by trained CPG personnel comprise the approved unique profile for that waste stream.

3.7.10 Information used to complete a waste profile for each waste stream, including those using multiple-use WPQs, is documented in the operating record. Land disposal restriction (LDR) forms are completed upon profile approval. A typical LDR form is included in Appendix IV. All dangerous waste accepted by the Emerald facility must have an appropriate LDR form available in the operating record. The LDR form will include one of the following:

3.7.10.1 A notice that the waste stream is restricted from land disposal and does not meet the application LDR treatment standards and prohibition levels;

3.7.10.2 A notice and certification that the waste stream is restricted from land disposal, but meets the applicable LDR treatment standards and prohibition levels, and can be land disposed without further treatment; or,

3.7.10.3 A notice that the waste is subject to an exemption and is not prohibited from land disposal.

3.8 **Confirmation Testing**

WAC 173-303-300(1) and (2)

3.8.1 The need for confirmation testing prior to profile approval and the parameters selected for confirmation testing are determined on a case-by-case basis.

3.8.1.1 Emerald will request a confirmation sample if a waste stream appears to be suitable for solvent recycling, or if the description provided in the Waste Material Profile Sheet does not appear to meet Emerald's process limitations (see Table C-2).

3.8.1.2 Parameters tested will be determined based on the reason that the confirmation sample was requested (i.e., Btu will be analyzed on samples that appear to have inadequate Btu for fuel blending, compatibility will be analyzed on samples that have constituents that are typically incompatible with other waste streams that Emerald receives at the Tacoma facility). Additional analytical testing by accredited laboratories may also be necessary to provide sufficient and reliable information on the waste stream for its safe management and compliance with the Permit.

3.8.2 Methods that may be used for confirmation testing conducted by the Emerald laboratory are the same as those utilized for verification testing and are outlined in Section 4.3 of this WAP. Additional analytical testing methods performed, including but not limited to volatiles by SW-846 Method 8260 and semi-volatiles by SW-846 Method 8270, will depend on

the information needed to complete the profile. Laboratories used will be accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program for the analytical method (see also Appendix II of this WAP for additional QAQC information). Samples will be handled and preserved according to requirements of the analytical methods.

3.8.3 Results of confirmation tests are compared to the information provided on the Waste Material Profile Sheet. Discrepancies between test results and Waste Material Profiling Sheet information are resolved prior to profile approval. Resolution may consist of modification to the information provided in the Waste Material Profiling Sheet, changing the initial intended treatment of the waste stream (i.e., recycling vs. fuel blending), or rejecting the waste stream. If the waste stream is rejected, Emerald may recommend an alternate disposal facility to the generator.

3.9 Confirmation and Profile Approval

WAC 173-303-300(1) and (2)

3.9.1 After the Waste Material Profiling Sheet is complete, and adequate information has been gathered for a profile, the Waste Material Profiling Sheet is signed by the generator, either electronically or on hard copy.

3.9.1.1 The signature by the generator certifies that the Waste Material Profiling Sheet information is complete and accurate.

3.9.1.2 Electronic signatures are only allowed if the generator has completed a form requesting an electronic signature account. The form requires the signor to certify that they are an authorized representative of the generator as defined in 40 CFR Part 260.10, and that they authorize use of electronic signature for profiles.

3.9.1.3 At any time during the profile review process, CPG personnel reviewing the generator information may request a confirmation sample or interview the generator or Technical Services representative further regarding their waste stream. Communications regarding this type of communication are documented in the operating record.

3.9.2 Following generator signature of the Waste Material Profiling Sheet, the generator information is reviewed by CPG to determine if the waste stream is suitable for recycling, appears to have adequate Btu, or has constituents listed that

have the potential to produce an adverse reaction if commingled with other waste streams received by Emerald.

3.9.2.1 At this time, if the Waste Material Profiling Sheet contains constituents with a high vapor pressure, a vapor pressure calculation is performed to ensure that the VOC Level 1 limit of 11.1 psia will not be exceeded should the waste stream be introduced into an Emerald dangerous waste storage tank (see Table 2 in Appendix I, Compounds with High Vapor Pressure).

3.9.2.2 If a profile does not meet the process limitations for Emerald, the Emerald facility is not available as an option in the WIN profiling system as a suitable receiving facility.

3.9.3 Once the WIN profiling system has identified Emerald as a suitable receiving facility based on Emerald process limitations, CPG personnel determine if the profile information is sufficient and reliable to ensure safe management at the Emerald facility, as well as to ensure that the characteristics of the waste stream are all clearly within Emerald's process limitations (see Table C-2).

3.9.4 The profile is reviewed for accuracy of shipping name, completeness of waste codes, and suitability of the waste stream for receipt by Emerald per requirements of the Waste Analysis Plan. This part of the review process includes a comparison of information provided on the Waste Material Profiling Sheet with information gathered from the generator during the profiling process to confirm that the information gathered agrees with that provided on the Waste Material Profiling Sheet.

3.9.5 Emerald then notifies the profile submitter and the generator by a WIN automated notification that the profile is approved to facilities that are permitted to manage the waste stream. The Clean Harbors, Safety-Kleen, or Emerald staff member overseeing the account can coordinate shipment of that waste stream to the Emerald facility.

3.9.6 Profile documentation, including the notification ,SDSs corresponding to the waste stream, process information, records of communication with the generator regarding their waste stream, and results of laboratory testing, is maintained until closure as part of the facility operating record.

3.9.7 Emerald requires a recertification of every profile every year.

3.9.8 Recertification of a profile will also occur:

3.9.8.1 When Emerald has been notified or has reason to believe that the process or operation generating the dangerous waste has significantly changed (WAC 173-303-300(4)(a)) or

3.9.8.2 In accordance with procedures in Section 4.6, when a dangerous waste received at Emerald does not match the identify of the waste specified on the manifest or shipping papers (WAC 173-303-300(4)(b)).

3.9.9 Recertification consists of obtaining a new generator signature on the Waste Material Profiling Sheet, then confirmation of the profile by CPG. Additional sampling may be required if the generator indicates that their process or feed stocks have changed.

3.10 Verification

WAC 173-303-300(3)

3.10.1 Verification is performed each time a waste shipment is received at the Emerald facility. Verification consists of a series of observations and tests designed to:

3.10.1.1 Verify that the characteristics of the waste stream received are consistent with the information included on the corresponding profile; and,

3.10.1.2 Ensure the waste stream's characteristics are within verifiable process limitations and the scope of the facility's Permit.

3.10.2 For each containerized waste shipment received by Emerald, the manifest is delivered first to administrative staff.

3.10.2.1 Administrative staff then contact Check-in Personnel to notify them of the arrival of the shipment.

3.10.2.1.1 Check-In Personnel perform a visual check of the shipment to determine if obvious discrepancies exist between the descriptions on the manifest and the actual shipment. Check-In Personnel then communicate with Administrative staff regarding any discrepancies noted prior to off-loading. These discrepancies are noted on the manifest prior to providing a signed copy of the manifest to the transporter who delivered the load (see also Section 4.6 for information regarding discrepancy resolution).

3.10.2.1.1.1 Some discrepant wastes could create significant potential hazards at the facility (examples are strong oxidizer or reactive wastes that are incompatible with flammable wastes). If such a waste arrives as part of a waste shipment manifested to the facility and Emerald must remove it from the transport vehicle, the waste container(s) will be placed in its (their) own containment tray(s) in the drum jail area of the dangerous waste container area (Figure D-6). Emerald will use procedures in the Contingency Plan (Section G)

if necessary, and will notify Ecology if actions not authorized in the permit are required to address the threats (for example, if the wastes should be stored under a roof because it is water reactive).

3.10.3 Only personnel who have been trained in DOT requirements and facility acceptance procedures may sign a manifest on behalf of Emerald.

3.10.3.1 In accordance with WAC 173-303-370(2)(d), a signed manifest copy is sent to the generator within 30 days of arrival at the Emerald facility.

3.10.3.2 In accordance with WAC 173-303-370(2)(e), Emerald maintains copies of all manifests from waste streams accepted by Emerald for a minimum of three years from the date of delivery.

3.10.4 After conducting the initial visual check of the load, Check-In Personnel continue with off-loading by performing the following:

3.10.4.1 Verify the manifest number and the container count;

3.10.4.2 Verify that the container has a marker identifying the waste stream;

3.10.4.3 Verify that the marker is completely filled out with all applicable information (any missing information is entered on the marker from manifest information);

3.10.4.4 Verify the container has the proper Department of Transportation (DOT) label identifying the major risks per WAC 173-303-630(3), if applicable;

3.10.4.5 Verify the container is in good condition. Look for holes in the drum, excessive dents, waste on the drum, excessive rust, or leaks. Bungs and rings must be tight in accordance with WAC 173-303-692(a) and 40 CFR 264.1086(c)(4) or (d)(4), as appropriate;

3.10.4.6 Record all problems relating to container count, container condition, markers, and labels;

3.10.4.7 Affix additional labels and/or markers, or enter any missing marker information as appropriate,

3.10.4.8 Notify supervisor of any errors recorded per 3.8.4.6.

3.10.4.9 Immediately over-pack any leaking containers.

3.10.5 Once off-loading of container loads is complete, the containers are moved to Production Pad 2 or 4 and the following steps are taken:

3.10.5.1 Place containers in generator-specific rows according to container storage requirements (i.e., proper aisle space with labels facing outward).

3.10.5.2 Determine the containers that will be sampled for verification testing purposes (one sample for 10% of containers from each waste stream per waste shipment identified using a random sampling chart (see Table 7)).

3.10.5.2.1 If there are fewer than 10 containers for a given waste stream then at least one will be sampled for verification; if there are between 10 and 20 containers at least 2 will be sampled.

3.10.5.2.2 For certain waste streams verification testing is at a reduced frequency as outlined in Appendix VI.

3.10.5.2.3 Emerald ensures personnel responsible for verification sampling and analysis are trained on limitations for composite sampling. Personnel will document in verification record when samples from a waste stream was composited.

3.10.6 Verification sampling is performed in accordance with procedures in Appendix II (Quality Assurance and Quality Control Plan) and Table 6 in Appendix I on containers identified for verification testing under section 3.8.5.3.

3.10.6.1 Ensure each container is open only when it is actively being sampled and then promptly closed to ensure compliance with 40 CFR 264.1086(c)(3)(iii) ;

3.10.6.2 Deliver verification samples to the laboratory for verification testing; and,

3.10.6.3 Conduct verification testing on parameters identified in Section 4.3 following methods and procedures in Appendix II (Quality Assurance and Quality Control Plan) and Table 5 in Appendix I.

3.10.7 Once verification testing is complete, move any containers that did not pass verification testing to drum jail for storage prior to discrepancy resolution and notify Environmental Staff of associated manifest and profile numbers. Move any containers that passed verification testing to a suitable storage location.

3.10.8 Verification and other actions specified in section 3.10.7 for containers are completed within 24 hours of when Emerald staff sign-off on the manifest for that waste shipment. Containers that have passed verification testing are marked as either "OK to Process" or "OK for Storage". Containers that do not pass verification testing are moved to drum jail for resolution.

3.10.9 All waste streams arriving in bulk form are sampled for verification testing prior to off-loading. Sampling procedures are identified in Appendix II (Quality Assurance and Quality

Control Plan) and Table 6 of Appendix I. Testing parameters are identified in Section 4.3 and analytical methods and procedures specified in Appendix II (Quality Assurance and Quality Control Plan) and Table 5 of Appendix I.

3.10.9.1 Prior to off-loading bulk waste streams, facility staff will verify the manifested volume of the waste using strapping charts or truck volume meters.

3.10.9.2 Bulk waste streams that pass verification testing are off-loaded within 24 hours of signing the manifest to available dangerous waste storage tanks.

3.10.9.3 Bulk waste streams that do not pass verification testing are not unloaded or reshipped until the discrepancy is resolved.

3.10.9.4 In cases where it would be a financial hardship to hold the waste stream in the truck until discrepancy resolution, Emerald will evaluate suitability of available, empty Emerald dangerous waste storage tanks for temporary storage of the failed waste stream. If a suitable empty tank is available, and the waste stream is not incompatible with other waste streams stored in the same containment area, Emerald may choose to off-load the waste stream and temporarily store it for the generator pending discrepancy resolution.

3.10.9.5 In cases where Emerald has a documented site audit, or a waste stream is profiled as either multi-user or CORE waste, Emerald will conduct verification sampling according to the 10% frequency outlined above. In other cases, Emerald Check-In personnel will collect samples according to the 10% sampling frequency, and also collect representative samples from all containers per waste stream. The representative samples from each container will be composited and the composite sample will be analyzed for verification parameters. This sampling and testing will be in addition to the normal 10% sampling frequency for verification testing, unless only one container is shipped, in which case no additional testing will be performed. Check-In personnel will visually verify that the waste in each container matches the profile description. Any discrepancy noted during visual verification or lab analysis will stop the Check-In process and result in placement of the waste stream in drum jail until the issue could be satisfactorily resolved. Additionally, any property or characteristics that indicate the waste is not permitted for management at Emerald would also stop the receiving process and result in placement of the waste stream in drum jail until the issue could be satisfactorily resolved.

Resolution may require testing by a third-party laboratory for the suspected property

4 TESTING PARAMETERS AND RATIONALE FOR SELECTION

WAC 173-303-300

4.1 Waste analysis must be performed to ensure accurate waste characterization, appropriate waste transportation, safe and appropriate waste handling, and proper final disposal.

4.1.1.1 Analysis for waste requiring characterization will always be conducted by a third-party laboratory that is accredited for the parameter requested. Emerald may also choose to conduct in-house testing using verification parameters in order to confirm information provided by the generator regarding the waste stream for profile approval.

4.1.1.2 The parameters tested by Emerald are designed to confirm the information provided by the generator, and also ensure that the waste stream can be safely managed by Emerald.

4.1.1.3 Waste confirmation conducted by Emerald to develop a reliable profile can require characterization analyses or verification parameters when analytical information is needed to supplement waste analysis information provided by the generator.

4.2 Waste Characterization

WAC 173-303-300(1) and (2))

4.2.1 Waste streams for which generator information is inadequate to properly prepare a profile may require characterization analysis. Emerald will ensure that all results for characterization analysis are provided by a laboratory accredited by Ecology, as noted on Ecology's website, or by a laboratory accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program, for the analysis performed.

4.2.2 Actual characterization analyses requested will vary based on the generator process, products used on site, and completeness of information provided by the generator.

4.3 Verification Parameters Used and Rationale

WAC 173-303-300(3)

4.3.1 Verification consists of a series of screening analyses conducted by Emerald. Primary analyses are conducted as described below. Should the results of the primary analyses be inconclusive, Emerald will conduct secondary analyses that will provide a more useable and specific result.

4.3.2 Results of all screening analyses are noted on a laboratory bench sheet. Waste stream results that match descriptions on the profile are noted as "Accepted." Table 1 in Appendix I provides "Acceptance Limits for Passing Verification Testing." Any discrepancies noted during verification testing are clearly identified (see Discrepancy Resolution, Section 4.6) on the bench sheet.

4.3.3 Primary Screening Analyses

The following list identifies the parameters tested during primary screening for confirmation and verification. Summaries of these tests, the rationale for selection, and their method numbers are also provided in Tables 3, 4, and 5.

4.3.3.1 Physical Description – ASTM D 4979-95: The physical description identifies the general characteristics of the waste stream. Physical state, color, number of layers/layering, turbidity, viscosity, and incidental odor can be used to compare with the profile and to provide the analyst with basic identification of the waste stream. A physical description from verification analysis is included on the bench sheet for all waste streams. The physical description may be a basis for verification failure, or used as an indicator that the analyst should be alert to potential discrepancies in other parameters.

4.3.3.1.1 Physical description discrepancies for verification testing results are defined as the following;

4.3.3.1.1.1 Discrepancies of more than ±20% in solid/liquid/sludge percentage;

4.3.3.1.1.2 Color discrepancies for waste streams not related to paint manufacturing, or antifreeze additives; and,

4.3.3.1.1.3 Other discrepancies (turbidity, viscosity, layering, or incidental odor) with profile information based on observations by the trained Check-In Personnel (see also Table 1 of Appendix I).

4.3.3.2 Specific Gravity – ASTM D 1298-99: Specific gravity results are used to verify that liquid waste streams do not exceed the

design criteria for dangerous waste storage tanks. This test is performed on waste streams with a high percentage of constituents that have a specific gravity greater than 1.6 (design criteria limitation). Specific gravity results that do not match the description provided on the profile will be considered a verification failure if it is outside the limits identified in Table 1 of Appendix I.

4.3.3.3 pH Screen – SW-846 9040, SW-846 9041, SW-846 9045: pH analysis is performed on aqueous waste stream layers and solid waste streams destined for storage to determine if a waste stream exhibits the characteristic of corrosivity and that the pH of the waste stream received matches information on the profile. Results of the pH screen will be used to ensure that corrosive waste streams ($pH \leq 2.0$ or $pH \geq 12.5$) are not commingled in tanks with other waste streams at the Emerald facility. A pH screen result that does not match the description provided on the profile will be considered a verification failure if it is outside the limits identified in Table 1 of Appendix I.

4.3.3.4 Water Reactivity Screen – ASTM D 5058-90C: The water reactivity screen primarily indicates whether the waste stream reacts with water, and also provides information regarding organic and inorganic properties. Reactivity with water includes vigorous reaction accompanied by evolution of gases, formation of precipitates, or generation of heat. A water reactivity screen for any waste stream that results in a temperature change of greater than 5°C which cannot be accounted for by sample temperature variation is considered water reactive and would result in a verification failure. A water reactivity screen for any waste stream that results in an evolution of gases or formation of precipitates would also be considered a verification failure. Discrepancies in expected solubility and apparent density of the waste relative to water will result in verification failure based on analyst judgment.

4.3.3.5 Ignitability Screen – ASTM D-4982-95: The ignitability screen determines how easily a waste stream will ignite and burn. This screen is performed on all waste streams and identifies a waste stream as ignitable, combustible, or as having a flashpoint greater than 200°F. The screen is also used to identify waste streams that contain water. Ignitability screen results which are unsuccessful at identifying a flashpoint range will result in flashpoint analysis (secondary screening) of the waste stream. Discrepancies in ignitability screen results will not directly result in verification failure. Rather,

the ignitability screen results in combination with the results of flashpoint analysis may result in verification failure.

4.3.3.6 Compatibility Screen – ASTM D 5058-90A: The compatibility screen is used to determine the compatibility and potential reactivity of a waste stream which is being considered for consolidation with other waste streams in a tank. This screen is performed on all verification samples from waste streams which will be commingled with other waste streams already accepted by Emerald. Incompatibility with other waste streams is indicated by a vigorous reaction accompanied by evolution of gases, polymerization, formation of precipitates, or generation of heat. Waste streams that result in a temperature change of greater than 5°C during the compatibility screen that cannot be accounted for by sample temperature variation will be considered a verification failure and evaluated for alternative treatment options. Incompatible waste streams will not be stored in tanks, commingled on-site, or treated in the processing units at the Emerald facility, but will be properly stored until transport to alternate facilities for treatment or disposal.

4.3.3.7 Radiation Screen – ASTM D 5928-96: The radiation screen is used to detect the presence of radiation above twice the current daily background and is performed on waste streams generated in industries that are known to use radioactive sources or may generate radioactive waste streams in their processes (for example, laboratories or subsurface drilling operations). Any waste streams with radiation levels above twice the current daily background will be considered a verification failure and will be segregated until other offsite disposal options are identified and coordinated.

4.3.3.8 VOC Level 1 Calculation: The VOC Level 1 calculation is performed during profile review for waste streams that have any high vapor pressure constituents listed in Table 2 of Appendix I. The calculation is used to identify waste streams that exceed the vapor pressure criteria of 11.1 psia or 574 mm Hg at 25°C in order to apply VOC emission Level 1 storage tank control imitations outlined in 40 CFR 264.1080 Subpart CC (as referenced in WAC 173-303-692(a)). If one or more constituents listed in Table 2, or other constituents with a vapor pressure above 11.1 psia at 25°C, are present in a waste stream, Emerald will estimate a weight percent for each constituent. Based on vapor pressure data for each pure component, the partial pressure of each constituent in the waste stream is calculated. Any waste stream that

exceeds the vapor pressure criteria will not be accepted for tank storage at the Emerald facility.

4.3.3.9 Sulfide Screen – ASTM Method D4978-95 (2007) - This screen detects the presence of hydrogen sulfide in waste streams upon acidification below pH 2. It is performed on all waste streams with aqueous constituents that are from an industry that generates sulfides (petroleum refining, sewage treatment, mining, or others noted as generating sulfide on the Site Audit Checklist). This method detects hydrogen sulfide at a concentration of 1ppm in solution, which is well below the established threshold for D003, or 500ppm. Should initial testing result in a "positive", Emerald will conduct a second test on a 1/500 dilution of the waste stream. A positive result at this dilution will be considered a D003 for sulfide, and the waste will be considered a verification failure. A calibration standard solution at a concentration of 1ppm will be used for conducting the test.

4.3.4 **Secondary Screening Analyses**

The following secondary analyses are used when primary screening analyses are not conclusive enough to clearly identify a waste stream as discrepant. These analyses are conducted only on certain types of waste streams as described below:

4.3.4.1 Flash Point (closed cup) – SW-846 1020: A closed cup flash point analysis is conducted after a potential flash point discrepancy is determined from the ignitability screen. Flashpoint results which identify specific discrepancies in flashpoint that can be accounted for by variability of the waste stream identified in the profile will not result in verification failure if the result is more conservative (i.e., higher) than the range identified in the profile. Flashpoint results that are less conservative (i.e., lower) than the range identified in the profile, or that cannot otherwise be accounted for by the constituents listed on the profile, will result in verification failure.

4.3.4.2 Heat of Combustion (Btu) – ASTM D 240: Heat of combustion is performed to determine the heating value of different materials. This test is used when the ignitability screen does not clearly indicate that the waste stream has adequate Btu for fuel blending.

4.4 Methods for Collecting Samples for Analyses

4.4.1 Samples for waste streams that require confirmation analysis by Emerald or third-party analyses by an accredited laboratory are either provided by the generator (who certifies that the sample is representative) or by CHES, Safety-Kleen, or Emerald personnel who are trained in proper sampling procedures.

4.4.2 Samples for on-site verification are collected by Emerald personnel who are trained in proper sampling procedures. Methods of sampling are summarized in Table 6 of Appendix I. Waste streams that are not identified in Table 6 are sampled in accordance with methods specified in WAC 173-303-110.

4.4.3 Containers to be sampled during verification are determined by using a random number procedure. Table 7 of Appendix I outlines how the random number procedure is implemented.

4.4.4 Verification samples for containerized waste streams are collected at a frequency of 10% for each waste stream per waste shipment.

4.4.5 Verification samples for bulk waste streams are collected at a frequency of 100%.

4.4.6 Waste streams which require an alternate sampling frequency are addressed in Appendix VI of this WAP.

4.4.7 In addition to verification sampling, samples may also be collected for the following:

4.4.7.1 Confirmation of a generator's waste stream; and,

4.4.7.2 Discrepant waste streams that need to be re-profiled.

4.4.8 The screening methods used by Emerald do not require sample preservation.

4.4.8.1 Emerald collects all verification samples in clear glass or polyethylene containers.

4.4.8.2 Verification samples are delivered to the Emerald laboratory in a timely manner and analyzed as soon as possible and no later than 24 hours after sample collection.

4.4.8.3 Confirmation samples may be collected in either clear glass or polyethylene containers and are analyzed as soon as possible following receipt and not to exceed 24 hours.

4.4.9 Samples that are delivered to third party laboratories for analysis will be collected in sample containers suitable for the method. Emerald will also ensure that samples delivered to third party laboratories for analysis have the necessary volume and preservation for the analysis.

4.5 Frequency of Analysis

WAC 173-303-300(3) and (4)

The frequency of laboratory analysis is dependent upon the completeness of information provided by the generator, the number of waste shipments received by Emerald, discrepancies in waste streams received by Emerald, the frequency of analyses requested by disposal facilities, and whether or not generating processes or feed stocks have changed. Emerald conducts analyses at the frequencies indicated below:

Analytical Need	**Frequency of Analysis**
Initial Profiling	As needed based on completeness of information provided by the generator.
Verification for Storage for Incineration and Fuel Blend Waste Streams (containers)	10% of containers per waste stream per shipment plus one composite sample from all containers.
Verification for Recyclable Waste Streams (containers)	10% of containers per waste stream per shipment, or as outlined in Appendix VI, plus one composite sample from all containers.
Verification for Bulk Waste Streams	Each load (100%)
Profile Recertification	Every year, and as needed based on requirements in WAC 173-303-300(4) (i.e. a change in generator processes or products used at the generator site or discrepancies as discussed in Section 4.6)

4.6 Discrepancy Resolution

WAC 173-303-370(4)

Emerald may encounter manifest or verification discrepancies during the process of waste acceptance.

4.6.1 Manifest discrepancies may include, but are not limited to, the following discrepancies in container count, or bulk volume of waste received.

4.6.1.1 For containers a difference in piece count will result in investigations under section 4.6.1.3.

4.6.1.2 For bulk loads a difference of ±10% in bulk weight will result in investigations under section 4.6.1.3.

4.6.1.3 For discrepancies under sections 4.6.1.1 and 4.6.1.2. Emerald contacts Technical Services staff who will work with the generator to determine if an error was made on the manifest. If the generator agrees that there was an error, then Emerald makes the appropriate notation in the discrepancy box of the manifest form, and also in the Waste Information Network (WIN). If the generator does not agree that there was an error, Emerald would investigate the matter further to determine the cause of the discrepancy.

4.6.2 In the event that results of verification analyses do not agree with information on the profile, verification discrepancy procedures are initiated. All verification discrepancies are reviewed by either the Facility Operations Manager, environmental staff, or properly trained designee for a determination on proper corrective action (see Appendix I, Table 1, Acceptance Limits for Passing Verification Testing). There are two categories of verification discrepancies that occur at Emerald; for purposes of this WAP, they are segregated into "simple" discrepancies, and "significant" discrepancies.

4.6.2.1 Simple verification discrepancies occur when the verification analyses do not agree with the information on the profile, but verification results indicate that the waste stream is still suitable for management at the Emerald facility. Verification results for these discrepancies show that the waste stream met all process limitations, but did not match the profile description.

4.6.2.1.1 In these cases, the generator will be questioned by Technical Services staff regarding the reason for the discrepancy. If the reason for the discrepancy could be rationally explained (i.e., waste stream contained a higher percentage of water than originally described, flashpoint is

slightly outside the range specified on the Waste Material Profile Sheet, waste stream is a different color, or there is an additional layer of solvent present), and the explanation and information provided were not inconsistent with Emerald's waste acceptance requirements, the profile would either be amended to account for the additional variability in the waste stream, or a new Waste Material Profile Sheet and new profile would be created for use on the shipment in question, and future shipments if applicable.

4.6.2.1.2 All correspondence with the generator and rationale or justification regarding changes made due to simple discrepancies will be included with the appropriate profile in the operating record.

4.6.2.1.3 Discrepant flashpoints are an example of simple verification discrepancies. Emerald will generally not make any adjustments if the generator is worst-casing their flashpoint on the profile (i.e., waste stream received flashes at 142°F, but the profile form indicates a flashpoint of 100°F). However, the profile will be modified in reverse situations (i.e., Waste Material Profile Sheet indicates a flashpoint of 142°F, but the flashpoint of the waste stream received is 100°F). In situations where verification analysis indicates that the generator's waste stream is repeatedly worst-cased, Emerald will contact the generator and ask them if they would prefer to make the appropriate change to their Waste Material Profile Sheet. Emerald will make corresponding changes to the profile and document decisions in the operating record.

4.6.2.2 Significant verification discrepancies occur when verification analysis shows that the waste stream does not match the description of the profile and also is not suitable for management at Emerald.

4.6.2.2.1 In these cases, Emerald will contact the generator and notify them that the waste stream cannot be managed at the Emerald facility.

4.6.2.2.2 Emerald will then proceed with assisting the generator with profiling of the waste stream directly to a suitably permitted disposal facility.

4.6.2.2.3 All correspondence with the generator regarding changes made due to discrepancies will be included with the appropriate profile in the facility operating record. Documentation of correspondence may be in the form of copies of phone logs, emails, or notes made in electronic

databases (WIN, Beacon, or SharePoint). Procedures for profiling the waste stream are similar to those outlined in Section 3.7, Waste Characterization and Profiling, and must also incorporate any additional information required by the TSDF.

4.6.2.3 Verification discrepancies are tracked in WIN A. WIN contains information on the manifest number, number of discrepant drums, the reason for the discrepancy, and date the containers were placed in "drum jail." Once the verification discrepancy is resolved, the appropriate entries are made in the WIN data base to show proper tracking of the waste stream.

4.6.2.4 For verification discrepancies that result in a profile change, and Emerald is still managing the waste stream, an entry is made in WIN for the corresponding manifest line identifying the new profile number that was created and approved.

4.6.2.5 For waste streams that are ultimately reprofiled for shipment to alternate TSDFs, the entry states what line of the manifest was reprofiled, where the waste stream was, or will be shipped, the new profile number, and the new manifest number (if appropriate). If all containers on a manifest are, or will be, redirected, the entries are similar to those for redirection of single containers, with the exception that the entry indicates that the entire manifest is redirected, rather than specific containers or line items.

4.6.3 Emerald ensures discrepancy resolution within 15 days of receiving the waste stream at the facility.

4.6.3.1 Discrepancies which cannot be resolved within 15 days are reported to Ecology in accordance with WAC 173-303-370(4)(b).

4.6.3.2 A verification discrepancy is considered to be resolved when Emerald has sufficient information to store the waste stream safely until proper disposal can be arranged.

4.6.3.3 A manifest discrepancy is considered resolved when all containers and volumes have been accounted for, and all corresponding changes have been made to the manifest, the Emerald waste tracking system, and any other applicable documents.

5 QUALITY ASSURANCE PROGRAM

WAC 173-303-300(5)(b) and (c)

5.1 The Emerald laboratory primarily performs screening analysis. The objective of most screening analysis is to provide either a positive/negative result, or a result that provides a value within a defined range. Emerald's primary screening analyses provide this type of result (for example, a flash point range, or a negative/positive result for compatibility).

5.2 Secondary screening is designed to provide results that are more specific than the primary screening when the primary screening result is not clearly within Emerald's process limitations or acceptance criteria. Both primary and secondary screening are conducted in the Emerald laboratory.

5.3 The screening methods performed by Emerald do not require sample preservation.

5.4 Analytical data used for waste characterization is required to be from a laboratory accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program for the required analytical method, and specific sample preservation requirements of the method apply.

5.5 Within one year of Permit approval, Emerald will conduct a Self-Audit of the WAP by randomly selecting waste streams received and having them tested by a third-party laboratory.

5.5.1 During the Self-Audit, samples will be submitted to a third-party laboratory to verify results and profile information obtained through Emerald WAP procedures. Only a laboratory accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program for the analytical method requested will be used. Parameters requested for analyses will be based on what can reasonably be expected to be present in the waste stream. All Self-Audit samples will also be tested for all parameters of the verification testing protocol by the third-party laboratory.

5.5.2 During the time of third-party laboratory testing, Emerald will conduct the normal check-in and verification process for the waste stream.

5.5.3 Once results are received from Self-Audit testing, they will be reviewed and compared to the verification results reported by the Emerald laboratory as well as to the applicable generator

profile. Discrepancies in any of the results will be investigated and corrective action will be taken as necessary according to normal discrepancy resolution procedures. Emerald will then prepare a formal report of the Self-Audit results and submit that to Ecology. In the report, and based on Self-Audit results, Emerald will recommend continuation, modification, or discontinuation of the Self-Audit program. Emerald will formally continue, modify, or discontinue the program upon approval by Ecology.

5.5.4 Additional information regarding Emerald's Quality Assurance and Quality Control Plan and the Self Audit program is included as Appendix II of this WAP.

5.6 Within the Emerald laboratory, instruments are maintained according to manufacturer's recommendations and maintenance is documented in the laboratory maintenance notebook. Instrument calibration is conducted according to requirements of the applicable method and calibration is documented in the laboratory notebook. Standards are used until they have reached their expiration date, at which time they are discarded.

5.7 Due to the nature of the analyses performed, data obtained by the Emerald laboratory does not require reduction. Rather, results are either positive/negative or analysis provides a specific number that requires no further manipulation. Results can therefore be transferred directly to the laboratory bench sheet for comparison with information provided by the generator.

5.8 Emerald laboratory results and documentation are routinely reviewed during profile approval and verification for waste stream acceptance. While there are limited samples received for confirmation analysis prior to profile approval, results from confirmation samples are reviewed by Regulatory Review personnel to ensure that the results agree with the description on the Waste Material Profile Sheet and also to ensure appropriate management codes are assigned. Confirmation samples may be analyzed by Emerald for parameters included in this WAP, or by a laboratory accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program for the analytical method.

5.9 Waste streams for which verification analysis shows a clear agreement between the profile and verification results receive a routine check of the results reported by the Emerald laboratory, generally by an administrative staff member. Verification results which show a disagreement between the waste stream received

and the information provided by the generator are reviewed by the Environmental Manager or designee for a determination of further action.

5.10 All laboratory bench sheets are signed by personnel who conducted the testing. All Waste Material Profile Sheet are signed by the generator, either with pen or electronic signature. Profiles are reviewed and signed by at least one CPG employee specifically qualified and trained in profile review procedures. All manifests are signed by Emerald personnel who have been trained in DOT requirements. Any changes to any of these documents is initialed and dated by the person making the change. Changes to documents that have been signed by the generator are communicated with the generator by providing them with a letter explaining the change, or by providing them with a revised version of the document.

6 RECORDKEEPING AND WASTE TRACKING

WAC 173-303-380(1)(c)

6.1 All documents related to this WAP are maintained until facility closure as part of the facility operating record.

6.1.1 Waste Material Profile Sheets and all documents associated with generator profiles are maintained electronically within WIN and will be made available at any time upon request. Profile information includes the signed Waste Material Profile Sheet, and supplemental documentation to demonstrate that the information provided by the generator was sufficient to fully characterize the waste stream and reliable for Emerald to properly manage the waste stream. Supplemental documentation may include: laboratory results from a laboratory that is accredited for the analytical method, SDSs, process information, results of any confirmation testing performed by Emerald, and documentation of communications conducted with the generator.

6.1.2 Laboratory quality control information is maintained in laboratory notebooks in the facility laboratory.

6.2 Manifests and associated verification records and tracking logs are maintained together and filed by generator. However, as manifest records must be maintained for three years, rather than until closure, Emerald may choose to separate the manifests from the verification records and tracking logs if it is operationally feasible.

6.3 Emerald's waste tracking system has been developed to allow accurate waste tracking for all waste streams managed by Emerald from arrival at the Emerald facility to final disposal.

6.3.1 It is designed to track all inbound containers, both bulk and non-bulk, from the point of acceptance, through the different stages of facility processing, and finally to each waste stream's final disposal.

6.3.2 It also has the capability of tracking outbound loads back to the initial container numbers and manifests that were accepted at the Emerald facility.

6.4 Tracking of inbound waste streams begins with information from waste profiles and manifests. Information from the Waste Material Profile Sheet is entered into the WIN database. Once a customer's waste stream has been approved for acceptance (profiled) and a shipment date has been coordinated, a manifest is developed. If the manifest is prepared from WIN, the database draws information such as proper shipping name, applicable waste codes, and the intended processing method

directly from profile information. All information for approved transporters and TSDFs is also pulled from the WIN database for the manifest. Markers and manifests are printed directly from the database and used for the inbound shipment. In cases where the manifest is prepared by the customer, the manifest information is entered into the database upon arrival of the waste stream at the facility.

6.5 Once a shipment arrives at the facility, a barcode is generated from WIN for each manifest received. During the check-in procedure each container is assigned a separate unique barcode number that is linked to the manifest for tracking purposes. These numbers are automatically recorded into the WIN database via a barcode scanner. Each time a container is relocated, the movement is recorded via barcode scanner or on a Production Log and subsequently entered into the WIN database. In the event of a system malfunction, Emerald is able to utilize a paper tracking method so that all material is still tracked effectively from cradle to grave.

6.6 Non-bulk containers that are consolidated into bulk containers or tanks are tracked to final disposal by their container numbers. When the non-bulk container is pumped to a bulk container or tank, the non-bulk container number is tracked to the bulk container or tank. Each time waste is removed from a bulk container or tank for further processing, the volume is tracked to the corresponding process or outbound container. The batch number and container numbers for the waste streams consolidated in the tank are recorded on the Container to Tank Log. Transfer of batches to different tanks within the facility is recorded on the Tank to Tank Tracking Log, and transfer of any container to a container for outbound shipment is recorded on the Consolidation Log or Container to Container Tracking Log. Each transfer is recorded in the WIN database for the purpose of easily tracking all containers from acceptance to final disposal. In the case of recyclable wastes, tracking ends at the point the wastes are recycled.

6.7 Outbound loads may be tracked back to inbound containers. By entering the outbound manifest number in the WIN database, a listing of all inbound containers which were ultimately included with the specified load can be obtained.

6.8 Waste streams generated on site are tracked in a similar manner to waste streams received from off-site. Once a container of Emerald-generated waste is accumulated, a bar code is assigned. The waste stream is then tracked using Production

Logs until it is fuel blended on-site or shipped off-site to a permitted third-party TSDF for disposal.

6.9 The Emerald waste tracking system can also provide specialized reports. A facility inventory can be obtained for any particular day that provides locations of all containers at the facility during the specified time. An incomplete tracking report can be obtained which identifies containers which have been at the facility for an extended period of time. These specialized reports assist Emerald in tracking potential problems in the waste management process.

7 WASTES GENERATED ON-SITE

7.1 Emerald generates waste on-site as part of processing operations, and also "becomes" the generator on waste streams received for storage.

7.1.1 All waste streams generated by Emerald undergo characterization at the time of initial profiling, and recertification according to requirements of the permitted disposal facility. Testing is performed in accordance with WAC 173-303-070, as required under WAC 173-303-140, and as requested by the permitted disposal facility.

7.1.2 Reprofiling, follow-up testing, or changes to the existing profile are conducted per the requirements of the disposal facility or this Permit and applicable regulations.

7.2 For waste streams with recoverable fuel value, Emerald maintains a master profile with a permitted burner that encompasses a wide variety of constituents that may be present in the waste stream. This allows Emerald a high degree of flexibility regarding what can reasonably be consolidated on-site (i.e., not all constituents need to be present in the waste stream each time) while also ensuring adequate fuel value for the burner. These waste streams may be in liquid or solid form.

7.2.1 Liquids are consolidated into the railcar for shipment.

7.2.2 Solids are typically shipped out in drums and may be consolidated with other solids if space is available in the container.

7.3 Waste streams generated on-site and consolidated for management under Emerald's recoverable fuel profile include:

- Still bottoms from fuel blending and recycling (both solvent and glycol);
- Process residues, rags/sorbents, contaminated PPE;
- Retain samples from confirmation and verification testing;
- Oils skimmed from recycling processes; and,
- Activated carbon from glycol recycling or industrial wastewater processing operations.

7.4 Debris and personal protective equipment generated on-site may not have sufficient recoverable fuel value, and would then be managed under a separate outbound profile. This profile is specific to Emerald, rather than inclusive of other waste streams that would be received by Emerald. Waste streams managed under this profile include:

- Rags and sorbents from clean-up operations; and,
- Used personal protective equipment (gloves, tyvek).

7.5 Rainwater collected from dangerous waste management areas is managed on-site according to the requirements of the Industrial

Wastewater Discharge Permit that Emerald maintains with the City of Tacoma.

7.6 Boiler blowdown water is managed as a direct discharge.

7.7 Emerald generates other wastewaters that are not suitable for management on-site under the Industrial Wastewater Discharge Permit. These wastewaters are managed off-site. Non-RCRA wastewaters, or other wastewaters with contaminant concentrations below dangerous waste limits, are primarily managed at Emerald's facility in Seattle. RCRA wastewaters are managed by a suitably permitted TSDF. These wastewaters include:

- Wash water from washout of the glycol processing unit;
- Wastewater that would normally be treated under the requirements of the existing Industrial Wastewater Discharge Permit, but has a higher than permitted concentration of metals constituents or low/high pH;
- Stormwater that has been contaminated due to a spill event.
- Glycol distillate from the glycol recycling operation;
- Equipment wash water; and,
- Oily wastewater generated from the used oil re-refinery operation.

Part B

Section C

Waste Analysis Plan
Appendix I
Tables 1 thru 7

Table 1 Acceptance Limits for Passing Verification Testing					
Waste Analysis and Acceptance Parameters	**Solvent Recycling**	**Fuel Blending**	**Glycol Recycling**	**Tank Storage for Incineration**	**Container Storage Only**
Compatibility Screen	Compatible	Compatible	Not Analyzed	Compatible	Not Analyzed
Flash Point	Not Analyzed	Within ±8°C of profile range[1]	>140°F	Within ±8°C of profile range[1]	Not Analyzed
Heat of Combustion (BTU)	Not Analyzed	Btu meets minimum requirements for burner and is within ± 20% of profile value.	Not Analyzed	Within ±20% of profile value.	Not Analyzed
Ignitability Screen	Profile agreement within range	Positive	Negative	Profile agreement within range	Profile agreement within range
pH	Within ±1 pH units of range identified in profile, and not exceeding process limit (2> pH <12.5).	Within ±1 pH units of range identified in profile, and compatible[4].	Within ± 1pH units of range identified in profile, and not exceeding process limit (2< pH ≤12.5).	Within ± 1pH units of range identified in profile, and not exceeding process limit (2< pH ≤12.5).	Within ±1 pH units of range identified in profile, and compatible[4].
Specific Gravity	Within ±20% of range identified in profile, and not exceeding process limit (0.5-1.6).	Within ±20% of range identified in profile, and not exceeding process limit (0.5-1.6).	Not Analyzed.	Within ±20% of range identified in profile, and not exceeding process limit (0.5-1.6).	Not Analyzed.
Physical description	Profile agreement overall - see Section 4.3.3.1.1	Profile agreement overall - see Section 4.3.3.1.1	Profile agreement overall - see Section 4.3.3.1.1	Profile agreement overall - see Section 4.3.3.1.1	Profile agreement overall-see Section 4.3.3.1.1
Radiation Screen	No more than 2X current daily background	No more than 2X current daily background	No more than 2X current daily background	No more than 2X current daily background	No more than 2X current daily background
Water Reactivity Screen[2]	Non-reactive	Non-reactive	Non-reactive	Non-reactive	Profile agreement
Glycol Content	Not Analyzed	Not Analyzed	>10%	Not Analyzed	Not Analyzed
Oil Content	Not Analyzed	Not Analyzed	[3]	Not Analyzed	Within 20% of range identified in profile.
Sulfide Content	<500ppm	<500ppm	Not Analyzed	<500ppm	<500ppm

[1] Waste streams that show a flashpoint more than 8°C outside the high side of the range on the profile during verification may not be immediately rejected, reprofiled, or require a change to the existing profile. Rather, Emerald may choose to monitor subsequent shipments to determine if a long term change is needed.

[2]Water Reactivity is defined as a temperature change of greater than 5°C when mixed with water which cannot be accounted for by sample temperature variation, or evolution of gases or formation of precipitates when mixed with water.

[3] Emerald will check each inbound load of antifreeze for oil content. Each inbound load of antifreeze with greater than 5% oil will be flagged as "high oil" by the Emerald laboratory as part of the check-in procedure. Should subsequent loads from the same geographic area be flagged as "high oil", Emerald will send out reminders to drivers in that

Table 2 Compounds with High Vapor Pressure*		
Compound	**Molecular Weight**	**Vapor Pressure (mm Hg at 25°C)**
1-chloro-2, 2 dibromoethane	222.50	1520
Acetaldehyde	44.05	760
Alpha-hydroxyacetaldehyde	60.00	1520
Benzo(B)fluoranthene	252.32	1626
Bis(1,1,2,2-tetrachloropropyl)ether	377.70	875
Butadiene (1,3)	54.09	2095
Carbon oxyfluoride	65.01	1520
Chloroethane	64.52	1200
Chloromethane	50.49	3830
Dichlorodifluoromethane	120.92	5000
Dichloroethylene (1,1)	97.00	630
Dichloromonofluoromethane	102.92	1360
Dimethyl amine	45.09	1520
Ethyl chloride	64.52	1200
Ethylene oxide	44.00	1250
Formaldehyde	30.00	3500
Furon	68.08	596
Methanethiol	48.11	1520
Methyl chloride	5.05	3830
Methyl ether	46.09	3082
Methylamine	31.06	1520
Monochlorodifluoromethane	86.50	7483
Phosphine	34.00	2000
Propylene	42.12	7600
Trichlorofluoromethane	137.40	796
Trifluoroethane (1,1,1)	84.00	9241
Trimethylamine	59.11	1520

*40 CFR 264.1080 Subpart CC

Note, these are the most common compounds with vapor pressure above 574 mm Hg at 25°C (11.1 psia), but there may be other such compounds in wastes Emerald receives. If that occurs it will trigger the same waste analysis evaluation as if any of the above compounds are in the waste.

Table 4 Verification Parameters and Rationale - Secondary Screening Analyses		
Parameter	**Wastes Tested**	**Rationale**
1) Flashpoint analysis	• All liquid waste streams for which a flashpoint range is not confirmed or verified during ignitability screen	• Establish a more specific flashpoint value. • Identify D001
2) Heat of combustion (Btu)	• All liquid waste streams destined for fuel blending that fail the ignitability screen and for which the ignitability screen does not clearly indicate a Btu sufficient for energy recovery.	• Verify Btu sufficient for energy recovery and select appropriate treatment and disposal options

Table 5 Parameters and Test Methods for Verification Analyses		
Parameter	**Method**	**Reference**
pH sample, liquid	SW-846, 9040, 9041	1
pH sample, solid	SW-846, 9045	1
Closed cup flashpoint	ASTM D3278-78	1
Heat of combustion (Btu/lb)	ASTM, D 240-02	2
Specific gravity	ASTM, D1298-99	2
VOC Level 1 Calculation		
Ignitability screen	ASTM, D 4982-95	2
Compatibility screen	ASTM, D 5058-90A	2
Physical description	ASTM, D 4979-95	2
Radiation screen	ASTM, D 5928-96	2
Water reactivity screen	ASTM, D 5058-90C	2
Sulfide Screen	ASTM Method D4978-95 (2007)	2
[1]Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA SW-846, 2007. [2]American Society for Testing and Materials, Individual Standards, Editions updated individually		

Table 7
Method for Selecting Containers to Undergo Verification Sampling

Random Numbers

03	47	43	73	86	36	96	47	36	61	46	98	63	61	62
97	74	24	67	62	42	81	14	57	20	42	53	32	37	32
16	76	62	27	66	56	50	26	71	07	32	90	79	78	53
12	56	85	99	26	96	96	68	27	31	05	03	72	93	15
55	59	56	35	64	38	54	82	46	22	31	62	43	09	90
16	32	77	94	39	49	54	43	54	82	17	37	93	23	78
84	42	17	53	31	57	24	55	06	88	77	04	74	47	67
63	01	63	78	59	16	95	55	67	19	98	10	50	71	75
33	21	12	34	29	78	64	56	07	82	52	42	07	44	38
57	60	86	32	44	09	47	27	96	54	49	17	46	09	62
18	18	07	92	46	44	17	16	58	09	79	83	86	19	62
26	62	38	97	75	84	16	07	44	99	83	11	46	32	24
23	42	40	64	74	82	97	77	77	81	07	45	32	14	08
52	36	28	19	95	50	92	26	11	97	00	56	76	31	38
37	85	94	35	12	3	39	50	08	30	42	34	07	96	88
70	29	17	12	13	40	33	20	38	26	13	89	51	03	74
56	62	18	37	35	96	83	50	87	75	97	12	25	93	47
99	49	57	22	77	88	42	95	45	72	16	64	36	16	00
16	08	15	04	72	33	27	14	34	09	45	59	34	68	49
31	16	93	32	43	50	27	89	87	19	20	48	37	00	49

Selecting containers to be sampled:

1. Based on available information, segregate the containers into two categories: generator specific profiles and multi-user profiles.
2. Number the containers containing waste streams from generator specific profiles consecutively with the container number labels that are in numerical order.
3. Ten percent will be sampled.
4. Using the set of random numbers above, choose any number as a starting point.
5. From this number, go down the column, then to the next column to the right, or go in any predetermined direction until you have selected the numbers between the lowest number, the last two digits on the number label, and the highest. The possible range is 00-99. Larger numbers are ineligible.

Example: If you were to select 16 (row 19, column 1) as the starting point and there are 30 drums in the group, the next 3 (10%) numbers that are eligible, reading from left to right, would be 08, 15, and 04, assuming the last two digits on the number label are 00 (container number 64900). The containers with those corresponding numbers would be sampled.

Table 6 Methods Used to Sample Regulated Wastes			
Waste Type	**Sampler[3]**	**Frequency**	**Reference**
1) Bulk liquids	COLIWASA or core sampler	One representative sample per load	EPA Test Methods for the Evaluation of Sold Waste, Physical/Chemical Methods, EPA SW-846, Revision 5, 1998
2) Containerized solids and liquids	Glass tube or COLIWASA for liquids. Scoop, spoon, trowel, Shelby tube or similar device for solids.	10% of containers for each generator per waste stream for verification testing per waste shipment. [1]	EPA Test Methods for the Evaluation of Sold Waste, Physical/Chemical Methods, EPA SW-846, Revision 5, 1998
3) Composite	Glass tube or COLIWASA	One composite sample from non-uniform waste streams in non-bulk containers.[2]	EPA Test Methods for the Evaluation of Sold Waste, Physical/Chemical Methods, EPA SW-846, Revision 5, 1998

[1] See Appendix 4 of this WAP for procedures outlining exceptions to this sampling frequency.
[2] A composite sample from up to 10 containers are allowed subject to limits in section 3.8.5.3.3. of the waste analysis plan. If there are more than 10 containers of a waste stream in a waste shipment, then additional composite samples are required for verification testing. Restrictions for composite sampling are addressed in section 3.8.5.3.3 of the Waste Analysis Plan.
[3]Other sampling devices may be used if circumstances require it.

Table 7
Method for Selecting Containers to Undergo Verification Sampling

Random Numbers

03	47	43	73	86	36	96	47	36	61	46	98	63	61	62
97	74	24	67	62	42	81	14	57	20	42	53	32	37	32
16	76	62	27	66	56	50	26	71	07	32	90	79	78	53
12	56	85	99	26	96	96	68	27	31	05	03	72	93	15
55	59	56	35	64	38	54	82	46	22	31	62	43	09	90
16	32	77	94	39	49	54	43	54	82	17	37	93	23	78
84	42	17	53	31	57	24	55	06	88	77	04	74	47	67
63	01	63	78	59	16	95	55	67	19	98	10	50	71	75
33	21	12	34	29	78	64	56	07	82	52	42	07	44	38
57	60	86	32	44	09	47	27	96	54	49	17	46	09	62
18	18	07	92	46	44	17	16	58	09	79	83	86	19	62
26	62	38	97	75	84	16	07	44	99	83	11	46	32	24
23	42	40	64	74	82	97	77	77	81	07	45	32	14	08
52	36	28	19	95	50	92	26	11	97	00	56	76	31	38
37	85	94	35	12	3	39	50	08	30	42	34	07	96	88
70	29	17	12	13	40	33	20	38	26	13	89	51	03	74
56	62	18	37	35	96	83	50	87	75	97	12	25	93	47
99	49	57	22	77	88	42	95	45	72	16	64	36	16	00
16	08	15	04	72	33	27	14	34	09	45	59	34	68	49
31	16	93	32	43	50	27	89	87	19	20	48	37	00	49

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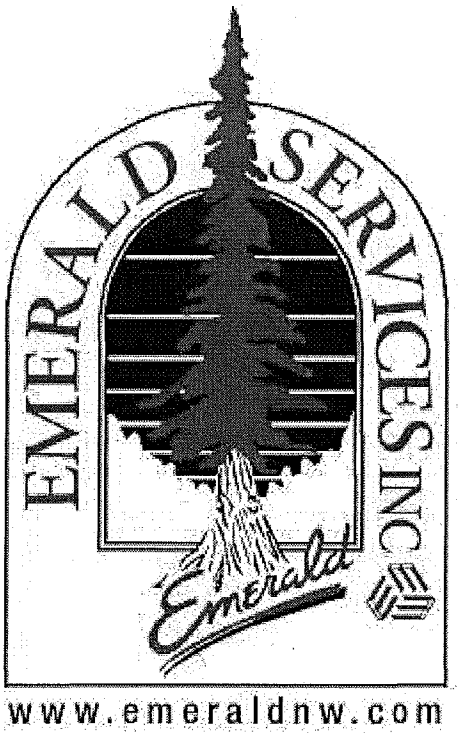
Part B

Section C

Waste Analysis Plan
Appendix II
Quality Assurance and Quality Control Plan



Emerald Services, Inc.

Quality Assurance and Quality Control Plan

For

Emerald Services, Inc. Tacoma Facility Laboratory

Operating Under the
Tacoma Facility Part B Permit

WAC 173-303-300(5)

1.0 Introduction

The purpose of this Quality Assurance and Quality Control Plan (QA/QC Plan or Plan) is to outline quality assurance and quality control (QA/QC) measures that assure the quality of data collected during waste evaluation meets the requirements of the facility quality standards as well as the facility Waste Analysis Plan (WAP). The WAP is part of the Permit for Storage of Dangerous Waste issued by the Washington State Department of Ecology.

This Plan has been prepared following the guidance "EPA Requirements for Quality Assurance Project Plans (QAPP) for Environmental Data Operations." The facility laboratory conducts limited screening and qualitative analysis on behalf of dangerous waste generators for waste verification, and data is for internal purposes only. Therefore, portions of the QAPP guidance are not applicable to the Emerald facility operation. Only elements that have been deemed applicable to Emerald laboratory operations are included.

This Plan will be reviewed on an annual basis during the first two years following Permit approval. Any changes made based on identification of practices that result in data which does not meet the need of the facility and related permits will be outlined in a permit modification request submitted to Ecology. All updates will be communicated to all staff performing operations under this Plan as well as agencies and personnel listed on the Permit Distribution List. Staff performing Plan operations will be trained on all updates.

2.0 Project Management

2.1 Project and Task Organization

Data generated under this Plan will be primarily utilized by facility operations and regulatory staff who are responsible for approving wastes for shipment, verifying waste identity when accepting wastes for management at the facility, and shipping recycled products to

customers for re-use. Analytical data generated under this Plan may not be used for waste characterization purposes.

The facility Laboratory Manager is responsible for laboratory quality control, ensuring that aspects of this plan are adhered to at all times. The Laboratory Manager serves as technical advisor to laboratory personnel. The Laboratory Manager reports to Emerald's Facility Manager III, Refinery.

This Plan will be reviewed on an annual basis during the first two years of implementation by the Environmental Manager. All proposed changes to the Plan will be reviewed by either Emerald staff who are not directly involved in production aspects of the facility, or a third party consultant prior to implementation. The Director, Environmental Compliance, is responsible for communicating any changes to this Plan to facility personnel and individuals on the Distribution List.

2.2 Facility Background

Emerald Services, Inc. is a hazardous and dangerous waste management facility that is permitted to recycle solvents and antifreeze, fuel blend waste streams with recoverable fuel value, and store a limited variety of other waste streams prior to shipment off-site. In order to properly manage the types of waste streams accepted by Emerald, Emerald must perform screening tests to eliminate the possibility of waste stream mismanagement. These tests must be performed in a timely manner to ensure efficiency of operation. Verification testing is performed to ensure that each waste stream received at the facility matches the description provided by the generator. A flowchart for verification testing is included for reference in Appendix II of the Waste Analysis Plan.

The Emerald laboratory performs a majority of the testing required for facility operation. All analyses necessary for waste stream characterization are performed at laboratories accredited by a third-party accreditation authority such as the National Environmental Laboratory Accreditation Program (NELAP), the American Association for Laboratory Accreditation (A2LA), or recognized accreditation program, for the required analytical method at the time of the request.

2.3 Quality Objectives

All results from analyses performed by the Emerald laboratory are for screening and qualitative analysis purposes only. Primary and secondary screening methods utilized for confirmation and verification testing clearly identify a waste stream as satisfying the process limits of the facility.

2.4 Minimum Staff Qualifications

The Laboratory Manager provides technical oversight to the laboratory operation and has a Bachelor's Degree in Chemistry or related field plus a minimum of two years experience in laboratory operations.

Laboratory personnel performing screening analysis must have the following qualifications:

- Minimum AA degree or higher, or equivalent experience.
- Knowledge of pertinent environmental regulations.
- Knowledge of hazardous waste management procedures including labeling, packaging, and shipping.
- Familiar with general facility operations.
- Capable of performing production-related activities.

2.5 Documentation and Records

Laboratory personnel will be notified by the Laboratory Manager when changes are made to either the Waste Analysis Plan or this Plan. A current version of each Plan will be maintained in the facility laboratory. Training regarding the Waste Analysis Plan, this Plan, and any associated changes will be conducted by the Laboratory Manager, or personnel or consultants overseeing the change. Training records are kept as part of the facility operating record.

Chain of custody records are maintained according to the date received for a minimum of 30 days after analysis. Calibration and maintenance information, as well as all analyst notes regarding analysis is recorded in a laboratory notebook. Manifests are retained

in the facility operating record for 3 years following waste receipt. Audit reports are maintained in the facility operating record. All records that are connected with profile approval, verification, and other activities performed under this Plan are maintained in the facility operating record until facility closure.

3.0 Data Acquisition

3.1 Sample Requirements

A majority of samples analyzed by the Emerald laboratory are collected during verification sampling. Emerald samples 100% of bulk containers, and 10% of containers from each waste stream per shipment per generator for verification testing. Waste stream is defined as dangerous waste from a single generator that is specific and unique to the waste generation process.

For waste streams identified in Appendix VI of this WAP from multi-user or CORE profiles, Emerald may conduct container verification sampling at a reduced frequency. Requirements and procedures are outlined in Appendix VI of this WAP. Emerald also analyzes samples for confirmation sampling prior to approval to ship a waste stream to the Emerald facility. The frequency of this sampling varies and the need is determined on a case-by-case basis.

There are no specific preservation requirements for the methods performed by the Emerald laboratory. Samples collected on-site are delivered to the laboratory by facility personnel after completion of verification sampling for a shipment. Verification samples are analyzed as soon as possible and no later than 24 hours after sample collection. Samples that are collected at generator locations (confirmation samples) are stored away from excessive heat or cold until delivery to the Emerald laboratory. Confirmation samples are analyzed as soon as possible after receipt at the Tacoma facility, within 24 hours with the following potential exemption. Samples that are received after laboratory operating hours and prior to a period of laboratory closure (weekends and holidays) will be analyzed during the next laboratory operating day.

Sample matrices vary, and some create difficulty in obtaining a representative sample. Samplers are required to notify the laboratory of non-representative samples and to provide a representative description of the waste stream to laboratory personnel prior to analysis.

3.2 Sampling Methods and Requirements

Sampling will be performed according to the standard procedures listed in Table 6 or Appendix I of the facility Waste Analysis Plan. Only personnel trained in sampling procedures are authorized to deliver samples to the laboratory for analysis.

Confirmation samples are analyzed by the laboratory as soon as possible after receipt at the Tacoma facility and not to exceed 24 hours unless received during laboratory non-operational hours, when they would be analyzed during the next laboratory operating day. Verification samples are collected in 4-oz poly sample containers with tight fitting lids, and are analyzed by the laboratory no later than the following business day. There are no specific preservation requirements for the screening methods used by Emerald. For opaque samples, Emerald will ensure that the physical description will be determined using a clear glass or translucent plastic container. Samples sent for characterization analysis are preserved and containerized according to the requirements of the method and receiving laboratory.

Information accompanying confirmation samples must include the following:

- Unique sample identification;
- Sampling date; and
- Generator name.

A chain of custody form must accompany all samples delivered from off-site locations.

Samples collected for verification purposes are labeled with the appropriate container number.

3.3 Analytical Methods

The following methods are utilized for confirmation and verification purposes (please also refer to Section 3.0 of the facility Waste Analysis Plan).

- Physical Description – ASTM D 4979-95
- pH Screen – SW-846 9040, 9041, 9045
- Water Reactivity Screen – ASTM D 5058-90C
- Ignitability Screen – ASTM D 4982-95
- Compatibility Screen – ASTM D 5058-90A
- Radiation Screen – ASTM D 5928-96
- Flash Point (closed cup) – ASTM D 3278-78
- Heat of Combustion (Btu) – ASTM D 240-02
- Specific Gravity – ASTM D 1298-99
- Sulfide Screen - ASTM Method D 4978-95 (2007)

Emerald performs the above methods as specified in the reference material.

3.4 QC Requirements

QC measures conducted by Emerald follow those outlined in the standardized methods referenced above. Additional QC measures include standard recommended laboratory practices as follows:

- Maintain manufacturer and vendor operation and maintenance (O&M) manuals in the laboratory area at all times;
- Follow the testing and QA procedures set forth in the O&M manuals when using the meters during screening analysis; and,
- After use, ensure that reusable equipment is clean and contains no residue or remnants of the prior test samples.

Third party laboratories utilized by Emerald will be responsible for following the QC procedures established in its quality assurance project plan and by the analytical method.

3.5 Instrument Maintenance, Calibration, and Frequency

Instruments are maintained according to manufacturer's recommendations. Calibration of instruments is performed as follows:

Calorimeter:	Initial and monthly calibration according to ASTM D 240 instructions.
pH Meter:	Prior to pH meter use as specified by manufacturer's operating instructions and SW-846 9040.
Closed cup flashpoint:	As specified in ASTM 3278
Lab balances:	Monthly calibration using certified weights and following manufacturer's recommendations.

Other calibration is performed using internally prepared standards.

3.6 Inspection/Acceptance Requirements for Supplies and Consumables

All supplies and consumables are inspected upon receipt to ensure the requested products are received and that damage has not occurred during shipment. Any damaged goods which are determined to be unusable will be returned to the manufacturer.

3.7 Data Management

All samples are retained for a minimum of 30 days following analysis. All results and notes from analysis are recorded in a laboratory notebook according to the date analyzed. Results for confirmation and verification sampling are recorded on laboratory bench sheets which are maintained with profiles until facility closure as part of the facility operating record. The laboratory bench sheet also records the date the sample was collected and the date the sample was analyzed.

4.0 Data Validation and Usability

4.1 Verification and Validation Methods

All laboratory operations will be audited by an Emerald employee not involved in facility production on an annual basis to determine conformance with this Plan and the facility Waste Analysis Plan. An internal audit will include review of laboratory practices and a comparison to documented methods.

An annual quality check of typical samples will also be performed. This quality check is a major part of the Emerald Self-Audit program. Typical samples from verification sampling will be split and delivered to outside laboratories for analysis. Typical samples will be from waste streams destined for fuel blending and solvent recycling.

In previous year's quality checks, Emerald has determined the samples that will be used through the ORCA database. Emerald set limitations on the selection process, then directed ORCA to select 10 random profiles for the Self-Audit program. Upon arrival of waste streams attached to the profile, a notice was printed on the tracking log, instructing Check-In personnel that the profile and waste stream were part of the Self-Audit program and that the waste stream must be sampled accordingly.

For the first quality check conducted under this Permit, Emerald will focus on waste streams destined for recycling. Emerald will use the ORCA system to select one random profile per day for waste streams destined for recycling for a period of ten working days. Emerald will ensure one of the selections includes composited Emerald Wash solvent for recycling. Since Emerald receives information on inbound loads on the day prior to arrival, ORCA can be set to select the random profile for the following day. As with the previous quality check, a notice will be printed on the tracking log, instructing Check-In personnel that the profile and waste stream are part of the Self-Audit program and that the waste stream must be sampled accordingly.

Emerald will provide additional details for each quality check in a proposal to Ecology each year prior to commencing sampling and analysis. The scope of the quality check will vary each year based on results of the previous year's quality check and current practices underway at the Emerald facility.

Analysis will be requested according to the profiling requirements of the facility Waste Analysis Plan. This includes analysis that would be performed for characterization analysis (i.e., what can reasonably be expected to be present in the waste stream) and also duplicate screening analysis per the requirements of the verification testing portion of the Emerald Waste Analysis Plan. Parameters will be selected based on target waste streams for the quality check.

Any laboratory results which are identified as non-compliant will be noted in the audit report and corrective measures will be outlined, along with a target date for implementation. Sample results for the split samples must be in agreement with Emerald results as follows:

Parameter	Acceptance Criteria
pH	± 1 pH unit
Water Reactivity Screen	Agreement (negative/positive)
Ignitability Screen	Agreement within range specified in profile.
Compatibility Screen	Agreement (negative/positive)
Flashpoint	Within ±8°C
Btu	Within ±20%
Specific Gravity	Within ±20%
Sulfide	Agreement (negative/positive)

Upon completion of self-audit testing, Emerald will prepare a summary report for submittal to Ecology. This report will include the following at a minimum:

- Report summarizing results of the quality check and any abnormalities;

- Copies of signed WPQ forms or Waste Material Profile Sheets for waste streams analyzed for the quality check; and,
- Copies of laboratory data reports.

4.2 Review of Data Quality Objectives

Data produced from confirmation and verification testing is utilized to help determine whether wastes may be accepted for management at the Emerald Tacoma facility. Data must clearly identify a waste as satisfying the process limitation criteria outlined in Table 1 of Appendix I of the facility Waste Analysis Plan.

Part B

Section C

Waste Analysis Plan
Appendix III
Designating Dangerous Waste

Designating Dangerous Waste

Ecology Fact Sheet **Publication #96-436,** *Revised October 2004*

As a business in Washington State, you are responsible for knowing what and how much dangerous waste you generate. The *Dangerous Waste Regulations* in Chapter 173-303-070 WAC describe the characteristics or properties that cause a waste to be considered dangerous, and what amounts of waste cause you to be regulated as a dangerous waste generator. This guide leads you through the steps that you must take to determine whether you generate a dangerous waste subject to special handling requirements. This process of classifying wastes is called "designation." The document also contains a flow chart that can be used with a copy of the regulations to help you designate wastes more easily and accurately.

The designation process identified in this guide is appropriate for most waste streams. Generators should be aware, however, that exclusions exist for certain waste streams. The majority of these exclusions may be found in Chapter 173-303-071 WAC.

What you need to know to start

Look around your facility and locate all of the wastes and processes that produce waste. You need to know how much of each waste you generate each month, and how much of each waste you have accumulated on-site. You will also need to know something about the physical and chemical nature of your wastes. It is usually necessary to know the name of all chemical components that make up the specific waste stream.

Material Safety Data Sheets may tell you something about the physical and chemical properties of your waste. They might also show the names of the chemicals used in a product. Without this type of information about your waste, you may have to test each waste stream to determine if it is dangerous waste.

How to use this document

This guide is a three-step process. It is designed for people who intend to dispose of their wastes. You will need a copy of the *Dangerous Waste Regulations* to use as a reference. If you are recycling or reusing your wastes, refer to sections -016 and -017.

Step 1 - Inventory Your Wastes

Find out what wastes you have, and how much waste you generate each month and accumulate on-site at any one time before disposal. Write these quantities in the Waste Inventory section of the Generator Status Worksheet printed on page 3.

Step 2 - Designating

For each of your wastes, follow the Dangerous Waste Designation Flow Chart on page 4. This flow chart leads you through a series of questions that will help you to decide if your waste is dangerous.

All dangerous wastes have a four-digit code number assigned to them based on their properties. If your waste meets the definition of a particular type of dangerous waste, write the four-digit waste number in the **Designation** column of the Waste Inventory table on page 3.

Following the flow chart, write down all of the waste numbers that apply to your waste on the **Generator Status** section of the worksheet. Stop when you reach a box on the flow chart that reads, "No further designation is required."

Step 3: Generator Status

After tracing each waste through the flow chart, go back to the generator status worksheet and follow the instructions. Add up all of the pounds of wastes that have been assigned waste numbers. You can now figure out if you are a small, medium or large quantity generator, and what you must do to correctly handle your waste. You may be:

- a ***small quantity generator*** (SQG) and responsible only for following the handling requirements described in WAC 173-303-070(8) in addition to any county or city hazardous waste management requirements; or
- a ***medium quantity generator*** (MQG) and required to follow the standards listed by WAC 173-303-201 and -202; or
- a ***large quantity generator*** (LQG) subject to full regulation under the requirements of WAC 173-303-170 and -200.

Generator Status Worksheet

Waste Inventory: Fill in the spaces below for each of your waste streams. First, write in the waste name, number of pounds you generate each month, and the number of pounds you accumulate on-site at any time. Once this information is complete, go through the steps of the flow chart to find out which dangerous waste numbers apply to your waste. Write in all of the dangerous waste numbers for each waste in the spaces marked "Waste Numbers".

	Waste Name	Pounds Generated Each Month	Pounds Accumulated On-site	Waste Number(s) (Designation)
Waste 1.				
Waste 2.				
Waste 3.				
Waste 4.				
Waste 5				
Waste 6.				
Waste 7.				
Waste 8.				
Waste 9.				

Waste Totals: Add up the amount of waste you generate and/or accumulate on-site at any time that has any of these waste numbers: any number beginning with P, WT01, F020-F023, F026, and F027. Write these quantities on Line 1 below. On Line 2, write in the amount of spill residues from all numbers beginning with P, F020-F023, F026 and F027. Then write in the total amount of all other wastes that are "dangerous wastes" on Line 3.

	Wastes	Pounds Generated Each Month	Pounds Accumulated On-site
Line 1.	All numbers beginning with P, WT01, F020-F023, F026, F027		
Line 2.	Spill residues from all numbers beginning with P, F020-F023, F026, F027		
Line 3.	All other Dangerous Waste numbers		

Generator Status: Compare your totals to the quantities listed below to determine your generator status.

You are a Small Quantity Generator if:

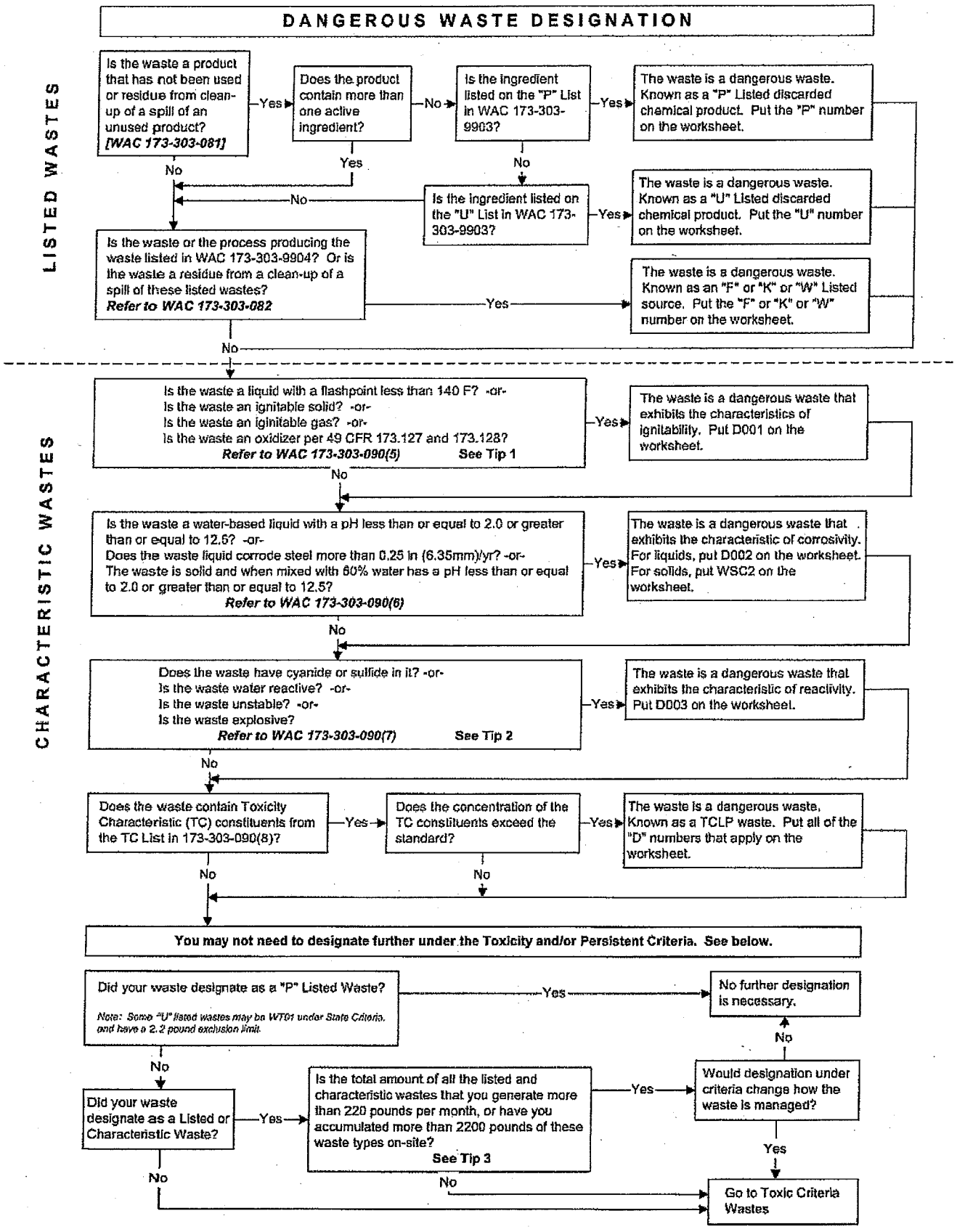
Line 1 quantities are less than	2.2 pounds	and	2.2 pounds
and			
Line 2 quantities are less than	220 pounds	and	220 pounds
and			
Total of Lines 1, 2 and 3 is less than	220 pounds	and	2200 pounds

You are a Medium Quantity Generator if:

Line 1 quantities are less than	2.2 pounds	and	2.2 pounds
and			
Total of Lines 1, 2 and 3 is less than	2200 pounds	and	2200 pounds

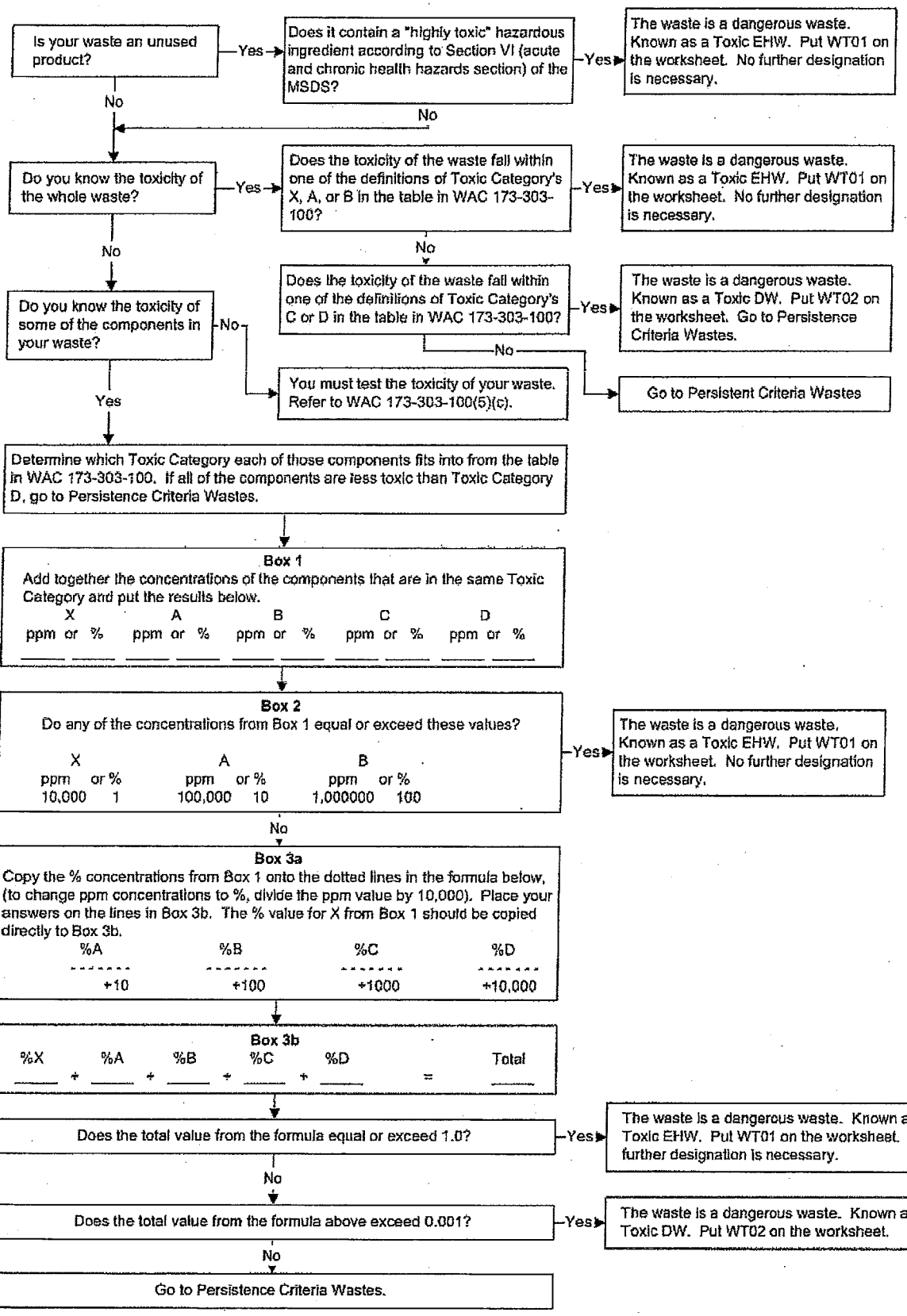
You are a Large Quantity Generator if:

Line 1 quantities are more than	2.2 pounds	or	2.2 pounds
or			
Total of Lines 1, 2 and 3 is more than	2200 pounds	or	2200 pounds


DANGEROUS WASTE DESIGNATION
LISTED WASTES
Is the waste a product that has not been used or residue from clean-up of a spill of an unused product? [WAC 173-303-081]
Yes
Does the product contain more than one active ingredient?
No
Is the ingredient listed on the "P" List in WAC 173-303-9903?
Yes
The waste is a dangerous waste. Known as a "P" Listed discarded chemical product. Put the "P" number on the worksheet.
No
Yes
No
No
Is the ingredient listed on the "U" List in WAC 173-303-9903?
Yes
The waste is a dangerous waste. Known as a "U" Listed discarded chemical product. Put the "U" number on the worksheet.
Is the waste or the process producing the waste listed in WAC 173-303-9904? Or is the waste a residue from a clean-up of a spill of these listed wastes? Refer to WAC 173-303-082
Yes
The waste is a dangerous waste. Known as an "F" or "K" or "W" Listed source. Put the "F" or "K" or "W" number on the worksheet.
No
CHARACTERISTIC WASTES
Is the waste a liquid with a flashpoint less than 140 F? -or- Is the waste an ignitable solid? -or- Is the waste an ignitable gas? -or- Is the waste an oxidizer per 49 CFR 173.127 and 173.128? Refer to WAC 173-303-090(5) See Tip 1
Yes
The waste is a dangerous waste that exhibits the characteristics of ignitability. Put D001 on the worksheet.
No
Is the waste a water-based liquid with a pH less than or equal to 2.0 or greater than or equal to 12.5? -or- Does the waste liquid corrode steel more than 0.25 in (6.35mm)/yr? -or- The waste is solid and when mixed with 60% water has a pH less than or equal to 2.0 or greater than or equal to 12.5? Refer to WAC 173-303-090(6)
Yes
The waste is a dangerous waste that exhibits the characteristic of corrosivity. For liquids, put D002 on the worksheet. For solids, put WSC2 on the worksheet.
No
Does the waste have cyanide or sulfide in it? -or- Is the waste water reactive? -or- Is the waste unstable? -or- Is the waste explosive? Refer to WAC 173-303-090(7) See Tip 2
Yes
The waste is a dangerous waste that exhibits the characteristic of reactivity. Put D003 on the worksheet.
No
Does the waste contain Toxicity Characteristic (TC) constituents from the TC List in 173-303-090(8)?
Yes
Does the concentration of the TC constituents exceed the standard?
Yes
The waste is a dangerous waste. Known as a TCLP waste. Put all of the "D" numbers that apply on the worksheet.
No
No
You may not need to designate further under the Toxicity and/or Persistent Criteria. See below.
Did your waste designate as a "P" Listed Waste?
Note: Some "U" listed wastes may be WT01 under State Criteria, and have a 2.2 pound exclusion limit.
Yes
No further designation is necessary.
No
Would designation under criteria change how the waste is managed?
Yes
No
Did your waste designate as a Listed or Characteristic Waste?
Yes
Is the total amount of all the listed and characteristic wastes that you generate more than 220 pounds per month, or have you accumulated more than 2200 pounds of these waste types on-site? See Tip 3
Yes
No
No
Go to Toxic Criteria Wastes

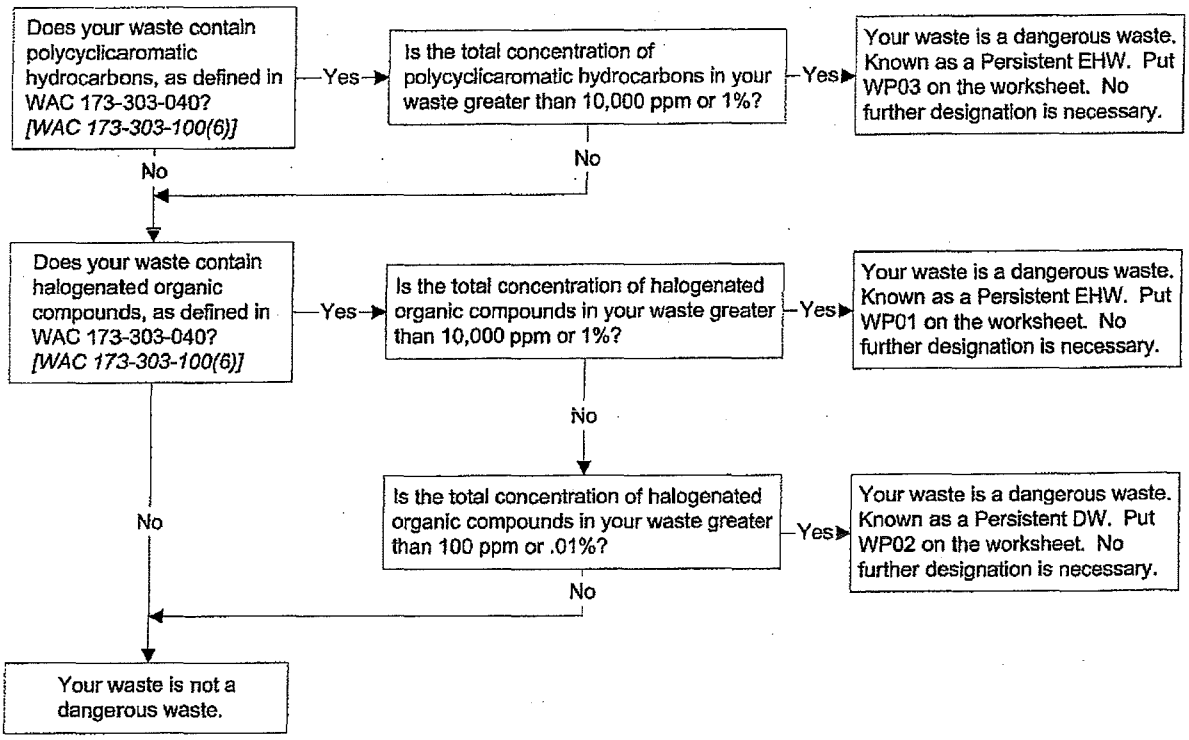
TOXIC CRITERIA WASTES

DANGEROUS WASTE DESIGNATION



PERSISTENT CRITERIA WASTES

DANGEROUS WASTE DESIGNATION



TIP 1
These definitions correspond to U.S. Department of Transportation (USDOT) regulations. If your waste is an unused product that has USDOT flammable, ignitable solid, oxidizer, or peroxide labels then it meets the definition of ignitable waste.

TIP 2
The definition of reactive waste and explosive waste corresponds to USDOT regulations. If your waste is an unused product that carries these warning labels then the waste meets the definition of dangerous waste.

TIP 3
If you are designating more than one waste you should designate them all to this point before you go further so you can use the total amounts to answer the question in this box.

For More Information

The Hazardous Waste and Toxics Reduction Program is responsible for the management and reduction of hazardous wastes and toxic substances in Washington State. We are available to answer your questions. Contact a regional office near you and ask for a Toxics Reduction Specialist for information on reducing or recycling hazardous waste. If you are uncertain about your responsibilities as a hazardous waste generator, ask for a Hazardous Waste Specialist.

Additionally, staff from our program have authored over one hundred publications to help answer your questions about safely managing your hazardous waste. A few are listed below.

Step-by-Step: Fact Sheets for Hazardous Waste Generators This packet of fourteen, easy to use guidelines provides an overview of the requirements of the *Dangerous Waste Regulations*. All of the fact sheets listed can be obtained as part of the packet, or individually, according to their corresponding publication number.
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Fact Sheet 5: *Properly Accumulate Hazardous Waste*, #91-12m, Rev. 5/03
Fact Sheet 6: *Plan For Emergencies*, #91-12n, Rev. 6/03
Fact Sheet 7: *Use Proper Containers and Manage Them Correctly*, #91-12o, Rev. 5/03
Fact Sheet 8: *Arrange For Proper Transportation and Disposal*, 91-12p, Rev. 5/03
Fact Sheet 9: *Manifest Shipments of Hazardous Waste*, #91-12q, Rev. 6/03
Fact Sheet 10: *Keep Records of Hazardous Waste Activity*, #91-12r, Rev. 10/04
Glossary, #91-12x, Rev. 10/04
Subject Index, #91-12, Rev. 4/03

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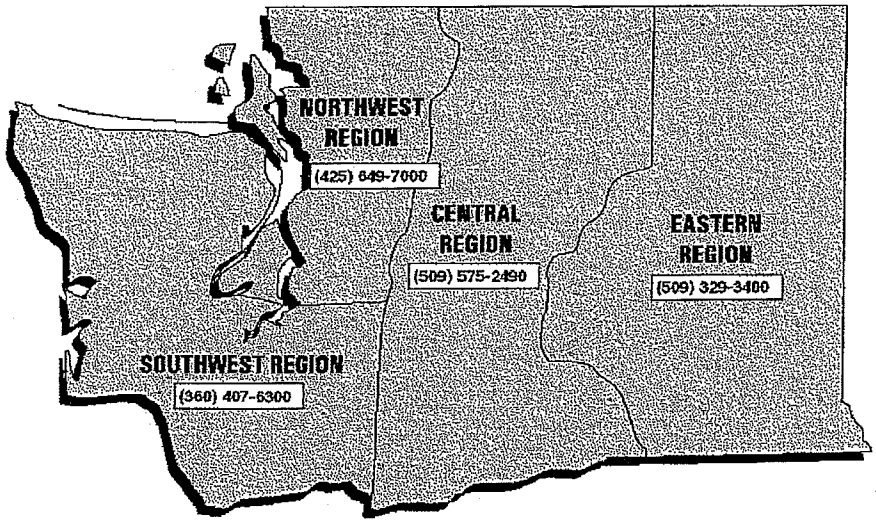

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Part B

Section C

Waste Analysis Plan
Appendix III
Designating Dangerous Waste

Designating Dangerous Waste

Ecology Fact Sheet **Publication #96-436,** *Revised October 2004*

As a business in Washington State, you are responsible for knowing what and how much dangerous waste you generate. The *Dangerous Waste Regulations* in Chapter 173-303-070 WAC describe the characteristics or properties that cause a waste to be considered dangerous, and what amounts of waste cause you to be regulated as a dangerous waste generator. This guide leads you through the steps that you must take to determine whether you generate a dangerous waste subject to special handling requirements. This process of classifying wastes is called "designation." The document also contains a flow chart that can be used with a copy of the regulations to help you designate wastes more easily and accurately.

The designation process identified in this guide is appropriate for most waste streams. Generators should be aware, however, that exclusions exist for certain waste streams. The majority of these exclusions may be found in Chapter 173-303-071 WAC.

What you need to know to start

Look around your facility and locate all of the wastes and processes that produce waste. You need to know how much of each waste you generate each month, and how much of each waste you have accumulated on-site. You will also need to know something about the physical and chemical nature of your wastes. It is usually necessary to know the name of all chemical components that make up the specific waste stream.

Material Safety Data Sheets may tell you something about the physical and chemical properties of your waste. They might also show the names of the chemicals used in a product. Without this type of information about your waste, you may have to test each waste stream to determine if it is dangerous waste.

How to use this document

This guide is a three-step process. It is designed for people who intend to dispose of their wastes. You will need a copy of the *Dangerous Waste Regulations* to use as a reference. If you are recycling or reusing your wastes, refer to sections -016 and -017.

Step 1 - Inventory Your Wastes

Find out what wastes you have, and how much waste you generate each month and accumulate on-site at any one time before disposal. Write these quantities in the Waste Inventory section of the Generator Status Worksheet printed on page 3.

Step 2 - Designating

For each of your wastes, follow the Dangerous Waste Designation Flow Chart on page 4. This flow chart leads you through a series of questions that will help you to decide if your waste is dangerous.

All dangerous wastes have a four-digit code number assigned to them based on their properties. If your waste meets the definition of a particular type of dangerous waste, write the four-digit waste number in the **Designation** column of the Waste Inventory table on page 3.

Following the flow chart, write down all of the waste numbers that apply to your waste on the **Generator Status** section of the worksheet. Stop when you reach a box on the flow chart that reads, "No further designation is required."

Step 3: Generator Status

After tracing each waste through the flow chart, go back to the generator status worksheet and follow the instructions. Add up all of the pounds of wastes that have been assigned waste numbers. You can now figure out if you are a small, medium or large quantity generator, and what you must do to correctly handle your waste. You may be:

- a ***small quantity generator*** (SQG) and responsible only for following the handling requirements described in WAC 173-303-070(8) in addition to any county or city hazardous waste management requirements; or
- a ***medium quantity generator*** (MQG) and required to follow the standards listed by WAC 173-303-201 and -202; or
- a ***large quantity generator*** (LQG) subject to full regulation under the requirements of WAC 173-303-170 and -200.

Generator Status Worksheet

Waste Inventory: Fill in the spaces below for each of your waste streams. First, write in the waste name, number of pounds you generate each month, and the number of pounds you accumulate on-site at any time. Once this information is complete, go through the steps of the flow chart to find out which dangerous waste numbers apply to your waste. Write in all of the dangerous waste numbers for each waste in the spaces marked "Waste Numbers".

	Waste Name	Pounds Generated Each Month	Pounds Accumulated On-site	Waste Number(s) (Designation)
Waste 1.				
Waste 2.				
Waste 3.				
Waste 4.				
Waste 5				
Waste 6.				
Waste 7.				
Waste 8.				
Waste 9.				

Waste Totals: Add up the amount of waste you generate and/or accumulate on-site at any time that has any of these waste numbers: any number beginning with P, WT01, F020-F023, F026, and F027. Write these quantities on Line 1 below. On Line 2, write in the amount of spill residues from all numbers beginning with P, F020-F023, F026 and F027. Then write in the total amount of all other wastes that are "dangerous wastes" on Line 3.

	Wastes	Pounds Generated Each Month	Pounds Accumulated On-site
Line 1.	All numbers beginning with P, WT01, F020-F023, F026, F027		
Line 2.	Spill residues from all numbers beginning with P, F020-F023, F026, F027		
Line 3.	All other Dangerous Waste numbers		

Generator Status: Compare your totals to the quantities listed below to determine your generator status.

You are a Small Quantity Generator if:

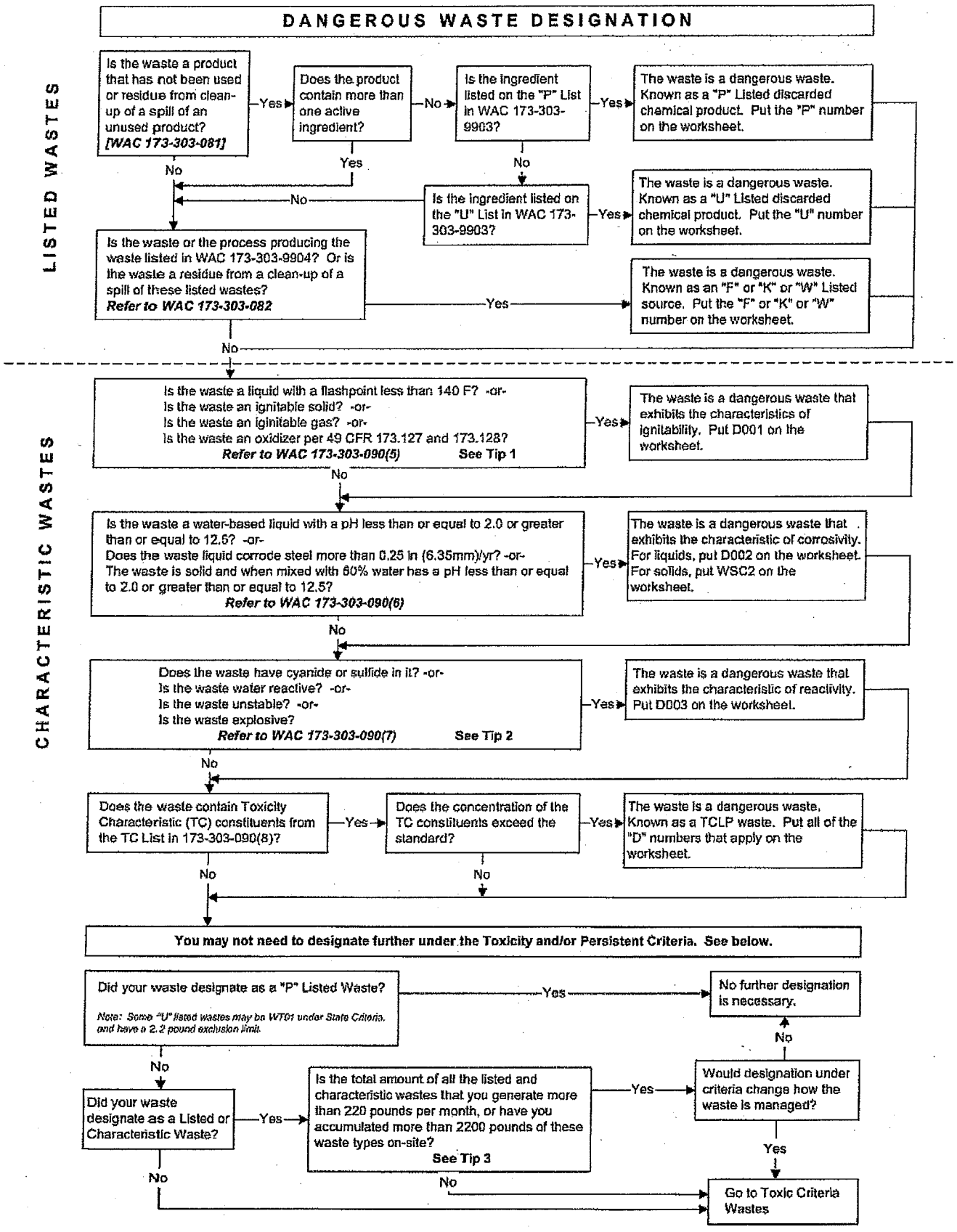
Line 1 quantities are less than	2.2 pounds	and	2.2 pounds
and			
Line 2 quantities are less than	220 pounds	and	220 pounds
and			
Total of Lines 1, 2 and 3 is less than	220 pounds	and	2200 pounds

You are a Medium Quantity Generator if:

Line 1 quantities are less than	2.2 pounds	and	2.2 pounds
and			
Total of Lines 1, 2 and 3 is less than	2200 pounds	and	2200 pounds

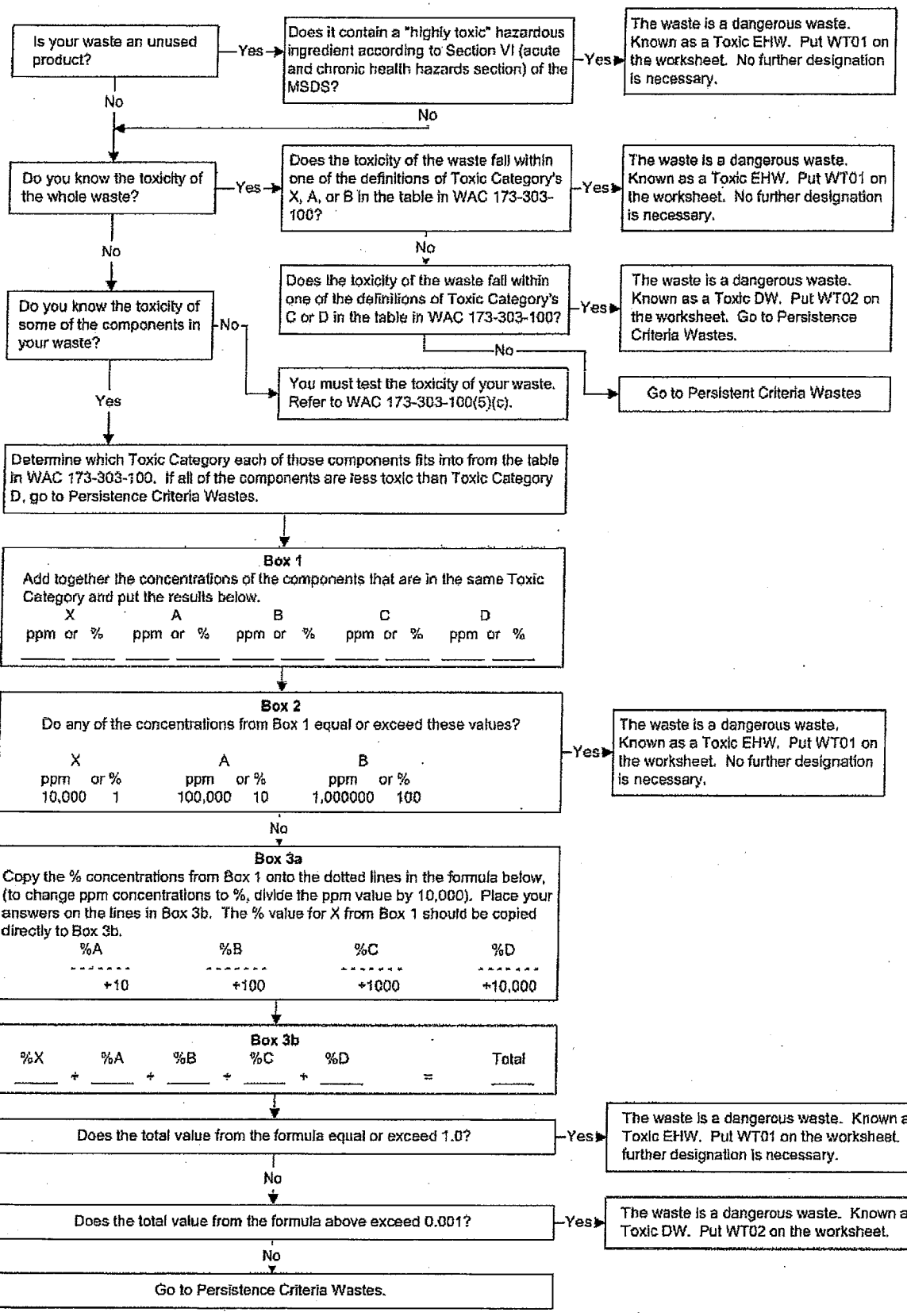
You are a Large Quantity Generator if:

Line 1 quantities are more than	2.2 pounds	or	2.2 pounds
or			
Total of Lines 1, 2 and 3 is more than	2200 pounds	or	2200 pounds


DANGEROUS WASTE DESIGNATION
LISTED WASTES
Is the waste a product that has not been used or residue from clean-up of a spill of an unused product? [WAC 173-303-081]
Yes
Does the product contain more than one active ingredient?
No
Is the ingredient listed on the "P" List in WAC 173-303-9903?
Yes
The waste is a dangerous waste. Known as a "P" Listed discarded chemical product. Put the "P" number on the worksheet.
No
Yes
No
No
Is the ingredient listed on the "U" List in WAC 173-303-9903?
Yes
The waste is a dangerous waste. Known as a "U" Listed discarded chemical product. Put the "U" number on the worksheet.
Is the waste or the process producing the waste listed in WAC 173-303-9904? Or is the waste a residue from a clean-up of a spill of these listed wastes? Refer to WAC 173-303-082
Yes
The waste is a dangerous waste. Known as an "F" or "K" or "W" Listed source. Put the "F" or "K" or "W" number on the worksheet.
No
CHARACTERISTIC WASTES
Is the waste a liquid with a flashpoint less than 140 F? -or- Is the waste an ignitable solid? -or- Is the waste an ignitable gas? -or- Is the waste an oxidizer per 49 CFR 173.127 and 173.128? Refer to WAC 173-303-090(5) See Tip 1
Yes
The waste is a dangerous waste that exhibits the characteristics of ignitability. Put D001 on the worksheet.
No
Is the waste a water-based liquid with a pH less than or equal to 2.0 or greater than or equal to 12.5? -or- Does the waste liquid corrode steel more than 0.25 in (6.35mm)/yr? -or- The waste is solid and when mixed with 60% water has a pH less than or equal to 2.0 or greater than or equal to 12.5? Refer to WAC 173-303-090(6)
Yes
The waste is a dangerous waste that exhibits the characteristic of corrosivity. For liquids, put D002 on the worksheet. For solids, put WSC2 on the worksheet.
No
Does the waste have cyanide or sulfide in it? -or- Is the waste water reactive? -or- Is the waste unstable? -or- Is the waste explosive? Refer to WAC 173-303-090(7) See Tip 2
Yes
The waste is a dangerous waste that exhibits the characteristic of reactivity. Put D003 on the worksheet.
No
Does the waste contain Toxicity Characteristic (TC) constituents from the TC List in 173-303-090(8)?
Yes
Does the concentration of the TC constituents exceed the standard?
Yes
The waste is a dangerous waste. Known as a TCLP waste. Put all of the "D" numbers that apply on the worksheet.
No
No
You may not need to designate further under the Toxicity and/or Persistent Criteria. See below.
Did your waste designate as a "P" Listed Waste?
Note: Some "U" listed wastes may be WT01 under State Criteria, and have a 2.2 pound exclusion limit.
Yes
No further designation is necessary.
No
Would designation under criteria change how the waste is managed?
Yes
No
Did your waste designate as a Listed or Characteristic Waste?
Yes
Is the total amount of all the listed and characteristic wastes that you generate more than 220 pounds per month, or have you accumulated more than 2200 pounds of these waste types on-site? See Tip 3
Yes
No
No
Go to Toxic Criteria Wastes

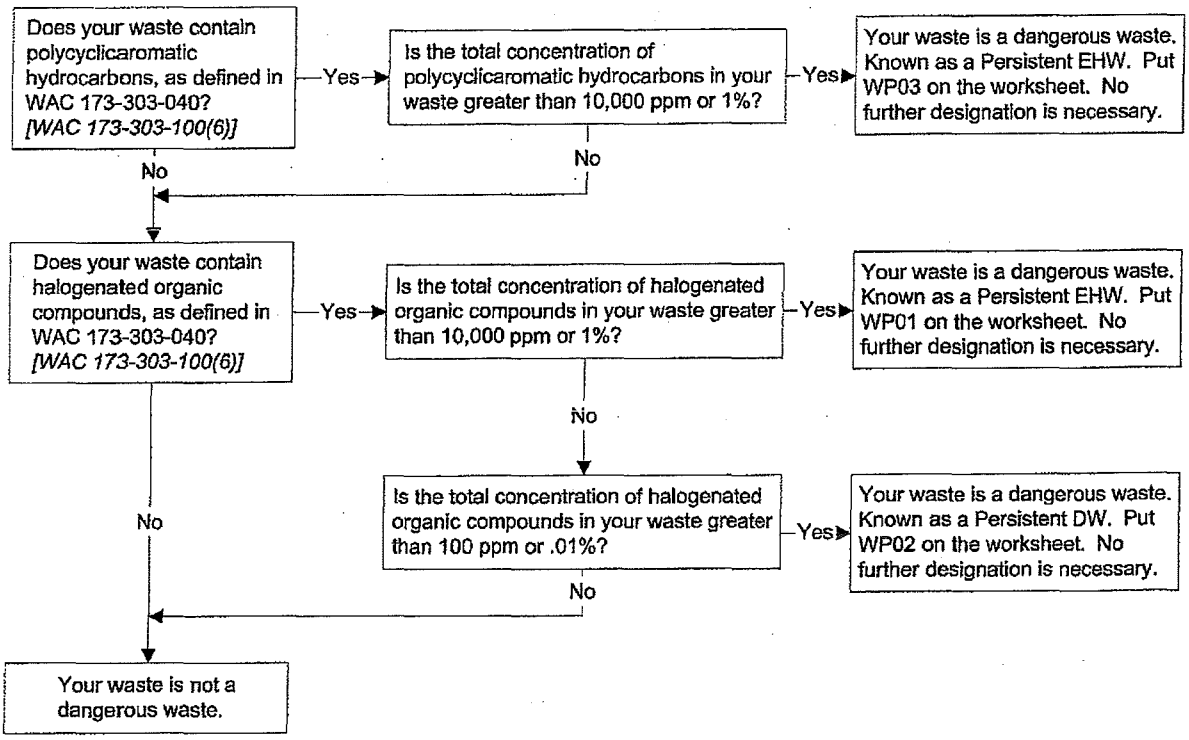
TOXIC CRITERIA WASTES

DANGEROUS WASTE DESIGNATION



PERSISTENT CRITERIA WASTES

DANGEROUS WASTE DESIGNATION



TIP 1
These definitions correspond to U.S. Department of Transportation (USDOT) regulations. If your waste is an unused product that has USDOT flammable, ignitable solid, oxidizer, or peroxide labels then it meets the definition of ignitable waste.

TIP 2
The definition of reactive waste and explosive waste corresponds to USDOT regulations. If your waste is an unused product that carries these warning labels then the waste meets the definition of dangerous waste.

TIP 3
If you are designating more than one waste you should designate them all to this point before you go further so you can use the total amounts to answer the question in this box.

For More Information

The Hazardous Waste and Toxics Reduction Program is responsible for the management and reduction of hazardous wastes and toxic substances in Washington State. We are available to answer your questions. Contact a regional office near you and ask for a Toxics Reduction Specialist for information on reducing or recycling hazardous waste. If you are uncertain about your responsibilities as a hazardous waste generator, ask for a Hazardous Waste Specialist.

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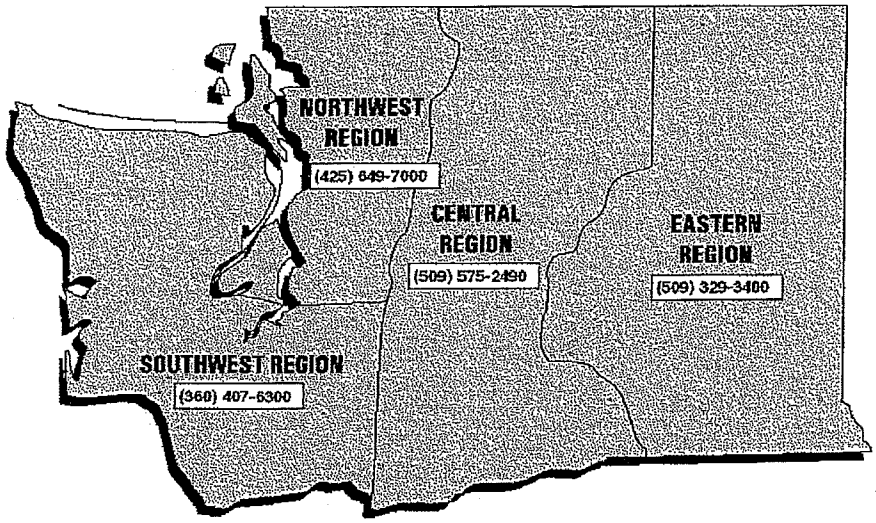

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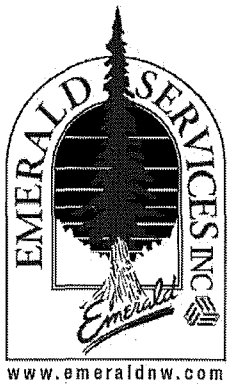
Part B

Section C

Waste Analysis Plan
Appendix IV
Forms

Generator Site Audit Checklist
Waste Profile Questionnaire
CC Checklist
LDR Notification Form

Generator Site Audit Checklist



1. Generator Name: _____

2. Generator Address: _____

3. Date of Audit: _____

4. Generator Industry Description _____

5. Generator Processes: _____

_____

6. Types of wastes generated: _____

_____

7. Does generator have waste streams with any of the following properties on-site?

biological?	□ yes □ no	pesticide/herbicide/insecticide?	□ yes □ no
infectious?	□ yes □ no	explosive/radioactive?	□ yes □ no
reactive?	□ yes □ no	corrosive?	□ yes □ no
sulfide?	□ yes □ no	cyanide?	□ yes □ no
PCB?	□ yes □ no	oxidizer?	□ yes □ no

8. Provide description of how generator manages categories identified in Question 7, if applicable:

_____

_____

9. Does customer generate universal waste? □ yes □ no

If universal waste, indicate profile number or type: _____

10. Does generator have MSDS(s) on-site for all products used during waste generation? □ yes □ no

11. Does generator knowledge of on-site processes and products used appear to be adequate for WPQ form completion and profiling of dangerous waste? □ yes □ no

NOTE: If the answer to question #11 is no, obtain representative samples and submit to laboratory for characterization analysis and/or confirmation testing as appropriate.

12. If site audit was not performed, provide explanation: _____

_____

A. Do generator's processes match description provided? □ yes □ no

B. Does generator routinely use products that cannot be accepted at Emerald? □ yes □ no

C. Are generator processes well-defined for the industry? □ yes □ no

If either A or C is "no," or B is "yes", this process is "at risk" - provide additional justification for lack of site audit according to Section 3.3.1.3 of the Tacoma facility Waste Analysis Plan.

_____

13. If samples were collected, include chain of custody number: _____

14. Indicate RCRA generator status: □CESQG □ MQG □ LQG If CESQG, obtain generator signature on statement below.

Other notes: _____

_____

Form Completed by: _____ Date: _____

Generator CESQG Certification (Washington State SQG):

According to Section 40 of the Code of Federal Regulations (CFR), subsection 261.5, and WAC 173-303-070(c)(8) a Conditionally Exempt Small Quantity Generator (Small Quantity Generator in WA State) is a generator who is conditionally exempt in a calendar month if they generate no more than 100 kilograms (220 pounds) of hazardous waste or 1 kilogram (2.2 pounds) of acute hazardous waste in a month. Additionally, a CESQG may not accumulate at any one time in excess of 1,000 kilograms (2,200 pounds) of hazardous waste or 2.2 pounds of acute hazardous waste without being subject to 40 CFR 262.44, 263 through 266, 268, and parts of 270 and 124 of this chapter, and the applicable notification requirements of section 3010 of RCRA. As generator, or generator's authorized representative, I hereby certify that the conditions for CESQG (SQG for WA State) status are being met for waste generation at this site.

_____ _____

Generator's Signature (or signature of generator's authorized representative) Date

WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. stacyblankform

A. GENERAL INFORMATION

GENERATOR EPA ID #/REGISTRATION #	*MAD999999999*	GENERATOR NAME:	*E Commerce Test Account 4*				
GENERATOR CODE (Assigned by Clean Harbors)	*ECOMT4*	CITY	*Norwell*	STATE/PROVINCE	*MA*	ZIP/POSTAL CODE	*02129*
ADDRESS	*42 Longwater Drive TEST BM*			PHONE:	(781) 849-1800 x 000		
CUSTOMER CODE (Assigned by Clean Harbors)	*ECOMT4*	CUSTOMER NAME:	*E Commerce Test Account 4*				
ADDRESS	*42 Longwater Drive TEST BM*	CITY	*Norwell*	STATE/PROVINCE	*MA*	ZIP/POSTAL CODE	*02129*

B. WASTE DESCRIPTION

WASTE DESCRIPTION:

PROCESS GENERATING WASTE:

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ?

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
- % FREE LIQUID
- % SETTLED SOLID
- % TOTAL SUSPENDED SOLID
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS

1 2 3

% BY VOLUME (Approx.)

TOP	*0.00*
MIDDLE	*0.00*
BOTTOM	*0.00*

ODOR
- NONE
- MILD
- STRONG

Describe:

BOILING POINT °F (°C)
- <= 95 (<=35)
- 95 - 100 (35-38)
- 101 - 129 (38-54)
- >= 130 (>54)

VISCOSITY (If liquid present)
- 1 - 100 (e.g. Water)
- 101 - 500 (e.g. Motor Oil)
- 501 - 10,000 (e.g. Molasses)
- > 10,000

COLOR

MELTING POINT °F (°C)
- < 140 (<60)
- 140-200 (60-93)
- > 200 (>93)

TOTAL ORGANIC CARBON
- <= 1%
- 1-9%
- >= 10%

FLASH POINT °F (°C)
- < 73 (<23)
- 73 - 100 (23-38)
- 101 -140 (38-60)
- 141 -200 (60-93)
- > 200 (>93)

pH
- <= 2
- 2.1 - 6.9
- 7 (Neutral)
- 7.1 - 12.4
- >= 12.5

SPECIFIC GRAVITY
- < 0.8 (e.g. Gasoline)
- 0.8-1.0 (e.g. Ethanol)
- 1.0 (e.g. Water)
- 1.0-1.2 (e.g. Antifreeze)
- > 1.2 (e.g. Methylene Chloride)

ASH
- < 0.1
- 0.1 - 1.0
- 1.1 - 5.0
- 5.1 - 20.0
- > 20
- Unknown

BTU/LB (MJ/kg)
- < 2,000 (<4.6)
- 2,000-5,000 (4.6-11.6)
- 5,000-10,000 (11.6-23.2)
- > 10,000 (>23.2)

Actual:

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN	--	MAX	UOM

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX., METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")?	YES	NO
If yes, describe, including dimensions:		
DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM?	YES	NO
DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING; ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL?	YES	NO
I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:		
The waste was never exposed to potentially infectious material.	YES	NO
Chemical disinfection or some other form of sterilization has been applied to the waste.	YES	NO
I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS.	YES	NO
I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED.	YES	NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE.

SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE.

E. CONSTITUENTS

Are these values based on testing or knowledge? Knowledge Testing

If constituent concentrations are based on analytical testing, analysis must be provided. Please attach document(s) using the link on the Submit tab.

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLICABLE
D004	ARSENIC	5.0				
D005	BARIUM	100.0				
D006	CADMIUM	1.0				
D007	CHROMIUM	5.0				
D008	LEAD	5.0				
D009	MERCURY	0.2				
D010	SELENIUM	1.0				
D011	SILVER	5.0				
	VOLATILE COMPOUNDS					
D018	BENZENE	0.5				
D019	CARBON TETRACHLORIDE	0.5				
D021	CHLOROBENZENE	100.0				
D022	CHLOROFORM	6.0				
D028	1,2-DICHLOROETHANE	0.5				
D029	1,1-DICHLOROETHYLENE	0.7				
D035	METHYL ETHYL KETONE	200.0				
D039	TETRACHLOROETHYLENE	0.7				
D040	TRICHLOROETHYLENE	0.5				
D043	VINYL CHLORIDE	0.2				
	SEMI-VOLATILE COMPOUNDS					
D023	o-CRESOL	200.0				
D024	m-CRESOL	200.0				
D025	p-CRESOL	200.0				
D026	CRESOL (TOTAL)	200.0				
D027	1,4-DICHLOROBENZENE	7.5				
D030	2,4-DINITROTOLUENE	0.13				
D032	HEXACHLOROBENZENE	0.13				
D033	HEXACHLOROBUTADIENE	0.5				
D034	HEXACHLOROETHANE	3.0				
D036	NITROBENZENE	2.0				
D037	PENTACHLOROPHENOL	100.0				
D038	PYRIDINE	5.0				
D041	2,4,5-TRICHLOROPHENOL	400.0				
D042	2,4,6-TRICHLOROPHENOL	2.0				
	PESTICIDES AND HERBICIDES					
D012	ENDRIN	0.02				
D013	LINDANE	0.4				
D014	METHOXYCHLOR	10.0				
D015	TOXAPHENE	0.5				
D016	2,4-D	10.0				
D017	2,4,5-TP (SILVEX)	1.0				
D020	CHLORDANE	0.03				
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008				

OTHER CONSTITUENTS	MAX	UOM	NOT APPLICABLE
BROMINE			
CHLORINE			
FLUORINE			
IODINE			
SULFUR			
POTASSIUM			
SODIUM			
AMMONIA			
CYANIDE AMENABLE			
CYANIDE REACTIVE			
CYANIDE TOTAL			
SULFIDE REACTIVE			

HOCs

NONE
< 1000 PPM
>= 1000 PPM

PCBs

NONE
< 50 PPM
>=50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

YES NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES NO (If yes, explain)

CHOOSE ALL THAT APPLY

DEA REGULATED SUBSTANCES	EXPLOSIVE	FUMING	OSHA REGULATED CARCINOGENS
POLYMERIZABLE	RADIOACTIVE	REACTIVE MATERIAL	NONE OF THE ABOVE

F. REGULATORY STATUS

YES NO USEPA HAZARDOUS WASTE?

YES NO DO ANY STATE WASTE CODES APPLY?

Texas Waste Code

YES NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?

YES NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?

LDR CATEGORY:
VARIANCE INFO:

YES NO IS THIS A UNIVERSAL WASTE?

YES NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR (CESQG)?

YES NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(II))?

YES NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?

YES NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

YES NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

YES NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 77 KPA (11.2 PSIA)?

YES NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?

YES NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?

Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)

YES NO IF THIS IS A US EPA HAZARDOUS WASTE, DOES THIS WASTE STREAM CONTAIN BENZENE?

YES NO Does the waste stream come from a facility with one of the SIC codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?

YES NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) >10 Mg/year?

What is the TAB quantity for your facility? Megagram/year (1 Mg = 2,200 lbs)

The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing

Describe the knowledge :

G. DOT/TDG INFORMATION

DOT/TDG PROPER SHIPPING NAME:

H. TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY OTHER

CONTAINERIZED

0-0 CONTAINERS/SHIPMENT

STORAGE CAPACITY:
CONTAINER TYPE:

PORTABLE TOTE TANK BOX|CARTON|CASE
CUBIC YARD BOX DRUM
OTHER:
DRUM SIZE:

BULK LIQUID

GALLONS/SHIPMENT: *0 Min -0 Max* GAL.

BULK SOLID

SHIPMENT UOM: TON YARD

TONS/YARDS/SHIPMENT: *0 Min - 0 Max*

I. SPECIAL REQUEST

COMMENTS OR REQUESTS:

GENERATOR'S CERTIFICATION

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge.I also certify that any samples submitted are representative of the actual waste.If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE NAME (PRINT) TITLE DATE

Addendum

B. WASTE DESCRIPTION

Waste Material Profile Certification

Waste is being transported in the form of a combination package. A combination package is defined for transportation purposes as consisting of one or more inner packages secured in a non-bulk outer packaging.

The following conditions have been met and the listed material(s) have been properly classified, packaged, marked and labeled, and are in proper condition for transportation.

Shipping Containers:

- When applicable, must be a UN approved & stamped container
- Acids or bases when present will be packaged in poly containers

YES NO

Packaging Material and Inner Containers:

- All containers must utilize an absorbent or compatible packaging material.
- All inner containers are sealed and packaged upright.
- All inner containers are chemically compatible with the waste material.
- Glass containers will not exceed one gallon.
- Metal and plastic containers will not exceed 5.3 gallons if liquid or 50 lbs if solid.

YES NO

G. DOT/TDG INFORMATION

EMERALD SERVICES INC – TACOMA FACILITY **Waste Profile Questionaire #:**

A. Generator Information

EPA ID _____ Generator Status _____

ıerator Name _____ Phone _____
ɔıe Address _____ City ST Zip _____ Fax _____
Contact/Title _____ Sulfide Producing Industry _____

B. Shipping Information

Proper Shipping Name _____
DOT ID _____ Hazard Class _____ Packing Group ____ ERG_____ RQ _____

C. Regulatory Information

Name of Material _____ Generating Process _____
Form Code _____ Source Code _____ Origin Code_____ System Code _____
EPA Codes _____ State Codes _____
Container Type_____Size_____Number of Units_____Frequency_____

D. Chemical / Metal / Constituent Composition

Constituent	PPM	% Volume	Constituent	PPM	% Volume

... Physical Characteristics

Physical State (Include Range) % Liquids _____ % Sludge/Solids _____ Bi-Layer Liquid __ **Y N**__ Color _____
Odor / Describe _____ Specific Gravity _____ BTUs / Lb _____ pH: ___≤2 ___>2 and<12.5 ___≥12.5 ___N/A
FlashPt: _____<100°F_____ 100° - <140°F _____≥140°F ____141°-200°F _____>200°F _____None

H. Comments

Generator's Certification * If the profile rolls to 2 pages generator name and address to populate here*****

I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine that no deliberate or willful omissions of composition properties exist and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all material described by this profile.

Generator's Authorized Signature: _____ **Date** _____

Name (Print)_____**Title**_____

TSDF's Certification

EMERALD SERVICES INC
1825 ALEXANDER AVE
TACOMA, WA 98421

As an authorized representative of Emerald Services, Inc. , I certify, by my sgnature below, that Emerald Services, Inc. has the necessary permits per WAC 173-303-290(3) and 40CFR 264.12(b) to accept and properly manage the waste stream identified above.

TSDF's Authorized Signature: _____**Date**_____

Reviewer Information Only: VOC Level 1____ <11.1psia ____≥11.1psia____NA At Risk Waste Stream? _____Y N_____
Process _____**Storage**_____**FB**_____**OB**_____**RY**_____**RR**_____**AF**_____Initials_____

CHECKLIST FOR STAGING OF INBOUND LOADS FOR LONGER THAN 24 HOURS PRIOR TO UNLOADING (CC Checklist)

Load Received On Date _____ Time _____

Transporter _____

Description of waste(s) _____

Number of Containers _____

Transporter Certification

I certify that I visually inspected each container and its cover and closure devices to check for visible cracks, holes, gaps and other open spaces into the interior of the container when the cover and closure devices are secured in the closed position.

Signed _____ Date _____

Emerald Certification (this certification must be done immediately upon receipt of the waste if the driver can not certify the container condition).

I certify that I visually inspected each container and its cover and closure devices to check for visible cracks, holes, gaps and other open spaces into the interior of the container when the cover and closure devices are secured in the closed position.

Signed _____ Date _____

Waste material must be off-loaded within 24 hours of initiation of facility operation, not to exceed 72 hours of receipt. The preferred locations for staging are as follows in order of preference:

1. Loading Dock
2. Load/Unload Area #1
3. Load/Unload Area #2

No more than two loads may be held under the conditions of this checklist at one time.

Next Operating Day (date and time of start-up):_____

Load Must Be Checked In By: (date and time): _____

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION FORM LDR-1 MANIFEST NO_____

THE HAZARDOUS WASTES IDENTIFIED ON THE HAZARDOUS WASTE MANIFEST IDENTIFIED ABOVE AND BEARING THE EPA HAZARDOUS WASTE CODES LISTED BELOW ARE RESTRICTED WASTES WHICH ARE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT UNDER THE LAND DISPOSAL RESTRICTIONS, 40 CFR PART 268 .7 (a)(2), AND RCRA SECTION 3004(D). IN ACCORDANCE WITH 40 CFR 268.7(a), THE EPA WASTE CODE, WASTE SUBCATEGORY, AND TREATABILITY GROUPS, AS APPLICABLE, ARE INCLUDED BELOW.

INSTRUCTIONS -- COMPLETE ALL SECTIONS. REFER TO PAGE 3 OF THIS FORM FOR KEY TERMS/DEFINITIONS.
Column 1 - Line Item: Enter the manifest line item number (e.g., 11a) that corresponds to the waste code(s).
Column 2 - Waste Codes/Subcategory: Check off all applicable waste codes. For D001 through D043, also check applicable subcategory; for F001 through F005, check applicable constituents.
Column 3 - Wastewater/Non-wastewater: Check off "WW" for wastewater and "Non-WW" for non-wastewaters.
Column 4 - LDR Handling Code: Circle the appropriate handling code, as follows:

1 = The waste is a characteristic hazardous waste D001, D002, D003, D004-D011, or D018-43 which is intended for treatment/disposal in a CWA system, CWA-equivalent system, or Class I SDWA system. Underlying Hazardous Constituents (UHC's) are NOT required to be identified.

1A = The waste is a characteristic hazardous waste D001 High TOC Ignitable Liquids Subcategory (i.e., greater than or equal to 10% TOC). Pursuant to 40 CFR 268.40, the waste must be treated using organic recovery (RORGS) or combustion (CMBST) technology. UHC's are NOT required to be identified.

2 = The waste is a characteristic hazardous waste D001 (other than High TOC Ignitable Liquids), D002, D003 Explosive, Water Reactive or Other Reactive subcategory, D004-D011, D012-17 non-wastewater, or D018-43 which is intended for treatment/disposal in a non-CWA system, non-CWA-equivalent system, or non-Class I SDWA system located in the United States. All UHC's which are reasonably expected to be present must be identified, except for D001 waste that is intended to be treated using organic recovery (RORGS) or combustion (CMBST) technologies. Identify UHC's by completing Sections I and IV of CHI Form LDR-1 Addendum and attach completed Addendum to this form.

3 = The waste is a characteristic (i.e., D-code) or listed (i.e., F-, K-, U-, or P-code) hazardous waste which is intended for export and treatment/disposal at a facility located outside the United States. LDR treatment standards do not apply to hazardous waste treated/disposed in a foreign country, and per USEPA guidance, the identification of UHC's (if applicable) is not required for hazardous waste that is intended to be exported. Note however that if the exported waste is subsequently returned for treatment/disposal in the United States, all applicable LDR regulations would apply and a revised LDR notification would be required.

4 = The waste meets the definition of hazardous debris pursuant to 40 CFR 268.2(h) and is intended for treatment/ disposal in compliance with the alternate debris treatment technologies of 40 CFR 268.45. In accordance with the requirements of 40 CFR 268.7(a)(2) : the contaminants subject to treatment (CSTT's) must be identified as part of this notification. Identify CSTT's by completing Section III and IV of the CHI Form LDR-1 Addendum and attach completed Addendum to this form. These constituents are being treated to comply with 40 CFR 268.45.

5 = The waste is a characteristic waste D003 Reactive Sulfide, Reactive Cyanide, or Unexploded Ordnance subcategory, a characteristic waste D012- 17 wastewater, or a listed (i.e., F-, K-, U-, or P-code) hazardous waste. UHC's are NOT required to be identified.

6 = The waste is a lab pack that is intended for incineration using the alternative lab pack treatment standard under 40 CFR 268.42(c). UHC's are NOT required to be identified; however, the generator must complete and attach the lab pack certification statement on CHI Form LDR-LP. Note that in accordance with 40 CFR Part 268 Appendix IV, lab packs which contain waste codes D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, and U151 are not eligible for alternative lab pack treatment standard.

*** **NOTE: IF THE WASTE IS A SOIL CONTAMINATED WITH A LISTED OR CHARACTERISTIC WASTE AND THE GENERATOR WANTS TO USE THE ALTERNATE TREATMENT STANDARD FOR SOILS, CONTACT CORPORATE COMPLIANCE FOR THE APPROPRIATE LDR NOTIFICATION FORM.**

SECTION I. CHARACTERISTIC WASTES D001 THROUGH D043

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	[ ] D001 Ignitables, except High TOC subcategory	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D001 High TOC Ignitable Liquids Subcategory (Greater than or equal to 10% TOC)	[ ] Non-WW only	1A 3 6
_____	[ ] D002 Corrosives	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D003		
	[ ] Reactive Sulfide, per 261.23 (a)(5)	[ ] WW [ ] Non-WW	1 3 4 5 6
	[ ] Reactive Cyanide, per 261.23(a)(5)	[ ] WW [ ] Non-WW	1 3 4 5 6
	[ ] Explosive, per 261.23(a)(6), (7) & (8)	[ ] WW [ ] Non-WW	1 2 3 4 6
	[ ] Water Reactive, per 261.23(a)(2), (3) & (4)	[ ] Non-WW only	1 2 3 4 6
	[ ] Other Reactive, per 261.23(a)(1)	[ ] WW [ ] Non-WW	1 2 3 4 6
	[ ] Unexploded Ordnance, Emergency Response	[ ] WW [ ] Non-WW	1 3 4 5 6
_____	[ ] D004 Arsenic	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D005 Barium	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D006		
	[ ] Cadmium	[ ] WW [ ] Non-WW	1 2 3 4 6
	[ ] Cadmium Containing Batteries	[ ] Non-WW only	2 3 6
_____	[ ] D007 Chromium	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D008		
	[ ] Lead	[ ] WW [ ] Non-WW	1 2 3 4 6
	[ ] Lead Acid Batteries	[ ] Non-WW only	2 3 6

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION FORM LDR-1

MANIFEST NO_____

SECTION I. CHARACTERISTIC WASTES D001-43 (CONTINUED)

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	[ ] D009		
	[ ] Low Mercury, less than 260 mg/kg Mercury	[ ] WW [ ] Non-WW	1 2 3 4
	[ ] High Mercury Organic Subcategory	[ ] Non-WW only	2 3 4
	[ ] High Mercury Inorganic Subcategory	[ ] Non-WW only	2 3 4
_____	[ ] D010 Selenium	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D011 Silver	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D012 Endrin	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D013 Lindane	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D014 Methoxychlor	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D015 Toxaphene	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D016 2,4-D	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D017 2,4,5-TP (Silvex)	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D018 Benzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D019 Carbon tetrachloride	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D020 Chlordane	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D021 Chlorobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D022 Chloroform	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D023 o-Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D024 m-Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D025 p-Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D026 Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D027 1,4-Dichlorobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D028 1,2-Dichloroethane	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D029 1,1-Dichloroethylene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D030 2,4-Dinitrotoluene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D031 Heptachlor (and its epoxide)	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D032 Hexachlorobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D033 Hexachlorobutadiene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D034 Hexachloroethane	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D035 Methyl ethyl ketone	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D036 Nitrobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D037 Pentachlorophenol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D038 Pyridine	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D039 Tetrachloroethylene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D040 Trichloroethylene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D041 2,4,5-Trichlorophenol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D042 2,4,6-Trichlorophenol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D043 Vinyl Chloride	[ ] WW [ ] Non-WW	1 2 3 4 6

SECTION II. SPENT SOLVENT WASTES F001 THROUGH F005

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	[ ] F001 [ ] F002 [ ] F003 [ ] F004 [ ] F005	[ ] WW [ ] Non-WW	3 4 5 6

_____ [ ] 1. ALL F001-F005
_____ [ ] 2. Acetone
_____ [ ] 3. Benzene
_____ [ ] 4. n-Butyl alcohol
_____ [ ] 5. Carbon disulfide
_____ [ ] 6. Carbon tetrachloride
_____ [ ] 7. Chlorobenzene
_____ [ ] 8. o-Cresol
_____ [ ] 9. m-Cresol (difficult to distinguish from p-cresol)
_____ [ ] 10. p-Cresol (difficult to distinguish from m-cresol)
_____ [ ] 11. Cresol - mixed isomers (sum of o-, m- and p-cresol)
_____ [ ] 12. Cyclohexanone
_____ [ ] 13. o-Dichlorobenzene
_____ [ ] 14. 2-Ethoxyethanol (F005 only)
_____ [ ] 15. Ethyl acetate
_____ [ ] 16. Ethyl benzene
_____ [ ] 17. Ethyl ether
_____ [ ] 18. Isobutyl alcohol
_____ [ ] 19. Methanol
_____ [ ] 20. Methylene chloride
_____ [ ] 21. Methyl ethyl ketone
_____ [ ] 22. Methyl isobutyl ketone
_____ [ ] 23. Nitrobenzene
_____ [ ] 24. 2-Nitropropane (F005 only)
_____ [ ] 25. Pyridine
_____ [ ] 26. Tetrachloroethylene
_____ [ ] 27. Toluene
_____ [ ] 28. 1,1,1-Trichloroethane
_____ [ ] 29. 1,1,2-Trichloroethane
_____ [ ] 30. Trichloroethylene
_____ [ ] 31. 1,1,2-Trichloro-1,2,2-trifluoroethane
_____ [ ] 32. Trichloromonofluoromethane
_____ [ ] 33. Xylene - mixed isomers (sum of o-, m-, and p-xylene)

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION FORM LDR-1

MANIFEST NO_____

SECTION III. CALIFORNIA LIST WASTES

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	Hazardous waste containing one or more of the following California List constituents:	[ ] WW [ ] Non-WW	1 2 3 4 6

[ ] ALL CALIFORNIA LIST CONSTITUENTS
[ ] Liquids with nickel greater than or equal to 134 mg/l
[ ] Liquids with thallium greater than or equal to 130 mg/l
[ ] Liquids with PCB's > or = 50 ppm
[ ] Waste containing HOC's > or = 1,000 mg/kg

SECTION IV. OTHER LISTED WASTES (F006-12, F019-F028, F037-38, F039, K-, U-, AND P-CODES)

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6

[ ] CHECK HERE IF ADDITIONAL LISTED WASTE CODES ARE PRESENT. COMPLETE AND ATTACH LDR-1 CONTINUATION SHEET.
[ ] CHECK HERE IF WASTE CODE F039 (MULTISOURCE LEACHATE) IS PRESENT. IDENTIFY F039 CONSTITUENTS BY COMPLETING SECTIONS II AND IV OF CHI FORM LDR-1 ADDENDUM AND ATTACH COMPLETED ADDENDUM TO THIS FORM.

SECTION V. CONTACT NAME AND DATE

Print Name: _____ Date:_____

KEY TERMS/DEFINITIONS

CLASS I SDWA SYSTEM means a Class I deep well facility regulated under the Safe Drinking Water Act (SDWA).

CWA SYSTEM means a centralized wastewater treatment facility discharging under a Clean Water Act (CWA) permit. For example, a CWA facility would treat organic or inorganic aqueous wastes and discharge the treated effluent to the local sewer system. Examples of CWA treatment systems owned and operated by Clean Harbors include the wastewater treatment operations at Baltimore (including the CES system), Bristol, Chicago, Cincinnati and Cleveland.

CWA-EQUIVALENT SYSTEM means a "zero discharge system" that engages in "CWA-equivalent" treatment before land disposal. Zero-discharge facilities treat hazardous wastes using "CWA-equivalent" treatment methods, but do not discharge the treatment effluent to a sewer or water body (e.g., spray irrigation land farm). "CWA-equivalent" treatment methods means biological treatment for organics, alkaline chlorination, or ferrous sulfate precipitation for cyanide, precipitation/ sedimentation for metals, reduction of hexavalent chromium, or other treatment technology that can be demonstrated to perform equally or greater than these technologies.

HIGH TOC IGNITABLE LIQUIDS SUBCATEGORY means an ignitable liquid hazardous waste (waste code D001) which contains greater than or equal to 10% total organic carbon (TOC). Pursuant to 40 CFR 268.40, such wastes must be treated using organic recovery (RORGS) or combustion (CMBST) technology. Examples of RORGS technologies include the CES unit at Clean Harbors of Baltimore. Examples of CMBST technologies include hazardous waste fuel blending and subsequent reuse at a cement kiln, or destruction at a RCRA incinerator.

WASTEWATERS are wastes that contain less than 1% by weight total organic carbon (TOC) and less than 1% by weight total suspended solids (TSS). [See 40 CFR 268.2(f)]

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
CONTINUATION SHEET FOR USE WITH
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-1

MANIFEST NO_____

SECTION IV. OTHER LISTED WASTES (F006-12, F019-F028, F037-38, F039, K-, U-, AND P-CODES)
CONTINUED FROM PAGE 3 OF FORM LDR-1

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6

Part B

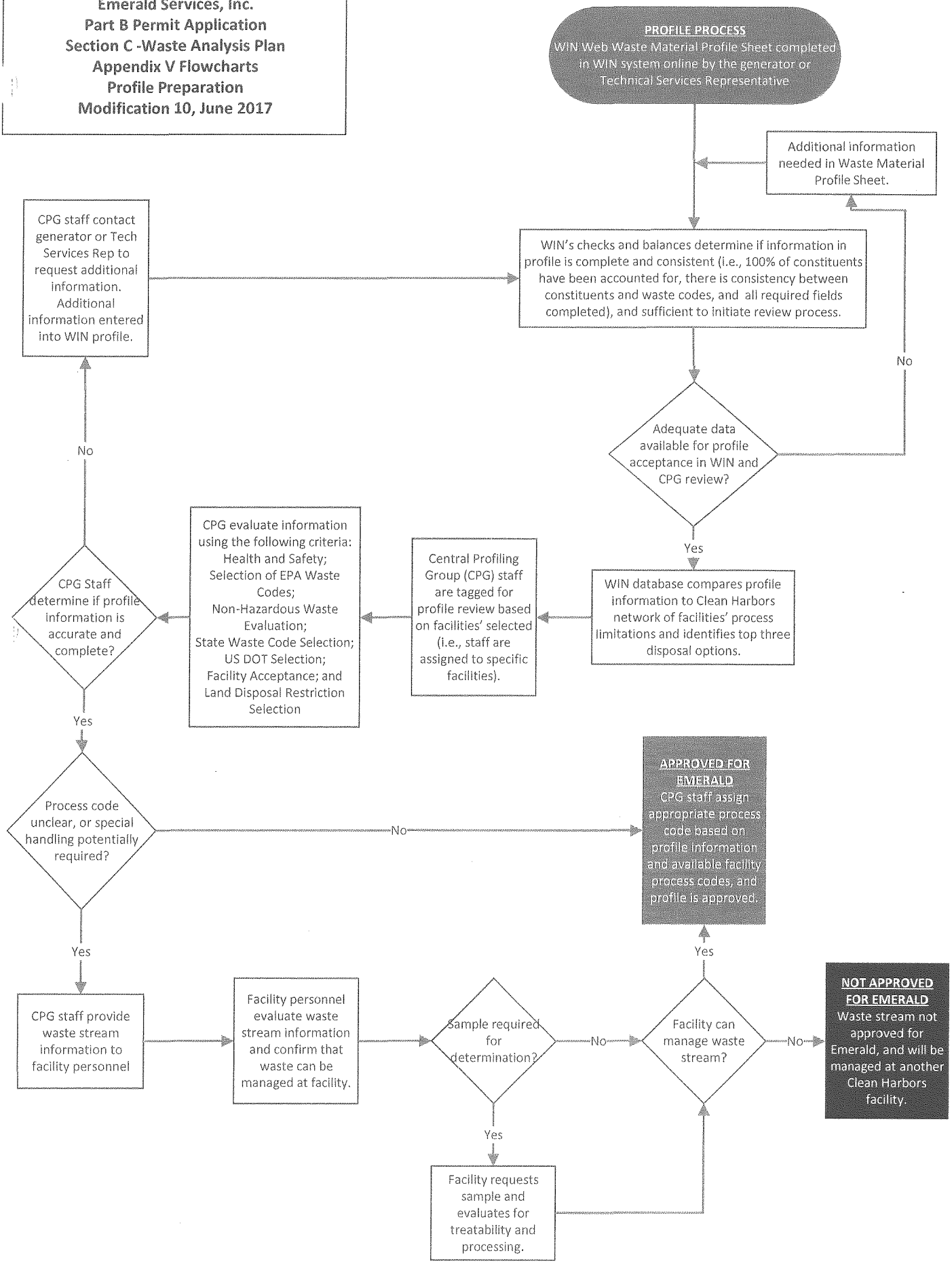
Section C

Waste Analysis Plan
Appendix V
Flowcharts

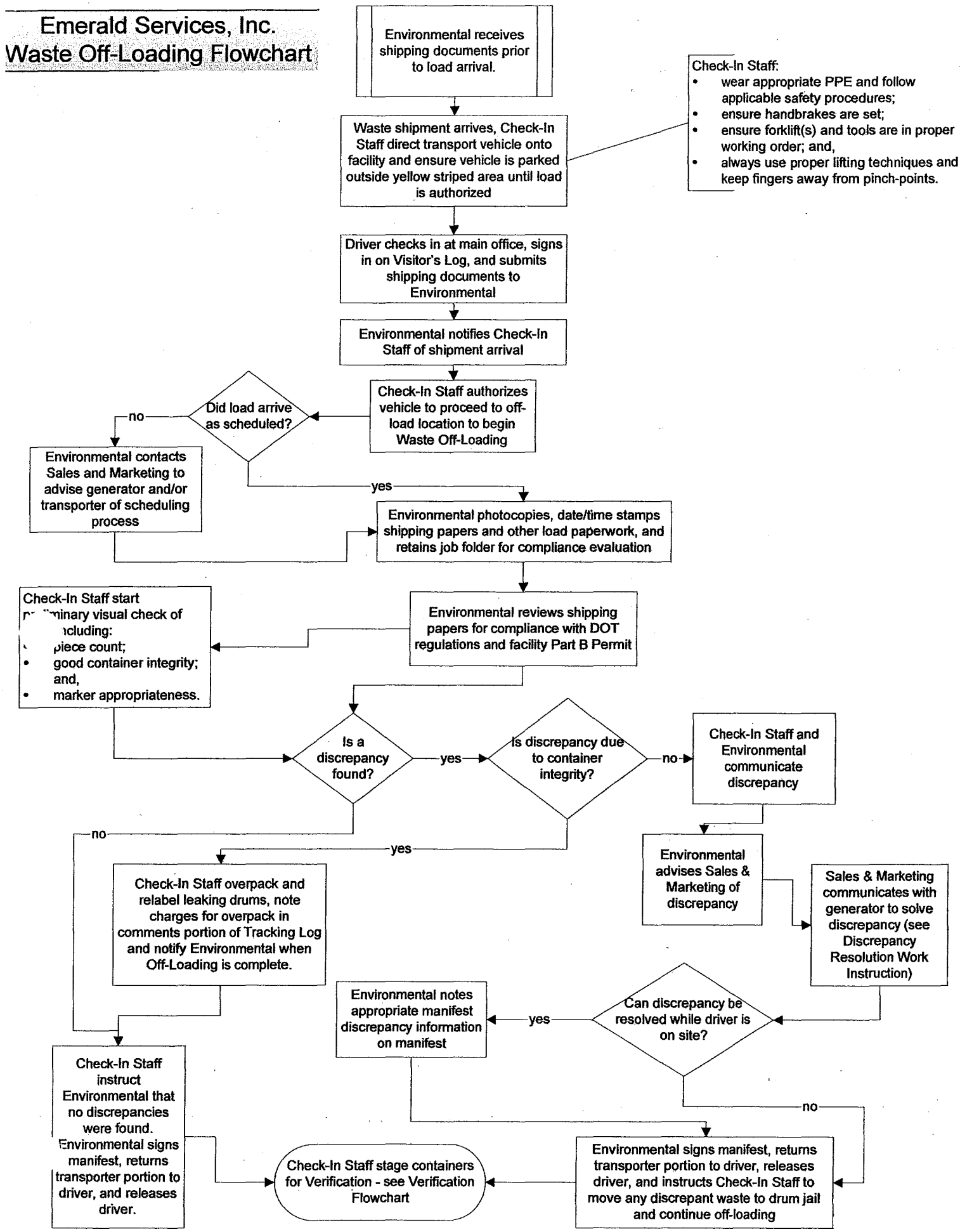
Profile Preparation
Waste Off-Loading
Verification
Discrepancy Resolution

These flowcharts depict sequential steps Emerald follows for these processes of the Waste Analysis Plan (WAP). Specific details on the processes are also in the WAP text.

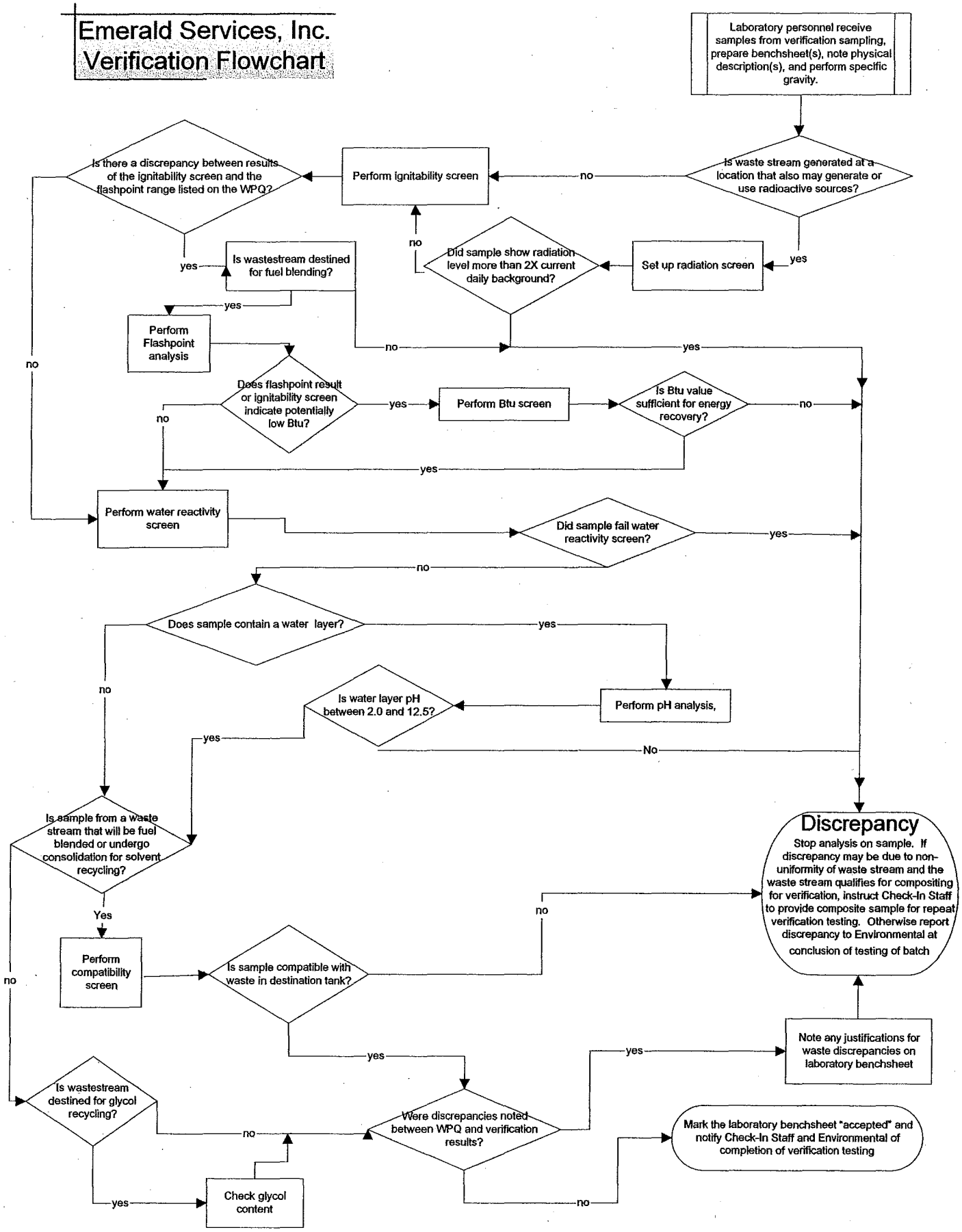
Emerald Services, Inc.
Part B Permit Application
Section C -Waste Analysis Plan
Appendix V Flowcharts
Profile Preparation
Modification 10, June 2017



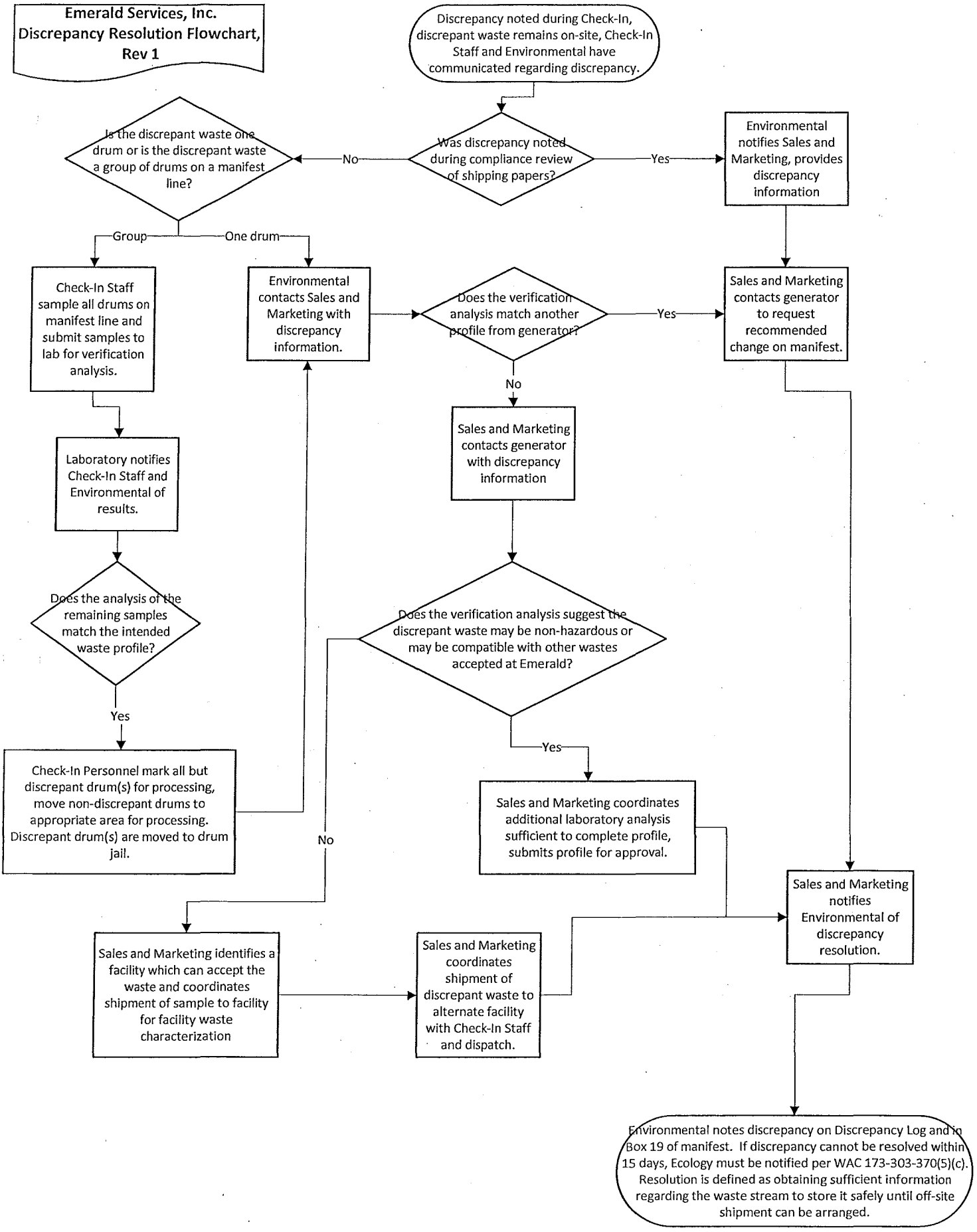
Emerald Services, Inc.
Waste Off-Loading Flowchart



Emerald Services, Inc.
Verification Flowchart



Emerald Services, Inc. Discrepancy Resolution Flowchart, Rev 1



Part B

Section C

Waste Analysis Plan
Appendix VI
Verification Sampling Frequency Exemptions

Emerald Services, Inc. – Tacoma Facility
Part B Permit Application Waste Analysis Plan
Appendix VI, November 2009
Verification Sampling Frequency Exemptions

Emerald has an extensive recycle return program for solvents and antifreeze used for specific purposes. In this program, solvents and antifreeze are essentially in a closed-loop of recycling:

- Emerald delivers a specific product to a customer,
- The customer uses the product for its intended use,
- The customer ships the same spent product (waste stream) back to Emerald,
- Emerald recycles the waste stream, then delivers the recycled waste stream (product) back to the customer.

In cases such as this, the variability of the waste stream delivered to Emerald is minimal. Due to Emerald's familiarity with each customer's waste stream through Emerald's waste confirmation process and the products use, Emerald believes that a reduced frequency of verification sampling should be allowed.

Emerald specifically requests reduced verification sampling frequency for Emerald "150 Solvent", or parts washer solvent, and Emerald Wash/Thinner.

Waste Emerald 150 solvent is assigned to multi-user waste profile questionnaire (WPQ) numbers 88881 and 88882 (one is for large and medium quantity generators, while the other is for conditionally exempt small quantity generators). This solvent is primarily mineral spirits (also commonly referred to as petroleum or solvent naphtha) with a flashpoint of greater than 140°F. The process generating this waste stream is well controlled as the solvent is removed directly from the parts washing unit by Emerald personnel prior to shipment to Emerald.

Emerald's requirements for reduced verification sampling of parts washer solvent are as follows:

- Consolidation will only be allowed if the solvent waste stream originated as 150 Solvent product from Emerald.
- Emerald will process the spent solvent for recycling and reuse for parts washing.

- Consolidation will not be allowed if the solvent waste stream will be fuel blended.
- Emerald will consolidate the solvent waste stream into containers no larger than 350 gallon capacity prior to verification sampling.
- A discrete representative sample will be taken from each tote (or other container within which waste streams have been consolidated, not to exceed 350 gallons) for verification purposes and undergo normal verification analyses.

Emerald Wash and Emerald Thinner are solvent blends of primarily acetone, toluene, and methyl ethyl ketone. Emerald Wash has a slightly higher percentage of acetone and methyl ethyl ketone than Emerald Thinner. Both blends are used as gun wash at body shops and are recycled and distributed by Emerald. The contaminant that is added to the solvent blend due to the operation is a mix of paints at a percentage of less than 15% of the waste stream, with occasional water contamination at less than 5%. The paints' constituents may vary slightly among brands. However, Emerald has accounted for the variability of the paint constituents in the ranges included on the profile.

Waste Emerald Wash/Thinner is received under the same multi-user Waste Profile Questionnaire (WPQ) number since the constituents are very similar and it is recycled in the same batch. The WPQ number used is either EW50 or EW52 (one is for large and medium quantity generators and the other for conditionally exempt small quantity generators.)

Emerald's requirements for reduced verification sampling of profiles EW50 and EW52 are as follows:

- Reduced verification sampling will only be allowed if the solvent originated as Emerald Wash or Emerald Thinner and is used as paint gun wash solvent;
- Emerald will process the spent solvent for recycling and reuse for gun washing;
- Consolidation will not be allowed if the solvent waste stream will be fuel blended;
- For every 10 containers of the same size of EW50 or EW52 received in a single day, Emerald will collect a composite sample that is representative of the 10 containers for verification sampling. If less than 10 containers of the same size are received in a single day, then a composite sample will be collected from the received containers for verification sampling.

- Acceptance limits for verification are outlined in Table 1 of Appendix I of this WAP, Solvent Recycling.

As a transporter, Emerald consolidates spent antifreeze at various Emerald locations prior to shipment to Emerald's Tacoma facility. While Emerald is not specifically requesting a verification exemption for spent antifreeze verification sampling, it should be noted that the containers being sampled are consolidated spent antifreeze from various generator locations, not containers that are being received directly from the generator site. Container sizes include drums, totes, and bulk tanks. The size of container used depends on the volume of antifreeze being collected in a specific geographic area.

Emerald may request additional exemptions to the verification sampling frequency in the event that additional waste streams demonstrate the same limited variability and have similarly controlled processes. However, should that occur, Emerald will request specific approval from Ecology prior to implementing any additional verification sampling frequency changes.

D. PROCESS INFORMATION

WAC 173-303-806(4)(a)(i), (viii), (ix), (x), (xi), (b), (c), (j), (k), (m), 340(3), 395(1), (4), (6), 630 670, 690, 691, 692.

A general description of the Emerald Services, Inc. Tacoma facility (Emerald) fuel blending and waste recycling operations is provided in Section B of this Part B Permit Application. That description identifies specific processes associated with those operations. The purpose of this section is to provide engineering details and management practices for processes and structures related to management of dangerous wastes at the facility.

1. Process Descriptions

WAC 173-303-806(4)(a)(i), (viii); 804(4)(c)(ii), (iii), (iv)

Specific processes are used for fuel blending, waste recycling, and used oil processing activities. The process used for fuel blending for energy recovery is the Fuel Blending System including equipment for shredding and mixing of wastes. The processes associated with waste recycling are the Thin Film Evaporator and High Boiler (Pot Still) Distillation Units, along with the Glycol Recycling Unit. The facility also consolidates compatible waste liquids with less than 5000 Btu into tank D-502 prior to shipment off-site for incineration as a form of destruction. The tanks listed in Table D-1, below, are utilized as dangerous waste storage tanks that may be associated with either storage activity (consolidation only), the Fuel Blending System, Thin Film Evaporator, or High Boiler Distillation Units (see also Figure D-23, Multi-Use Storage Tanks Piping and Instrument Diagram):

Table D-1
Dangerous Waste Storage Tanks
Storage for Incineration, Fuel Blending, High Boiler, and Thin Film Processes

Number		Location
Interim*	Final**	
C-100	D-310	Tank Area 1
C-102	D-312	Process Area 1
C-104	D-314	Tank Area 3
D-500	D-300	Tank Area 2
D-501	D-301	Tank Area 2
D-502	D-502	Tank Area 3
D-800	D-302	Process Area 2
C-801	D-311	Tank Area 1
C-802	D-315	Tank Area 1

* Tanks denoted with a "C" prefix are used for product storage until they are converted to dangerous waste tanks through a permit modification. These tanks will not be put into use as DW storage tanks until all applicable information has been provided, the tank has been incorporated into the LDAR program, and other permit requirements have been met.

** 300-Series numbers will be used to denote storage tanks that service multiple processes: Fuel Blending, High Boiler System, and Thin Film Evaporator System.

Tanks will have no more than 1 inch of wastes or no more waste than 0.3% of the tank total capacity, which ever is less, prior to commingling wastes from other processes in the tank. In cases where the waste is intended for tank storage only prior to shipment off-site for incineration, there is more residual waste in the tank, or if Emerald has reason to believe the wastes could be incompatible, procedures outlined in the WAP, Section C, apply, and compatibility testing would be conducted prior to commingling of wastes. In cases where Emerald is changing the unit's use from a dangerous waste unit to a used oil unit, partial clean closure will be conducted under WAC 173-303-610(3)(c) and WAC 173-303-610(6), and as outlined in the Closure Plan, and documented in the operating record.

Dangerous Waste Storage tanks utilized for the Glycol Recycling process are dedicated to that process. The following sections provide descriptions of the Fuel Blending System, High Boiler System, Thin Film Evaporator System, and Glycol Recycling System.

1.1. Fuel Blending System and Storage for Incineration

Dangerous waste fuel blending activities involve blending of waste paints, inks, oils, and other solvents with sufficient BTU for energy recovery. Emerald receives compatible liquids with less than 5000 Btu. While some of these waste streams have sufficient Btu for energy recovery (between 2500 and 5000 Btu), Emerald consolidates them for shipment offsite for incineration, as opposed to fuel blending. In these circumstances, the liquids can be consolidated into Tank D-502, which is part of the Fuel Blending System, prior to transfer to a railcar and off-site shipment for incineration.

Three processes make up the Fuel Blending System. These include the Dispersion System, the Bulk Liquid Blending System, and the Cascade Shredder. Each system is designed to process wastes with varying viscosity. A process flow diagram is provided in Figure D-1, Fuel Blending System. Major equipment items are listed in Table D-2.

1.1.1. The Dispersion System is designed to process solid and viscous materials that are suitable for use as a blended fuel. The Cascade Shredder is designed to shred solid material in preparation for the Dispersion System. The Bulk Liquid Blending System is designed to blend low viscosity wastes using a pump that is specifically designed for waste mixing. The Dispersion System is located on Production Pad 1; the Cascade Shredder and Bulk Liquid Blending equipment are located in Process Area 2. Engineering information for the fuel blending system and operational aspects of this equipment are presented below.

Table D-2
Fuel Blending System Equipment List

Number	Equipment Type	Location	Use
CH501	Chute	Process Area 2	Flow thru device
H-500	Hopper	Production Pad 1	Flow thru device
H-501	Hopper	Process Area 2	Flow thru device
F-501	Filter	Production Pad 1	Debris filtration
P-500	Blend pump	Process Area 2	Blending/forwarding pump
RT-500	Tank	Process Area 2	Recirculating tank
D-502	Tank	Tank Area 3	Mixing tank (Consolidation for either energy recovery or destructive incineration)
P-502	Centrifugal pump	Tank Area 3	Recirculating/forwarding pump
P-503	Centrifugal pump	Tank Area 3	Forwarding pump
MT-500	Tank	Production Pad 1	Mix tank
S-500	Cascade Shredder	Process Area 2	Waste shredding
P-501	Pump	Production Pad 1	Feed pump
P-504	Pump	Process Area 2	Forwarding pump
M-500	Mixer	Production Pad 1	Blending
	Vacuum Truck	Production Pad 4 or Load/Unload Area 1	Direct transfer to Railcar or Storage Tanks
CH-500	Chute	Process Area 2	Flow thru device
SG-500	Slide Gate	Process Area 2	Closes shredder
S-80	Skid Vac	Production Pad 1	Direct transfer to Railcar or Storage Tanks

1.1.2. Trucks are staged in the appropriate area (Load/Unload Area 1 for vacuum trucks and tank trucks, the loading dock for containerized loads, or Load/Unload Area 2 or Production Pad 4 for containerized loads if the Loading Dock is unavailable). For bulk loads, waste streams are checked in according to requirements of the Emerald Waste Analysis Plan (WAP) Subsection C.3.8, then a hose connection is

made to the suction side of a pump. The waste may be transferred to the recirculating tank (RT-500) and a pump then transfers the waste to either a dangerous waste storage tank (see Table D-1), or to a railcar. The liquid waste from vacuum truck, tank truck, or containers that is suitable as a fuel is filtered to remove any debris as required.

1.1.3. Containerized wastes destined for the Fuel Blending System are off-loaded, checked in according to subsection C.3.8, and moved onto the Dangerous Waste Container Area, or Production Pad 2, 3, or 4 for storage, then subsequently moved to another production pad if necessary for further processing. Only Production Pads 2, 3, or 4 will be used if the container must remain on the production pad for longer than 24 hours.

1.1.4. For containers suitable for processing in the Dispersion System, a container is lifted by forklift equipped with a drum rotator to the top of the Dispersion System structure. The contents are discharged into the hopper (H-500) and gravity fed into the mix tank (MT-500). Material with high solids content that needs to be shredded before entering the mix tank is placed into the hopper (H-501) then fed into the Cascade Shredder (S-500).

1.1.5. Shredded material is discharged into process containers for subsequent processing in the Dispersion System, or placed into process containers located on Production Pad 1 that are destined for storage. Containers destined for storage are assigned an internal profile number and drum number, then logged in to the Emerald waste tracking system. Proper marking and labeling is then applied to the process container and it is moved to a production pad or the Dangerous Waste Container Area, prior to shipment to a permitted third-party TSDF for final disposal. Only Production Pads 2, 3, or 4 are

used if the container will remain in the production pad for longer than 24 hours.

1.1.6. Emerald also receives waste streams in solid form with sufficient Btu for energy recovery that are not processed in the shredder and dispersion system. Some of these are placed directly into storage. Lightweight and non-compacted paints solids, rags, filters, and debris are compacted prior to storage to achieve higher efficiency in transportation. Emerald combines these waste streams into a single container by use of a compactor located on Production Pad 1. Once no additional removal will occur within 15 minutes, or the person performing the operation leaves the immediate vicinity of the container, or the destination container is full, containers are closed to maintain compliance with 40 CFR Part 264 Subpart CC and WAC 173-303-692.

1.1.7. Waste suitable for fuel blending is blended in Tank D-502 or mix tank MT-500. During blending, other dangerous wastes are transferred to the mix tank from DW storage tanks (see Tables D-1 and D-2) or containers or from a vacuum truck via hose connection. A suspending agent may be added to the mix tank to enhance suspension of solids and reduce the formation of "heels" in railcars. After blending, the waste is transferred to a dangerous waste storage tank (see Table D-1), or directly to a railcar. A vacuum truck staged on Production Pad 4, or skid vac located on Production Pad 1, may also be used to transfer material from the mix tank to storage tanks or a railcar. The vacuum truck and skid vac are not used as intermediate storage tanks, rather for direct transfer. All aspects of dangerous waste transfer operations are within dangerous waste permitted secondary containment.

1.1.8. Dangerous wastes brought to the facility in bulk via vacuum truck or tankers are processed through the Bulk Liquid Blending System, stored in a dangerous waste tank, or pumped directly to a railcar. The Bulk Liquid Blending System consists of a blend pump (P-501), then either a portable pump, the skid vac, or a vacuum truck, and associated ancillary equipment and piping. Waste is pumped from the truck through the filter and blended using the blend pump. After blending, the blended fuel is pumped directly to railcars or to dangerous waste storage tanks.

1.2. Waste Recycling

Recycling activities at Emerald include the use of three distillation units to recover clean, reusable solvent products or recycled antifreeze from various waste sources. The two systems currently used at Emerald for solvent recovery are the Thin Film Evaporator System and High Boiler System. The High Boiler System is also used to recover used oil products. The Glycol Recycling System uses vacuum distillation technology to recover glycols from various spent coolants. Engineering information and operational aspects of each of these systems is provided in the following subsections.

1.2.1. *Thin Film Evaporator System*

The Thin Film Evaporator System uses an oil-heated vertical, agitated thin film evaporator, designed to distill solvents with a boiling point range up to 300°F. A process flow diagram is provided in Figure D-2, Thin Film Evaporator System. Major equipment items associated with the Thin Film Evaporator System are listed in Table D-3. Associated utilities include a vacuum system (see Figure D-3 Vacuum System Utilities), flare, hot oil utility, and cooling water.

Table D-3
Thin Film Evaporator Equipment List

Number	Equipment Type	Location	Use
D-100	Tank	Tank Area 1	Feed tank
P-101	Diaphragm pump	Tank Area 1	Feed pump
T-100	Thin Film Evaporator	Process Area 1	Distillation
E-100	Condenser/Heat Exchanger	Process Area 1	Recycled product condenser
V-100	Vacuum receiver tank	Process Area 1	Recycled product receiving vessel
C-101	Tank	Process Area 2	Product Receiver Tank
C-103	Tank	Process Area 1	Product Receiver Tank
C-105	Tank	Process Area 1	Product Receiver Tank
P-100	Diaphragm pump	Process Area 1	Still bottom pump
D-101	Tank	Process Area 1	By-pass tank
P-103	Centrifugal pump	Process Area 1	Recycled product forwarding pump
VE-601	Vacuum vessel	Vacuum Utilities Room	Receiver for vapor from Thin Film Evaporator
VP-600	Vacuum Pump	Vacuum Utilities Room	Vacuum for Thin Film Evaporator
Flare	Flare		Emissions control
E-600	Heat Exchanger/Condenser	Vacuum Utilities Room	Cools liquid from liquid ring supply vessel
P-600	Liquid Ring Supply Vessel Pump	Vacuum Utilities Room	Pumps liquid through liquid ring supply vessel

1.2.1.1. Containerized wastes destined for thin film evaporation are checked in and verified according to WAP subsection 3.8, placed in a permitted storage area, then moved as needed to a production pad for further processing (see Table D-6). Only Production Pads 2, 3, or 4 will be used if the container must remain on the production pad for longer than 24 hours. While on the production pads, containers are opened and inspected for debris such as filters, sticks, and rags. Any debris is removed either manually, or by portable filters, and

placed into containers. Once no additional removal will occur within 15 minutes, or the person performing the operation leaves the immediate vicinity of the container, or the destination container is full, containers are closed to maintain compliance with 40 CFR Part 264 Subpart CC and WAC 173-303-692. The debris is reprocessed in the Fuel Blending System, or placed into process containers located in Production Pad 1. Once the process container is full, it is assigned a profile number, and drum number (waste tracking number) generated from Emerald's waste tracking system, then moved to the Dangerous Waste Container Area prior to shipment to a permitted TSD facility.

1.2.1.2. The recyclable waste is transferred to the feed tank (D-100) from containers or other dangerous waste storage tanks using a portable pump, or from a vacuum truck parked in Production Pad 4. If the waste was transported to the facility in bulk, and the waste is compatible with flammable liquids, the truck is staged in load/unload area #1 and the recyclable waste is pumped directly into the feed tank (D-100) via hose connection at the bottom of the tank. Material is pumped from feed tank D-100 to the Thin Film Evaporator (T-100) in a continuous manner, then recirculated from D-100 to T-100 throughout the recycling process. During the recycling process, and as discussed below, vapors are vented to the flare from V-100. Once the waste recycling operations are finished, still bottoms remain in tank D-100. At this point, the contents of tank D-100 are allowed to cool to ambient temperature. Non-contact heating oil is supplied to the unit from the hot oil utility.

1.2.1.3. Operators set the heat transfer fluid to the appropriate temperature, then monitor the operating

conditions of oil temperature, vapor temperature, inches of vacuum, distillate temperature, still bottom temperature, and water temperature going in and out of the condensers. Process temperatures differ based upon what type of solvent is being recycled. Each type of solvent has a specific set of parameters under which it is run to yield the highest return possible.

1.2.1.4. Solvent vapors are withdrawn by vacuum through a heat exchanger (E-100) where they are condensed on a continuous basis. The condenser ensures that vapors are recovered into the system, rather than being routed to the flare. The water that feeds the heat exchanger is routed through a cooling tower prior to recirculation. The distillate flows by gravity into the vacuum receiver tank (V-100). Clean, recycled distillate is pumped from the receiver tank to a recycled product tank or container.

1.2.1.5. Any vapors not condensed in the heat exchanger (E-100) are routed from the receiver tank (V-100) through the Vacuum System to a flare. A process flow diagram for the Vacuum System is provided in Figure D-3, Vacuum System Utilities. A description of the Vacuum System is provided at the end of this subsection.

1.2.1.6. Liquids that do not vaporize in the Thin Film Evaporator (referred to as still bottoms), flow to the bottom of the unit. Still bottoms are continuously pumped from the evaporator with the still bottom pump. The material being recycled is recirculated to the feed tank (D-100) either directly, or via the by-pass tank (D-101). Tank D-101 is a process component in the system and waste is not stored in the tank.

1.2.1.7. Process operations continue unchanged until the feed tank largely contains still bottoms and the quantity of recyclable material is depleted. Indicators that the process should be stopped include accumulation of the expected amount of solvent, a drop in the temperature of the cooling tower, an increase in other operating temperatures, or when the consistency of distillate changes.

1.2.1.8. The contents of the feed tank are then transferred by vacuum truck or pump to a railcar, or the Fuel Blending System. If the distilled product contains unacceptable amounts of water, the solvent laden process stream is transferred from the vacuum receiver (V-100) by pump to a process container located on a production pad (see section D.2.2.4.3). The container contents are subsequently reprocessed through the Thin Film Evaporator to recover the solvent, or blended as a fuel in the Fuel Blending System provided the fuel, as generated, can contribute substantial, usable energy to the receiving facility.

1.2.1.9. Other intermediate solvent laden process streams including draw water, still water, and tank washout water, would be transferred to a process container or dangerous waste storage tank via the vacuum receiver (V-100) and pump. If these process streams do not meet the heating value requirement, they are characterized per Section C and moved to the Dangerous Waste Storage Area prior to off-site shipment to a permitted TSDF. In the future, Emerald may consider adding these process streams to the Industrial Wastewater Discharge Permit. If Emerald were successful in including these process streams in the Industrial Wastewater Discharge Permit, they would be pre-treated and discharged to the POTW per

requirements of Emerald Industrial Wastewater Discharge Permit.

1.2.1.9.1. If these process streams designate as characteristic dangerous waste or have contacted a listed dangerous waste, Emerald must complete a permit modification to bring the tanks involved in the storage and/or treatment of such wastewaters into the dangerous waste permit. Under current operations no dangerous waste (including listed wastewater mixtures pursuant to WAC 173-303-081(3) and -082(3) are stored or treated in any of the wastewater management tanks (including W-920, W-921 and W-922).

1.2.1.10. The Vacuum System supports operation of the Thin Film Evaporator. A vacuum is drawn and maintained in the vacuum receiver tank (V-100), and vacuum vessel (VE-600) by a vacuum pump (VP-600), as well as in tank D-100 while the operation is underway. Air and non-condensable vapors pass through the system into the liquid ring supply vessel (V-602), through a knockout pot (V-601), then to a flare. Liquids in the liquid ring supply vessel are circulated to a heat exchanger (E-600) for cooling. Details of the Vacuum System are provided in Figure D-3. The Thin Film Evaporator is used for larger batch volumes of recyclable solvent and/or when a faster throughput of recycled solvent is required.

1.2.2.*High Boiler Distillation System*

1.2.2.1. High boiler distillation uses an oil-heated, electronic controlled pot still, designed to distill solvents and used oil "light ends" with boiling points up to 500°F. A process flow diagram is provided in Figure D-4, High

Boiler Distillation System. Major equipment items associated with High Boiler Distillation are listed in Table D-4. Associated utilities include hot oil utility and cooling water.

Table D-4
High Boiler Distillation Equipment List

Number	Equipment	Location	Use
T-800	Pot still	Process Area 2	Distillation
E-800	Heat exchanger	Process Area 2	Recycled product condenser
E-801	Heat exchanger	Process Area 2	Recycled product condenser
P-800	Centrifugal pump	Process Area 2	Recycled product forwarding pump
VP-800	Vacuum pump	Process Area 2	Vacuum for distillation unit
C-101	Tank	Process Area 2	Product Receiver Tank
C-103	Tank	Process Area 1	Product Receiver Tank
C-105	Tank	Process Area 1	Product Receiver Tank
C-803	Tank	Process Area 2	Intermediate recycled product tank
C-804	Tank	Process Area 2	Intermediate recycled product tank

1.2.2.2. The high boiler distillation unit can alternately be utilized for further distillation of used oil from the facility's used oil re-refining process.

1.2.2.3. Used oil light ends from the used oil re-refinery are accumulated in totes, then moved via forklift from the used oil re-refinery area to Production Pad 3. All movement of used oil containers outside of containment areas is conducted with two personnel present, with the container strapped to the forklift, with any nearby catch

basins be covered and stormwater vault gate valves closed.

1.2.2.4. Partial clean closure (see Closure Plan) of the unit is conducted on the unit each time its use is being changed from solvent recycling to used oil light ends recycling.

1.2.2.5. If the waste solvent is transported to the facility in bulk, via vacuum truck or tank truck, it is checked in according to WAP Subsection C.3.8, pumped directly into a feed tank via hose connection using portable pumps or the pump on the truck at Load/Unload Area 1. Containerized wastes are off-loaded from trucks, checked in according to WAP Subsection C.3.8, and moved to the Dangerous Waste Container Management Area, or Production Pads 2, 3, or 4 prior to processing.

1.2.2.6. Containers are opened and inspected for debris such as filters, sticks, or rags. Any debris is removed either manually or by portable filters and placed into process containers. Once no additional removal will occur within 15 minutes, or the person performing the operation leaves the immediate vicinity of the container, or the destination container is full, containers are closed to maintain compliance with 40 CFR Part 264 Subpart CC and WAC 173-303-692. The debris is reprocessed in the Fuel Blending System (see Figure D-1), or assigned a waste tracking number generated from the Emerald waste tracking system, and moved to the Dangerous Waste Container Area where it is prepared for shipment to a permitted TSD facility.

1.2.2.7. If the quantity of waste or used oil to be recycled is less than 440 gallons, the waste or used oil can be transferred directly to the distillation unit from each individual container. Containers to be pumped directly

into the Pot Still (T-800) are staged in Process Area 2 or Production Pad 3. A hose is connected to the fill line of the pot still and material is withdrawn by the distillation system vacuum and transferred into the unit.

1.2.2.8. If the distilled product contains unacceptable amounts of water, this solvent laden stream is transferred from the intermediate recycled product tank (C-804) to process containers in Process Area 2. In addition, other intermediate solvent laden process streams, including draw water, and tank washout water, are also placed into process containers in Process Area 2. The container contents are subsequently reprocessed through the High Boiler Distillation System to recover the solvent. Alternatively, the container may be moved to a production pad and the contents may be blended as a fuel in the Fuel Blending System provided the fuel, as generated, can contribute substantial usable energy to the receiving facility. Process containers are labeled according to their assigned waste profile number while they are accumulating waste (see section 2.2.4.3). Any process container that is moved requires a waste tracking number (see section 2.2.4.3). Containers that require storage for longer than 24 hours are moved to Production Pads 2, 3, or 4, or the Dangerous Waste Container Area.

1.2.2.9. The distillation unit (T-800) is filled on a batch basis from a DW storage tank (see Table D-1) or containers. Non-contact heating oil is supplied to the unit from the hot oil utility system. The temperature of the heat transfer fluid varies depending on the type of waste or used oil being recycled. A vacuum is applied to the unit using a vacuum pump (VP-800), and vapors are withdrawn. The vapors are condensed in a series of two in-line heat exchangers (E-800 and E-801) with non-

contact cooling water. The condensed distillate passes through two intermediate tanks (C-803 and C-804), then to a recycled product tank, product containers, or to waste containers if the product does not meet intended specifications.

1.2.2.10. Still operators monitor the operating conditions of the Pot Still unit every 30 minutes during operation. Operating conditions monitored include oil temperature, vapor temperature, inches of vacuum, distillate temperature, still bottom temperature, and water temperature in and out of the heat exchangers. Increased temperatures or thickening of contents may cause the distillation process to be stopped short of completion. If this occurs, the ratio of recycled product to still bottoms is decreased. Still operators also track how much waste or used oil is transferred into the batch and how much recycled product is recovered.

1.2.2.11. Still bottoms from solvent recycling that accumulate at the bottom of the distillation unit (T-800) are periodically removed through a drain valve to either process containers, or a vacuum truck. Process containers with still bottoms remain in Process Area 2 until cooled (less than 24 hours). The process containers or vacuum truck are designated per Section C and assigned a profile number and a tracking number (drum number) from Emerald's waste tracking system. The contents of either the process container or vacuum truck are subsequently transferred to a railcar, to the Fuel Blending System, or shipped to a permitted TSD facility. The High Boiler Distillation System is used for smaller volume batches of recyclables (300 to 400 gallons).

1.2.2.12. When the high boiler distillation system is used for used oil processing, product is distilled in used oil fractions. The light fraction is drawn off to a receiving tank, while the heavier fraction is drawn off through the drain valve to containers or to a used oil re-refining facility product tank. Depending on market demand, each fraction has the potential to be a product. Fractions that have no market value are properly designated, then managed in the same manner as the still bottoms discussed in 1.2.2.11, above.

1.2.3.*Glycol Recycling System*

Table D-5
Glycol System Equipment List
(all equipment located in Glycol Process Area)

Section	Number	Equipment	Description
Feed Tank and Filtration	D-209	Tank	Glycol Spent Antifreeze
	D-210	Tank	Glycol Spent Antifreeze
	P-210	Pump	Waste glycol feed pump
	D-211	Tank	Glycol Spent Antifreeze
	D-212	Tank	Filtered feed tank
Vacuum Distillation	T-2	Evaporator	Vaporizes Spent Glycol
	V-3	Conditioning Carbon	Adjusts pH of emissions from Glycol Recycling System
	V-4	VOC Carbon	Removes VOCs from emissions prior to release to atmosphere
	E-1	Heat exchanger	Evaporator feed preheater
	T-1	Evaporator	Vaporizes spent glycol
	P-214	Pump	Evaporator recirculation pump
	E-3	Heat exchanger	Evaporator tower reboiler
	T-3	Distillation tower	Separates recycled product and water
	P-215	Pump	Distillation tower recirculation pump
	E-2	Heat exchanger	Evaporator tower reboiler
	P-217	Pump	Glycol product pump
	E-5	Heat exchanger	Product cooler
	E-4	Heat exchanger	Distillation tower reboiler
	E-6	Distillation tower	Outlet condenser
	V-1	Vacuum receiver	Vacuum receiver vessel
	P-219	Pump	V-1 level control
	P-216	Pump	Evaporator recirculating pump
	C-1	Vacuum pump	Vacuum pump for distillation
	CT-1	Cooling tower	Cools separated water
	P-222	Pump	Recirculation pump
	P-218	Pump	Waste glycol pump

1.2.3.1. Containerized used antifreeze and glycol-based coolants are off-loaded from trucks, checked in according to subsection C.3.8, and moved to the Dangerous Waste Container Area for storage. The recyclable liquid is transferred using portable pumps from each individual container on the Dangerous Waste Container Area to the Glycol Spent Antifreeze Tank, D-210 or D-209. (Tank D-209 will not be put into use until approved through a permit modification.) Bulk rail deliveries of antifreeze and glycol-based coolants are off-loaded in Rail Spots 1 and 2 into tanker trucks spotted in Load/Off-Load Area 1. All bulk liquids in tanker trucks are transferred via vacuum truck or portable pump to Tank D-210 or D-209. The trucks are staged over the containment pan located next to the Dangerous Waste Container Storage Area. The dimensions of the containment pan are 9'4" wide by 15' long, and 4" high, with a containment volume of approximately 349 gallons. Dedicated flexible hose is used to connect the truck to hard-piping located along the north side of the Dangerous Waste Container Storage Area. Dedicated flexible hose is also used between the hard-piping and the destination tank. Spent antifreeze transfer is monitored by two qualified facility personnel at all times. Emerald also ensures the following occurs:

- Any spilled antifreeze is removed from the containment pan as soon as possible and managed as a dangerous waste;
- Any stormwater that has accumulated in the containment pan is removed prior to using the pan for containment during off-loading and treated as contact stormwater per requirements of Emerald Industrial Wastewater Discharge Permit with the City of Tacoma;

- The containment pan is inspected daily according to requirements of the Inspection Plan.

1.2.3.2. Residual oil physically separates from the antifreeze in Tanks D-210 or D-209 and is later managed as used oil under 40 CFR Part 279 and WAC 173-303-515. As shown in Figure D-5, Glycol Recycling System Flow Diagram, as well as Figures D-17a and D-17b, Glycol Recycling System Piping and Instrument Diagram, the spent antifreeze layer of the Glycol Spent Antifreeze Tank (D-210 or D-209) is pumped through a filter into the Glycol Spent Antifreeze Tank (D-211). The contents of Tank D-211 are filtered as they are transferred to D-212. Contents of Filtered Feed Tank D-212 are pumped through Evaporators (T-1 and T-2), which are externally heated. Bottoms from the evaporator are pumped to process containers located in the Dangerous Waste Container Area. Process containers are assigned a profile number and drum number (tracking number) from Emerald's waste tracking system. Contents of these process containers are ultimately pumped to a railcar as fuel for off-site shipment to a permitted TSDF.

1.2.3.3. The glycol and water are removed from the evaporator as a vapor, and then pass to the vacuum distillation tower (T-3). Liquids are circulated through the Distillation Tower Reboiler (E-4) to make the required product concentration. The water vapor removed from the mixture is withdrawn from the top of the distillation tower by the Vacuum Pump (C-1) and condensed and cooled in an in-line condenser (E-6). The condensate water is collected in V-1, then removed and treated on-site in accordance with Emerald's Industrial Wastewater Discharge Permit with the City of Tacoma POTW. The desired concentrated glycol product is

pumped from the bottom of the distillation tower to a Glycol Product Storage Tank or into containers.

1.3. Summary of Waste Generation

1.3.1. Specific types of dangerous waste generated during fuel blending,, waste, and used oil recycling operations include still bottoms, filter debris, process residues, floor sweepings and activated carbon. Wastewater is also generated on-site from rainfall entering containment areas, operator hand washing, rinsate from equipment cleaning, and from glycol recycling operations. Such wastewater contains less than 1% TOC and does not designate as dangerous waste. The wastewater is transferred via portable pumps into the Wastewater Accumulation Tanks (W-920, W-921 or W-922). The following describes how these wastes are managed:

1.3.1.1. Waste still bottoms and unmarketable used oil fractions are pumped into railroad tank cars, transferred to the Fuel Blending System, or to DW storage tanks provided fuel blend requirements are met. If the waste does not meet fuel blend requirements, it is prepared for shipment to a separate off-site, permitted TSDF.

1.3.1.2. Filter debris, process residues, and floor sweepings are placed into process containers on a production pads, assigned a profile and tracking (drum) number from Emerald's waste tracking system, and moved to the Dangerous Waste Container Area to be prepared for shipment to a permitted TSD facility.

1.3.1.3. Activated carbon is used to remove contaminants from wastewater. As the activated carbon becomes saturated or spent, it loses its effectiveness for contaminant removal. The spent carbon is placed in process containers in Load/Unload Area 1, assigned a

profile number and tracking (drum) number from Emerald's waste tracking system, and moved to the Dangerous Waste Container Area and prepared for shipment to a permitted TSD facility or carbon regeneration facility.

1.3.1.4. Wastewater generated on-site is treated by carbon adsorption in accordance with industrial wastewater pretreatment requirements, or shipped to an off-site facility permitted to handle the wastewater. Emerald discharges pretreated wastewater to the Tacoma POTW under the terms of its Industrial Wastewater Discharge Permit.

1.3.2. Glycol recycling wastes include emulsified oils skimmed from tanks, spent filter socks, still bottoms from the distillation units, and water removed from received glycol waste. Emulsified oil skimmed from tanks is placed in containers and prepared for shipment to an off-site permitted facility. Filter socks used for emulsified oil removal deteriorate or otherwise become non-usable. Any spent filter socks that cannot be cleaned and reused are placed into containers, moved to the Dangerous Waste Container Area and prepared for shipment to an off-site permitted TSD facility. Still bottoms have sufficient recoverable fuel for a burner, and are transferred to containers, then pumped to the railcar for off-site shipment to a permitted TSD facility. Distillate removed from glycol waste is managed according to the facility's Industrial Wastewater Discharge Permit.

2. Description of Containers

WAC 173-303-630

2.1. Introduction

2.1.1. This section provides information on the proper use and management of containers holding dangerous waste. The information includes a description of the containers, container management practices, container labeling, the design for secondary containment, and a discussion on prevention of reaction of wastes.

2.1.2. All containerized dangerous wastes shipped to and used at the Emerald facility are transported in containers which meet the specifications as required by the U.S. Department of Transportation (DOT) in 49 CFR 172.101 and Parts 173 through 178 appropriate for the hazard class of the waste. The majority of containers used for storage of wastes are 16-, 30-, and 55-gallon steel drums, and 85-gallon plastic and steel over pack drums. Other outer packaging DOT specification containers received at Emerald include jerricans, boxes, barrels, and intermediate bulk containers (referred to herein as "totes") with capacities to a maximum of 793 gallons. The materials of construction as specified by DOT include steel, aluminum, plywood, natural wood, fiberboard, or plastic. Inner packaging for such containers includes glass, earthenware, plastic or metal.

2.1.3. The types of dangerous waste handled at the Emerald facility are:

- Solvents;
- Waste petroleum products;
- Other organic materials;
- Paints and paint related materials;

- Ink formulations; and,
- DOT hazard class wastes 3, 4.1, 6.1(packing groups II and III only), 8 (corrosive as subsidiary hazard class when DOT class 3 is the primary hazard), and 9.

2.1.4. These wastes are contained in DOT specification containers with a lining that is compatible with the contents. The containers used to store dangerous waste may be new, reconditioned, or used, provided they meet DOT specifications. As described in Section D.3, Emerald is prepared to respond to any unexpected situation where a waste arrives at the facility in a container that is not compatible with the contents.

2.2. Container Management Practices

WAC 173-303-630(2), (4), (5) and (8), 340(3)

This section describes the procedures Emerald follows to ensure safe management of all containers holding dangerous waste, as well as equipment and structures used for the proper management of those containers.

2.2.1. **Procedures, Equipment and Structures**

2.2.1.1. Drivers of trucks, flat beds, and semi-tractor trailers carrying shipments of containerized dangerous wastes will position their vehicle at the loading dock in preparation for load inspection, approval and off-loading. In cases where there is no available space on the loading dock, drivers may also be directed to position their vehicle on Production Pad 4, (for smaller vehicles), or at Load/Unload Area 2.

2.2.1.2. All shipments of dangerous waste in containers arriving at the Emerald facility are sampled and

inspected by Emerald personnel. As described in Section C, Waste Characterization, each container is inspected for the following:

- Verify the manifest number and the container count;
- Verify that the container has a marker identifying the waste stream;
- Verify that the marker is completely filled out with all applicable information (any missing information is entered on the marker from manifest information);
- Verify the container has the proper Department of Transportation (DOT) label identifying the major risks per WAC 173-303-630(3), if applicable;
- Verify the container is in good condition. Look for holes in the drum, excessive dents, waste on the drum, excessive rust, or leaks. Bungs and rings must be tight in accordance with WAC 173-303-692(a) and 40 CFR 264.1086(c)(4);
- Record all problems relating to container condition, markers, or labels;
- Affix additional labels and/or markers, or enter any missing marker information as appropriate,
- Notify supervisor of any errors in container count, and,
- Immediately over-pack any leaking containers.

2.2.1.3. Procedures for collection and analysis of samples are described in Section C, Waste Analysis Plan.

2.2.1.4. Inspection, sampling, and analysis of inbound containers is completed within 24 hours. This period may be extended to 72 hours (24 operating hours) provided the following conditions are met:

- The transporter provides signed documentation that a CC inspection was completed for the shipment;
- Emerald provides a signed manifest to the driver while the driver is still present at the facility;
- The timeline for check-in may only be extended if the day following shipment arrival is a day on which the facility is not operating;

- Trucks are staged at the Loading Dock during the time period between load arrival and check-in (Load/Unload Area #1 may also be used if Loading Dock is unavailable. Load/Unload Area #2 may be used if both the Loading Dock and Load/Unload Area #1 are unavailable); and,
- No more than two loads are managed under this criteria at one time.

2.2.1.5. Containers are moved from the vehicle to the tailgate using a drum dolly, pallet jacks or via forklift. Containers are unloaded from the vehicle using forklifts that can be equipped with drum grabber attachments. All compatible containers are placed on wooden pallets to facilitate movement. The palletized containers are then carried by forklift to Production Pad 2 or 4 to await check-in and verification according to requirements of the WAP. Production Pads may not be used for check-in if storage is being conducted. Once check-in and verification is completed, Emerald will mark containers as "OK to Process" (waste streams with adequate Btu for fuel blending, or are suitable for recycling), "OK for Storage" (waste streams which will be managed as storage only – either as bulk or container), or "Drum Jail" (for waste streams which fail verification). Containers will be moved to a storage location if appropriate. See Figure D-6 for the location of "Drum Jail."

2.2.1.6. Any waste residue found on the top, sides, or bottom of a container is removed and placed into a DOT specification container that is compatible with the waste. If a situation occurs where, upon arrival at Emerald, the waste is not compatible with its container or liner, the waste is removed and transferred to a DOT specification container (or tank) which is compatible with the waste.

In order to respond to unanticipated situations, Emerald typically stores various types of empty containers onsite. These include 30- and 55-gallon DOT steel drums, and 85-gallon DOT steel and plastic over pack drums. If a container is leaking or is damaged, it is managed as follows:

- The container is placed in a DOT specification over pack container which is appropriately sized for the intended use and compatible with the waste, or
- The contents are removed and transferred into another DOT specification container or tank that is compatible with the waste.

2.2.2. **On-site Movement of Containers**

2.2.2.1. Various types of equipment are used on-site to facilitate the safe movement of containers. Equipment such as forklifts, pallet jacks, hydraulic drum tippers, pallets, dollies and hoists are all used throughout the facility. Only equipment specifically designed for the safe movement of containers is used.

2.2.2.2. Movement of containers is accomplished in a safe manner so as not to cause rupture or leakage of the contents. Prior to container movement, Emerald visually inspects the containers to ensure that they can be safely moved without risk of spills or leaks. Before and during movement, dangerous waste containers are completely closed, sealed, and secured. If a container is damaged, corroded, or otherwise structurally inadequate, the waste is transferred to an appropriate DOT specification over pack container prior to moving.

All dangerous waste container load/unload operations and on-site movement to and from load/unload, processing, storage

and staging areas are conducted within approved dangerous waste secondary containment with the exception of used oil being moved from the used oil re-refining facility to the Part B facility. Used oil containers are transported over an uncontained portion of the facility when the following conditions are met: two personnel are available to attend the movement of the used oil light ends; the used oil light ends containers are strapped to the forklift; nearby catch basins are covered; and stormwater gate valves are closed.

2.2.3. Container Staging and Processing

2.2.3.1. Containers of dangerous waste are primarily stored in the Dangerous Waste Container Area until such time that they are to be transferred to various processing areas at the facility. Containers of dangerous waste may also be stored in Production Pads 2, 3, or 4 provided their containment and stacking pattern limitations are not exceeded, check-in is not being conducted in that area, and requirements to separate incompatible wastes (drum jail) are met. Containers of used oil may be stored in Production Pad 3 provided containment and stacking pattern limitations are not exceeded.

2.2.3.2. When the containers are transferred, they are moved to authorized areas in close proximity to the appropriate fuel blending, or recycling processes which are located at Production Pads 1, 2, 3, or 4. Only Production Pads 2, 3, or 4 are used if the container must remain in the production pad for longer than 24 hours. Only Production Pad 3 will be used for used oil container management for transferring used oil to the High Boiler Distillation System. Each of these pads or areas has concrete secondary containment and is designed in accordance with local building codes and WAC 173-303-

630. Additionally, for areas under the low canopy over Production Pads 2, 3, and 4, a hydraulically designed automatic sprinkler system was installed per NFPA 13-1996.

2.2.3.3. Production Pads 1, 2, 3, and 4 are areas where dangerous wastes will be transferred between the container and process units, tank systems, the Cascade Shredder, tankers, or vacuum trucks. Only Production Pad 3 is used for transfer of used oil between the container and the SIVA High Boiler Distillation Unit using a portable pump. All production pads will be used to process dangerous waste stored in containers by using a vacuum truck, skid vac, or portable pump to transfer the material to the fuel blending and recycling processes. When a vacuum truck is used, it is staged on either Production Pad 4 or Load/Unload Area No. 1. The skid vac would be staged on the aisle way adjacent to Production Pad 1. In addition, production pads will be used to support the distillation activities by providing an area to transfer dangerous waste material or used oil (from containers) into tanks or the distillation units. Production Pad 3 and Process Area 2 will be used to stage containers to feed the High Boiler Distillation System. These pads will also provide an area to fill containers with recycled product from the distillation units and storage tanks.

2.2.3.4. Compactor unit on Production Pad 1

2.2.3.4.1. Containers with lightweight and non-compacted paint solids, rags, filters, and debris can be managed more efficiently if the contents are consolidated and compacted prior to off-site shipment. For these types of waste streams, Emerald utilizes the compactor located on Production Pad 1 to ensure that each container's full

capacity is utilized for off-site shipment. The waste to be compacted must have no free liquids.

2.2.3.4.2. Containers with wastes described 2.2.3.4.1 having compactable solids and no free liquids are staged next to the compactor on Production Pad 1.

2.2.3.4.2.1. One drum is situated within the compactor housing. A "pancake" fitting with diameter less than the diameter of the drum is installed, and the operator activates the compactor to hydraulically compress the container's contents. The operator then releases the pressure on the container's contents, and transfers additional compactable solids from other containers to the drum situated within the compactor housing. The hydraulic controls are reactivated and the process repeated until the drum situated within the compactor housing is considered full after compaction.

2.2.3.4.2.2. Containers being staged are kept closed until waste is transferred to the compactor unit. The container within the compactor housing is kept closed while not in active use and as soon as it is full.

2.2.3.4.3. The compactor is also used for crushing drums that are RCRA empty. For the drum crushing process, a pancake with a diameter larger than the diameter of the container is used.

2.2.3.4.4. The motor and power switch of the compactor are explosion proof and intrinsically safe.

2.2.3.5. The arrangements for storage and staging of containers in the Production Area are shown on Figure D-7, Process/Production Container Areas Layout. The arrangements are typical for these areas and will vary based on container volume on-site and production demand. The arrangements are based on set-back distances from ramps and berms, Fire Code stacking requirements, and containment volume limitations. Dangerous Waste Container Area Layout (Figure D-6) shows a standard arrangement of containers in the

Dangerous Waste Container Area. This Layout shows locations of different categories of waste streams, the set-back requirements, and stacking limitations. The volume for both areas is limited by the volume of the Part A, which is 40,810 gallons for containers. Where volume is not completely utilized in the Process Areas and Production Pads, it would be utilized in the Dangerous Waste Container Area as long as set backs, aisle space, and stacking limitations are met. Table D-6 summarizes the number of drums shown in Figures D-6 and D-7. Compliance with capacity limitations is evaluated during facility daily inspections as outlined in Section F, Inspection Plan. Specific stacking limitations are noted on signs at the end of each stack to ensure facility operations staff can monitor compliance throughout each day. Overall containment limitations are posted on a sign located on the Dangerous Waste Container Storage Area for reference.

Table D-6
Container Storage & Staging Areas

Area	Description	Maximum Number 55 Gallon Drums[a]	Volume (gals)
Production Pad 1	Staging only	64	3,520
Production Pad 2	Storage	80	4,400
Production Pad 3	Storage	32	1,760
Production Pad 4	Storage	92	5,060
Process Area 2	Staging only	8	440
Dangerous Waste Container Mgmt Area[b]	Storage	742	40,810

[a] - Number of containers stored or staged in each area is noted in Figures D-6 and D-7. The production pads and Process Area 2 have a shared containment. One 330 gallon tote is equivalent to six drums. Other size containers are allowed to be stored; their volume will be accounted for when calculating the volume limit. All containers are counted as though they are full for purposes of meeting the volume limits.

[b] Dangerous Waste Container Management Area can store up the maximum container storage volume limit (40,810 gallons) only if there are no wastes stored on Production Pads 2, 3, and 4. Actual volume allowed in the Dangerous Waste Container Management Area is reduced by the cumulative volume stored at that time on those Production Pads.

2.2.3.6. When containers are stored and staged in these areas, they are handled in a manner to avoid ruptures or leaks, with aisle ways clear and free from obstructions. A minimum aisle way is maintained at 30 inches, with a set back of five feet in many areas (see Figures D-6 and

D-7 for details). Each container is kept closed during staging or processing unless waste is being added or removed in compliance with 40 CFR Part 264 Subpart CC. In addition to staging the containers during processing operations, Emerald also moves containers within the facility to prepare materials for shipment to off-site permitted disposal facilities.

2.2.4. **Process Containers**

2.2.4.1. Process containers are containers that are a functioning part of the waste management process. Waste streams are accumulated into process containers near a specific operation. The waste streams may then either be reprocessed, or moved to storage prior to final disposal at a permitted TSDF. One of these occurs within 24 hours of the container being full or otherwise taken out of service as a process container, whichever is first.

2.2.4.2. All process containers are DOT approved for the hazard class of the container contents. Process containers that will be holding hot liquids have lids fitted with a two-way vent for pressure release. Once the process container is full, or no additional waste will be added to the container within 15 minutes, or the person performing the operation leaves the immediate vicinity of the container, containers are closed to maintain compliance with 40 CFR Part 264 Subpart CC and WAC 173-303-692.

2.2.4.3. Process containers that are moved to storage are moved to a storage area (if needed) when full. While the process container is accumulating waste, it is labeled according to assigned profile number. Prior to moving the process container, it is assigned a drum (tracking)

number from Emerald's waste tracking system. The process container is then appropriately labeled, and moved to a suitable storage location prior to off-site shipment to a permitted TSDF.

2.2.4.4. The following areas are used for staging of process containers:

- Production Pad 1: Process containers from solids consolidation.
- Production Pad 2: Consolidation of solids from fuel blending and recycling operations.
- Production Pad 4: Consolidation of paint solids from fuel blending.
- Process Area 2: Consolidation of still bottoms from High Boiler Distillation system, other solids consolidation.
- Dangerous Waste Container Area: Consolidation of waste generated from glycol processing.
- Load/Unload Area 1: Carbon from wastewater treatment system.

2.2.5. Empty Containers

2.2.5.1. Following the transfer of container contents to a tank, other containers, or process equipment, containers considered empty per WAC 173-303-160 (2)(a) (i.e., all wastes has been taken out that can be removed using commonly used practices and, depending on the size of the container, no more than one inch of wastes or no more 0.3% of the container capacity remains), will be moved to the designated empty drum trailer or the Used Container Storage Area located at the northeast corner of the facility (see Figure D-8). Those empty containers that are placed on the empty drum trailer are then shipped off-site to a permitted recycling facility. Other

empty containers may be crushed and sent to a metal recycling facility.

2.2.5.2. Those containers that are moved to the Used Container Storage Area or stored on top of the heavy-duty steel grating that is over the Railcar Supplemental Containment Area may be reused by Emerald. Reused drums must be in good condition and meet DOT specifications and requirements, and may only have been used for storage of antifreeze, flammable or combustible liquids.

2.2.5.3. Empty containers for the Emerald parts washer program may be washed in the Container Washing System which is situated in the Used Container Storage Area. These containers have been previously emptied into a storage tank or recycling process. The containers are manually rinsed to remove the remaining contents. The wash water generated by Emerald is then moved to a container or tank for subsequent proper recycling, reuse, or disposal in accordance with the requirements of Emerald's Industrial Wastewater Discharge Permit.

2.3. Container Marking and Labeling

WAC 173-303-806(4)(b)(iii), 395(6), 630(3), (6)

2.3.1. All dangerous waste containers at the Emerald facility will have a hazardous waste marker affixed with the minimum information as required by WAC 173-303-190(3)(b).

2.3.2. As required by WAC 173-303-630(3), container markers and labels identify the WDOE major risk(s) classification (i.e., Toxic, Carcinogenic, Persistent, and Polycyclic) and DOT hazard class associated with the dangerous waste, and will not be obscured, removed or unreadable.

2.3.2.1. Upon transfer of dangerous waste from one container to another, a hazardous waste marker and identifying label will be affixed to the receiving container.

2.3.2.2. When a container that last held dangerous waste is empty in accordance with WAC 173-303-160(2)(a), markers are removed from the container or obliterated. DOT hazard labels are only removed once the container meets the criteria for DOT empty.

2.4. Container Storage

2.4.1. Containers holding dangerous waste that are to be stored on-site are placed in a suitable, permitted storage area only after verification analysis as described in Section C, Waste Characterization. Containers remain on pallets or skids while in storage, keeping them elevated from the concrete base to prevent contact with water or any released material and to facilitate inspection for spills or leaks. Dangerous waste containers are kept closed during storage and are handled in a safe manner to avoid rupturing. Because of the initial inspection for soundness and minimal handling, the likelihood of a spill/leak involving the containerized waste is minimal. Any container that is found to be leaking will be immediately placed in a compatible over pack container and/or transferred into another compatible DOT specification container.

2.4.2. A layout of the Dangerous Waste Container Area, including stacking patterns, arrangements, and staging and aisle way areas is shown on Figure D-6, Dangerous Waste Container Area Layout per outdoor storage requirements as defined by NFPA 30-4-7. Figure D-7 shows arrangements for storage and staging plus aisle way areas, ramps, and set backs for Production Pads 1, 2, 3, and 4 and Process Area 2. Storage

of containers is permitted in the Production Pads 2, 3, and 4 and the Dangerous Waste Container Area.

2.4.3. Class IB and corrosive waste streams require five feet of aisle space. Class IB waste streams require a five foot set-back from containment walls. Each row of Class IB liquids (flammable liquids) contains 5 pallets of containers stacked two high. Rows of other hazard classes do not have a pallet limitation. Rather the limiting volume factor based on Emerald's is the Part A volume. Each pallet in the row may contain up to four 55-gallon drums or three 85-gallon over packs. Smaller containers may also be placed on pallets, but stacking will only occur on top of pallets with 55-gallon and 85-gallon drums. The piles and rows are separated by spacing consistent with fire code and dangerous waste storage requirements. The maximum storage volume of wastes is 40,810 gallons in the Dangerous Waste Container Area and Production Pads 2, 3, and 4.

2.4.4. Stored containers are placed in a manner as to avoid ruptures or leaks, with areas between containers clear and free from obstructions. Containers are inspected on a weekly basis in accordance with the Inspection Plan (see Section F, Procedures to Prevent Hazards) to ensure the integrity of each container has not been compromised (i.e. leaking, ruptured, etc.). Each container is also kept closed during storage unless waste is being added or removed.

2.5. Secondary Containment

All areas where containers are staged for subsequent processing are covered by a canopy to provide protection from precipitation. The canopy is equipped with appropriate gutters and downspouts to route precipitation away from the secondary containment areas. There is adequate fire protection equipment for Production Pads 2, 3, and 4 where containers are stored or staged. For these areas, a hydraulically designed automatic sprinkler system was installed per

NFPA 13-1996 (see Exhibit D-19). Fire protection requirements as specified by the City of Tacoma Fire Department are provided in Exhibit D-1 (this Exhibit is included for information purposes only; it is not a part of the Permit). The following provides design information on the secondary containment structures, canopy structures, structural integrity of the concrete base, control of run-on, and removal of liquids from containment areas.

2.5.1. Containment Design

WAC 173-303-806(4)(b)(i) and (iv), 630(7)

2.5.1.1. There are several areas where dangerous wastes are stored in containers: the Dangerous Waste Container Area and Production Pads 2, 3, and 4.

2.5.1.2. Emerald considers any production area where containers are staged as a "container area." Staging areas include Production Pad 1 and Process Area 2 (Process Area 1 is not included). Tank Areas 1, 2, and 3 are not included as those areas are used for processing dangerous wastes in tanks and are described in Section D-4, Tank Systems.

2.5.1.3. The containment for Load/Unload Area No. 2 is adjacent to the Dangerous Waste Container Area and is therefore described here with container storage area containment. Design information is provided below for the following secondary containment structures:

- Dangerous Waste Container Area (including Load/Unload Area No. 2);
- Process Areas 1 (due to its relationship to other staging and storage areas) and 2;
- Production Pads 1, 2, 3, and 4; and,
- Loading Dock

2.5.1.4. The arrangement of these structures is shown in Figure D-9, Secondary Containment for Containers. The design of the containment structures is based on criteria presented in WAC 173-303-630 "Use and Management of Containers" and the applicable Fire Code requirements.

2.5.2. **Container Storage Area Containment**

WAC 173-303-806(4)(b)(i), 630(7)(a) and (d), 630(9)

2.5.2.1. The containment consists of an impermeable concrete base and perimeter wall with a containment volume to handle potential spills and precipitation. The layout, design parameters, dimensions, and materials of construction for the Dangerous Waste Container Area are presented in Exhibit D-2, Structural Design Layout and Detail. This area is constructed of reinforced concrete with a perimeter wall that is 10 inches high. Also included is the arrangement of a blind monolithic sump, specifications for the placement of concrete and chemical resistant water stops.

2.5.2.1.1. The concrete surfaces are coated with a chemically resistant epoxy (See Exhibit D-4 for information on existing coating for each dangerous waste management area).

2.5.2.1.2. Any coatings proposed for future use will be subject to Ecology approval.

2.5.2.2. The volumetric capacity of the secondary containment holds at least 10 percent of the 40,810 - gallon maximum design liquid waste volume in storage plus allowance for precipitation from the maximum 25-year storm of 24-hour duration. Calculations demonstrating adequacy of the containment volume are presented in Exhibit D-3, Containment Calculations.

2.5.2.3. Wastes that are placed in drum jail may not be compatible with other wastes stored in the Dangerous Waste Container Area. Emerald places waste that fail verification into drum jail. The waste container is placed on a containment pallet (separate containment per WAC 173-303-630(9)(c)) until discrepancy resolution is complete (see section C subsection 4.6) or the waste can be shipped off-site for disposal at a suitably permitted TSDF.

2.5.2.4. The containment pallets used for drum jail will be such that the containment can hold 10 % of the volume of liquid waste stored on the pallet or the largest container, whichever is greater. Minimum design specifications for containment pallets that would be used by Emerald are provided in Exhibit D-25.

2.5.2.4.1. Compatibility will be determined from the EPA compatibility chart and testing required according to the Emerald WAP. Information provided in 40 CFR Part 265 Appendix V and the definition of incompatible provided in WAC 173-303-040 will be used as additional references in cases where compatibility is not clearly determined from the EPA compatibility chart and WAP testing. This information is provided in Exhibit D-22.

2.5.2.4.2. A minimum aisle space of five feet will be maintained between containers that are placed on containment pallets or containment pans and incompatible waste streams in storage.

2.5.2.5. Load/Unload Area No. 2 on the south end of the Dangerous Waste Container Area consists of an impermeable concrete base and perimeter wall with a containment volume to handle potential spills and

precipitation. It is sloped from grade downward toward the Dangerous Waste Container Area to a blind monolithic sump (see detail in Exhibit D-2). A 4-inch berm exists at the southern end of the area at grade to control run-on. The volumetric capacity of the secondary containment will contain at least 10 percent of the 4,840 gallon maximum design liquid waste volume contained on a vehicle parked in the area, plus allowance for precipitation from the maximum 25 year storm of 24-hour duration.

2.5.3. **Production Area Containment**

WAC 173-303-806(4)(b)(i), 630(7)(a) and (d), 630(9)

2.5.3.1. The containment includes Production Pads 1, 2, 3 and 4, and Process Areas 1 and 2. Containers will be staged on Production Pads 1, 2, 3, and 4 for processing. Production Pads 2, 3, and 4 may be also be used for container storage for periods longer than 24 hours. The Production Area containment is covered by canopy structures. The general arrangement of the canopy structures is shown in Figure D-10, Canopies: Plan and Sections.

2.5.3.2. A reinforced concrete perimeter wall surrounds the area; however, various walls currently exist within the Production Area containment. Such walls include an internal bermed aisle way, and individual containment cells at each existing production pad and process area.

2.5.3.3. As shown in Figure D-12 and Exhibit D-2, each of the existing internal berms is perforated to achieve a single common containment that allows free flow of liquids between the existing cells. Those cells include all production pads, and process areas.

2.5.3.4. The containment consists of an impermeable concrete base and perimeter wall with a containment volume to handle potential spills and flow from fire control equipment. The layout, design parameters, dimensions, and materials of construction for the new sections of the Production Area Containment are presented in Exhibit D-2, Structural Design Layout and Detail. This area is constructed of reinforced concrete with a perimeter wall that is 8 inches high. Also included is the arrangement of a blind monolithic sump, specifications for the placement of concrete, chemical resistant water stops, and sealing of the dike penetrations. The concrete surfaces are coated with a chemically resistant epoxy. An information sheet on the epoxy coating is provided in Exhibit D-4, Epoxy Coating Information.

2.5.3.5. The volumetric capacity of the secondary containment will contain at least the volume of the largest tank or 10% of the total volume of containers, whichever is greater, plus allowance for 20 minutes of firewater. Table D-6 lists the maximum number of containers which can be staged or stored in each of the individual production pads and process areas; however, the DW Storage Tank (D-302) is located in Process Area 2. Accordingly, the 10,000-gallon proposed maximum design capacity of Tank D-302 is used to determine the minimum containment volume of the Production Area as this volume is greater than 10 percent of the volume of containers staged in this area.

2.5.3.6. Calculations demonstrating adequacy of the containment volume are presented in Exhibit D-3, Containment Calculations.

2.5.4.**Loading Dock**

WAC 173-303-806(4)(a)(viiii)(A), 395(4)

2.5.4.1. The Loading Dock makes up the eastern perimeter wall of the Dangerous Waste Container Area and the southern perimeter wall of Production Pad 4. The containment consists of an impermeable reinforced concrete slab. The Loading Dock slab slopes toward two catch basins situated on the surface of the slab; there is no measurable berm around the Loading Dock. Piping interconnects the catch basins and the piping terminates at the Dangerous Waste Container Area. There is a valve at the piping termination point, which is closed during loading and off-loading activities. This ensures that any small spills can be isolated, rather than migrating to the dangerous waste container area containment.

2.5.4.2. The layout, design, dimensions, and materials of construction for the Loading Dock are presented in Exhibit D-2, Structural Design Layout and Detail - Loading Dock. The volumetric capacity of the DW Container Area secondary containment will hold at least 10 percent of the 40,810-gallon maximum design liquid waste volume in storage plus allowance for precipitation from the maximum 25-year storm of 24-hour duration. The calculations demonstrating adequacy of the containment volume of the Dangerous Waste Container Area are presented in Exhibit D-3, Containment Calculations. These calculations demonstrate that any spills or precipitation on the Loading Dock can be properly accommodated in the DW Container Area. The concrete slab surface is coated with a chemically resistant epoxy. An information sheet on the epoxy

coating is provided in Exhibit D-4, Epoxy Coating Information – Loading Dock.

2.5.4.3. The Loading Dock structure consists of reinforced concrete retaining walls, placed upon spread footings, and surfaced with the reinforced concrete slab. The concrete slab bears on approximately 48" of compacted structural fill.

2.5.4.4. Palletized containers are placed on the Loading Dock prior to movement to the Production Pads for Check-In, and also prior to loading onto trailers for off-site shipment.

2.5.4.4.1. Containers awaiting Check-In remain on the Loading Dock for a limited period of time that ensures Check-In is completed within 24 hours. In any case, total time between offloading from the transport vehicle to completing Check-In and being placed into permitted storage or processing will not exceed 24 hours.

2.5.4.4.2. Containers being loaded for off-site shipment remain on the Loading Dock for less than 24 hours.

2.5.4.4.3. No stacking pattern is followed if containers are actively being loaded or unloaded (attended). Any waste streams that are considered incompatible are placed on containment pallets. No containers are placed within five feet of the "facility east" or "facility south" perimeter of the Loading Dock.

2.5.4.4.4. Should containers be left unattended, at least 30 inches of aisle space between stacks is maintained, with five feet of aisle space maintained for Class IB liquids. Any waste streams that are

considered incompatible are placed on containment pallets. All containers are single stacked, and no containers are placed within five feet of the "facility east" or "facility south" perimeter of the Loading Dock.

2.5.4.4.5. The maximum number of 55-gallon containers that would be on the Loading Dock at any one time is an equivalent of 80 55-gallons drums. Figure D-25, Loading Dock Container Layout, provides a stacking pattern.

2.6. Structural Integrity of Base

WAC 173-303-806(4)(b)(i), 630(7)(a)

Evaluations of the structural integrity of the containment base have been performed and are provided in Exhibit D-5, Structural Integrity Certifications. These evaluations include calculations, methods for preparation of the foundation for newly constructed areas, the design of the base and construction procedures for the Dangerous Waste Container Area, Production Pads 1, 2, 3, and 4, (1998 reports) and the Loading Dock (2001 report).

2.7. Control of Run-on

WAC 173-303-806(4)(b)(i)D, 630(7)(b)

2.7.1.1. The grade of the areas adjacent to and surrounding the containment areas are sloped away from each containment area to catch basins to prevent any run-on of accumulated precipitation into areas where containers are stored or staged. The containment walls are higher than any accumulated precipitation that could occur from the maximum 25-year storm of 24-hour duration

(3.5 inches) per WAC 303-630(7) and WAC 303-640(4)(e)(ii)(B).

2.7.1.2. Precipitation from the canopy will be properly controlled by a series of gutters and downspouts that are connected to the facility's stormwater drainage system. Figure D-11, Stormwater Drainage System Layout, provides the arrangement of the downspouts, catch basins, subsurface drainage system for the site, and elevation data. The spot elevations shown on Figure D-11 are tied to the NGVD-29, on the east side of Alexander Avenue.

2.8. Removal of Liquids

WAC 173-303-806(4)(b)(i)(E), 630(7)(a)(ii)

The base of the containment areas is equipped with blind monolithic sumps (see detail in Exhibit D-2) to allow for collection and subsequent removal of any free liquid from the containment area. Any free liquid in the sump will be removed in a timely manner (at least daily) with a pump and liquid contents will be transferred into an appropriate container, or wastewater accumulation tank (W-920, W-921, W-922, or W-923). The liquid removed will be properly managed as described in Section C, Waste Analysis. For liquids that have accumulated as a result of a spill, proper facility procedures will be followed that will ensure the liquid is managed in a safe and environmentally responsible manner (see also Section G of this Permit Application, Contingency Plan for specific procedures).

2.9. As-Built Drawings for Existing Containment Structures

There are no existing as-built drawings for certain concrete containment areas at the Emerald facility. However, the true

dimensions and the dike heights for Production Pads 1 and 2, Process Areas 1 and 2, and Tank Areas 1, 2, and 3 are presented in Figure D-12, Dangerous Waste Containment Layout. Information on the design of Process Areas 1 and 2, and Tank Areas 1, 2, and 3 is presented in Section D.4, Tank and Process Systems.

3. Prevention of Reaction of Wastes

WAC 173-303-806(4)(b)(iv), 630(8)(b)

3.1. The dangerous wastes that are fuel blended and recycled at the Emerald facility are mutually compatible and include: 1) solvents, 2) waste petroleum products, 3) other organic materials, 4) paints and paint related materials, 5) ink formulations, 6) flammable liquids mixed with corrosive liquids (only DOT primary hazard class 3 with DOT subsidiary hazard class for corrosivity), and 7) glycol based coolants.

3.2. Emerald also accepts DOT hazard class 6.1 poisons (packing group III only), Class 9, and low BTU waste streams regulated only by WAC 173-303-100. These waste stream categories are accepted for storage only. Class 9, DOT Hazard Class 6.1 poisons (packing groups II and III) and low BTU waste streams are considered compatible per EPA guidance, therefore no special segregation requirements for storage are necessary.

3.3. Reactive and other classes of incompatible wastes are not accepted for management in the process units at the facility. If a reactive or another class of incompatible waste is mistakenly received at the facility for processing, Emerald will direct the waste stream to drum jail and contact the generator to make arrangements for shipment to a permitted third-party TSD facility. In cases where a generator refuses to cooperate in making third-party disposal arrangements, Emerald will ship the reactive or incompatible waste back to the generator and note

the return shipment in the operating record. Any shipments of waste back to the generator will be accompanied by a notification to Ecology.

3.4. If a reactive or incompatible waste must be temporarily removed from a truck, containers are placed on portable containment pallets (spill skids). These containment pallets are constructed of polyethylene and meet the requirements of WAC 173-303-630(7) for secondary containment of hazardous materials. Containers on containment pallets awaiting off-site shipment will be segregated from other wastes and placed in the northwest corner of the Dangerous Waste Container Area away from any incompatible materials (see Figure D-6 – Drum Jail).

4. Tank Systems

WAC 173-303-806(4)(c), 640, 395(6)

This section provides information on the proper design and management practices for tank and process systems handling dangerous wastes. The information includes tank design specifications, details on process and ancillary equipment, a description of the railcar area, the design for secondary containment, tank and process management practices, a description of labels and signs, and a discussion on management of ignitable wastes in tank systems.

4.1. Tank Design Information

WAC 173-303-806(4)(c)(i), (ii) (v) and (vi), 640(2) and (3)

This section describes the design features of the facility tanks that store dangerous wastes.

4.1.1.**Design Specifications**

WAC 173-303-640(2)(c), (3)(a)

4.1.1.1. Table D-7, Dangerous Waste Management Tanks, lists all tanks that manage dangerous waste at Emerald. Included in the Table are the current volume for existing tanks permitted for dangerous waste storage, the current volume of existing product storage tanks that Emerald proposes to be permitted for dangerous waste storage, and the proposed future volume of tanks that may be replaced with larger tanks in the future. Emerald will ensure that the requirements of WAC 173-303-640(3)(c) are met prior to and during installation of new tanks at the Emerald facility as well as prior to utilizing existing dangerous waste storage tanks for storage of waste streams that are flammable as well as corrosive (i.e., with subsidiary DOT hazard class for corrosivity).

4.1.1.2. Pertinent design specifications and drawing of each of the tanks are provided in Exhibit D-6, Tank Data Sheets. The tank data sheets include key design information such as process conditions, construction details, dimensions, connection details, and a sketch of the tank.

Table D-7
Dangerous Waste Management Tanks

Tank ID	Description	Location	Process System	Volume (gallons)	Proposed Future Volume
D-100	Feed tank	Tank Area 1	Thin Film Evaporation	3,581	3,581
D-101	By-pass tank	Process Area 1	Thin film evaporation	755	755
D-209[a]	Glycol Spent Antifreeze Tank	Glycol Process Area	Glycol Recycling System	6,700	20,000
D-210	Glycol Spent Antifreeze Tank	Glycol Process Area	Glycol Recycling System	10,000	10,000
D-211	Glycol Spent Antifreeze Tank	Glycol Process Area	Glycol Recycling System	11,000	11,000
D-212	Filtered Feed Tank	Glycol Process Area	Glycol Recycling System	4,500	8,000
D-300 (D-500)	DW storage tank	Tank Area 2	Multi-Use	10,000	10,000
D-301 (D-501)	DW storage tank	Tank Area 2	Mutli-Use	10,000	10,000
D-502	Mixing tank and DW storage tank	Tank Area 3	Fuel Blending for Energy Recovery and Storage for DW destined for Incineration	9,230	9,230
D-310 (C-100[b])	DW storage tank (new)	Tank Area 1	Multi-Use	6,000	10,000
D-312 (C-102[b])	DW storage tank (new)	Process Area 2	Multi-Use	4,800	10,000
D-314 (C-104[b])	DW storage tank (new)	Tank Area 3	Multi-Use	6,300	10,000
D-311 (C-801[b])	DW storage tank (new)	Tank Area 1	Multi-Use	5,000	10,000
D-315 (C-802[b])	DW storage tank (new)	Tank Area 1	Multi-Use	7,500	10,000
MT-500	Mix tank	Production Pad 1	Fuel Blending	300	300
RT-500	Recirculating tank	Process Area 2	Fuel Blending	1,100	1,100
D-302 (D-800)	DW storage tank	Process Area 2	Multi-Use	6,250	10,000

[a] Design specifications and tank integrity assessment information will be provided upon tank

installation. Tank will not be used until approved through a permit modification. [b] Tank is proposed as part of facility expansion. This tank will not be in service at the time the permit is re-issued.	

4.1.1.3. The tanks listed in Table D-7 are adequately designed and constructed, to prevent corrosion without special lining or coating material, to hold solvent wastes such as paints, inks, oils, other petroleum products, other solvents (or glycol containing materials, as applicable), and compatible wastes with Btu value<5000 (high water content They are maintained with a shell thickness that exceeds the minimum acceptable thickness (see Sections D.4.2 and D.4.4.2, Integrity Assessment). All waste streams managed in tanks will have chemical compatibility as determined by the Emerald Waste Analysis Plan.

4.1.2.**Consideration of Earthquake Stresses**

An independent Professional Engineer conducted an engineering evaluation of the adequacy of the storage tanks at Emerald to withstand earthquake stresses. The analysis entailed a structural adequacy evaluation of the anchors and support legs for the tanks listed in Table D-8, Structural Assessment of Tanks. Table D-8 provides a summary of the findings of the engineering evaluation. The complete written assessment for Tanks on supports is provided in Exhibit D-7, Earthquake Stress Assessments. Assessments for other tanks are included in Exhibit D-8, Tank Integrity Assessments. For those tanks being converted from product storage tanks to dangerous waste storage tanks, an appropriate assessment by an independent Professional Engineer will be completed prior to the tanks being put into service.

Table D-8
Structural Assessment of Tanks

Tank ID	Description	Material	Findings
D-310	DW storage tank (new)	Stainless Steel	TBD upon installation
D-312	DW storage tank (new)	Stainless Steel	TBD upon installation
D-314	DW storage tank (new)	Stainless Steel	TBD upon installation
D-311	DW storage tank (new)	Stainless Steel	TBD upon installation
D-315	DW storage tank (new)	Stainless Steel	TBD upon installation
D-100	Feed tank	Steel	OK
D-101	By-Pass tank	Carbon Steel	OK
D-209	Glycol Spent Antifreeze (new)	Fiberglass	TBD upon installation
D-210	Glycol Spent Antifreeze	Carbon Steel	OK
D-211	Glycol Spent Antifreeze	Carbon Steel	OK
D-212	Filtered Feed Tank (Glycol)	Carbon Steel	OK
D-500 (D-300)	DW storage tank	Carbon Steel	OK
D-501 (D-301)	DW storage tank	Carbon Steel	OK
D-502	Mixing tank and DW storage tank	Carbon Steel	OK
D-800 (D-302)	Feed tank	Stainless Steel	OK
MT-500	Mixing tank	Carbon Steel	OK
RT-500	Recirculating tank	Carbon Steel	OK

4.1.3. **Waste Types Managed In Each Tank System**

The waste types managed in each tank system are listed in Table D-9, Waste Types Managed. Information includes the tank identification number and the associated types of waste managed in each tank.

Table D-9
Waste Types Managed

Tank ID No.	Waste Type Managed
D-100, D-101	Paint related materials, solvents, waste petroleum products, other organic materials
D-209	Waste glycol containing materials, glycol product
D-210, D-211, D-212	Waste glycol containing materials
D-300, D-301	Paint and paint related materials, solvents, waste petroleum products, ink formulation, flammable corrosive liquid mixtures (subsidiary DOT hazard class for corrosivity), other organic materials
MT-500 RT-500, D-302	Paint and paint related materials, solvents, waste petroleum products, ink formulation, other organic materials
D-502	Paint and paint related materials, solvents, waste petroleum products, ink formulation, other organic materials either with sufficient Btu for energy recovery or less than 5000 Btu for destructive incineration (high water content mixtures)
D-310, D-312, D-314, D-311, D-312	Paint and paint related materials, solvents, waste petroleum products, ink formulation, other organic materials

4.2. Integrity Assessments

WAC 173-303-640(2)(a),(c) and (e); 3(a), (b), (c), (e), (f), (g), (h)

4.2.1. Certified tank integrity assessments prepared for all existing dangerous waste storage tanks demonstrate that the tanks are properly designed and meet integrity requirements. A copy of the most current integrity assessment for each current, and proposed, tank is provided in Exhibit D-8, Tank Integrity Assessments. These integrity assessments show that the subject tanks will not collapse, rupture, or fail over the intended life of the tanks when used to store the material described in Table D-9.

4.2.2. An independent, qualified Professional Engineer registered in the State of Washington and qualified for tank integrity evaluation conducted the integrity inspection. The inspections entailed a review of the design standard (if available), tank drawings and records of operation, corrosion protection measures, and a thorough visual inspection to identify any evidence of leaks or corrosion, and signs of potential collapse, rupture, or failure. Measurements of shell thickness using an ultrasonic, pulse-echo method were also obtained during the inspection. Summaries of these measurements are included in the tank integrity assessments provided in Exhibit D-8.

4.2.3. All new tanks that are proposed to be used for dangerous waste storage will not be put into service until an independent, qualified Professional Engineer performs the proper assessment and approves for the tank for service as described in Subsection D.4.4.

4.2.4. There are six proposed tanks that will not yet be in dangerous waste service at the time this permit is re-issued (see Table D-7). Emerald also stores flammable corrosive

liquid mixtures (subsidiary DOT hazard class for corrosivity) in two tanks (D-300 and D-301). Those tanks have been assessed and certified for their integrity including corrosion control protection (WAC 173-303-640(3)(a) and proper installation (WAC 173-303-640(3)(c) for the waste streams specified. Introduction of other types of corrosive waste streams will not be performed until an updated assessment is completed and provided to Ecology through a permit modification.

4.3. Additional Requirements for Existing Tanks

WAC 173-303-640(2)(a), (c), (d), (e)

4.3.1. Results of the tank integrity assessments show that the shell thickness of each existing tank exceeds the minimum acceptable thickness requirement. The evaluation of the tanks including leak tests, visual inspections, and assessment of the wastes managed was found to be acceptable for the intended uses of the tanks.

4.3.2. The tank integrity assessments also include a recommendation for the next scheduled assessment (WAC 173-303-640(2)(a) and (c)). As described in Exhibit D-8, all of the Dangerous Waste Management tanks need to be re-evaluated at 5 year intervals ((WAC 173-303-640(2)(e)) or more frequently if required by the certifying engineer or Department of Ecology. The evaluation will include the tank itself as well as the tank system (including anchor bolts and other appropriate equipment that is not already on an inspection schedule).

4.4. Additional Requirements for New Tanks

WAC 173-303-640(3)(c),(e), (f), (g), (h)

This section presents the methods used to assure that the proposed additional Dangerous Waste tanks are tested for flaws prior to installation, and are properly installed to avoid damage.

4.4.1. **Tank Testing**

If the replacement tank(s) is new, the tank(s) will be tested in accordance with appropriate tank testing standards before installation at the Emerald facility. The steel tanks will be tested in accordance with the procedures contained in API 620, paragraph 5.18.

4.4.2. **Integrity Assessment**

4.4.2.1. A certified tank integrity assessment will be prepared for any replacement tank(s) and will demonstrate that the tank(s) is properly designed and meets integrity requirements. The integrity assessment will show that the subject tank(s) will not collapse, rupture, or fail over the intended life of the tank(s) when used to store the material described in Table D-9. A copy of each integrity assessment will be kept on file at the facility.

4.4.2.2. New dangerous waste management tanks will be placed into service through a permit modification(s). This will not occur before an independent Professional Engineer performs a structural and corrosion protection integrity assessment (WAC 173-303-640(3)(a) and ensures proper installation (WAC 173-303-640(3)(c).

4.4.2.3. There are five proposed tanks that will not yet be in dangerous waste service at the time this permit is re-issued. These are identified in Table D-7. Those tanks

must be assessed and certified as outlined above for their integrity and proper installation. Final approval to place those tanks in dangerous waste service will be conducted through a permit modification.

4.4.3. **Tank Installation & Conversion**

4.4.3.1. Emerald will follow procedures and guidelines as outlined below to assure the tank installation and conversion is performed in a manner to prevent any damage to the tank and ancillary equipment.

4.4.3.2. Tanks will be transported in a horizontal position on a flat bed trailer. Care will be taken to prevent damage to the exterior coating when placed and secured onto the trailer. The tank and ancillary equipment will be protected during installation. Each replacement tank comes equipped with appropriate lifting lugs, located on the top and bottom. A certified crane operator will use an appropriate sized crane, taking into account the weight of the tank and the position of the crane with regard to the placement location.

4.4.3.3. For additional safety, facility operations in the vicinity of the installation will be suspended during the period of tank installation. A crane with two lines will be used. The main line will be attached using shackles and cable to the lifting lugs located at the top of the tank. A "whip" line will be attached to the lifting lug at the bottom of the tank. During the setting operation, the tank will be lifted, and the trailer will be removed from underneath the tank. The "whip" line will be slowly lowered until the tank is in a vertical position. At no time will the tank be allowed to touch the ground. The tank will then be positioned on pre-set anchor bolts provided on the tank pad and secured in place.

4.4.3.4. For those tanks that are existing product tanks that will be converted to dangerous waste tanks, care will be taken when fitting for necessary valves, gauges, manifolds, and process vents as to avoid any tank damage.

4.4.3.5. All tanks will meet the requirements of WAC 173-303-640 and will not be placed in service until an independent Professional Engineer performs the proper installation assessment and approves the tank for use (WAC 173-303-640(3)(c)) and their use is authorized by a permit modifcation.

4.4.4. **Responses to Leaking or Unfit for Use Tanks**

WAC 173-303-640(7)

If a tank system is taken out of service under conditions described in WAC 173-303-640(7), it must be recertified before placed back into service according WAC 173-303-640(7)(f) or closed according to Emerald's Closure Plan (Section I). The schedule for the next integrity assessment of that tanks system may be adjusted according to current concerns and conditions.

4.5. Process and Flow-Through Equipment

This section describes the mechanical components within the process units such as flow-through devices (pumps, valves, etc.) and ancillary equipment (condensers, pot stills, etc.). Detailed piping and instrument diagrams are provided.

Engineering and design features for the process units and ancillary equipment are summarized in Table D-10, Process Unit Equipment List. Details on the flow-through devices are presented in Table D-11, Flow-Through Device Equipment

List. The equipment listed in Tables D-10 and D-11 are shown in the piping and instrumentation diagrams that are described below. Additional information is provided in Section D.6, Tank and Process Management Practices.

4.5.1. **Fuel Blending System**

4.5.1.1. Containers of semi-solid wastes may be processed in the Dispersion System through a hopper, chute, and mix tank. A surfactant, surfactant catalyst, and additional solvents are added to the mixture to enhance blending. During operation, nitrogen is purged through the Fuel Blending system storage and mix tanks to protect the process from explosive conditions. The resulting mixture of nitrogen and hydrocarbon vapors is vented to the flare. The final blended product is transferred either to a railcar, or storage tanks. Material that is high in solids content is shredded in the Cascade Shredder before being placed into the mix tank for blending. Alternatively, containers of semi-solid wastes or material that can be shredded may be stored and shipped to an energy recovery facility. The decision on whether to store or shred is based on market conditions and volume available for shipment. Components of the system and associated storage tanks are shown in Figure D-13, Fuel Blending System Piping and Instrument Diagram.

4.5.1.2. Tanks D-300, D-301 and D-302 store waste materials that contain high amounts of recoverable solvents for subsequent transfer to the High Boiler Distillation Unit, Thin Film Evaporator, or to the Fuel Blending System. Mixing tank D-502 is used to store blended fuel prior to loading into railcars. Tanks D-310, D-312, D-314, D-311 and D-315 may be used to store dangerous waste for fuel blending as needed.

4.5.2.**Thin-Film Evaporation**

The Thin Film Evaporator is designed to distill solvents with a boiling point range up to 300°F. Material to be processed by thin film distillation is first transferred into feed tank D-100, then recirculated through feed tank D-100 during operation of the unit. A detailed piping and instrumentation diagram for the thin film distillation process is presented in Figure D-14, Thin Film Evaporator System Piping and Instrument Diagram (see also Section D.1.2).

4.5.3.**Vacuum System**

The vapors not condensed in the Thin Film Evaporator condenser (E-100) are processed through the vacuum system (or closed vent system) to the flare. A vacuum is drawn through the Thin Film Evaporator System by vacuum pump VP-600. Air and non-condensable vapors pass through the vacuum system into the liquid ring supply vessel (V-602), through the knockout pot (V-601), then to the flare. Also, vapors drawn from the High Boiler Distillation and Fuel Blending Systems are passed through the knockout pot and to the flare. A detailed piping and instrumentation diagram for the Vacuum System is presented in Figure D-15, Vacuum System Utilities Piping and Instrument Diagram. Further discussion on emission control systems is provided in Section D.8.

Save for Table D-10, Process Unit Equipment List

Save for Table D-10 page 2 – Process Unit Equipment List

Save for Table D-11, Flow-Through Device Equipment List

Save for Table D-11 page 2 Flow Through Device Equipment List

4.5.4. **High Boiler Distillation**

High boiler distillation uses an oil-heated pot still designed to distill solvents with boiling points up to 500°F. Solvent to be processed by high boiler distillation is first transferred into feed tank D-800 (D-302) or other permitted tank then to the pot still or directly to the pot still from containers. Used oil light ends are transferred to the pot still directly from containers. A detailed piping and instrumentation diagram for the High Boiler Distillation System is presented in Figure D-16, High Boiler Distillation System Piping and Instrument Diagram.

4.5.5. **Glycol Recycling System**

4.5.5.1. Glycol recycling uses filtration and vacuum distillation to distill waste antifreeze and glycol containing materials. It consists of forced circulation evaporator, distillation tower, cooling tower and variable rate feed and product pumps. The unit is designed to process 5,760 gallons per day of pretreated used antifreeze of nominal concentration of approximately 50% glycol. Material to be processed is transferred from storage tank D-210 through a filter into tank D-211, then from D-211 to D-212 through another filter. Contents of the filtered feed tank D-212 are then pumped through evaporators for distillation. Prior to introduction into D-210, waste glycol may also be stored in D-209 once D-209 is approved through a permit modification. A detailed piping and instrumentation diagram for the glycol recycling system is presented in Figures D-17a and D-17b, Glycol Recycling System and Instrument Diagram (Sheets 1 & 2).

4.5.5.2. Feed materials in the Glycol Recycling System contain an organic concentration that exceeds 10 ppm by weight. Glycol based coolants placed in the Glycol

Recycling System may exceed the 500 ppmw threshold for volatile organic compounds (VOCs). Therefore, VOC emissions will be controlled as required by 40 CFR Subpart AA, BB, or CC standards. A discussion of compliance with Subparts AA, BB, and CC is provided in Section D.8 (Air Emission Control).

4.6. Railcar Area

4.6.1. Emerald utilizes railcars for the safe transportation of recovered fuels to permitted facilities that use the material as an alternate to fossil fuel. The railcars are loaded at the Railcar Area located on the east side of the facility. This area consists of railroad tracks, concrete track pan, and the Railcar Supplemental Containment Area. The facility has the capacity to position seven railcars within the fenced boundaries. The position for placement of each railcar is designated a spot number from 1 to 7; spot 1 is on the far north terminus of the tracks, while spot 7 is at the southern most side of the facility. Only Spots 1 and 2 are used for transfer of dangerous waste (see Figure D-24, Dangerous Waste Management Areas).

4.6.2. Spots 1 and 2 are within approved dangerous waste secondary containment and are the only spots used for railcars that hold dangerous waste, including antifreeze and other glycol mixtures. These railcars are in-process until they are filled or otherwise prepared to be moved offsite. The railcars will remain in secondary containment while they hold dangerous waste until they are shipped off the Emerald facility. The maximum time a full railcar containing dangerous waste will remain at the Emerald facility is 10 days.

4.6.3. Railcars are moved by Tacoma Rail at the request of Emerald. Railcars not containing dangerous waste may be

moved to different spots at the facility, or moved off-site to a pre-determined destination. Movement of railcars typically occurs during evening hours, and within 24 hours of a request by Emerald to Tacoma Rail. Tacoma Rail personnel have access to the Emerald facility rail spur at Gate 4.

4.6.4. The railcars used at Emerald conform to DOT requirements specified for general service tank cars. These tank cars are specifically designed and constructed to hold flammable liquids and meet the requirements of 49 CFR Part 179.200 for interstate commerce. Every railcar is certified for structural integrity on a periodic basis as required by DOT.

4.6.5. The containment structures for the Railcar Area are described in Section D.5.4, Secondary Containment for Railcar Area and Exhibit D-11. The Railcar Area containment is provided within two containment sections. Section 1 is a covered concrete track pan situated below the tracks at spots 1 and 2. Section 2 is a 3-foot deep concrete supplemental containment structure immediately adjacent to Section 1. It is designed to receive liquids from Section 1 and contain the volume of the largest railcar plus allowance for precipitation onto Section 1. The Railcar Supplemental Containment Area (Section 2) is covered with a canopy.

4.6.6. Dangerous wastes are transferred from the Production Area to the Railcar Area through overhead piping. The pipe is double walled carbon steel and terminates at the railcar loading spouts situated at spots 1 and 2. The layout of the transfer piping is shown in Figure D-18, Arrangement of Double Contained Piping. The pipe is supported by steel structures that are designed to adequately support the load. Figure D-19, Blended Fuel Pipe Supports Site Plan, presents the design of the pipe support structures. Containment structures for the transfer piping are described in Section D.5.7, Secondary Containment for Liquid Transfer.

Information on the transfer of bulk liquids within the Production and Railcar Areas is provided in Section D.6, Tank and Process Management Practices.

4.7. Load/Unload Area No. 1

The Load/Unload Area No. 1 will be used to load and unload bulk dangerous waste, and virgin and recycled product to/from trucks arriving at the facility. The layout and design of the Area are provided in Exhibit D-11, Structural Design for Railcar Areas. The structure is located between Tank Area No. 1 and the Railcar Supplemental Containment Area and consists of an impermeable concrete base and perimeter dike. It is sloped downward toward the Railcar Supplemental Containment Area and is constructed of reinforced concrete with a perimeter wall that is 4 inches high. Exhibit D-11 also includes specifications for the placement of concrete, chemical resistant water stops, and sealing of the dike penetrations. The concrete surfaces are coated with a chemically resistant epoxy. An information sheet on the epoxy coating is provided in Exhibit D-4, Information on Epoxy Coating.

4.8. Loading Dock

As shown in Exhibit D-2, the Loading Dock is four-feet high and consists of a nominal 41' x 60' arrangement of reinforced concrete retaining walls, placed upon spread footings, the interior area filled with 48" of compacted structural fill, and surfaced with an impermeable six to eight inch-reinforced concrete slab. The loading dock is used for off-loading of non-bulk containers. Non-bulk containers are off-loaded from trailers, set on the loading dock using a forklift, then moved to Production Pad 4 via forklift for check-in and waste acceptance. In cases where the loading dock is full, smaller trucks would be directed to park for off-loading on Production Pad 4, larger trucks would be off-loaded from Load/Unload Area 2. Containers would be moved via forklift from

the trucks to Production Pad 4 for check-in as required in WAP Subsection 3.8.

5. Secondary Containment and Release Detection

WAC 173-303-640(4), 806(4)(c)(vii)

The Emerald facility has been constructed to provide for efficient and safe management of tanks and railcars. There are 7 areas where dangerous wastes are stored in tanks: Tank Areas 1, 2, 3, Production Pad 1, Process Areas 1 & 2, and Glycol Recycling Area. Each of these areas is equipped with a concrete containment structure. Wastes are also contained in the Railcar Area. Tank Areas 1 and 2, Production Pad 1, and Process Areas 1 & 2 are covered by a canopy to provide protection from rainfall. A canopy (see Figure D-10) also covers the Railcar Supplemental Containment Area.

The canopies are equipped with appropriate gutters and downspouts to route precipitation away from the secondary containment (see Figure D-11, Stormwater Drainage System Layout). Emerald has installed the necessary fire protection equipment to protect wastes stored in Production Pads 2, 3, and 4. This section provides design information on the secondary containment structures, structural integrity of the base, and removal of liquids from the tank and railcar containment areas.

5.1. Structural Integrity for Concrete Containment

An evaluation of the structural integrity of the containment base has been performed by a Professional Engineer. The evaluations for the Railcar Area, Railcar Supplemental Containment, Glycol Recycling System Containment, Tank Areas 1, 2, and 3 and Process Areas 1 & 2 are provided in Exhibit D-9, Integrity Certification for Containment. The evaluations for Production Pads 1, 2, 3, and 4, the Dangerous Waste Container Area, and the Loading Dock are

provided in Exhibit D-5, Structural Integrity Certifications. The evaluation for the Glycol Area is provided in Exhibit D-10, Glycol System, Structural Design. This evaluation includes calculations and documentation of all assumptions. The structural integrity analysis shows that the concrete base holding the tanks are capable of providing adequate support and will not fail due to pressure gradients caused by tank filling and climatic conditions. Exhibit D-4 provides information on the coating systems that have been applied to the dangerous waste management areas.

5.2. Leak Detection

Leaks are detected by visual inspection of the tank areas, containment sumps, and double walled piping which is routed outside of secondary containment. The visual leak inspections, their extent and frequency are part of the hazards prevention program that is described in Section F, Inspection Plan, of this Permit Application.

5.3. Secondary Containment for Tank Systems

The secondary containment consists of an impermeable concrete base and perimeter wall with a containment volume adequate to handle potential spills from the largest tank within each area. The concrete surfaces are coated with a chemically resistant epoxy (see Exhibit D-4, Epoxy Coating Information).

Calculations demonstrating the adequacy of the containment volume are presented in Exhibit D-3, Containment Calculations. Table D-12, Summary of Containment Capacities, provides a summary of the available containment, and largest tank (current or proposed) in each of the areas where a dangerous waste storage tank is located.

Table D-12
Summary of Containment Capacities

Area	Capacity (gals)	Volume of Largest Tank	Tank ID	Fire flow	Precipitation
Tank Area 1	20,357	10,000	D-310, D,311, D-315	N/A	N/A
Tank Area 2	15,245	10,000	D-300, D-301	N/A	N/A
Tank Area 3	11,034	10,000	D-314	N/A	25-year
Production Pad 1, 2, 3, and 4	(a)	10,000	D-302, D-312	20-min	N/A
Process Area 1					
Process Area 2					
Glycol Process Area	43,495	20,000	D-209	N/A	25-year
(a) This is a single containment structure which includes Production Pads 1, 2, 3, 4, and Process Areas 1 and 2. The available capacity of the shared containment based on the layout in Figure D-7 is 30,275 gallons.					

5.4. Secondary Containment for Railcar Area

WAC 173-303-630(7), 395(4)

The Railcar Area consists of a 10.67 ft wide impermeable concrete base and perimeter wall situated along a 118 ft section of railroad track (Section 1), and an impermeable concrete base and perimeter wall of the adjacent Railcar Supplemental Containment Area (Section 2). Both sections 1 & 2 are covered by a canopy to protect from precipitation. The containment structure provides adequate volume to contain potential spills from a railcar. The layout, design parameters, dimensions, and materials of construction for the Railcar Area are presented in Exhibit D-11, Structural Design for Railcar Areas. This area includes reinforced concrete with a

perimeter wall that is 3 feet high. Exhibit D-11 includes the design of a blind monolithic sump, specifications for placement of concrete, and installation of chemical resistant water stops. The concrete surfaces are coated with a chemically resistant epoxy. Also included in Exhibit D-11 are the designs for the Flammable Storage Containment Floor Retrofit, which was completed in 2008 to allow storage of containers of flammable product on the grating above the Railcar Supplemental Containment Area. The containment calculations in Exhibit D-3 show that a maximum of 140 55-gallon drums of product can be stored on the grating.

Calculations demonstrating adequacy of the containment volume are presented in Exhibit D-3, Containment Calculations. The Railcar Area and Railcar Supplemental Containment Area has a capacity of 28,268 gallons that will adequately contain the 26,671-gallon maximum design liquid volume of a railcar plus allowance for precipitation from the maximum 25-year storm of 24-hour duration. The precipitation calculation is necessary as the Railcar Supplemental Containment Area is also used as containment for Load/Unload Area 1, which is not covered.

5.5. Secondary Containment for Load/Unload Area No. 1

This concrete structure is physically connected to the Railcar Supplemental Containment Area. The dike between Load/Unload Area No. 1 and the Railcar Containment is perforated to achieve a single common containment that will allow free flow of liquid. The perforation is made by installing piping and a gate valve through the concrete dike (see Exhibit D-11). The gate valve will normally be set in the open position. In the event of a small leak or spill, the valve would be manually closed to contain the material for recovery. The Railcar Supplemental Containment Area has a capacity of 28,268 gallons that will adequately contain the maximum design liquid volume of the largest tank (a railcar) plus

allowance for precipitation from the maximum 25-year storm of 24-hour duration on the Railcar Area and Load/Unload Area No. 1.

5.6. Secondary Containment for Loading Dock

The slab surface is sloped at a 1½-percent grade to two catch basins. The basins are sealed with a pre-formed rubber gasket. An eight-inch PVC pipe sloping east to west at a downward 1.7% grade interconnects the two catch basins and continues at a downward 3% grade to the DW Container Area. The slab underlying any containers placed on the Loading Dock is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated rainfall until the collected material is detected and removed. The base is sloped and the containment system including catch basins and interconnecting piping is designed to drain and remove liquids resulting from leaks, spills, or precipitation. The Dangerous Waste Container Area that receives such liquids from the Loading Dock has sufficient capacity for proper containment. Emerald would only off-load waste if sufficient capacity was available for storage, so no separate calculations have been made for the staging or storage capacity of the Loading Dock. Calculations demonstrating adequacy of the containment volume of the DW Container Area are presented in Exhibit D-3, Containment Calculations.

5.7. Secondary Containment for Liquid Transfer

Dangerous wastes are transferred at several locations throughout the facility where secondary containment for liquid transfer is provided by either double walled piping, or concrete secondary containment approved for dangerous waste management. Figure D-18, Arrangement of Double Contained Piping, provides arrangement and design information for piping that connects to the rail car. This transfer occurs over a stormwater management area. All other liquid transfers occur over dangerous waste containment areas.

As shown on Figure D-18, a sample valve is installed on the outside pipe for each section of double walled piping. This valve will allow Emerald to determine if the inside pipe is leaking. Provisions for inspection of these valves are described in Section F, Procedures to Prevent Hazards, Inspection Plan.

5.8. Secondary Containment Structures

All components of the Fuel Blending, Thin Film Distillation, and High Boiler Distillation Systems are located within containment areas. Each of these areas is surrounded by a perimeter wall and several internal berm walls and covered by a canopy. The internal walls are perforated to achieve a single common containment. The containment in Production Pad 1, Process Areas 1 and 2 consists of an impermeable concrete base and perimeter wall with a containment volume sufficient to handle potential spills and 20 minutes of firewater flow.

5.9. Secondary Containment for Glycol Recycling System

5.9.1. The arrangement of the containment structure for the Glycol Recycling System is shown in Figure D-20, Secondary Containment for Glycol Recycling System. The containment is designed to prevent run-on into the waste management unit, or run-off from the unit into other areas of the site. It consists of a concrete base and perimeter wall with a containment volume to handle potential spills and precipitation. The layout, design parameters, dimensions, and materials of construction are presented in Exhibit D-10, Glycol System, Structural Design. This area is constructed of reinforced concrete with a perimeter wall that is 24 inches high.

5.9.2. An evaluation of the structural integrity of the Glycol Area containment base has been performed and is provided in Exhibit D-10, Glycol System, Structural Design. This

evaluation includes calculations, methods for preparation of the foundation, the design of the base and construction procedures. Prior to construction of the concrete containment base, representative samples of the surface and subsurface soils in the area of the proposed units were analyzed. A copy of the report certified by a Professional Engineer is provided in Exhibit D-9, Integrity Certification for Containment. In that report, it was found that the test results conform to applicable specifications. The structural engineer reviewed the test results and prepared a certification as to the proper structural integrity of the containment system. Exhibit D-9 (Integrity Certification for Containment) provides a copy of the test results and the engineer's integrity assessment certification showing that the concrete containment structure conforms to the requirements on the engineer's drawings and specifications. Also included is the arrangement of a blind monolithic sump, specifications for the placement of concrete and chemical resistant water stops.

5.9.3. The concrete surfaces are coated with a chemically resistant epoxy. A new coating system was applied to the glycol containment area in 2008. Information sheets on the coating system are provided in the third section of Exhibit D-4 (Epoxy Coating Information – Glycol Area).

5.9.4. The concrete containment slab bears on six to twelve inches of compacted granular structural fill as recommended by the geotechnical report with final criteria to be verified by the geotechnical engineer. The containment pad is relatively lightly loaded and has been designed with a double layer of reinforcement to allow the slabs to bear on fill with a low modulus of sub-grade reaction. Preload of the site is not necessary due to the conservative design of the new pad. This design approach was chosen since preloading could induce unnecessary settlement and stress in adjacent

existing foundations. The geotechnical engineer made final recommendations for site work prior to new construction.

5.10. Removal of Liquids

The base of the storage tank and railcar containment areas are equipped with blind monolithic sumps (see detail in Exhibits D-2 and D-11) to allow for collection and subsequent removal of any free liquid from the containment areas. The base of the Glycol containment area is equipped with blind monolithic sumps (see detail in Exhibit D-10). Free liquid in the sumps will be removed with a pump and transferred into an appropriate container, or Wastewater Accumulation Tank (W-920, W-921, W-922, or W-923). The liquid will be properly managed as described in Section C, Waste Analysis.

6. Tank and Process Management Practices

6.1. Tank Management Practices

WAC 173-303-806(4)(c)(iii), (iv), (ix); 640(5)(a) and (b)

6.1.1. Several tank management practices are employed in the design and operation of each tank system. These systems include provisions to ensure safety of the processes, and protect human health and the environment.

6.1.2. Each tank system is constructed of concrete secondary containment foundations and dike walls that are appropriately designed to support the tank, and prevent failure due to settlement, compression, or upset. Concrete surfaces are coated with a chemically resistant epoxy to ensure impermeability, and to prevent migration of liquid from the system. These structures are sloped to blind sumps for ease of detection and collection of any releases or

accumulated liquids. Removal of any liquid occurs within 24 hours of detection.

6.1.3. Leak detection at containment structures is conducted on a periodic basis as described in Section F, Procedures to Prevent Hazards, Inspection Plan. As described in Section D.4.2 and D.4.4.2, an independent, qualified Professional Engineer performs a structural integrity assessment on each of the storage tanks on a periodic basis as discussed in D.4.3.

6.1.4. Emission controls, which include conservation vents, are provided on each new and existing storage tank containing dangerous waste to control pressure, vacuum and VOC emissions (see Exhibit D-16). Conservation vents permit the safe operation of each tank by controlling pressure and vacuum variations caused by normal operation (loading and unloading), and fluctuations in ambient temperature which affect tank pressure. These conservation vents also reduce emissions to the atmosphere. The tanks are also equipped with emergency relief devices, which are used to relieve pressure buildup within the tank in the event of a fire. Pressure control devices are designed in accordance with applicable NFPA 30, API 2000, and API 520 standards.

6.1.5. Spill and overfill prevention control is provided on each tank by the use of sight glasses, level limit switches, and/or manual measurements cross-checked with the amount of material transferred and updated daily on facility tank logs. Tank levels are checked prior to loading or unloading to ensure that the tank capacity is not exceeded during material transfer. Sight glasses and level limit switches are inspected per the inspection schedule outlined in Section F, Procedures to Prevent Hazards, Inspection Plan, to ensure proper working conditions of these safeguards. Specific tanks, their location, and the type of overfill prevention

control for each is provided below in Table D-13. Specific information on the level limit switches for several of the tanks is provided in Exhibit D-20.

Table D-13
Dangerous Waste Tank Overfill Prevention

Tank Number	Location	Type of Overfill Prevention Control
D-100	Tank Area 1	Level Limit Switch
D-209	Glycol Processing Area	Hydrostatic pressure gauge**
D-210	Glycol Processing Area	Sight Glass
D-211	Glycol Processing Area	Sight Glass
D-212	Glycol Processing Area	Sight Glass
D-300 (D-500)	Tank Area 2	Level Limit Switch
D-301 (D-501)	Tank Area 2	Level Limit Switch
D-502	Tank Area 3	Level Limit Switch
D-310*	Tank Area 1	To be determined
D-312*	Process Area 2	To be determined
D-314*	Process Area 1	To be determined
D-311*	Tank Area 1	To be determined
D-315*	Tank Area 1	To be determined
MT-500	Production Pad 1	Tank Logs
RT-500	Process Area 2	Tank Logs
D-302 (D-800)	Process Area 2	Level Limit Switch

* Tank is proposed as part of facility expansion. This tank will not be in service at the time the permit is re-issued.
** Proposed
NOTE: All tanks are managed at 90% maximum fill elevation.

6.1.6. For the Glycol Recycling System, spill and overflow prevention control is provided on tanks D-209, D-210, D-211, and D-212 by manual measurements cross checked with the amount of material transferred. Tank D-209 will be equipped with a hydrostatic pressure gage, and D-210, D-

211, and D-212 are equipped with a series of sight glasses. The tank levels are manually checked prior to loading or unloading to ensure that the tank capacity is not exceeded during material transfer.

6.1.7. Wastes are evaluated in accordance with the Waste Analysis Plan (see Section C), to verify that material is compatible with the tank system and its contents. No treatment reagents or dangerous wastes are placed in tanks that would cause rupture, leakage, corrosion, or failure.

6.1.8. In cases where it would be preferable to off-load a discrepant bulk load, as opposed to returning it to the generator, Emerald will evaluate the waste stream for suitability for storage (i.e. tank is certified for the type of waste) in an empty permitted dangerous waste storage tanks. Cleaning or decontamination of the tank will be done as necessary to ensure that no adverse reactions occur. Any tank selected will be capable of managing a wide variety of waste characteristics, as indicated in the tank's integrity assessment report.

6.2. Process System Safeguards

Equipment has been installed on each process system to provide safeguards against releases to the environment, personal injury, and loss of property. Individual process safeguards are described below with additional information provided in Section F, Procedures to Prevent Hazards, Inspection Plan.

6.3. Fuel Blending System

6.3.1. Individual components of the Dispersion System (part of the Fuel Blending System) are provided with specific safeguards. Each component of the system including the hopper, chute and mix tank is purged with nitrogen to

reduce oxygen levels to below explosion limits. Oxygen sensors are provided and interlocked with a nitrogen regulator, hopper doors, mixer and pumps to ensure safe operation of the system. A menu driven microprocessor controls the operations of the unit.

6.3.2. The hopper is fitted with doors that form an enclosure while waste is being processed. The hopper and chute are designed in accordance with NFPA 68 to withstand a 5-psig deflagration. The chute is fitted with a deflagration vent set at 1.5 psi to provide protection from excess pressure conditions. A carbon dioxide fire suppression system is connected to the hopper and the chute to provide additional safeguards. The in-feed doors of the hopper are fitted with limit switches to provide interlock capability with the nitrogen system and the operation of the mixer. All electrical components affixed to the hopper and chute are designed in accordance with National Electric Code (NEC) Class I, Division I requirements. The hopper and chute are constructed of carbon steel.

6.3.3. The Cascade Shredder is an electrically driven, low speed, high torque unit designed to reduce heat accumulation. A jam circuit is provided that automatically reverses the machine if it is overloaded. The shredder is supplied with an explosion proof motor with NEC Class I, Division I electrical components. Emerald will construct and operate a VOC emission control system where vapors are collected in a hood then routed through a series of carbon adsorption units. Subsection 8.4.4.1.7 provides additional information on implementation of this control system.

6.3.4. The mix tank is designed to withstand a 5-psig deflagration and is fitted with a deflagration vent set at 1.5 psi to protect the system from excessive pressure. The mixer contains an explosion proof Class I, Division I motor and electrical

components. Emission controls include a vent port located at the top of the mix tank for venting VOCs to the flare. All systems are electrically grounded to prevent accumulation of static charges.

6.4. Thin Film Evaporator

6.4.1. The Thin Film Evaporator System is specifically designed for solvent recovery. The unit has been designed and tested in accordance with the requirements of ASME Code, Section VIII. Installation of the unit was completed under the supervision of the manufacturer's process engineer. The evaporator is constructed of 316L stainless steel and 316 SS titanium stabilized clad to prevent corrosion of all parts coming into contact with the product. It is fitted with an explosion proof, NEC Class I, Division I, electrically driven motor which powers the internal rotor.

6.4.2. An air-operated diaphragm feed pump controls waste fed to the evaporator. The air-operated diaphragm pump also controls still bottoms. Overfill protection is provided by an ammeter located on the switchboard which indicates load on the rotor. An increase in amperage may mean the concentrate has become either too viscous, or that material is backing up in the evaporator.

6.4.3. Vacuum is controlled by a liquid ring vacuum pump fitted with a NEC Class I, Division I, explosion-proof motor coupled to an audible alarm to warn the operator of vacuum loss. Heating temperature is controlled at the hot oil heater control panel. During operations, oil pressure and temperature at three zones, vacuum, cooling water temperature, still bottoms and vapor temperature are all recorded and are used to determine process conditions.

6.4.4. Emission controls include a vapor vent kept under constant vacuum throughout the recycle run that is vented to the flare. The evaporator and its structure are electrically grounded to prevent the accumulation of static charges.

6.5. High Boiler Distillation

6.5.1. The High Boiler Distillation System is specifically designed for the safe and efficient operation for solvent recovery. It is constructed of 304 stainless steel. All systems meet ANSI and NFPA 70 requirements and are rated with NEC Class I, Division I electrical components.

6.5.2. A menu driven microprocessor controls the unit. This allows the unit to be operated simply using control buttons to select listed items, and make control settings from a variety of display menus. Temperature, pressure, oil temperature and vacuum are all controlled using the microprocessor. Overfill protection is provided by using high level alarms and trips. Feed to the distillation unit and machine shutdown can be performed automatically or manually. Other safeguards include high temperature and pressure alarms.

6.6. Glycol Recycling System

6.6.1. The control system is designed for minimum operator adjustment. This unit operates at a set vacuum and the concentration of the glycol product is determined by the boiling temperature of the system. Condensed water vapor and VOCs are evacuated from the distillation towers by vacuum and are collected in the vacuum vessel (V-1). VOCs are vented from the top of V-1 and routed to the gas conditioning vessel (V-3) and then the carbon adsorber (V-4). Water accumulation in V-1 is automatically removed by

pump when the water level triggers a limit switch. The limit switch activates the discharge pump.

6.6.2. Temperature of the distillation tower and evaporator is manually controlled. A manual control valve on the feed pump adjusts the feed rate to the unit. The product pump and the evaporator bottoms pump use manual control valves with site glasses to direct product streams to storage. If the operator must shut-down the unit for any reason, the unit will not restart without the operator resetting the control panel.

7. Process Management Practices

Dangerous wastes, blended fuels, used oil, and recycled product are routinely transferred from tanks, trucks, containers, and railcars located at various areas of the facility. The following provides a description of the process management practices to transfer those materials.

7.1. Transfer of Wastes and Products

7.1.1. The process systems and storage tanks at the facility are highly integrated; therefore Emerald uses a combination of process system pumps and piping, or a vacuum truck or skid vac, and hoses to transfer waste. For situations where a process pump is used, process system valves are opened (or closed) to connect the source to the destination and the transfer is initiated. For certain configurations, a flexible hose is connected between a hose connection on the suction or discharge side of a process pump, and an appropriate hose connection located on a storage tank, or process unit. A series of pumps are used for such transfer.

7.1.2. For situations where a vacuum truck or skid vac is used, the truck or skid vac temporarily holds liquid and pumps it to

a destination container, tank, railcar, or process unit. The vacuum truck is staged on Production Pad 1 or 4, or Load/Unload Area No. 1 before the transfer occurs. The skid vac is staged on Production Pad 1. A flexible hose is connected between the truck and the appropriate hose connection located at the destination unit. Hose connections are installed at various locations to allow transfer of materials into dangerous waste tanks. The fuel blend header piping is also fitted with hose connections to receive liquid material. A hose connection to the fuel blend header pipe is also installed within the secondary containment structure at Load/Unload Area No. 1.

7.1.3. All flexible hoses used to transfer wastes are maintained in good condition (i.e., free of leaks and excessive wear). Hoses with evidence of cracking, excessive wear or other defects are removed from use. Hoses are dedicated for DW fuels and compatible low Btu wastes, DW solvent, DW spent antifreeze, used oil, or product use. Hoses for product, used oil, and waste are different colors to prevent cross contamination of product. Upon completion of waste or product transfer, hoses are completely emptied via pump or manually by technician, also to prevent cross contamination of material. Procedures and criteria for inspecting hoses are included in Emerald's Inspection Plan, Section F.

7.1.4. With the exception of a short length of hose used to transfer spent antifreeze, flexible transfer hoses are located entirely within concrete secondary containment authorized for dangerous waste management. Any container staged for waste transfer (e.g., 55 gallon drum, tote, or vacuum truck) is also completely within such secondary containment.

7.1.5. With the exception of a short length of hose used to transfer spent antifreeze, any dangerous waste transfer piping outside of concrete secondary containment authorized

in the permit for dangerous waste management is within approved double walled piping meeting requirements in WAC 173-303-640(4)(f).

7.2. Transfer of Blended Fuel and Wastes Destined for Destructive Incineration to Railcars

7.2.1. Blended fuel and liquid waste mixtures destined for incineration can be transferred to railcars by process system pumps and piping directly from Tank Areas 2 or 3, Production Pads 1, 2, or 4, process area 2, and Load/Unload Area No. 1.

7.2.2. A vacuum truck can also be used to perform the transfer. An example would be to stage the vacuum truck on Production Pad 1, then remove material from tank D-300 via flexible hose connection at the side of the tank, and temporarily hold the contents in the truck. The truck would then be repositioned to Load/Unload Area No. 1, connecting a flexible hose to valve V-517 to transfer contents to the railcar.

7.2.3. A fixed skid mounted vacuum pump is primarily used to transfer material from dangerous waste tanks or containers into the railcars. It is positioned in Production Area 1 for easy accessibility to all areas of the facility.

7.2.4. Before transfer of waste to the railcar is initiated, a technician visually verifies that the railcar contains adequate volume to accommodate the transfer. Railcar levels are recorded on a daily log at the beginning of each morning shift to determine the maximum volume that can be added.

7.2.5. Railcars are labeled with appropriate DOT placards at all times. When a railcar is full and ready for shipment, a sample of the contents is collected in accordance with the

Waste Analysis Plan (see Section C). After completion of laboratory analysis and preparation of the necessary shipping papers, Tacoma Rail takes control of the railcar and transfers it to the appropriate interstate rail line.

7.3. Tank Labels and Identification

7.3.1. each tank storing dangerous waste is associated with the Glycol Recycling System, Fuel Blending System, Thin Film Evaporator, or High Boiler Distillation System. To aid with equipment identification, Emerald has identified each system with a Series Identification Number. The Glycol Recycling System is Series 200, Fuel Blending System is Series 500, the Thin Film Evaporator is Series 100, the High Boiler Distillation System is Series 800, and tanks that provide storage for Fuel Blending, Thin Film Evaporator, and High Boiler Distillation are Series 300. Tank D-502 was previously associated with the fuel blending system, but it's use was expanded to include waste destined for destructive incineration. The tank number is being maintained for simplicity at least until the next permit renewal period. Each storage tank is labeled with a letter prefix, followed by a three-digit identification number. The letter prefix identifies the type of tank, and the three-digit identification number signifies the associated process. Table D-14, Definition of Tank and Equipment Prefixes, provides a list of prefixes and description of the tanks and equipment.

Table D-14
Definition of Tank and Equipment Prefixes

Prefix	Description
D	Dangerous waste feed or storage tank
RT	Dangerous waste recirculation tank
MT	Dangerous waste mixing tank
C	Product tanks proposed for conversion to dangerous waste feed or storage and product intermediate tanks (C-803 and C-804).
W	Wastewater Tank
S	Vacuum Skid
E	Heat Exchanger/Condenser
V	Valve
F	Filter or Flange
CH	Chute
SG	Slide Gate
SC	Screwed Connection
S	Misc. Equipment (shredder and vac skid)
M	Mixer
T	Glycol Evaporator Tower
VE	Vessel
VP	Vacuum pump
H	Hopper
P	Pump (diaphragm, centrifugal, or gear pump)

7.3.2. As an example, the DW feed tank associated with the Thin Film Evaporator System is numbered D-100. With this application, Emerald is proposing to permit several additional tanks for dangerous waste storage (D-310, D-312, D-314, D-311, D-315 and D-209).

7.3.3. Tanks containing dangerous waste are also labeled with the symbol "DW" to warn employees, emergency response personnel, and the public of the major risk(s) associated

with the materials being stored in the tank. Emerald has adopted NFPA 704, "Standard System for the Identification of the Fire Hazards of Materials for Emergency Response" to also aid in identifying the major risks associated with the waste. This nationally recognized system utilizes a diamond divided into four quadrants. Each quadrant represents a specific consideration; the left, blue quadrant refers to health; the top red quadrant pertains to flammability; the right, yellow quadrant is for reactivity; and the bottom white quadrant highlights special information. In addition, a number from 0 through 4 indicates the relative risk of the hazard with 0 being the minimum risk and 4 being the highest risk. Each tank label and corresponding identifiers are legible at a distance of at least 50 feet.

7.4. Management of Ignitable Wastes in Tank Systems

7.4.1. All Tank Areas and Process Areas, with the exception of the Glycol Recycling Area, hold storage tanks which may contain Class I flammable liquids. These tanks are situated in accordance with IFC, Table 7902.2-A 'Stable Liquids with Operating Pressure of 2.5 psig, or Less'. For vertical tanks with "protection for exposures", the minimum distance from a dry land property line is equal to the diameter of the tank. "Protection for exposures" is defined as protection by a public fire department capable of providing cooling water streams on structures on property adjacent to liquid storage. Table D-15 Minimum Distance: Tank-to-Property Line, shows the tank area, nearest tank to property line for each tank area, minimum distance required and the actual distance.

Table D-15
Minimum Distance: Tank-to-Property Line

Location	Nearest Tank to Property Line	Minimum Distance from Nearest Property Line (ft)	Actual Distance from Property Line (ft)
Tank Area 1	D-100	9	43
Tank Area 2	D-301	10	80
Tank Area 3	D-502	11	95
Process Area 2	D-312	3' 8.5"	51
Process Area 1	D-101	4	57
Production Pad 1	MT-500	2' 3"	96

7.4.2. Separation between adjacent tanks containing stable liquids is in accordance with IFC, section 7902.2.3.1 and Table 7902.2-G. Table D-16, Minimum Separation between Tanks, shows the minimum separation between tanks containing Class I flammables as measured from shell to shell. The table includes the tank area, adjacent tanks, minimum separation, and actual separation. The minimum separation for fixed roof tanks containing Class I Flammables is equal to 1/6 of the sum of adjacent tank diameters, but not less than 3 feet.

Table D-16
Minimum Separation between Tanks

Area	Adjacent Tanks	Minimum Separation (ft)	Actual Separation (ft)
Tank Area 1	D-311 has 3 adjacent tanks: D-100 = 9 ft diameter D-310 = 8 ft diameter D-315 = 8 ft diameter Sum of diameters ÷6 = 4.1 ft	4.1	D-100 & D-311 = 4.1 D-311 & D-315 = 5.5 D-311 & D-310 = 9.0
Tank Area 2	D-300 has 1 adjacent tank: D-301 = 10 ft diameter Sum of diameters ÷6 = 0.83 ft	3	D-300 & D-301 = 3
Tank Area 3	D-502 has 1 adjacent tank; D-314 = 9.5 ft diameter Sum of diameters ÷ 6 = 3.33 ft	3.33	D-502 & D-314 = 6
Production Pad 1	MT-500 has no adjacent tanks within Production Pad 1; nearest tank is D-301 D-301 = 10 ft diameter Sum of diameters ÷ 6 = 2.4 ft	3	MT-500 & D-301 = 7′8″
Process Area 1	D-101 has two adjacent tanks within Process Area 1: C-103 = 6 ft length (rectangular) C-105 = 7 ft diameter	3	D-101 & C-103 = 2′ D-101 & C-105 = 2′3″
Process Area 2	D-312 has two adjacent tanks within Process Area 2: C-101 = 3 ft 8 inches RT-500 = 5 ft	3	D-312 & C-101 = 5′5″ D-312 & RT-500 = 4′8″

8. Air Emission Control

WAC 173-303-806(4)(j), (k) and (m), 110 690, 691, 692; [40 CFR 270.24, 270.25, 270.27, Part 264 Subparts AA, BB, and CC]

This section provides information on how Emerald will manage and control volatile organic compound (VOC) emissions from containers, existing tanks, equipment and process systems. The information includes emission controls on the process vents (Fuel Blending System, Thin Film Evaporation, High Boiler Distillation, and Glycol Recycling System), leak detection and repair (LDAR) compliance protocols for equipment leaks, and compliance protocols for tanks and containers. Emerald proposes to install additional dangerous waste storage tanks following Permit approval (currently identified as D-310, D-312, D-314, D-311, D-315, and D-209.) Air emission control information and updated LDAR Tables will be provided once installation is complete as part of a permit modification needed to authorize these tanks for dangerous waste management service.

8.1. Process Vents

WAC 173-303-806(4)(j), 110, 690; [40 CFR 270.24, 264.1030-264.1036 (subpart AA)]

Process vents are connected to a vacuum system that provides off-gas ventilation to the Thin Film Evaporator and High Boiler Distillation Systems. The Glycol Recycling System also has a process vent that is connected to a carbon adsorber. These process vents are discussed below.

8.1.1. **Process Vents Subject to Subpart AA Standards**

WAC 173-303-690; [40 CFR 270.24(b), 264.1030, 264.1034(d), 264.1035(b)(2)]

8.1.1.1. The Glycol Recycling, Thin Film Evaporator and High Boiler Distillation Systems are described in Section D.1, Process Description. Piping and instrumentation diagrams for the systems are presented in Section D.4.5, Process and Flow-Through Equipment. The Glycol Recycling System vents to a carbon adsorber for control of VOC emissions. The Thin Film Evaporator and High Boiler Distillation systems have an associated ventilation system that is connected to a flare to control VOC emissions. The vent systems for the Thin Film Evaporator and High Boiler Distillation System are described in detail in Section D.8.1.4.12, Design Information for Vent Systems and Flare. Section D.8.1.4.13, Design Information for Carbon Adsorption, describes the vent system for the Glycol Recycling System. Subpart AA does not apply to the Fuel Blend System as the System does not have process vents, although emissions from parts of that system are directed to the flare.

8.1.1.2. The three process units are located within the containment of Process Areas 1 and 2, Production Pad 1, and the Glycol Process area. Figure D-21, Process Unit Locations, is a plan view diagram showing the locations of the three process units within the facility. Figure D-22, Process Vent Systems Piping and Instrument Diagram, is a schematic diagram that shows which portions of the three units are considered to be Subpart AA Closed Vent Systems.

8.1.1.3. The Glycol Recycling System includes a distillation system that recycles glycol containing wastes with an organic content that exceeds 10 ppm by weight. Therefore the process vent on the system is subject to 40 CFR Subpart AA standards.

8.1.1.4. For air emission considerations, the Glycol Recycling System is comprised of two sections, the feed tanks and the vacuum distillation. The feed tanks operate under positive pressure, but are only vented to the atmosphere through the Level 1 tank vent control devices. The vacuum distillation section is a closed system where liquids are drawn through three evaporator towers by the vacuum pump. This section operates under negative pressure. VOC emissions from the distillation section are only vented from one process vent – the exhaust of the vacuum pump. These emissions are routed through a gas conditioning unit then to a carbon adsorption system to control VOC emissions.

8.1.1.5. Each of the process units operates on a batch-basis system. The Emerald facility has the capability to operate the process units intermittently around the clock. The operating throughput of feed material through each of the on-site process units is presented in Exhibit D-21, Process Units Operating Throughput (this Exhibit is included for information purposes only; it is not a part of the Permit). The operating throughput values are based on previous volumes processed, anticipated future plant operational capabilities and account for potential business growth. These are not operational limitations; rather what Emerald anticipates managing in the near future.

8.1.2. Process Vents Not Subject to Subpart AA Standards

All process units handle materials that exceed 10 ppmw of VOCs. Therefore, all process units are subject to 40 CFR Subpart AA standards.

8.1.3. Re-evaluating Subpart AA Applicability

WAC 173-303-690; [40 CFR 270.24(b) and (d), 264.1030, 1035]

8.1.3.1. VOC emission control technology is installed on all process vents subject to 40 CFR Subpart AA. Therefore, no re-evaluation of Subpart AA applicability will be necessary for those process vents if they continue to be operated under conditions described in this application. Also, for purposes of Subpart AA applicability, it is assumed that the VOC concentration of future feed materials will be above the specified 10-ppmw threshold.

8.1.3.2. If there are any operational changes affecting a process vent that could result in an increase in emissions, Emerald will do a new emissions determination and place that information in the operating record in accordance with WAC 173-303-690(2) (40 CFR 264.1035(b)(2)(ii)). The new determination will be signed and dated in accordance with WAC 173-303-690(2) (40 CFR 264.1035(b)(4)(iv) and (v)).

8.1.4.**Subpart AA Compliance Demonstration**

WAC 173-303-806(4)(j), 110, 690; 40 CFR 270.24, 264.1030-264.1036]

8.1.4.1. Subpart AA includes process vent VOC emission limits requiring that total controlled emissions be less than 3.1 tons per year and 3.0 pounds per hour. Compliance with Subpart AA can be achieved by either meeting the emission limits, or by achieving an overall process vent reduction of 95 percent. Emerald's flare and glycol carbon adsorption unit are designed and operated to achieve 95% reduction in compliance with WAC 173-303-690(2) (40 CFR 264.1032(a)(2)). Table D-17, Summary of Process Vent Emissions, shows the uncontrolled and controlled VOC emissions from the process vents, including emissions from the Cascade Shredder (not vented to the flare) and the Dispersion System that are not considered process vents.

8.1.4.2. Emission factors from EPA Publication AP-42, Section 4.7 (Waste Solvent Reclamation), were used to calculate uncontrolled emissions from the process vents. Engineering calculations were used for the Glycol system to document compliance by calculating uncontrolled emissions from the process vent. Sampling data used in the calculations is from two sources- samples collected by Emerald at the Tacoma facility and data presented in a Washington Department of Ecology Study of Waste Antifreeze. The determination of VOC emissions is provided in Exhibit D-18, Glycol VOC Emissions. This analysis considers vent stream composition, constituent concentrations, flow rate, relative humidity and temperature. In compliance with WAC 173-303-690(2) (40 CFR 264.1033(f)(1)), this system has a flow indicator that allows the operator to record flow to the

glycol carbon adsorber once every hour. Information regarding the flow indicator is provided in Exhibit D-24.

8.1.4.3. In order to determine worst case values, the facility's maximum potential yearly and hourly feed throughput values are used.

8.1.4.4. A minimum destruction efficiency of 95 percent is demonstrated for the flare and glycol carbon absorption system. It is believed that the more realistic flare efficiency is close to 99 percent. This is based on published test results summarized in a 1982 report by Engineering-Science for the Chemical Manufacturers Association (CMA), and design information dated December 14, 1990 from the John Zink Company (the flare manufacturer) stating the destruction efficiency is equal to that published in the CMA report. The pertinent pages of the flare test report are provided in Exhibit D-12, Flare Efficiency Information.

8.1.4.5. The design information from John Zink for the flare is provided in Exhibit D-13, Flare Design Data. The design basis for the flare is 200 scfm for vent gas and 55 scfm for natural gas.[1] In calculating worst case requirements for the flare operation, John Zink assumed the organic vapor concentration in the vent gas to the flare was zero.

8.1.4.6. Since this is a nonassisted flare, the minimum net heating value of the gas being combusted must be 200 Btu/scf or greater (WAC 173-303-690(2) (40 CFR 264.1033(d)(3))). To ensure this during operation the ratio of vent gas to natural gas will be equal to or

[1] Natural gas is called "assist gas" in Exhibit D-13. However, Emerald's flare is a "non-assisted flare" as that term is used in 40 CFR 1033(d).

greater than 4 to 1.[2] In addition, the flow of vent gas to the flare will not exceed 200 scfm.

8.1.4.7. At the time of installation, the only process unit served by the flare was the Thin Film Evaporator. The vacuum pump (VP-600) which received vapors from the Thin Film Evaporator is sized to discharge 39 cfm. Therefore, the flare capacity is sufficient to properly handle additional vapor from the High Boiler Distillation and Fuel Blending Systems as long as conditions are met as outlined in Exhibit D-13 (i.e., the Dispersion Unit will not be operated during start-up of either the Thin Film Evaporator or High Boiler Distillation Unit). Table D-19 itemizes the current process units that are served by the flare.

8.1.4.8. As shown in Table D-17, uncontrolled emissions from process vents are greater than the 3.1 tons per year and 3.0 pounds per hour limits emission limits in 40 CFR 264.1032(a)(1). Therefore, Emerald will demonstrate that the flare and the glycol carbon adsorption unit are designed and operated to achieve 95% percent reduction in compliance with 40 CFR 264.1032(a)(2).

8.1.4.9. Certification statements outlined in WAC 173-303-806(j)(iv)(D) and (E) are included in Exhibit D-23. The statements confirm that operating parameters reasonably represent the conditions that exist for dangerous waste management units, and that control devices are designed to operate at an efficiency of at least 95 weight percent. See also Exhibits D-12, D-13, and D-18.

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[2] This assumes using natural gas with a heating value of at least 1000 Btu/scf. If Emerald uses another fuel this ratio will be adjusted to ensure a overall net heating value to the flare of at least 200 Btu/scf.

Save for Table D-17, Summary of Process Vent Emissions

8.1.4.10. The design analysis for the carbon adsorption system for the glycol operation also establishes the design outlet organic concentration level, capacity of carbon bed, and design carbon replacement interval (see Exhibit D-18). This design analysis provides a demonstration that Emerald meets requirements in 40 CFR 26.1032(a)(2). The design analysis is subject to revision based on operating experience with the system. If Emerald changes operations that could result in increased organic emission, Emerald will provide a new determination in accordance with 40 CFR 264.1035(b)(2)(ii) and a new certification statement in accordance with WAC 173-303-806(j)(iv)(D) and (E).

8.1.4.11. There are several requirements stipulated in Subpart AA where subject facilities with process vents must achieve compliance. Table D-18, Subpart AA Requirements and Compliance Demonstration Summary, presents the pertinent Subpart AA requirements for the Emerald process closed-vent system and flare, and glycol carbon adsorption system, and the corresponding compliance methods implemented by Emerald. The design details for the process vents and flare are provided in Section D.8.1.4.12. Design details for the glycol carbon adsorption system are provided in Section D.8.1.4.13.

8.1.4.12. Design Information for Vent Systems and Flare

WAC 173-303-806(4)(j)(iv), 110, 690; [40 CFR 270.24(d), 264.1032(b), 264.1033, 264.1034, and 264.1035]

8.1.4.12.1. Closed Vent Systems. The process vent systems are designed to capture VOC-laden off-gas from the process units and exhaust it through

dedicated piping to the flare. The Thin Film Evaporator and the High Boiler Distillation System each have a vacuum pump to draw a vacuum through the process unit. In compliance with 40 CFR 264.1033(f)(1), each of these systems have a flow indicator that records flow to the flare once every hour. The vacuum pump in the High Boiler System exhausts to the closed-vent system and the flare. The Dispersion System is purged with nitrogen thereby causing VOC-laden off-gas to exhaust to the flare. VOC-laden off-gas and non-condensable vapors are pumped through ventilation piping. Figure D-22, Process Vent Systems, shows the closed-vent system for the fuel blending, high boiler distillation, and thin film evaporator systems. The Vacuum System Utility is described in Section D.4.5.3 and a piping and instrumentation diagram for the Vacuum System Utilities is provided on Figure D-15.

Save for Table D-18, Subpart AA Requirements and Compliance Demonstration Summary

Save for Table D-18 (page 2)

8.1.4.12.2. Table D-19, Process Ventilation Flow Rates, provides a breakdown of the gas flow rates for the three process vent systems. The total flow rate into the combined vent system is lower than the 200-scfm design flow rate for the flare (not including the flow of natural gas). Therefore, the flare is adequate to control vapors from the three process vents.

Table D-19
Process Ventilation Flow Rates

Process Unit	Vacuum Pump ID No.	Flow Rate to Flare (scfm)
Dispersion System	No pump (N2 purge)	62
Thin Film Evaporator	VP-600	39
High Boiler Distillation	VP-800	0.3

8.1.4.12.3. The flare is a 30-foot high, self supported carbon steel unit. It was constructed by the John Zink Company and is model number EEF-U-4. The flare system is non-assisted and equipped with an energy efficient EEP pilot, a weatherproof flame front generator, and a 4-inch flame arrestor. The flare is part of the closed-vent system designed and dedicated to exclusively control VOC off-gas from the Fuel Blend System, High Boiler Distillation System and Thin Film Evaporator. The piping configuration relies upon vacuum-assist and nitrogen purge elements to enhance VOC gas flow to the flare. Accordingly, in order to maintain proper gas flow, the system is designed to accommodate only the three specific gas streams and it does not

provide a means where any other constituents could be directed into the closed-vent system. In addition, flow prevention devices are included to assure VOC laden gases only flow to the flare thereby eliminating any opportunity to vent to the atmosphere.

8.1.4.12.4. Exhibit D-13, Flare Design Data, provides detailed specifications and data sheets from John Zink Company on the flare equipment.

8.1.4.13. Design Information for Carbon Adsorption for Glycol Operation

WAC 173-303-806(4)(j)(iv), 110, 690; [40 CFR 270.24(d), 264.1032(b), 264.1033, 264.1034, and 264.1035]

8.1.4.13.1. The carbon adsorption system is a fixed-bed canister that does not regenerate the carbon bed directly onsite in the control device. The canister contains approximately 180 pounds of virgin granular activated carbon designed for use in low-flow gas phase applications. Calgon BPL 4x6 GAC (or equivalent) is an acceptable product. The design VOC removal efficiency is greater than 98 percent; however, to be conservative, 95 percent control efficiency is used in calculating VOC emissions. Documentation obtained from the Calgon Carbon Corporation (the carbon manufacturer) is provided for Calgon BPL 4x6 granular activated carbon in Exhibit D-18, Glycol VOC Emissions. Also included in Exhibit D-18 are specifications for an equivalent type of carbon, VOCarb® 46 and 410. Either the Calgon BPL or VOCarb® carbon will be used by Emerald for the carbon adsorption system. Other types of carbon will be used only following approval

by Ecology. The design analysis provides a carbon usage type and design replacement interval. The carbon replacement interval based upon vent stream parameters reasonably expected to occur is 600 days of continuous GRS service.

8.1.4.13.2. The process gas stream exhausted from the Glycol evaporation towers contains NOx and SOx residual constituents which are derived from corrosion inhibiting materials in the spent antifreeze. The exhaust gas passes thru a "gas conditioning unit" prior to entering the carbon adsorber. The gas conditioning unit contains carbon supplemented with potassium permanganate to remove the NOx and SOx constituents.

8.1.4.14. Compliance Re-evaluation Schedule

WAC 173-303-860(4)(j)(ii) and (iv), 690; [40 CFR 270.24(b), 264.1030, 264.1035(b)(2) and (4)]

Compliance with Subpart AA will be re-evaluated if the facility proposes process unit changes, or if the RCRA Part B Permit is changed to add new categories of wastes. Such changes might require a re-evaluation of Subpart AA compliance.

Re-evaluations will be accompanied with the appropriate certification statement as required in WAC 173-303-806(4)(j)(iv).

8.2. Equipment Leak Monitoring (Subpart BB)

WAC 173-303-806(4)(k), 110, 690, 691; [40 CFR 270.25, 264.1050-264.1065

8.2.1. This section describes the leak detection and repair (LDAR) program that Emerald will conduct to comply with the requirements of Subpart BB. The LDAR monitoring program will be conducted at the Thin Film Evaporator, the Fuel Blending System, the High Boiler System, and the Glycol Recycling System. These systems include all of the processing and storage tank systems, including associated equipment as defined by WAC 173-303-691 (40 CFR 264.1050).

8.2.2. The specific methods to conduct the LDAR program are described in the following subsections. In summary, the required monitoring, inspection and repair procedures that are stipulated by Subparts AA and BB are itemized in Table D-20, Required Monitoring and Inspections for Leak Detection and Repair. A summary of the required recordkeeping and reporting requirements is given in Table D-21, Recordkeeping and Reporting for Leak Detection and Repair.

8.2.3. Emerald has developed a database management system to schedule and track the LDAR monitoring and inspections, and to compile the required records and agency reports. Exhibit D-14, LDAR System Information, describes the database management system and provides a copy of typical records.

8.2.4. The glycol containing dangerous waste received at Emerald is a liquid at operating conditions. The vapor pressure of pure glycol is about 0.008 kPa (0.06 mm Hg at 68 F). There

are situations where the antifreeze and glycol-containing wastes received at the Emerald facility may be contaminated with VOC constituents. In accordance with the facility Waste Analysis Plan, a waste is only accepted if it is within the limitations specified in the "VOC Level 1 Screen". This assures that no waste placed into the Glycol System will exceed a vapor pressure of 76.6 kPa (11.1 psia or 574 mm Hg at 25 C).This is also a limitation for placement of any wastes into Tank D-210 (DW Glycol Tank). Tank D-209 has a vapor pressure limit of 27.6 kPa.

8.2.5. Various equipment including pumps, valves, and mechanical connections in the Glycol System are subject to the requirements of Subpart BB. The equipment is managed as "heavy liquid service" in accordance with the requirements specified under WAC 173-303-691, 40 CFR 264.1031, and 40 CFR 264.1051. However, due to the presence of VOC contaminants even though very low, Emerald considers such equipment as "light liquid service", and will meet the leak monitoring provisions specified below.

8.3. Process Devices Subject to LDAR Requirements

8.3.1. Components Subject to LDAR: Exhibit D-15 (this Exhibit is provided for information purposes only; it is not a part of the Permit) lists each component at Emerald that is subject to LDAR under Subpart BB, as well as components that are not subject to LDAR under Subpart BB. In accordance with the RCRA requirements, Exhibit D-15 lists the following information for each individual component subject to LDAR:

- Process area where the component is located: Figure D-21 shows the general location of each process area.
- Unique identification number - each component at the facility is fitted with a waterproof tag that gives its identification number.

- Designation of the type of component, and the type of waste handled by the component (gas, light liquid, or heavy liquid).
- Indication of whether Emerald has declared the component to be "Difficult to Monitor" and therefore subject to a reduced frequency of inspection.
- Monitoring frequency and type of monitoring. If "OVA" is indicated as the monitoring method, then EPA Method 21 (using handheld FID) will be used (see Note 1).

Note 1: The required monitoring frequency for the valves is subject to change, as described in Table D-20, depending on the method that Emerald chooses to designate the frequency of valve leaks.

Table D-20, Required Monitoring and Inspections for LDAR

Table D-21, Recordkeeping and Reporting for LDAR

Table D-21, Page 2

8.3.2. If Emerald chooses to aggregate all of the valves at the facility into the "2% Leak Group" as allowed under WAC 173-303-691(2) (40 CFR 264.1061), then the valves included in that group will be identified in the "2% Valve" column.

8.3.3. Components Exempted from LDAR - Exhibit D-15 (this Exhibit is provided for information purposes only; it is not a part of the Permit) lists all components at the facility that Emerald declares to be exempted from the LDAR requirements. The table includes the following rationale for excluding any individual component:

- The component handles material that is not a Federal- or State-regulated waste.
- The component handles gas under vacuum and is not part of a Subpart AA closed vent system, and is therefore exempted from monitoring under WAC 173-303-691(1)(e).

8.3.4. Special Components Not Used by Emerald – Emerald does not currently use any of the following types of equipment that would otherwise trigger special monitoring and recordkeeping requirements under RCRA:

- Components declared as "Unsafe to Monitor".
- Pumps and compressors that are declared as "no detectable emissions" because they use dual mechanical seals.
- Components that use closed vent systems to control fugitive emissions in lieu of LDAR monitoring and repair.

8.3.5. **Re-evaluating LDAR Applicability**

WAC 173-303-691(1) and (2), 110; [40 CFR 264.1063(d)-(g), 264, 1064(k)]

The specific components that are subject to LDAR could change in the future under the following circumstances:

- Major Process Changes - If Emerald makes major modifications to the process units, or changes the composition of the feed material, the RCRA applicability for some of the components could change.

- Routine Piping Changes – Emerald could make minor changes to the piping without changing the process unit. This could result in either adding or removing individual components. In such an instance, Emerald will continue to maintain a list of the components subject to the requirements, and continue to conduct the appropriate LDAR program for each component.

8.3.6. **Compliance Demonstration for LDAR Requirements**

WAC 173-303-806(4)(k), 691; [40 CFR 270.25, 264.1050-264.1065]

Tables D-20 and D-21 itemize the requirements for monitoring, inspections, repair methods, recordkeeping, and reporting that are required for LDAR under Subparts AA, BB and CC. Emerald has implemented a computerized database management system that will track and schedule the required LDAR monitoring and inspections, document the results of the monitoring, archive records of the monitoring and repair activities, and prepare reports. This section briefly describes the database management system. Exhibit D-14

presents examples of each of the records and reports that are generated by the database system.

8.3.7. **Procedures to Identify and Mark Equipment Subject to LDAR**

The database will prepare a list of each component subject to LDAR and a separate list of each component exempted from LDAR (see Exhibit D-15 (this Exhibit is provided for information purposes only; it is not a part of the Permit)). Emerald will affix a permanent label to each component listed in either of those two tables. Emerald will also keep on file a facility layout diagram that shows the general location of each process area that has components subject to LDAR (see Figure D-21).

8.3.8. **Procedures to Keep and Update Required Records.**

WAC 173-303-806(4)(k), 691; [40 CFR 270.25, 264.1050-264.1064]

8.3.8.1. The database generates the following records and reports as required by Subparts AA, BB and CC:

- Unique identification number for each component, and the approximate location of each component.
- Waste type handled by each component.
- Monitoring frequency and monitoring method for each component.
- List of the components that Emerald declares are exempt from LDAR, including a rationale for the exemption.
- Lists of each component that is either in vacuum service, "difficult to monitor", or "unsafe to monitor". Currently, Emerald is not declaring any components as "unsafe to monitor".
- Instrument calibration information.

8.3.8.2. Records are maintained as part of the facility operating record for a minimum of three years.

8.3.8.3. If Emerald uses equipment designated for "no detectable emissions", then Emerald will maintain a list of the exempted units and will conduct the required one-time monitoring. Currently, Emerald has no such equipment.

8.3.8.4. If Emerald uses pumps or compressors that are exempt from LDAR because they use dual mechanical seals, then Emerald will maintain a list of those exempted components. Currently Emerald does not use any such equipment.

8.3.8.5. Current LDAR Records

Exhibit D-15 (this Exhibit is provided for information purposes only; it is not a part of the Permit) includes a blank copy of the most recent LDAR records that are required under Subparts AA, BB and CC. In the future, Emerald will prepare updated LDAR records that are based on the then current facility configuration, and LDAR monitoring results.

8.3.8.6. Use of Closed Vent Systems Instead of LDAR

WAC 173-303-806(4)(k), 110, 690 691; [40 CFR 270.25, 264.1033-264.1035, 264.1052-264.1055, 264.1059, 264.1060, 264.1063]

Emerald does not intend to use closed vent systems to control fugitive emissions from piping components in lieu of conducting LDAR. Therefore, this Part B Permit Application does not include any information on any such closed vent systems.

8.4. Tanks, Equipment and Containers Subject to Subpart CC

WAC 173-303-692; [40 CFR 270.27, 270.15, 270.16, Part 264 Subpart CC]

This section describes how Emerald will comply with the requirements of Subpart CC for tanks and containers. In summary, the Subpart CC requirements for tanks and containers are itemized in Table D-22, Requirements for Subpart CC Tanks and Containers. As described in the following subsection, Emerald will comply with the emission control requirements by maintaining the composition of the waste within the concentration limits for Level 1 tanks and Level 1 containers in most units. However, Tank D-100 and totes containing solvents meet the criteria for Level 2 control for tanks and containers, respectively.

Table D-22, Requirements for Subpart CC Tanks and Containers

Table D-22, page 2, Requirements for Subpart CC Tanks and Containers

8.4.1. **List of Tanks Subject to Subpart CC**

WAC 173-303-692; [40 CFR 264.1080, 264.1082, 264.1084]

Table D-23, List of Tanks Subject to Subpart CC, lists all of the tanks that are subject to Subpart CC. The table itemizes the following information for each tank:

- Unique identification number
- Approximate location within the facility
- Storage capacity of each tank and container
- Indication of whether the tank is subject to Level 1 or Level 2 controls.

8.4.2. **Emission Control Method for Tanks and Containers**

WAC 173-303-692; [40 CFR 264.1080, 264.1082, 264.1084, 264.1086]

For the Level 1 and Level 2 tanks, Table D-23 specifies the design of the conservation vent. Containers are not listed in Table D-23. The containers used at the facility, including Level 2 containers (totes), meet DOT specifications for packaging hazardous materials and are not subject to special vapor controls with the exception of process containers used for accumulation of still bottoms from the high boiler distillation process. The still bottoms (see Section 1.2.2.8) from the high boiler distillation process are removed from the unit while they are hot and must be placed in containers with pressure-relief valves built into the lids to allow for cooling prior to the container being moved to a storage area.

Level 1 containers and container management operations will meet all requirements in WAC 173-303-692(2) (40 CFR 264.1086(c)). Level 2 containers and container management

operations will meet all requirements in WAC 173-303-692(2) (40 CFR 264.1086(d)).

8.4.3. **Verification of Level 1 and Level 2 Waste Types for Tanks**

WAC 173-303-692; [40 CFR 264.1080, 264.1083)

Emerald manages Level 2 waste types in Tank D-100. This tank is vented to the flare during operation of the Thin Film Evaporator (see Section 1.2.1). For all other management processes, the vapor pressure of the liquid waste materials handled in the tanks at the Emerald facility is far below the 76.6 kPa (11.1 psia) limit for tanks which are less than 20,000 gallons in capacity, and 27.6 kPa for Tank D-209. Therefore, with the exception of Tank D-100, the facility meets the requirements for applying Level 1 controls on the Subpart CC tanks. This is verified by following the procedures set forth in the facility Waste Analysis Plan (see Section C) to obtain a constituent breakdown by weight percent for the incoming waste streams. Material Safety Data Sheets (MSDSs) and other information used to complete waste profiles kept on file for the individual solvent components found in these waste streams are also used to obtain the pertinent vapor pressures.

Table D-23 – List of Tanks Subject to Subpart CC

8.4.4. **Subpart CC Compliance Demonstration**

WAC 173-303-806(4)(m); [40 CFR 270.27(a)(1)-(a)(3) and (a)(5)-(a)(6)]

8.4.4.1. Emerald will comply with all of the Subpart CC requirements as itemized in Table D-22. The key compliance methods are described below.

8.4.4.1.1. Level 1 Waste Applicability. Emerald will track the composition of the feed materials to the process units to ensure that it satisfies the vapor pressure limits for Level 1. Emerald will use waste analysis results and MSDSs to assure the vapor pressure corresponding to the composition of the feed material is Level 1 waste. These are the same feed materials that are managed in Tank D-100. However, due to the elevated temperature of feed materials in Tank D-100, it is subject to Level 2 controls (see below).

8.4.4.1.2. Level 2 Waste Applicability. Level 2 waste is managed in totes and in Tank D-100. All totes managing volatile waste streams meet DOT specifications for the waste being shipped, and inspections are conducted according to DOT regulations. Any removal or transfer of level 2 waste from totes is conducted in accordance with requirements outlined in 40 CFR 265.1087(d)(2) and (3).

8.4.4.1.3. Tank Level 1 Conservation Vents. As listed in D-23, List of Tanks Subject to Subpart CC, each of the Level 1 tanks is a fixed roof design, and is equipped with a conservation vent designed to comply with local fire codes (with the exception of

tank MT-500, which does not have a conservation vent). Exhibit D-16, Conservation Vents, provides engineering details for the conservation vent on each tank.

8.4.4.1.4. Tank Level 2 Controls. Tank D-100 is a Level 2 Tank due to the elevated temperature of the feed material that is recirculated through the tank during operation of the Thin Film Evaporator. During operation, this Thin Film Evaporation process is vented to the flare. Once the Thin Film Evaporator process is shut down, the contents of tank D-100 are allowed to cool As the cooling process continues, any VOC laden gases are contained within the tank as they condense back into the waste still bottoms. This is in compliance with requirements for Level 2 tanks as outlined in 40 CFR 265.1085(d)(3).

8.4.4.1.5. Transfer of Material Into Railcars. Emerald uses a submerged fill method to load the railcars with blended fuel material and low Btu waste mixtures destined for incineration. This method minimizes VOC release to the atmosphere.

8.4.4.1.6. Dispersion System. The dispersion system is in operation fewer than 300 hours per year and is therefore not subject to Subpart BB controls.

8.4.4.1.7. Cascade Shredder. VOC emission controls for the Cascade Shredder will be implemented through a permit modification. The conceptual design approved by Ecology is presented in Exhibit D-26.

8.4.4.1.7.1. The implementation schedule for the VOC emission control system is as follows:

8.4.4.1.7.1.1. Emerald will provide a detailed engineering design for the VOC emission control system by January 15, 2010. This date is based on the anticipated date of Permit issuance and is subject to change.

8.4.4.1.7.1.2. Emerald will report to Ecology on the selection of equipment for the VOC control system within 60 days after Ecology approves the engineering design referenced in subsection 8.4.4.1.7.1.1

8.4.4.1.7.1.3. Emerald will complete construction of the VOC control system within 90 days after Ecology approves selection of equipment referenced in subsection 8.4.4.1.7.1.2.

8.4.4.1.7.1.4. Emerald will complete start-up testing of the VOC control system and report the results to Ecology within 60 days after Ecology approves construction of the unit referenced in subsection 8.4.4.1.7.1.3.

8.4.4.1.7.1.5. Emerald will identify final performance characteristics of the VOC control system and report results to Ecology within 90 day after Ecology approves results of start-up testing referenced in subsection 8.4.4.1.7.1.4.

8.4.4.1.7.2. Final approval of the VOC emission control system will be processed through a class 1 permit modification with prior agency approval if the final design and operation are consistent with the conceptual design in Exhibit 26. If Ecology determines the substantially different than that conceptual design a higher class permit modification will be required.

8.4.5. **Subpart CC Inspections, Monitoring and Repair**

All of the Subpart CC tanks are included in the LDAR program. Each of the conservation vents on the Level 1 and Level 2 tanks will be inspected annually. The Emerald LDAR program is described in detail in Section D.8 of this application, and in Exhibit D-14. Emerald has implemented a computerized database management system to schedule the required inspections, archive the results of each inspection, document the completion of any needed repairs, and prepare all required Agency reports. The database tracks all LDAR activities for components subject to Subparts AA, BB or CC.

8.4.6. **Records and Reports**

WAC 173-303-692(2) [40 CFR 264.1089-1090]

Emerald will prepare all required records and reports as indicated in Table D-21. Emerald will maintain copies of these records and reports at the facility for 3 years.

8.4.7. **Transfer of Material Through Shredder**

The containers used in the transfer of bulk material through the Cascade Shredder meet DOT specifications for packaging dangerous wastes. The Cascade Shredder is operated for fewer than 300 hours per year, and each transfer operation through the Cascade Shredder is conducted in less than 15 minutes.

9. Waste Minimization

WAC 173-303-380(1)(q), 390(2)(g) and (h);

Emerald has prepared a Waste Minimization Plan in accordance with EPA guidance. This Waste Minimization Plan, current on March 2008,

is included as Exhibit D-17 (this Exhibit is included for information purposes only; it is not a part of the Permit). No less than annually, Emerald will certify that they have a program in place to reduce the volume and toxicity of dangerous waste they generate to the degree economically practicable and in accordance with WAC 173-303-380(1)(q). Emerald will keep this certification and method available to minimize present and future threats to human health and the environment in their operating record. Results of these efforts will be reported in the annual report in accordance with WAC 173-303-390(2)(g) and (h).

Part B

Section D
Figures D-1 thru D-25

Changes to location or nomenclature of flanges, valves, and connectors in Figures D-13 through D-17b will not require a permit modification (WAC 173-303-691 (40 CFR Part 264 Subpart BB))

TO WASTE RECYCLING OPERATIONS
(TANK D–100)

TO RAILCAR LOADING

HOSE CONNECTION
(VACUUM/TANK TRUCK FROM LOAD/UNLOAD AREA NO. 1)

MIXER

ECD

MIXING TANK
(D–502)

HOSE CONNECTION

ECD

STORAGE TANK
(RT–500)

P–500

VACUUM/TANK TRUCK CONNECTION

HOOD

CARBON ADSORBERS

ECD

HOPPER
(H–501)

SHREDDER
(S–500)

CH–501

SLIDE GATE
(SG–500)

CONTAINER CONNECTION

ECD

DW STORAGE TANK
(D–300)

ECD

DW STORAGE TANK
(D–301)

HOSE CONNECTION

ECD

HOPPER
(H–500)

CHUTE
(CH–500)

(M–500)

ECD

MULTI–USE
DW TANKS

(D–310)
(D–311)
(D–312)
(D–315)

Knock–out Pot

P

VACUUM SKID
S–80

IN

OUT

FROM CONTAINERS

P–501

HOSE CONNECTION

(FROM VACUUM TRUCK)

MIX TANK
(MT–500)

FILTER
(F–501)

(TO VACUUM TRUCK)

P–504
PORTABLE
PUMP

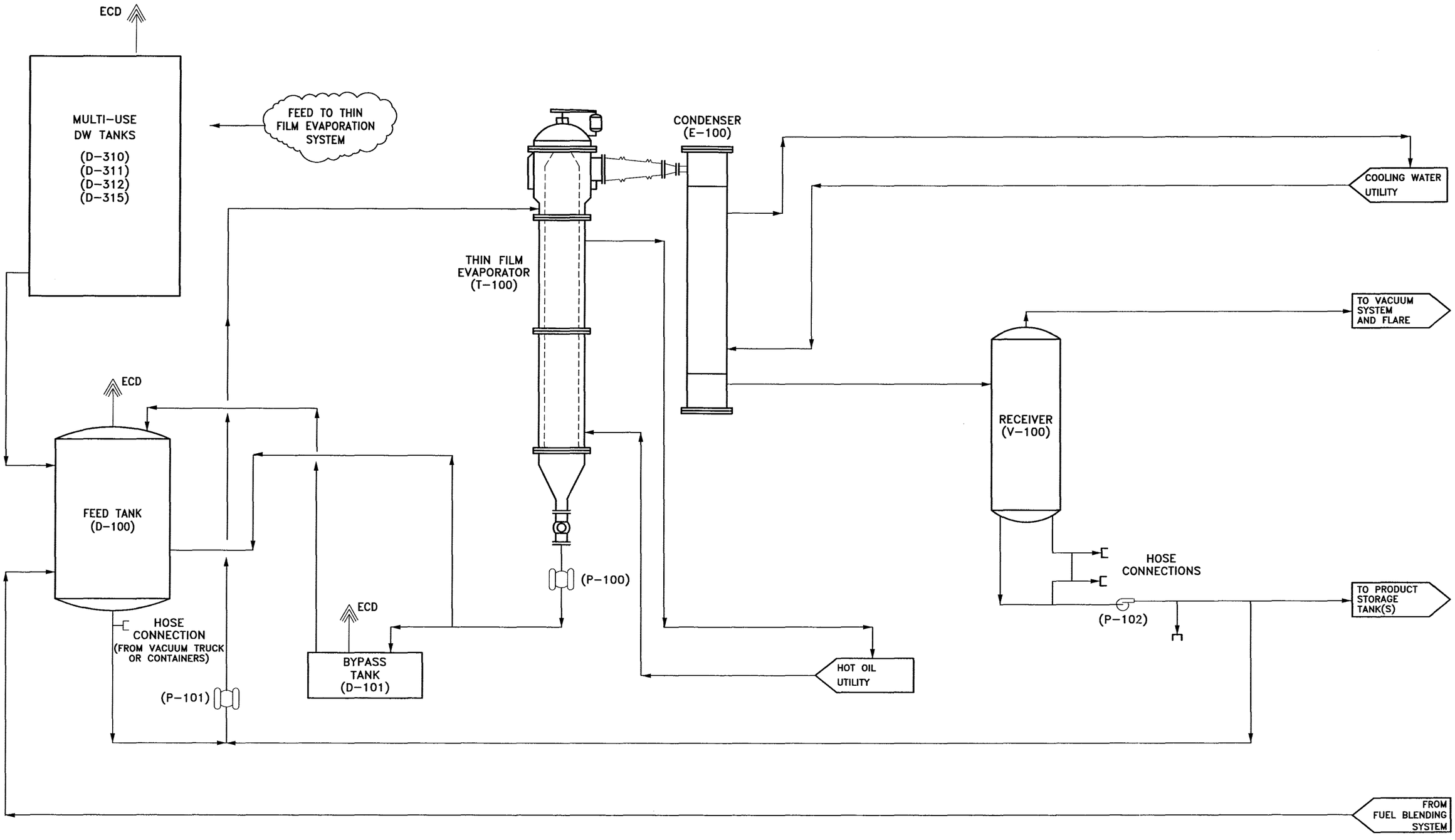
= EMISSION CONTROL DEVCE (ECD) [Emergency Vent & Conservation Vent]

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D–1

FUEL BLENDING SYSTEM

FILE NO: FBSFLO	DATE: Sept. 23, 2009	SCALE: NTS

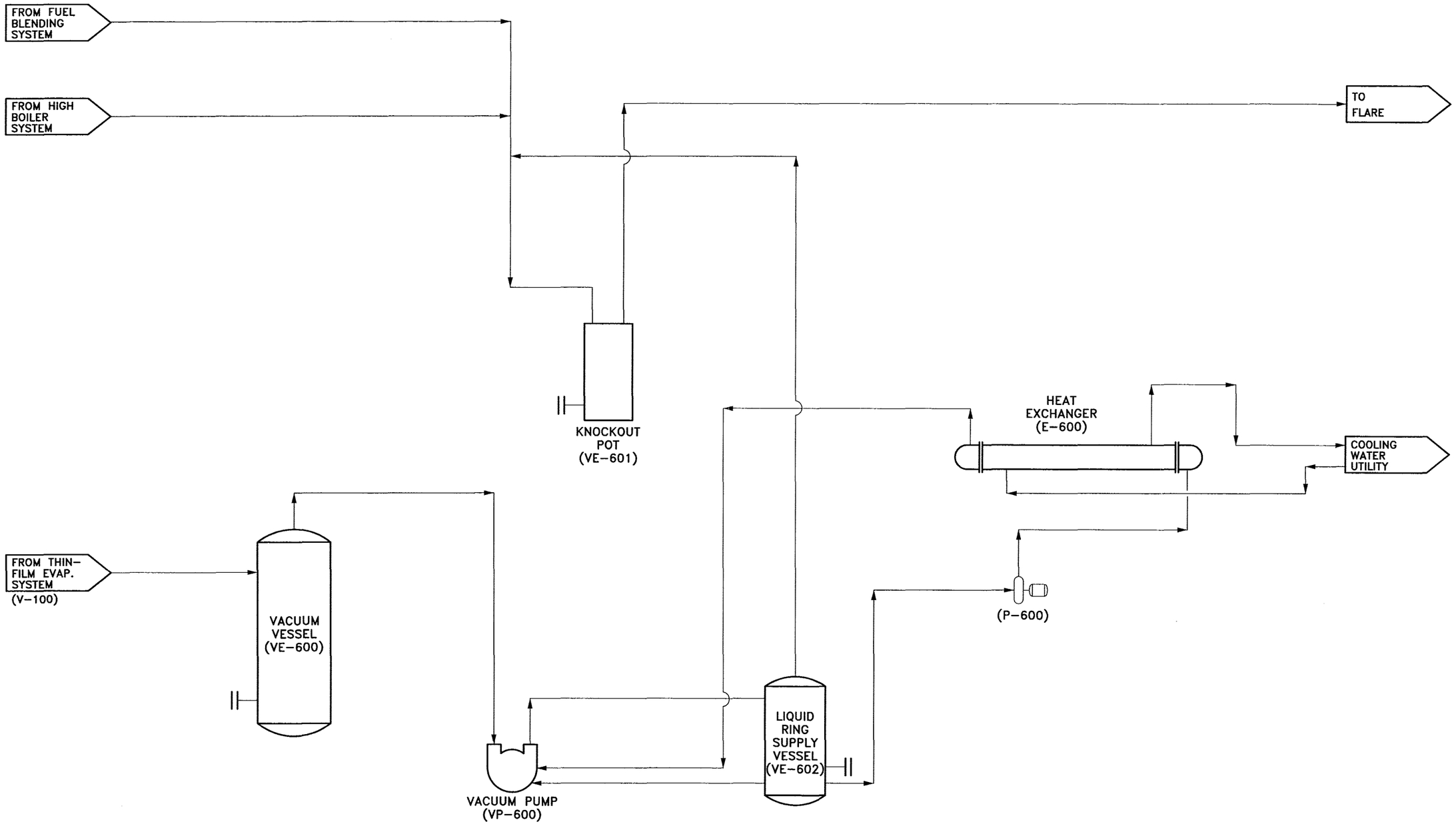


EMISSION CONTROL DEVICE (ECD) [Emergency Vent & Conservation Vent]

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-2
THIN FILM EVAPORATOR SYSTEM

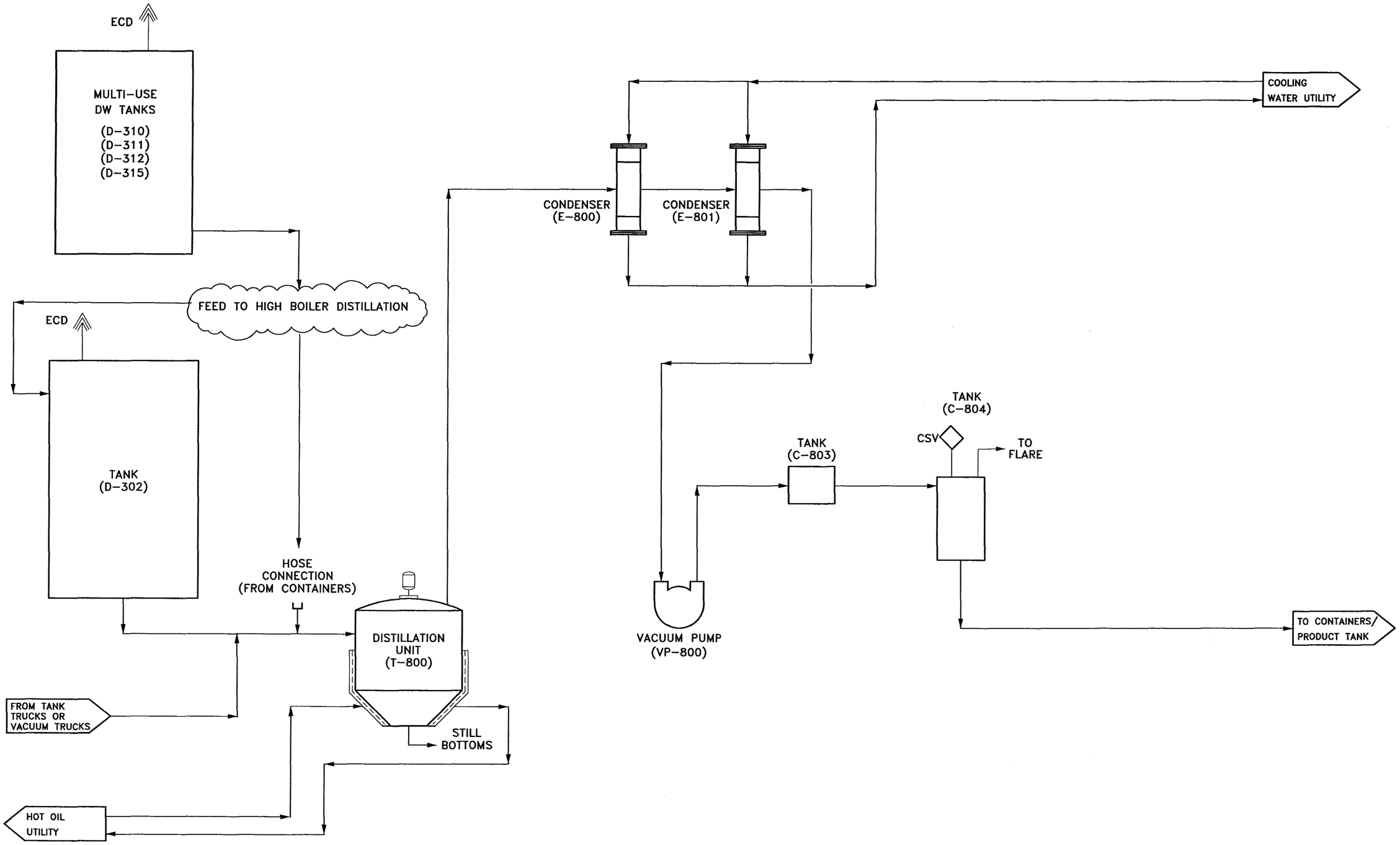
FILE NO: TFEFLO	DATE: Sept. 23, 2009	SCALE: NTS



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-3
VACUUM SYSTEM UTILITIES

FILE NO: VSUFLO	DATE: June 20, 2008	SCALE: NTS



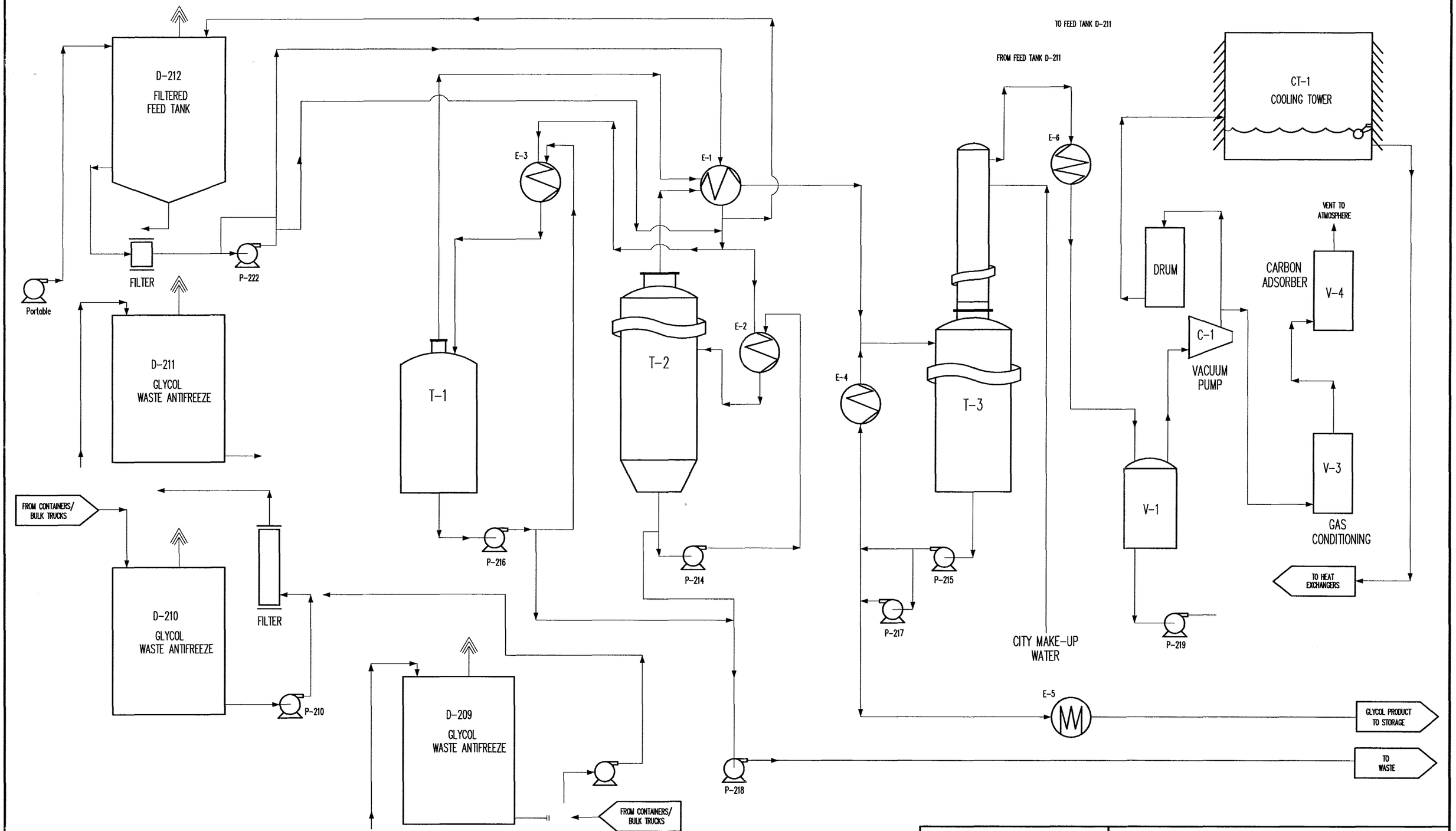
= EMISSION CONTROL DEVICE (ECD) [Emergency Vent & Conservation Vent]

CONSERVATION VENT

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D–4
HIGH BOILER DISTILLATION SYSTEM

FILE NO: HBSFLO	DATE: Sept. 23, 2009	SCALE: NTS



= EMISSION CONTROL DEVCE (ECD) [Emergency Vent & Conservation Vent]

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-5
GLYCOL RECYCLING SYSTEM

FILE NO: GRSFLO | DATE: Sept. 24, 2009 | NOT TO SCALE

NOTES

1. The layout shows the potential options for container placement. Other placement may be used as long as conditions for separate containment, Class 1B liquid storage restrictions, minimum aisle space, and limits on combined storage (40,810 gallons) are met.

2. Class IB wastes; stored in piles at a maximum of 2200 gallons per pile with 5 ft separation.

3. Storage of solid wastes: poisons (DOT Class 6.1 PG II & III), flammable solids, Class 9 and DOT "otherwise non–regulated wastes".

4. Storage of waste antifreeze.

5. Storage of any Tote replaces six 55–gallon drums

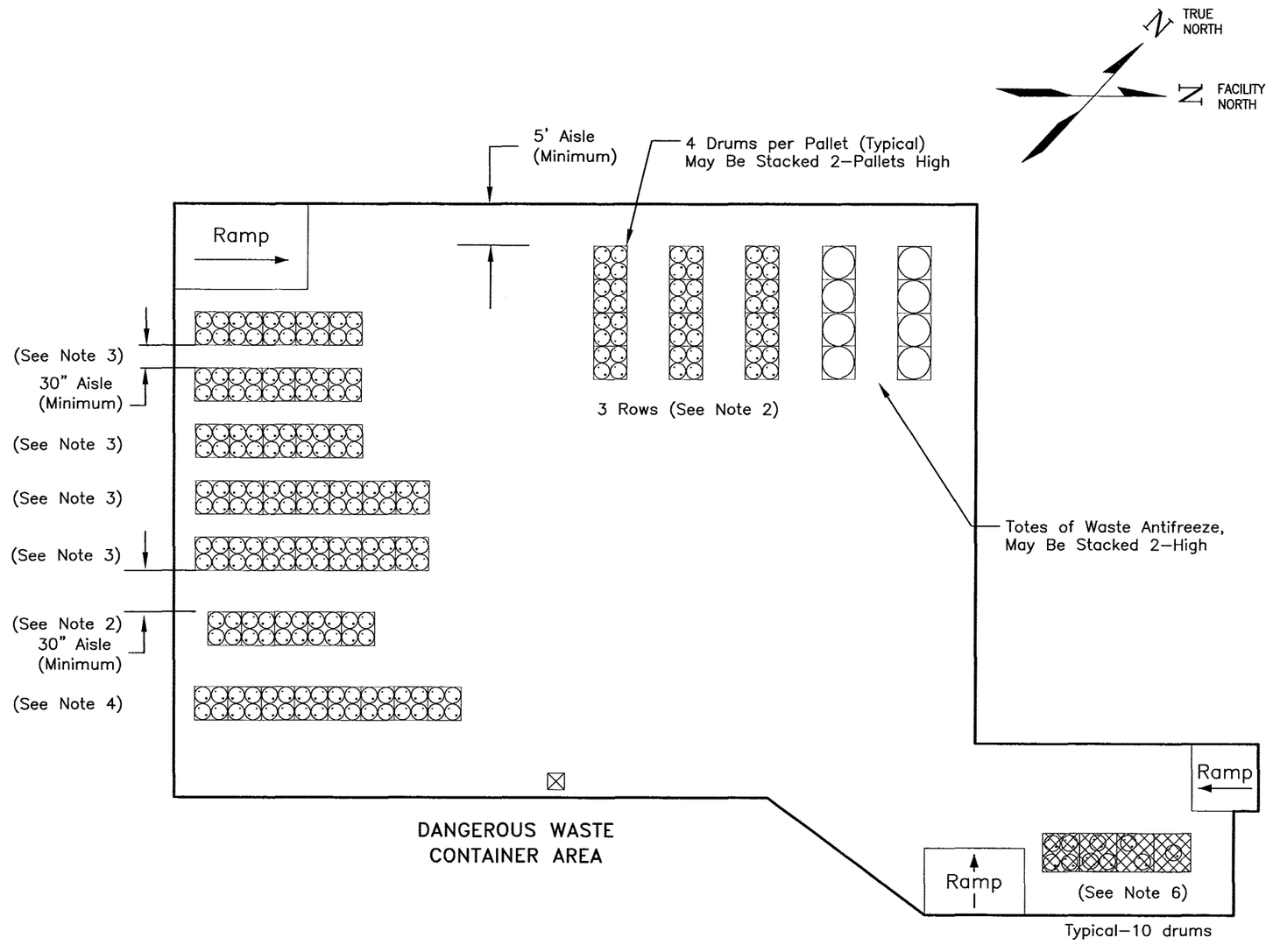
6. Drum jail can include any hazard class of waste stream. Incompatible waste streams will be placed on separate containment pallets with adequate separation until they are cleared for storage, processing, or alternate shipment.

7. Part A container storage volume not utilized in Production Pads 2, 3 or 4 may be utilized on DW Container Area as long as conditions for separate containment, minimum aisle space, Class IB liquids, and totes (volume calculation) are met. Combined storage volume may not exceed 40,810 gallons.

8. Total storage capacity as shown equals an equivalent of 538 55–gallon drums, or 29,590 gallons.

9. All storage is conducted a minimum of 30" from any containment perimeter.

10. Product held in containers and totes temporarily placed on the DW Area is not shown. Placement locations maintain minimum aisle space as noted above. The maximum number of containers is limited by available containment capacity of the DW Area.



LEGEND

⊠ Sump

Drum Jail

Layout Plan View

Scale: 1" = 16' (on 11"x17" sheet)

Aisleway

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1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D–6
DANGEROUS WASTE CONTAINER AREA LAYOUT

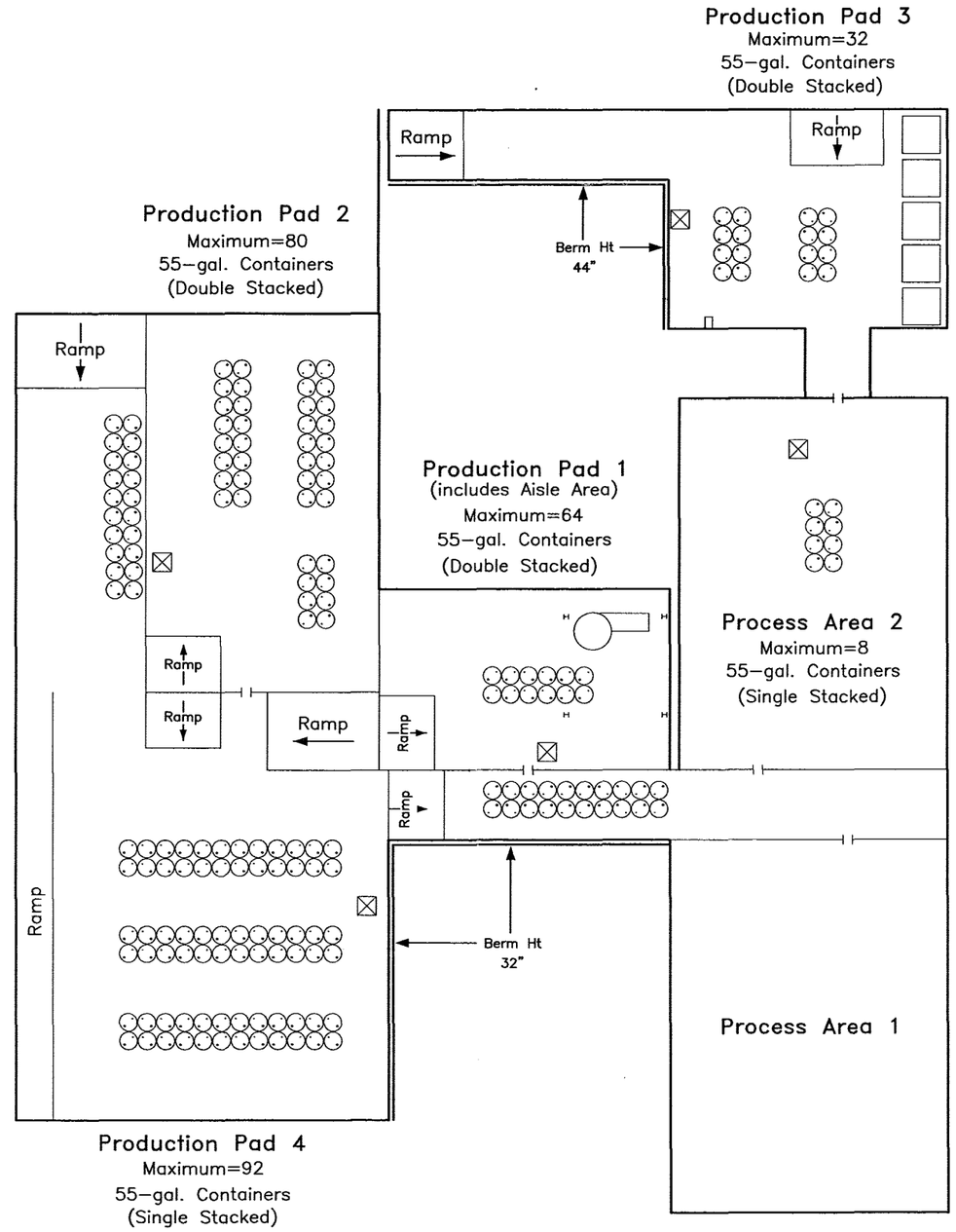
FILE NO: DWCAL	DATE: Aug. 12, 2009	SCALE: As Noted

NOTES

1. Process Areas and Production Pads share a common containment.
2. The total storage capacity not to exceed 204 drums (11,220 gallons)
3. Storage of any Tote replaces six 55–gal drums.
4. All berms are 8" high except where noted.
5. Container contents not to include Class IA liquids.
6. Class IB drums are stored in piles at a maximum of 2200 gals per pile, with 5 ft separation. All other classes of wastes will have minimum 30 inch separation between piles.
7. Drums may be single or double stacked (as noted). Double stacked drums will be placed on pallets. Single stacked drums may be placed on the floor.
8. Production Pad 1 and Process Area 2 are staging only.
9. Product held in containers and totes temporarily placed in Production Pads and Process Areas is not shown. Placement locations maintain minimum aisle space as noted above. The maximum number of containers is limited by available containment capacity of the combined containment area.

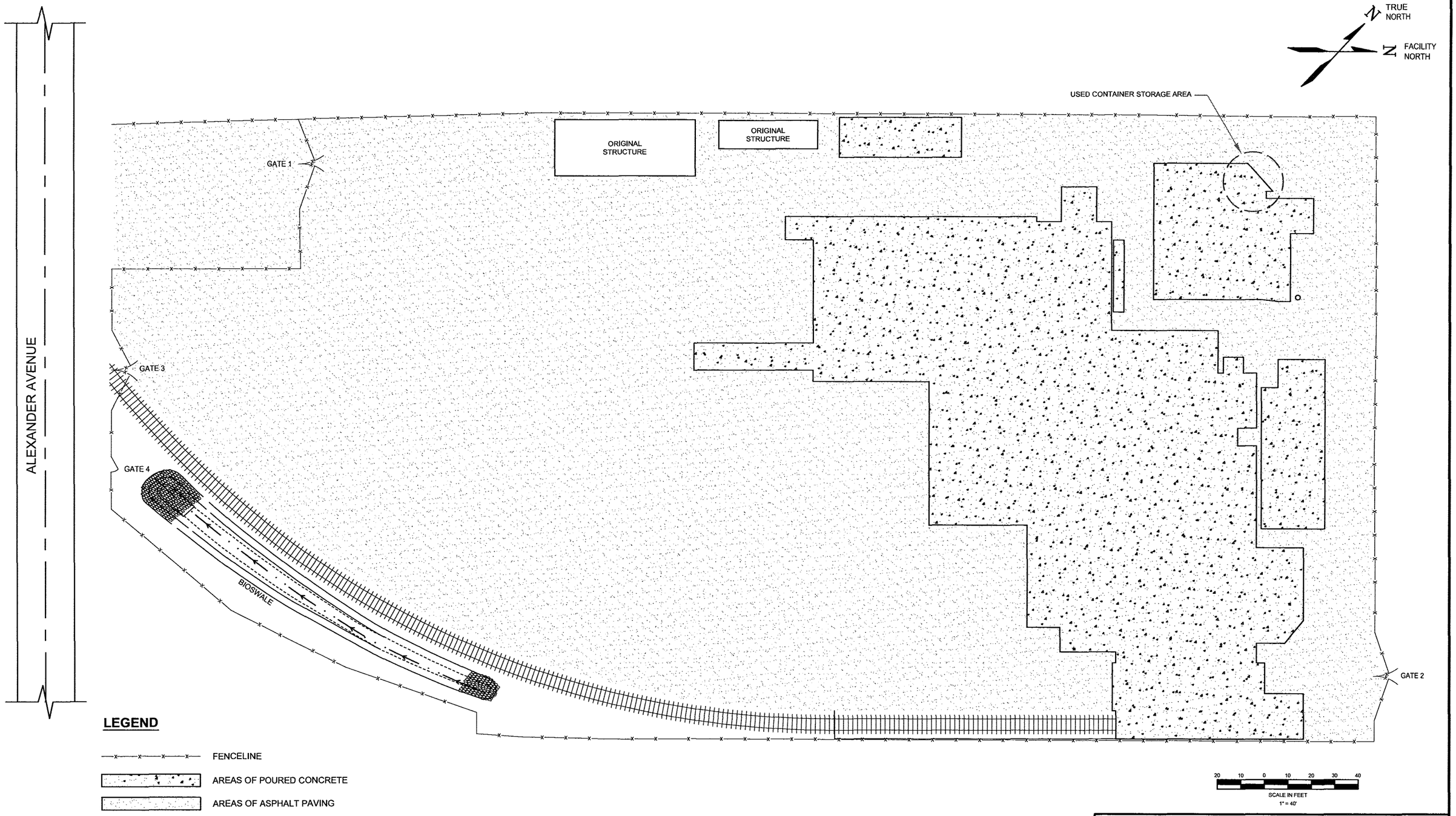
LEGEND

- ⊠ Sump
- Berm Perforation (Not to Scale)
- Process Unit
- H Structural Support
- Product Tote



Scale: 1" = 16' (on 11"x17" sheet)

Emerald Services, Inc. 1825 Alexander Avenue Tacoma, Washington 98421	FIGURE D–7 PROCESS/PRODUCTION CONTAINER AREAS LAYOUT
	FILE NO: CSAL | DATE: Nov. 14, 2009 | SCALE: As Noted



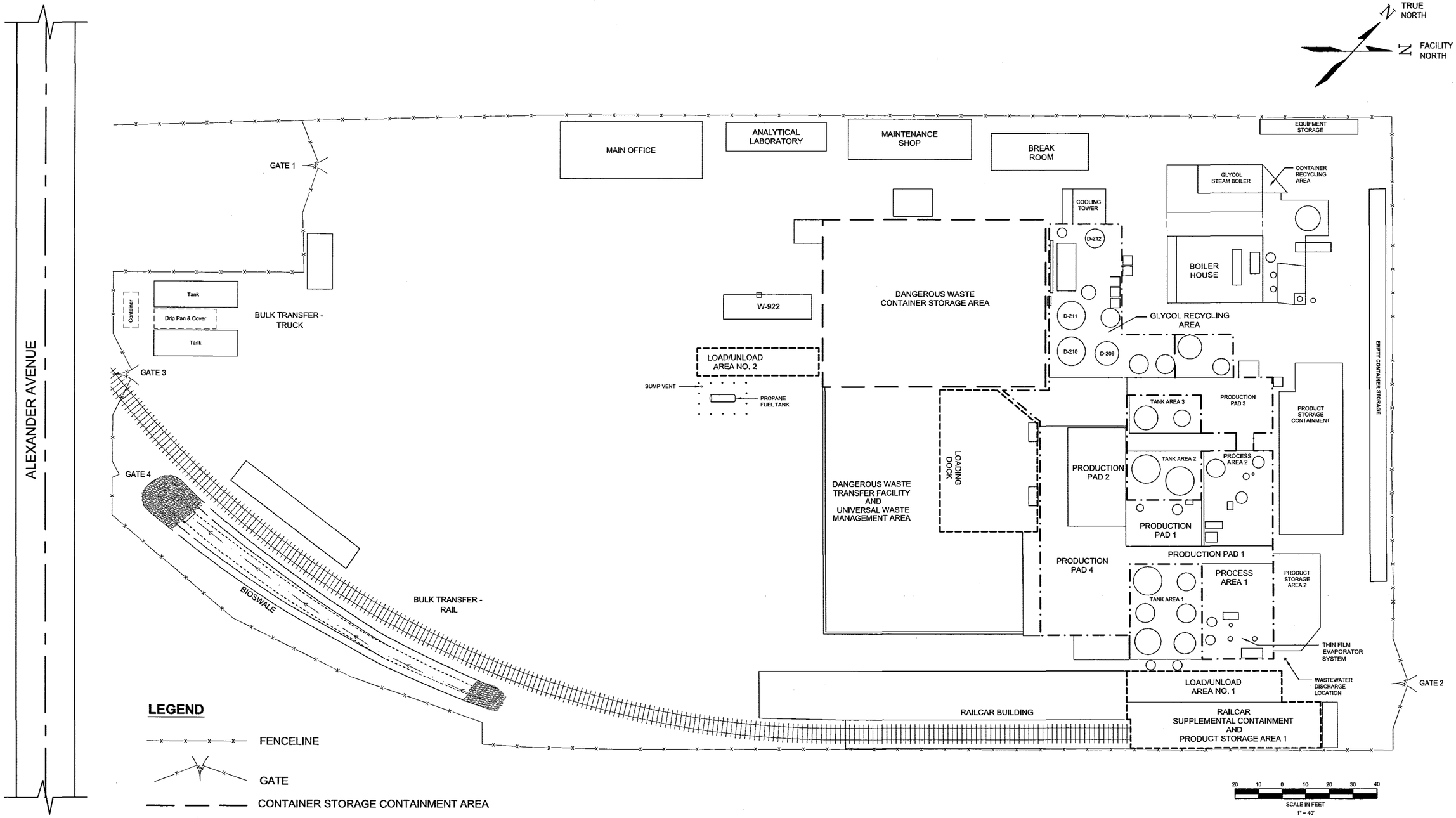
SOURCE: SITTS AND HILL ENGINEERS, INC.
PROJECT 9814, SHEET C3
"SITE GRADING AND STORM DRAINAGE"
NOVEMBER 17, 2000 (Rev. JUNE 4, 2001)

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-8

USED CONTAINER STORAGE AREA

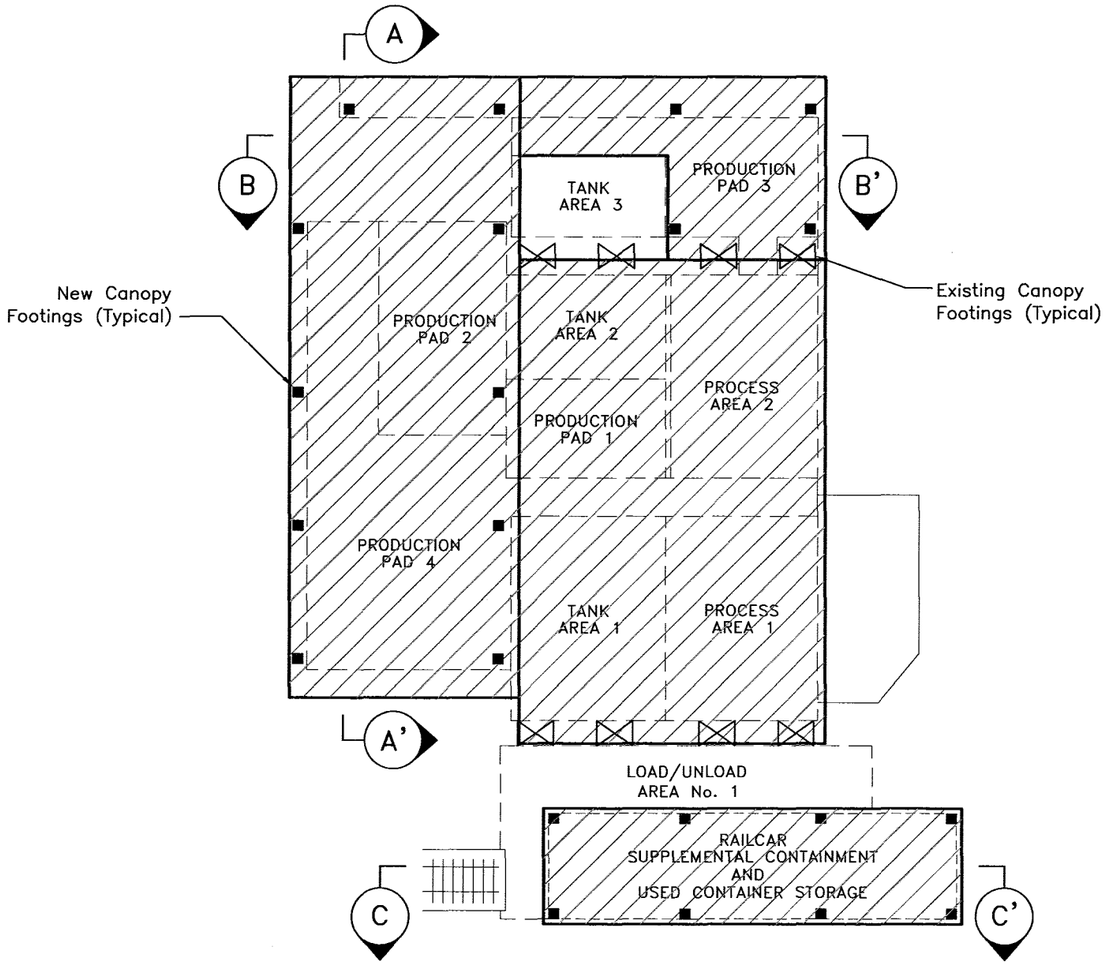
FILE NO: CRA	DATE: June 20, 2008	SCALE: 1"=40'



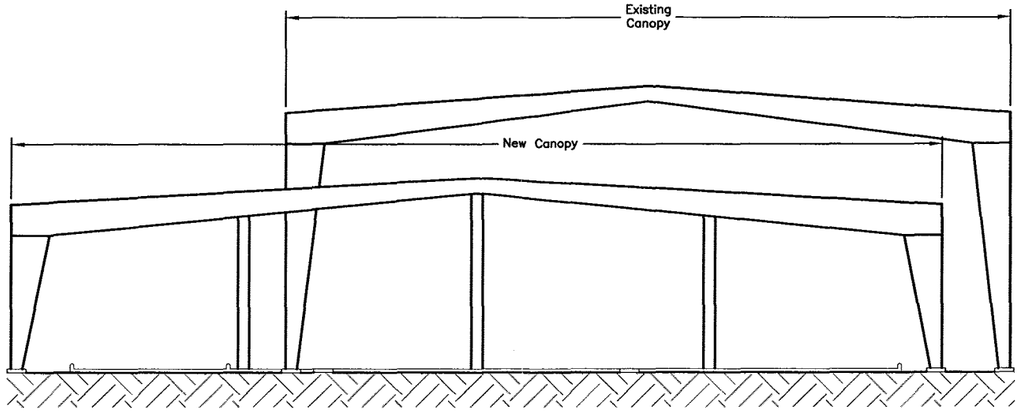
Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-9
SECONDARY CONTAINMENT FOR CONTAINERS

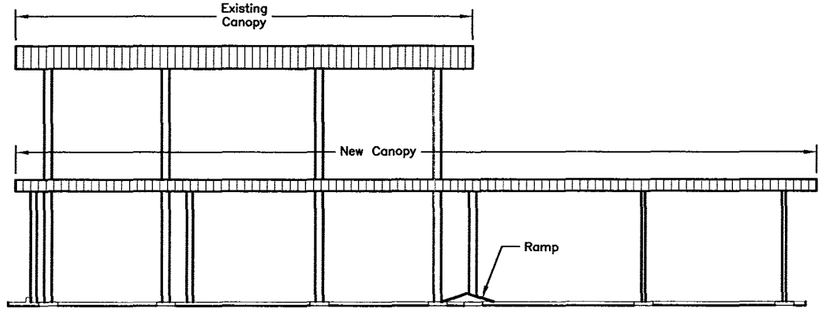
FILE NO: SECON-CON	DATE: Jan. 31, 2011	SCALE: 1"=40'



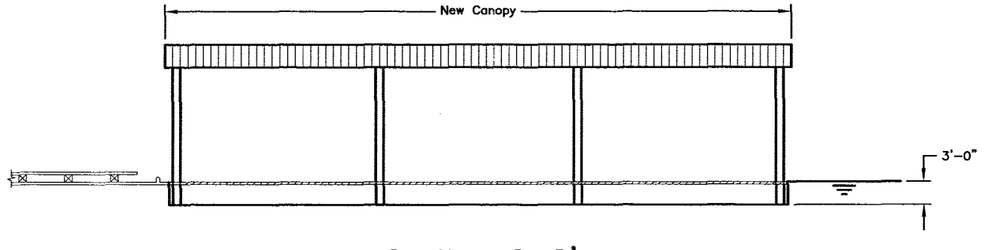
Facility Canopies – Plan View



Section A–A'



Section B–B'



Section C–C'

Note:
Total floor area of the combined production areas, (9,479 sq. ft.), is less than the maximum allowed per UBC, (15,000 sq. ft.).

Emerald Services, Inc. 1825 Alexander Avenue Tacoma, Washington 98421	FIGURE D–10 CANOPIES: PLAN AND SECTIONS
	FILE NO: C–P–E | DATE: July 2, 2007 | SCALE: NTS

TRUE NORTH

FACILITY NORTH

ALEXANDER AVENUE

Trailer Staging

Utility Standpipes

Person Gate

Gate 5

Gate 1

Emergency Response Conex

Gate 3

Gate 4

Main Office

Laboratory

Maintenance Shop and Storage

Locker Room and Break Room

Fire Control Room

Electrical Room

Control Room

MW-3

MW-4

Containment Pan for Anti-Freeze Transfer

Ramp

W-922

Dangerous Waste Container Storage Area

Cooling Tower

D-212

PT-5

D-211

PT-6

D-210

D-209

PT-11

PT-9

PT-10

PT-7

Ramp

Glycol Steam Boiler

Container Recycling Area

LUWA Vacuum System

Cooling Tower

Stairs

Boiler House and MCC Room

OT-1

Fuel Oil Tank

Flare

Glycol Recycling Area

Riser Room 1

Load/Unload Area #2

Sump Vent

(Grated)

MH

Fire Hydrant

Fire Main Indicator

Dangerous Waste Transfer Facility and Universal Waste Management Area

Loading Dock

Tank Area 3

D-502

W-923

Production Pad 3

High Boiler Distillation

ST-1

PT-1

ST-2

PT-2

White

DA-1

Silver

DA-2

Shack

DA-3

Product Storage Area 3 (PS 3)

MW-1

PRODUCTION PAD 2

COMPACTOR

D-301

D-300

TANK AREA 2

MT-500

Production Pad 1

D-302

Process Area 2

RT-500

C-101

D-312

Cascade Shredder

Fuel Blending System

Production Pad 1

Product Storage Area 2 (PS2)

C-105

C-103

Thin Film Evaporator System

Wastewater Discharge Location

Gate 2

Person Gate

Conex On-Site Equipment

Production Pad 4

W-921

D-315

Process Area 1

Tank Area 1

D-310

D-311

W-920

D-100

D-101

N_2 Pad

Ramp

Wastewater Treatment

Load/Unload Area #1

Railcar Supplemental Containment and Product Storage Area 1 (PS 1)

Railcar Building

Fire Control Room

MW-2

C-8K

T-440

Used Oil Re-Refining Facility

T-76A

T-76B

T-76C

T-79

T-76D

T-71A

B-1

V-400

V-500

T-52

T-72E

T-72A

T-72B

T-72C

T-72D

BULK TRANSFER - RAIL

Bioswale

#1

#2

#3

#4

#5

#6

#7

LEGEND

- (#) Railcar Spot
- Fenceline
- Catch Basin
- Blind Sump
- (MH) Manhole
- Trench Drain
- Gate
- ⊕ Monitoring Well

40 30 20 10 0 20 40

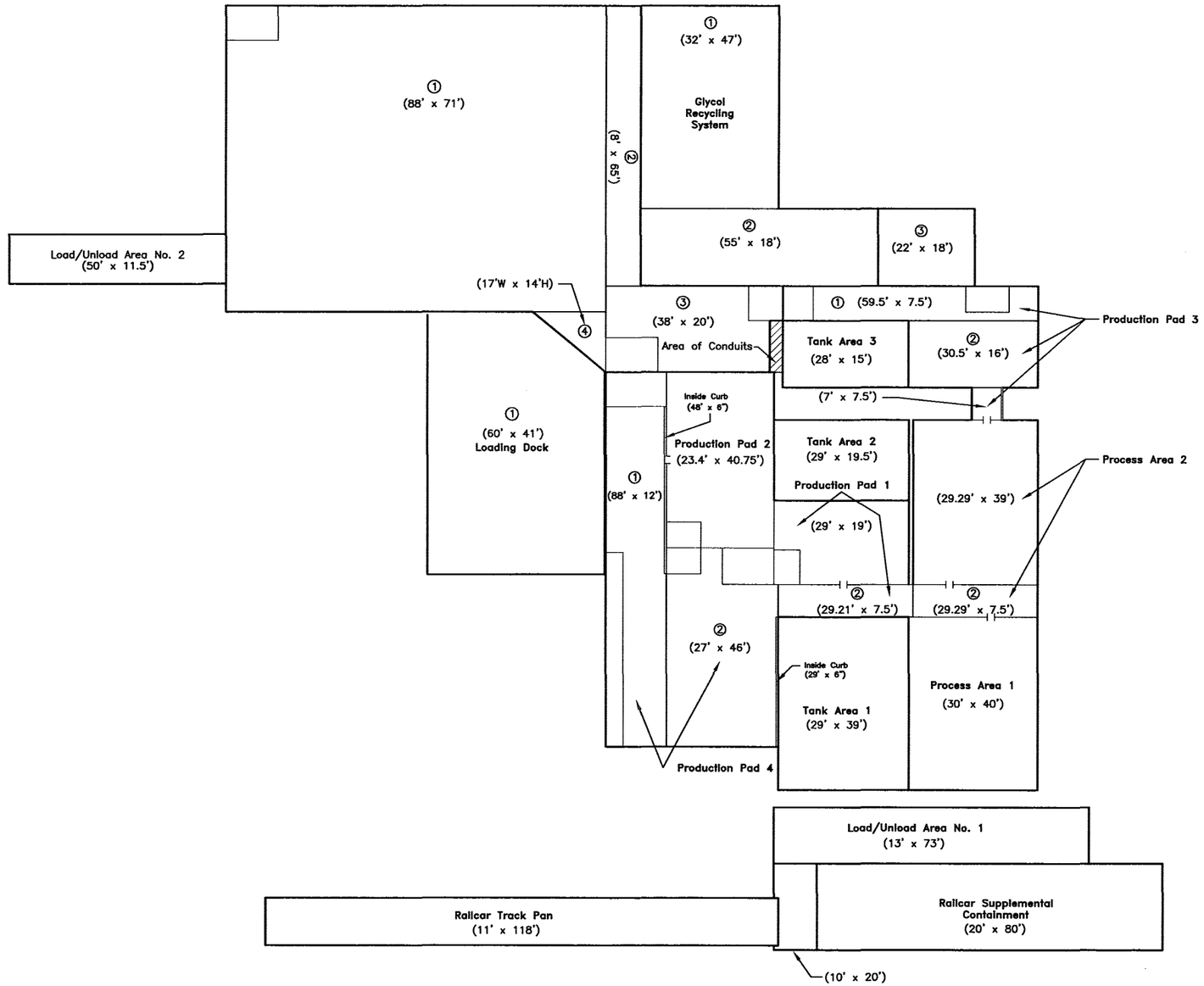
Scale in Feet
(1" = 40')

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-11

STORMWATER DRAINAGE SYSTEM LAYOUT

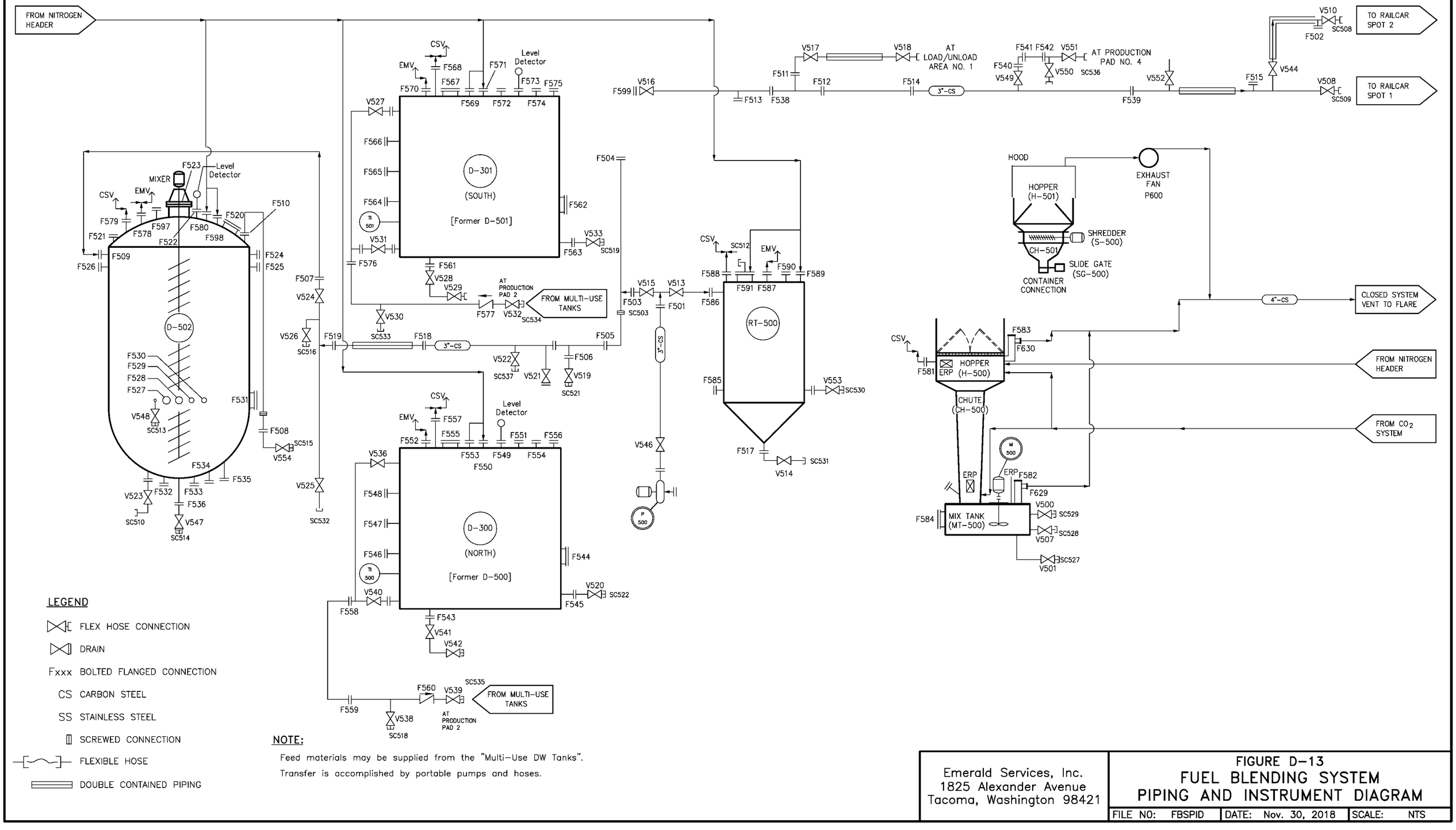
FILE NO:	SWDS	DATE:	Mar. 3, 2015	SCALE:	1"=40'



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-12
DANGEROUS WASTE
CONTAINMENT LAYOUT

FILE NO: CLD	DATE: July 2, 2007	SCALE: 1"=30'



LEGEND

- FLEX HOSE CONNECTION
- DRAIN
- Fxxx BOLTED FLANGED CONNECTION
- CS CARBON STEEL
- SS STAINLESS STEEL
- SCREWED CONNECTION
- FLEXIBLE HOSE
- DOUBLE CONTAINED PIPING

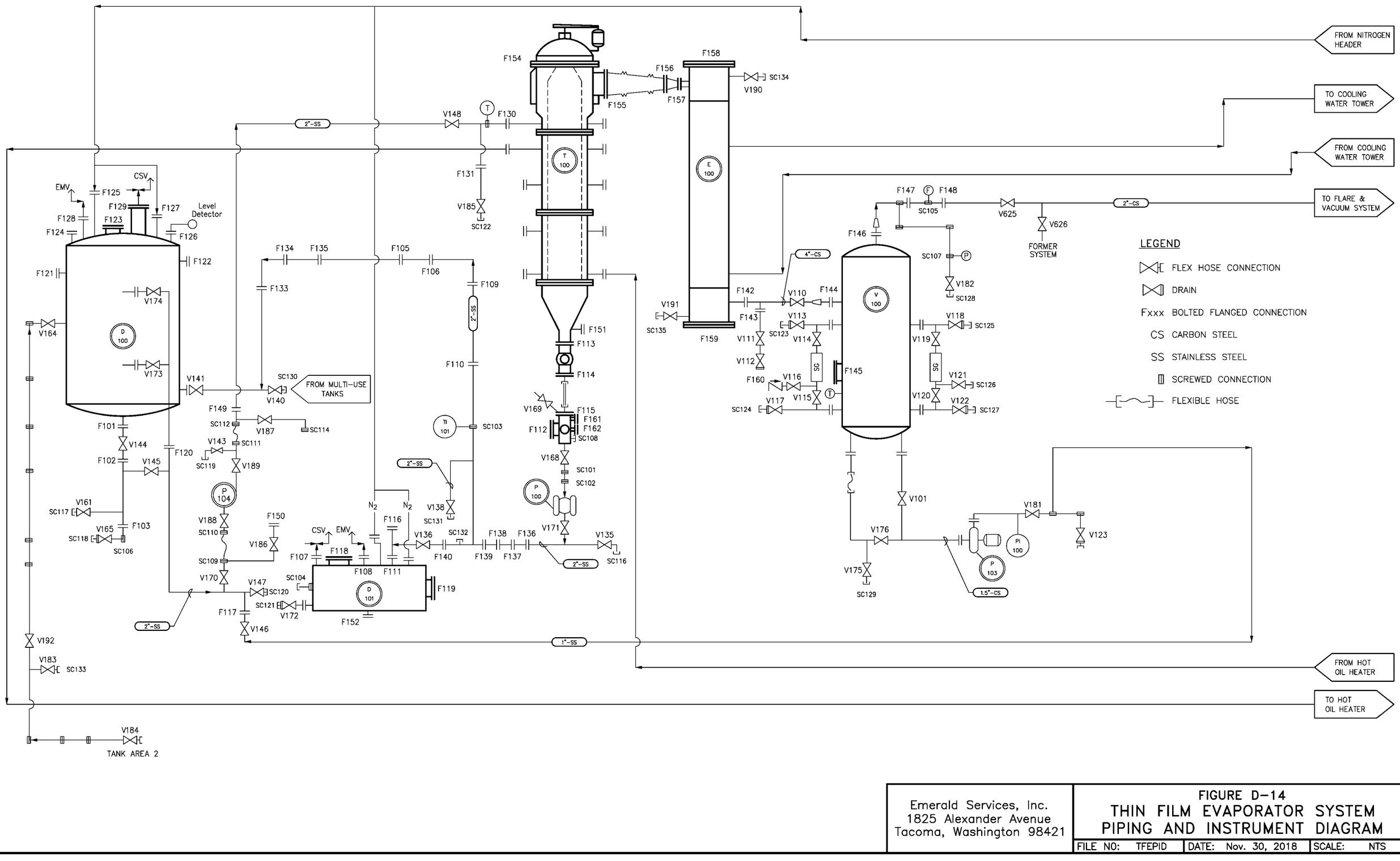
NOTE:

Feed materials may be supplied from the "Multi-Use DW Tanks".
Transfer is accomplished by portable pumps and hoses.

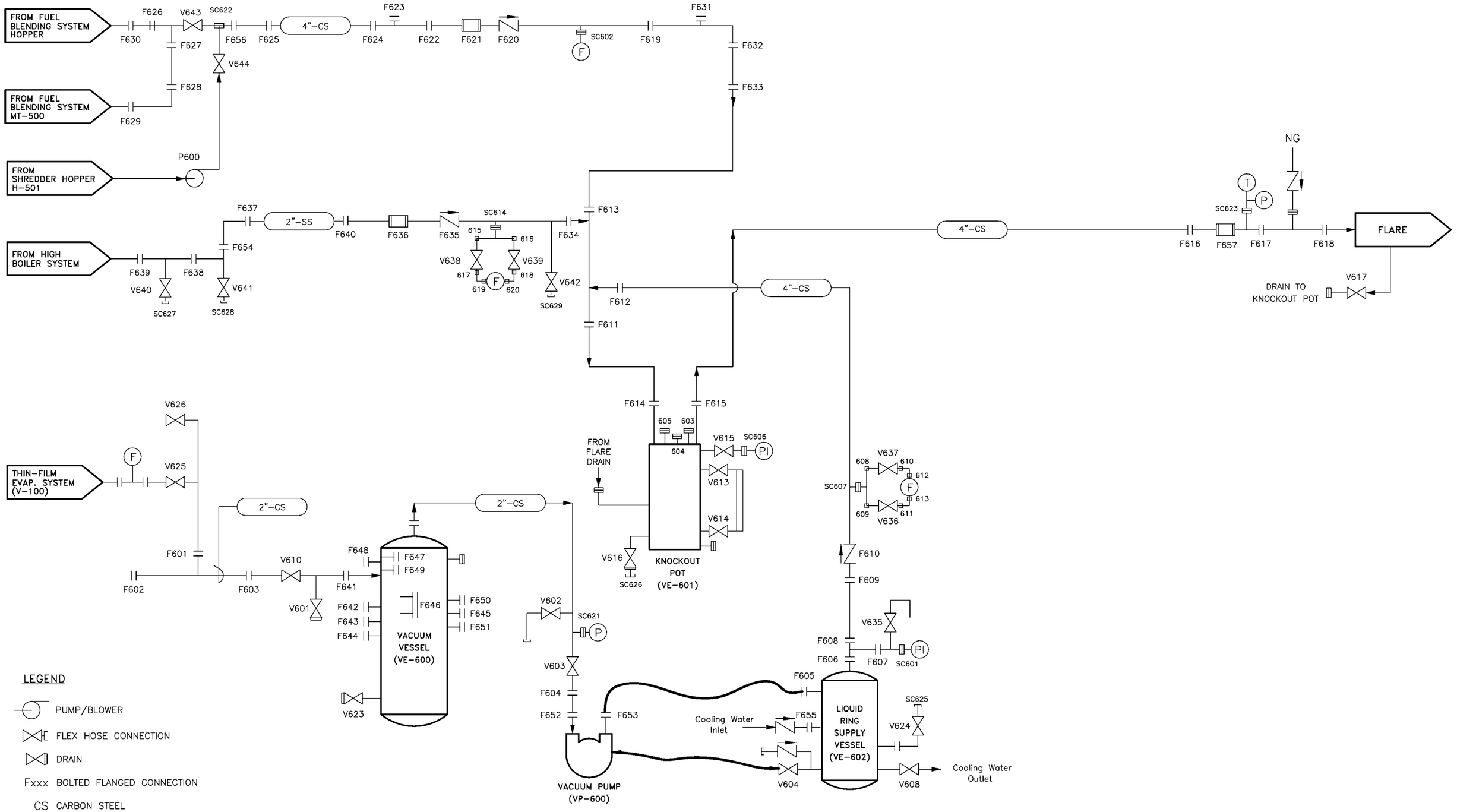
Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-13
FUEL BLENDING SYSTEM
PIPING AND INSTRUMENT DIAGRAM

FILE NO: FBSPID	DATE: Nov. 30, 2018	SCALE: NTS



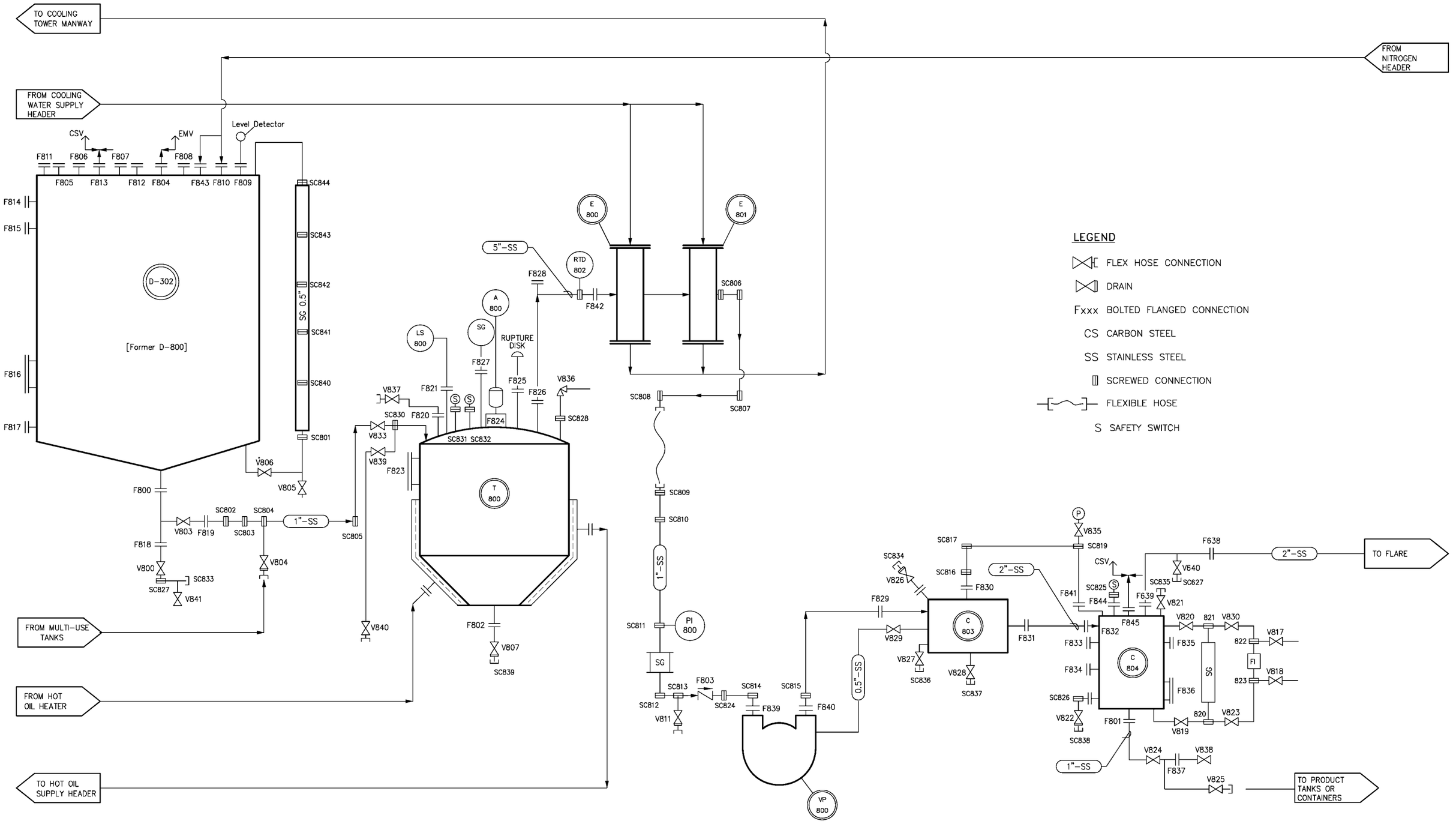
Emerald Services, Inc. 1825 Alexander Avenue Tacoma, Washington 98421	FIGURE D-14 THIN FILM EVAPORATOR SYSTEM PIPING AND INSTRUMENT DIAGRAM		
	FILE NO: TFEPID	DATE: Nov. 30, 2018	SCALE: NTS



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-15
VACUUM SYSTEM UTILITIES
PIPING AND INSTRUMENT DIAGRAM

FILE NO: VSUPID	DATE: Nov. 26, 2018	SCALE: NTS



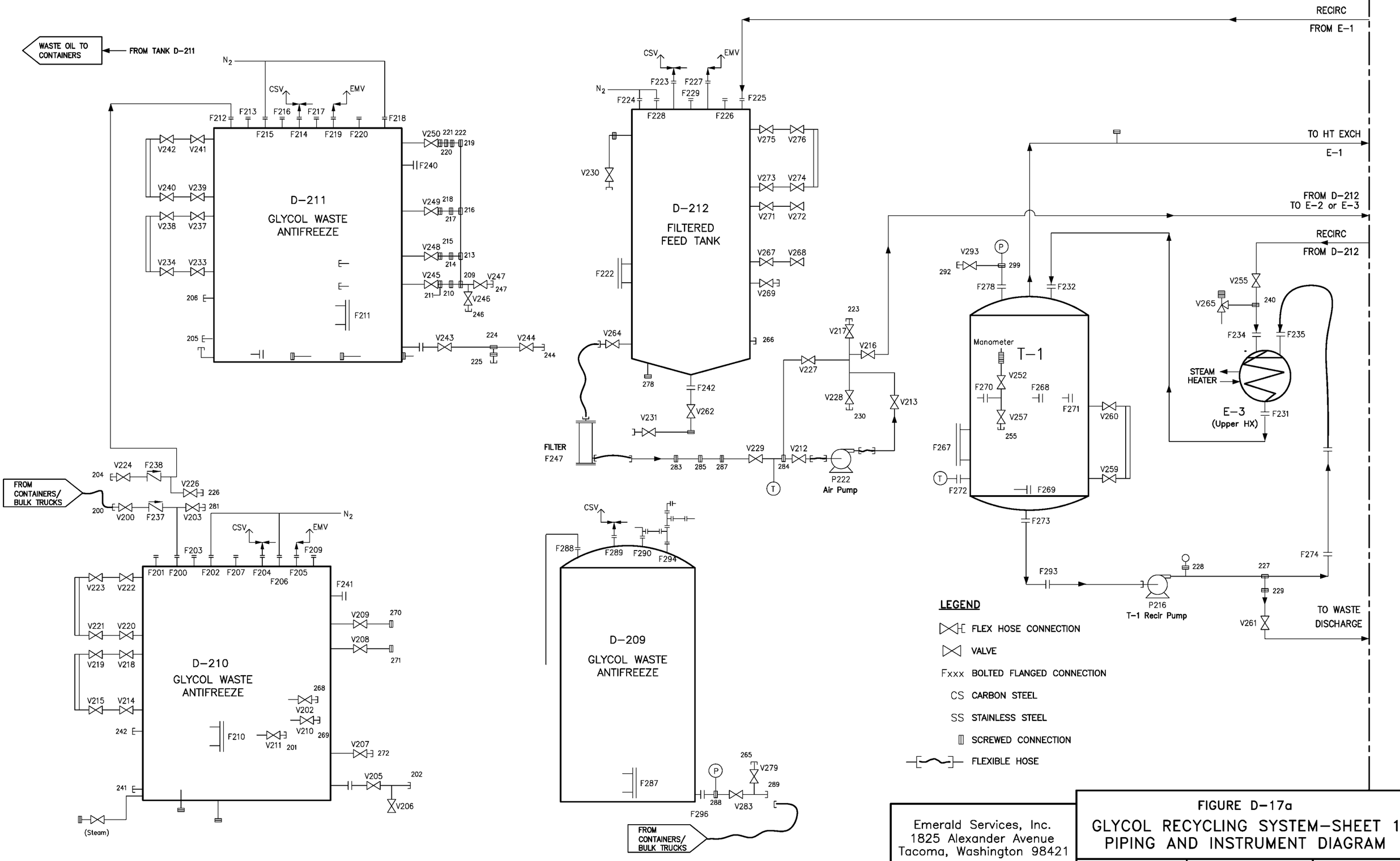
LEGEND

- FLEX HOSE CONNECTION
- DRAIN
- Fxxx BOLTED FLANGED CONNECTION
- CS CARBON STEEL
- SS STAINLESS STEEL
- SCREWED CONNECTION
- FLEXIBLE HOSE
- S SAFETY SWITCH

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-16
HIGH BOILER DISTILLATION SYSTEM PIPING AND INSTRUMENT DIAGRAM

FILE NO: HBSPID	DATE: May 23, 2018	SCALE: NTS



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D–17a

GLYCOL RECYCLING SYSTEM–SHEET 1
PIPING AND INSTRUMENT DIAGRAM

FILE NO: GPID–1	DATE: Nov. 30, 2018	NOT TO SCALE

TO TANK D-212
1"-SS
1"-SS
FROM T-1
FROM TANK D-212
TO HT EXCH E-3
V256
V254
E-1
F233
F248
4"-SS
F246
SC245
SC249
SC291
SC276
SC298
SC293
SC250
SC294
V286
SC295
SC252
SC248
V266
F230
F250
STEAM HEATER
E-2 (Lower HX)
F236
V291
SC243
SC251
V253
F245
F251
T-2
V287
F249
F265
V201
F252
SC296
SC274
V299
SC291
F291
SC275
F292
P214 T-2 Recirc Pump
F244
V277
V288
V282
SC279
SC277
P218 Waste Pump #2
F254
F263
2"-SS
F253
F261
E-4
STEAM HEATER
F260
T-3
V289
V298
F262
F266
SC280
V280
F259
V284
P215 T-3 Recirc Pump
V285
V278
P217 Glycol Product Pump
1/2"-SS
CITY MAKE-UP WATER
F255
E-6
COOLING TOWER WATER
F256
F276
HX COOLING WATER RETURN
CT-1 COOLING TOWER
TO HEAT EXCHANGERS
V251
V232
SC253
SC254
SC236
SC235
SC234
SC257
SC256
V-2 Knock Out
SC232
C-1
Seal Water
SC231
Seal Water Chiller
From CT-1
Condensate Pump
SC258
F282
F284
SC233
F280
F283
V235
F286
SC286
F281
V-1
F285
SC290
V290
V292
SC296
SC297
Drain
P219 V-1 Level Control Air Pump
VENT TO ATMOSPHERE
CARBON ADSORBER
V-4
SC282
SC262
V270
SC261
V297
SC260
V296
SC263
V295
SC259
F295
V-3
V236
SC238
SC239
SC237
V294
SC264
GAS CONDITIONING
COOLING TOWER WATER
E-5
GLYCOL PRODUCT TO STORAGE
SC267
SC273
V263
TO WASTE

LEGEND

- FLEX HOSE CONNECTION
- VALVE
- Fxxx BOLTED FLANGED CONNECTION
- CS CARBON STEEL
- (F) FLOW DETECTOR
- SS STAINLESS STEEL
- SCREWED CONNECTION
- FLEXIBLE HOSE

Emerald Services, Inc.
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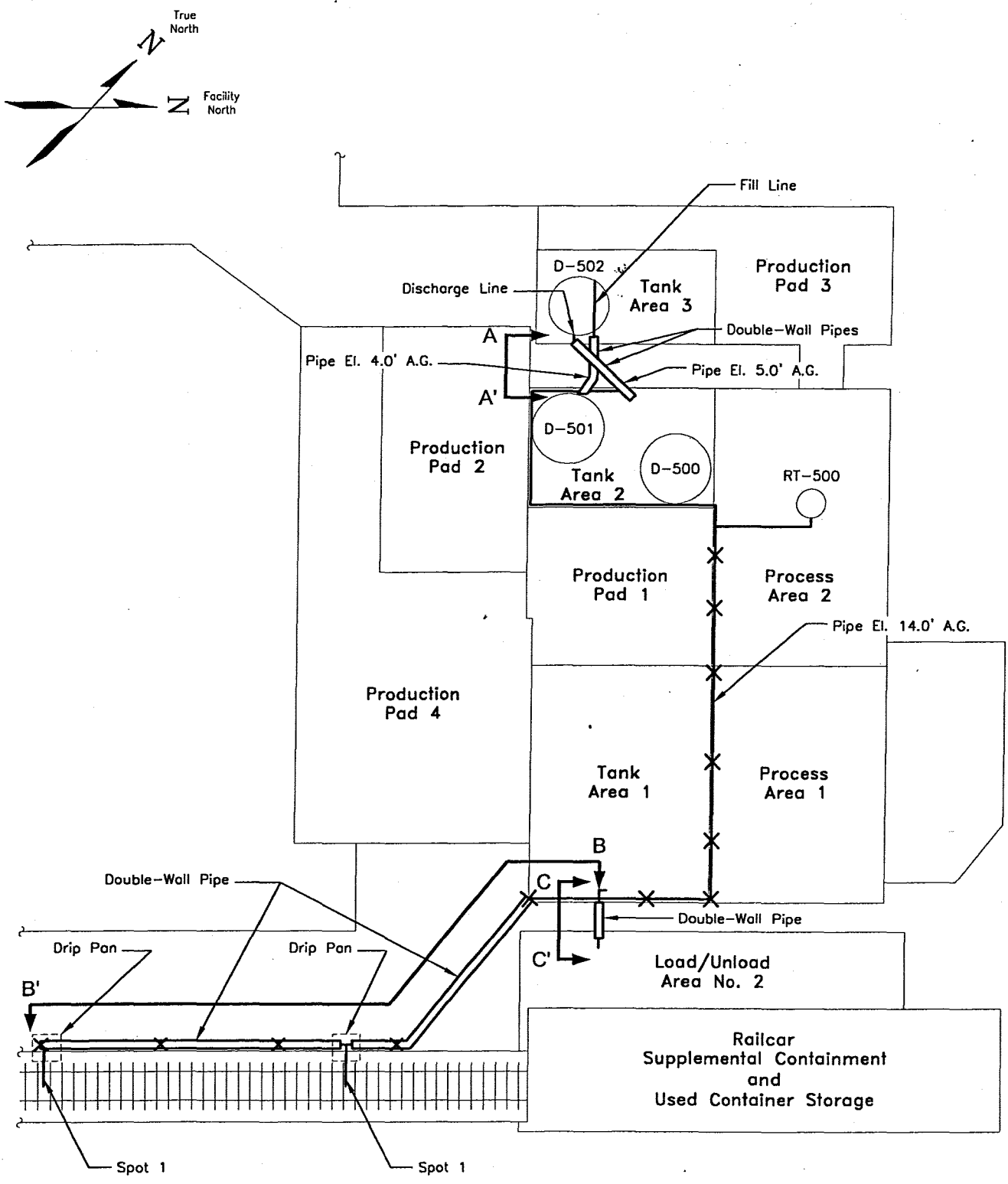
Tacoma, Washington 98421

FIGURE D-17b

GLYCOL RECYCLING SYSTEM-SHEET 2 PIPING AND INSTRUMENT DIAGRAM

FILE NO: GPID-2a | DATE: May 23, 2018 | NOT TO SCALE



Legend

- Railcar Pipeway
- Pipeway Support
- Double Wall Pipe

Emerald Services, Inc.
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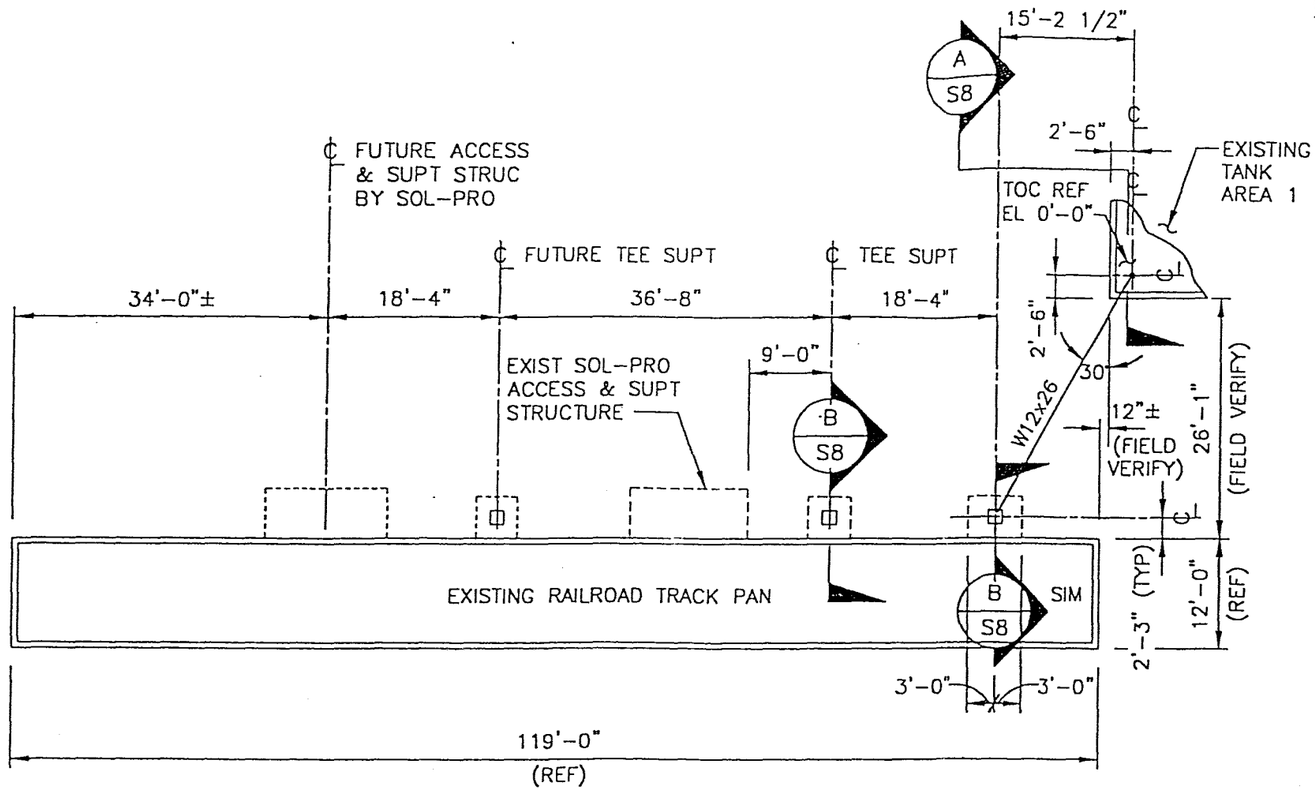
FIGURE D-18
ARRANGEMENT OF
DOUBLE-CONTAINED PIPING

FILE NO: ES405K	DATE: August 8, 2001	SCALE: 1"=25'



PLAN
1/16"=1'-0"

GENERAL NOTES:

1. CONCRETE f'c = 4000 PSI AT 28 DAYS.
2. REINFORCING ASTM A615 GRADE 60.
3. STRUCTURAL STEEL ASTM A36.
4. STRUCTURAL TUBES ASTM A500 GRADE B.
5. STRUCTURAL BOLTS ASTM A325N.
6. ANCHOR BOLTS ASTM A307.
7. ALLOWABLE SOIL BEARING 1500 PSF.
8. DESIGN CODE 1994 UBC
   80 MPH WIND ZONE, EXPOSURE C, I = 1.15
   SEISMIC ZONE 3, I = 1.50.
9. SHOP PRIME ALL STEEL & FIELD PAINT PER OWNERS SPECIFICATIONS.

CRAIG ALLEN HOUGHTON
STATE OF WASHINGTON
18556
REGISTERED PROFESSIONAL ENGINEER

EXPIRES 11JAN00
23 JUL98

Harris Group Inc.
97-1242
ISSUED FOR RCRA PERMIT - 5/21/98

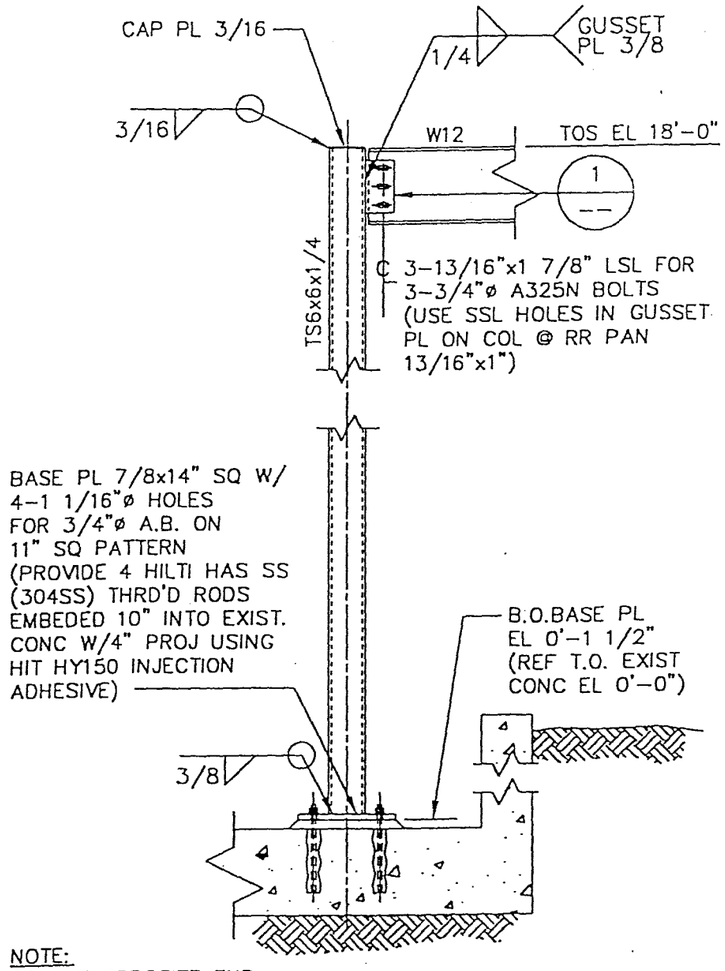
FIGURE D-~~17~~ 19
BLENDED FUEL PIPE SUPPORTS
SITE PLAN

DRAWN: AW	DATE: May 19, 1998	PROJECT NO: 8700-526-403
FILE NO: S7	CHECKED: C. Houghton	

Rev 8/4/01

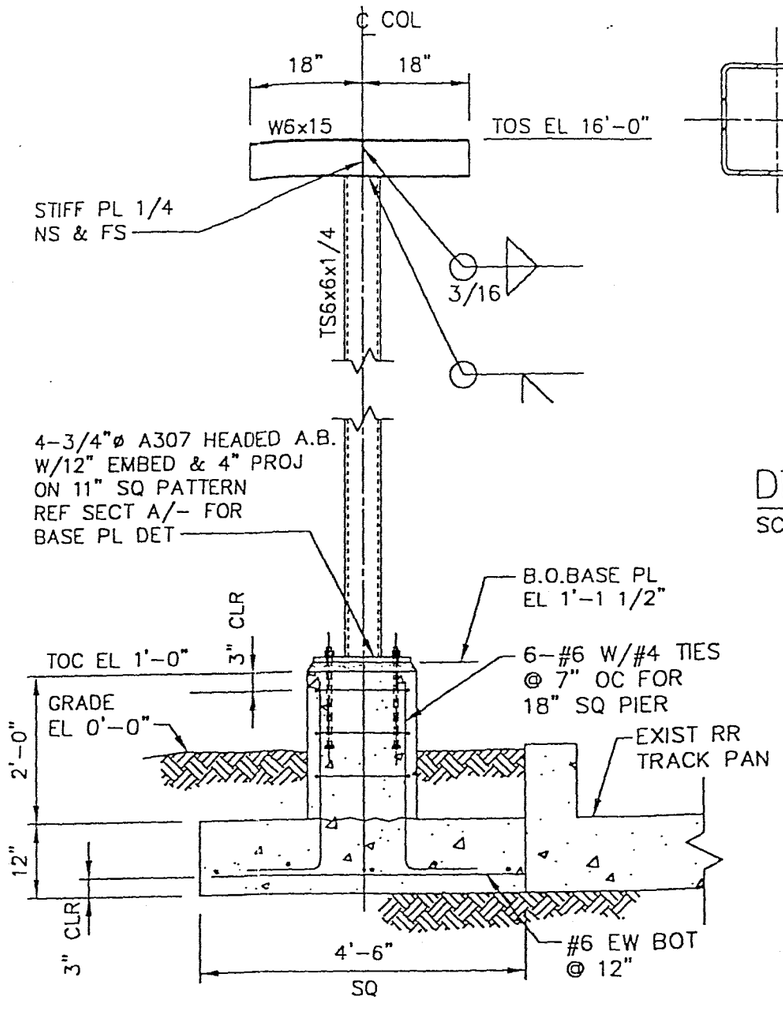
ENSR
Consulting • Engineering • Remediation
9521 Willows Rd. NE
Redmond, Washington 98052

Sol-Pro, Incorporated
1825 Alexander Avenue
Tacoma, Washington 98421

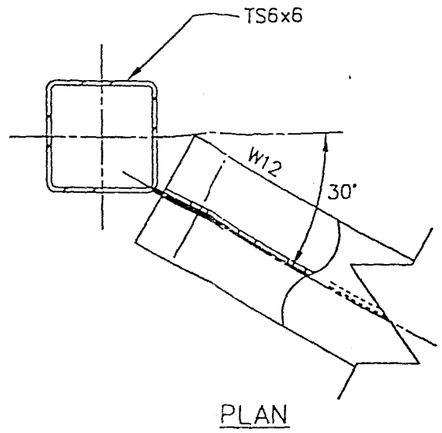


NOTE:
COL AT OPPOSITE END OF W12 SIM ON NEW FOUNDATION W/B.O.BASE PL EL 1'-1 1/2" & 4 EMBEDED A.B.

SECTION A / S7
SCALE: 1/2"=1'-0"



SECTION B / S7
SCALE: 1/2"=1'-0"



PLAN

DETAIL 1 / --
SCALE: 1 1/2=1'-0"

CRAIG ALLEN HOUGHTON
STATE OF WASHINGTON
18556
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 11JAN00
23JUL98

Harris Group Inc.
97-1242
ISSUED FOR RCRA PERMIT - 5/21/98

FIGURE D-~~17~~19
BLENDED FUEL PIPE SUPPORTS
SECTIONS & DETAILS

DRAWN: AW	DATE: May 19, 1998	PROJECT NO: 8700-526-403
FILE NO: S8	CHECKED: C. Houghton	

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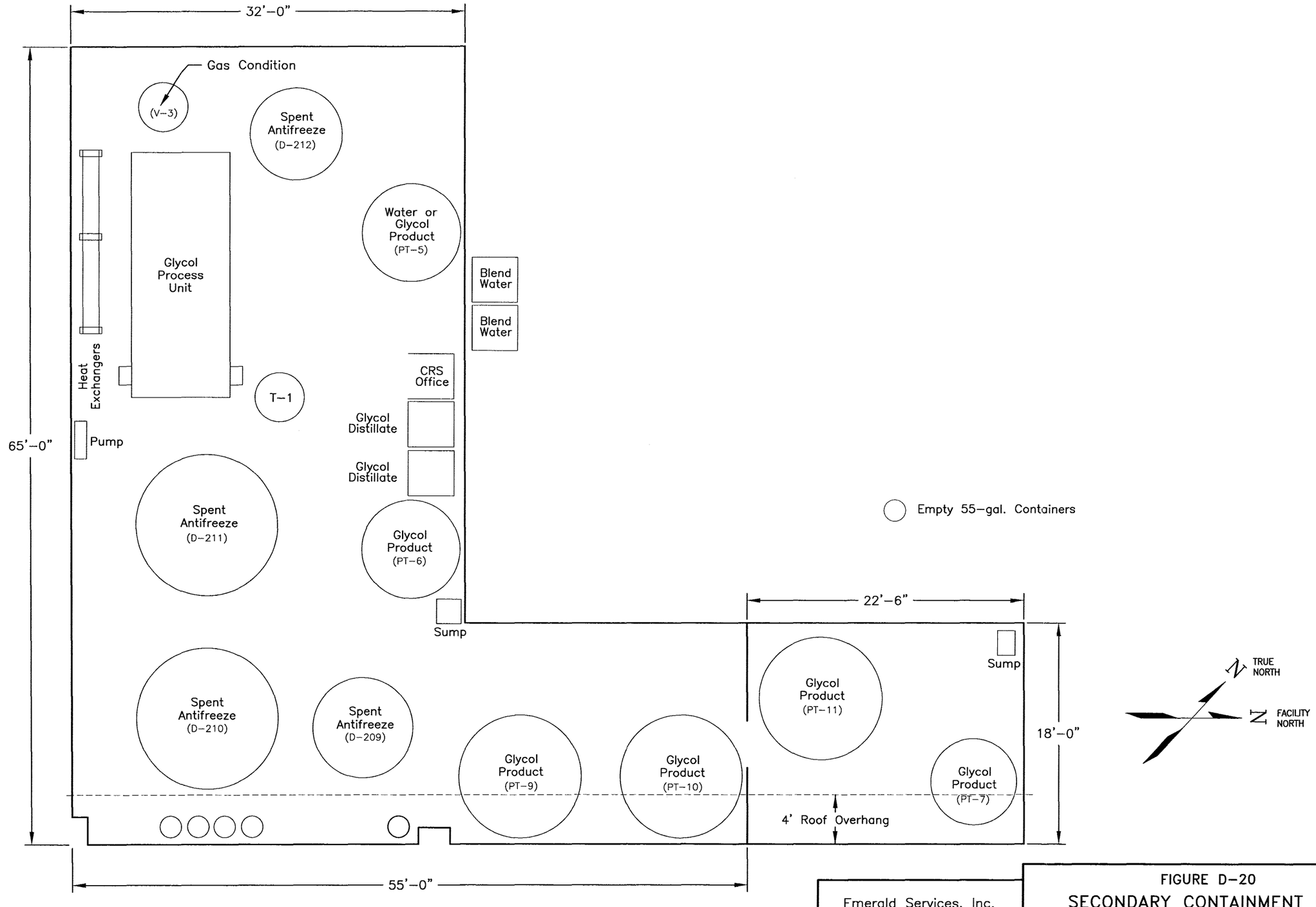

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Tacoma, Washington 98421

FIGURE D–20
SECONDARY CONTAINMENT FOR GLYCOL RECYCLING SYSTEM

FILE NO: GRSCALC	DATE: Aug. 12, 2009	SCALE: 1"=8'

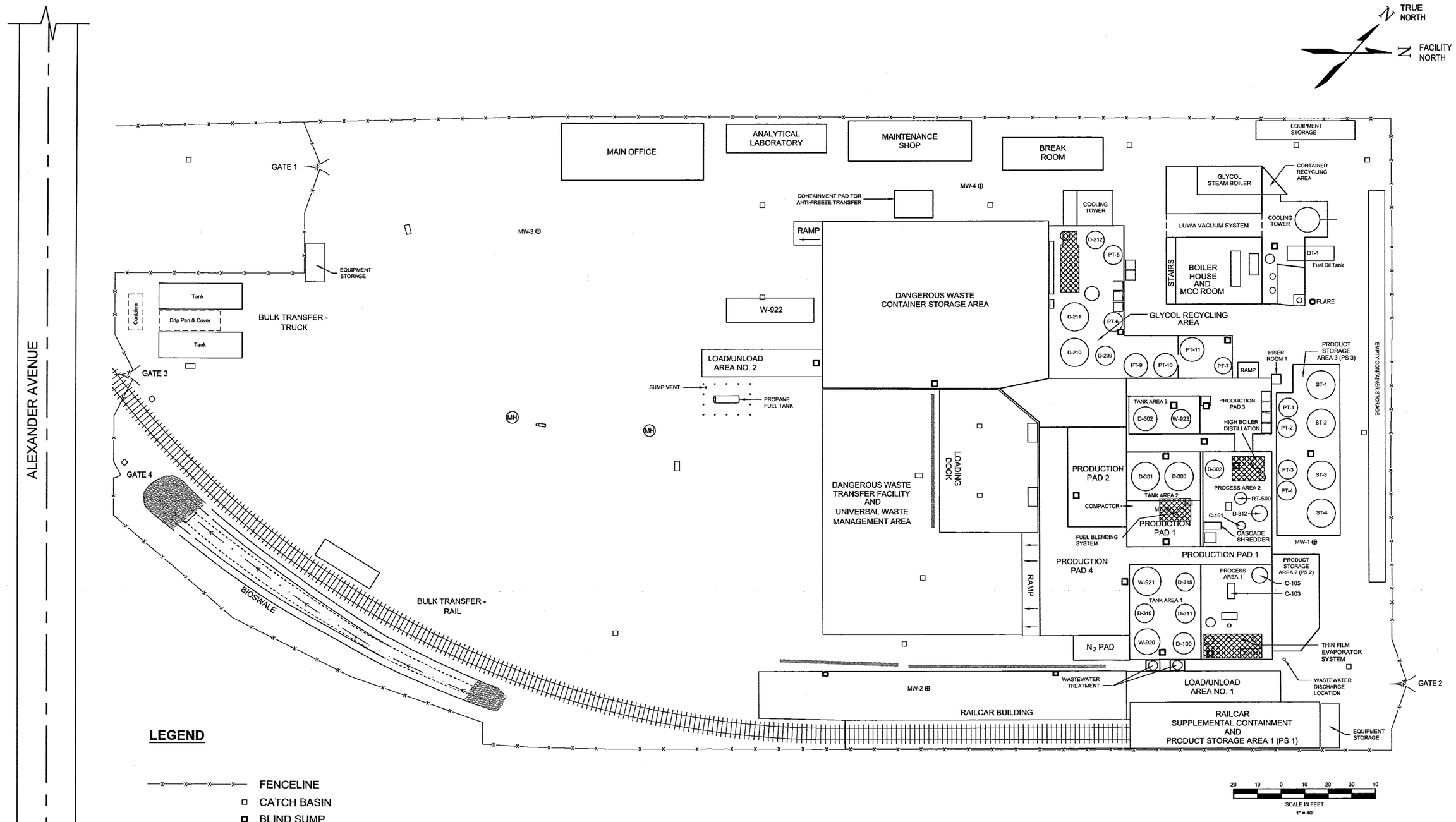

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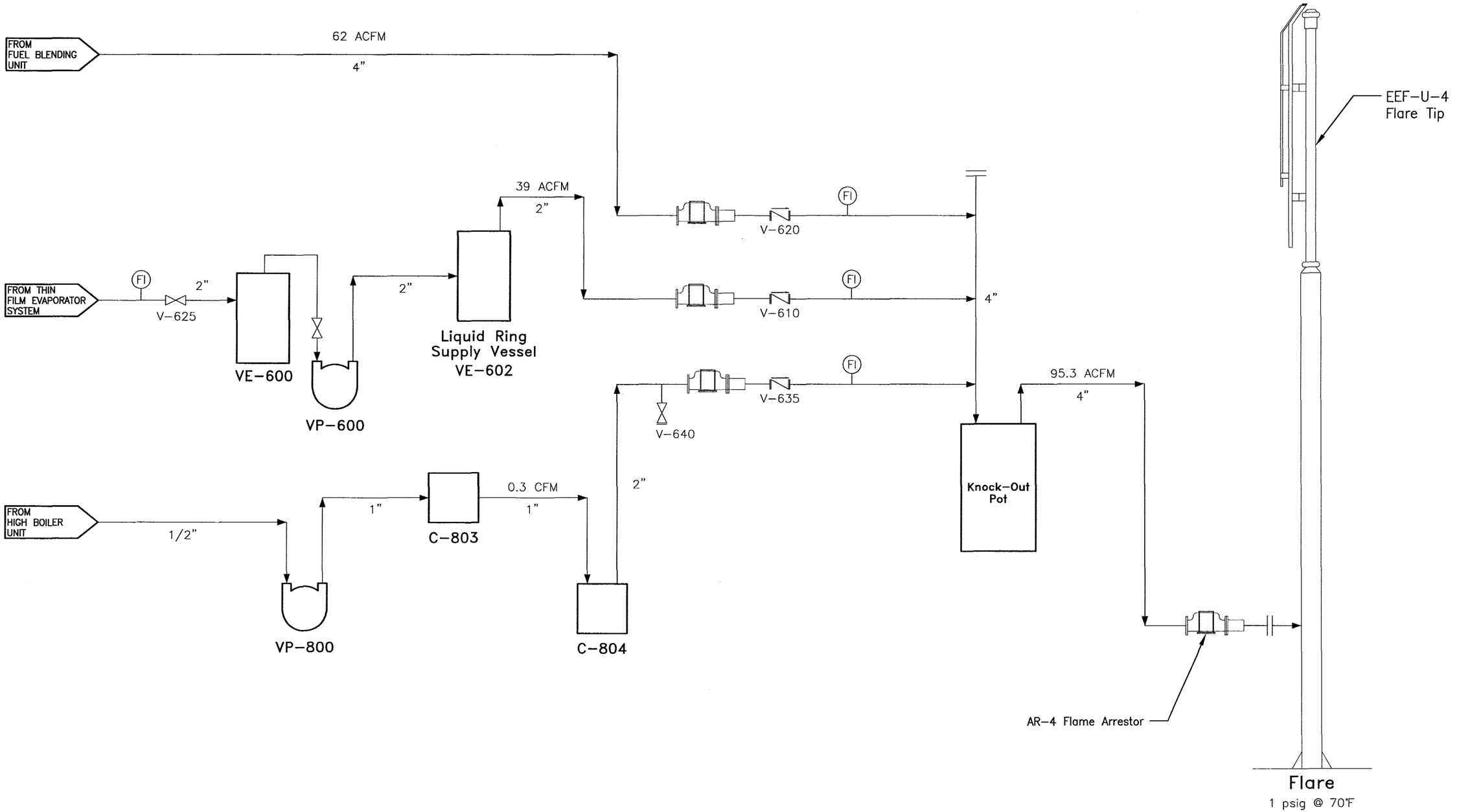
FIGURE D-21
PROCESS UNIT LOCATIONS

FILE NO: PUL	DATE: Feb. 15, 2011	SCALE: 1"=40'



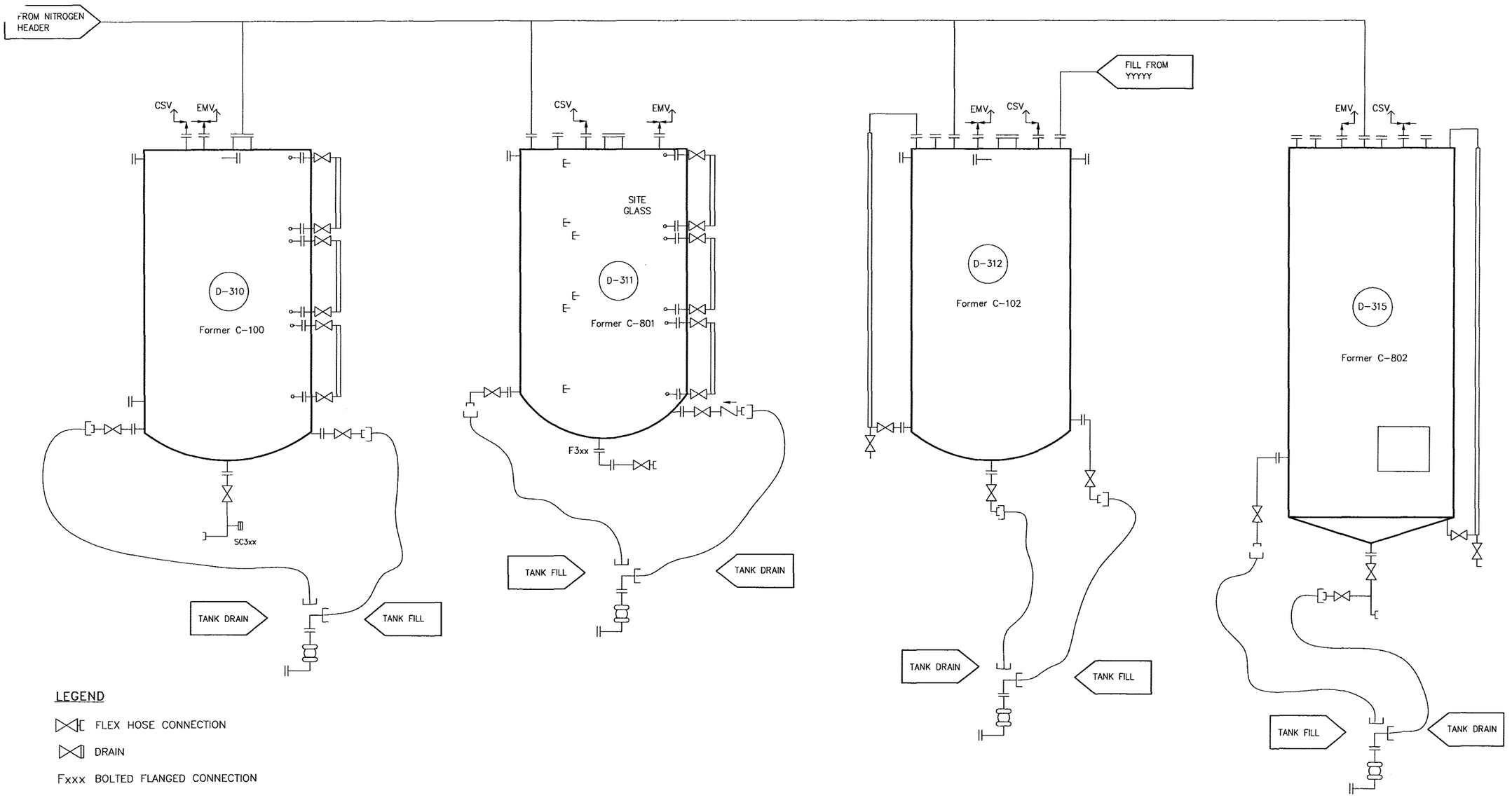
NOTE: SEE VACUUM SYSTEM UTILITIES P&I DIAGRAM

SOURCE: HARRIS GROUP, INC.
DESIGN SKETCH, 3/3/98

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-22
PROCESS VENT SYSTEMS
PIPING AND INSTRUMENTATION DIAGRAM

FILE NO: PVPID	DATE: June 20, 2008	SCALE: NTS



LEGEND

- FLEX HOSE CONNECTION
- DRAIN
- Fxxx BOLTED FLANGED CONNECTION
- CS CARBON STEEL
- SCREWED CONNECTION
- FLEXIBLE HOSE
- PORTABLE PUMP

Emerald Services, Inc.
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Tacoma, Washington 98421

FIGURE D-23
MULTI-USE STORAGE TANKS
PIPING AND INSTRUMENT DIAGRAM

FILE NO: TANKPID	DATE: Sept. 23, 2009	SCALE: NTS

TRUE NORTH

FACILITY NORTH

ALEXANDER AVENUE

GATE 1

GATE 2

GATE 3

GATE 4

BIOSWALE

CONTAINMENT PAD FOR ANTI-FREEZE TRANSFER

RAMP

DANGEROUS WASTE CONTAINER STORAGE AREA

COOLING TOWER

D-212

PT-5

LUWA VACUUM SYSTEM

FLARE

D-211

PT-6

GLYCOL RECYCLING AREA

D-210

D-209

PT-11

PT-9

PT-10

PT-7

RAMP

LOAD/UNLOAD AREA NO. 2

TANK AREA 3

D-502

PRODUCTION PAD 3

HIGH BOILER DISTILLATION

LOADING DOCK

PRODUCTION PAD 2

D-301

D-300

TANK AREA 2

D-302

PROCESS AREA 2

RT-500

D-312

COMPACTOR

MT-500

PRODUCTION PAD 1

CASCADE SHREDDER

FUEL BLENDING SYSTEM

PRODUCTION PAD 1

PRODUCTION PAD 4

RAMP

D-315

PROCESS AREA 1

TANK AREA 1

D-310

D-311

D-100

D-101

THIN FILM EVAPORATOR SYSTEM

LOAD/UNLOAD AREA NO. 1

RAILCAR BUILDING

#2

#1

RAILCAR SUPPLEMENTAL CONTAINMENT AND PRODUCT STORAGE AREA 1 (PS 1)

LEGEND

- (#) RAILCAR SPOT
- FENCELINE
- CATCH BASIN
- BLIND SUMP
- TRENCH DRAIN
- GATE

20 10 0 10 20 30 40

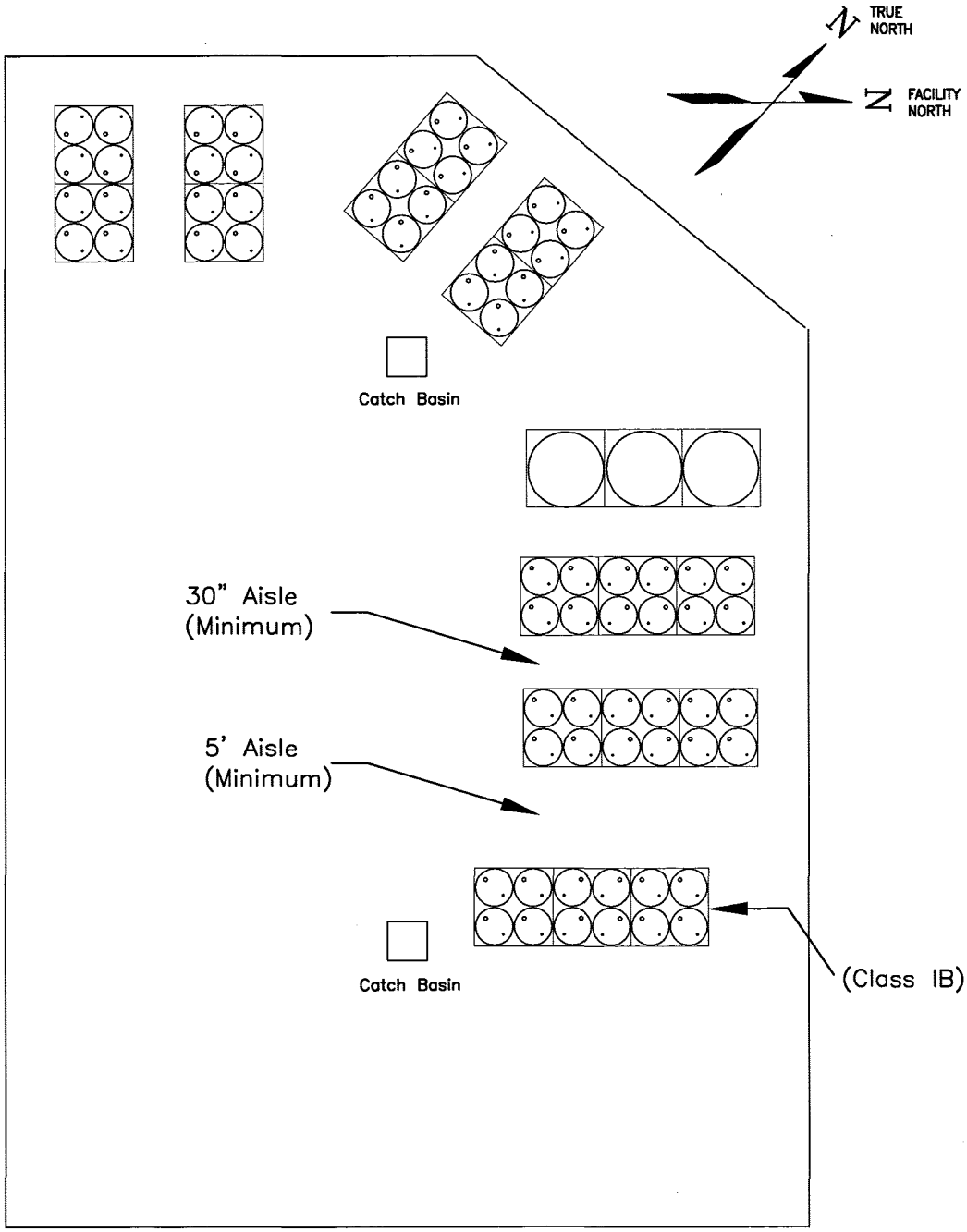
SCALE IN FEET

1" = 40'

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-24
DANGEROUS WASTE MANAGEMENT AREAS

FILE NO: DWMA	DATE: Jan. 31, 2011	SCALE: 1"=40'



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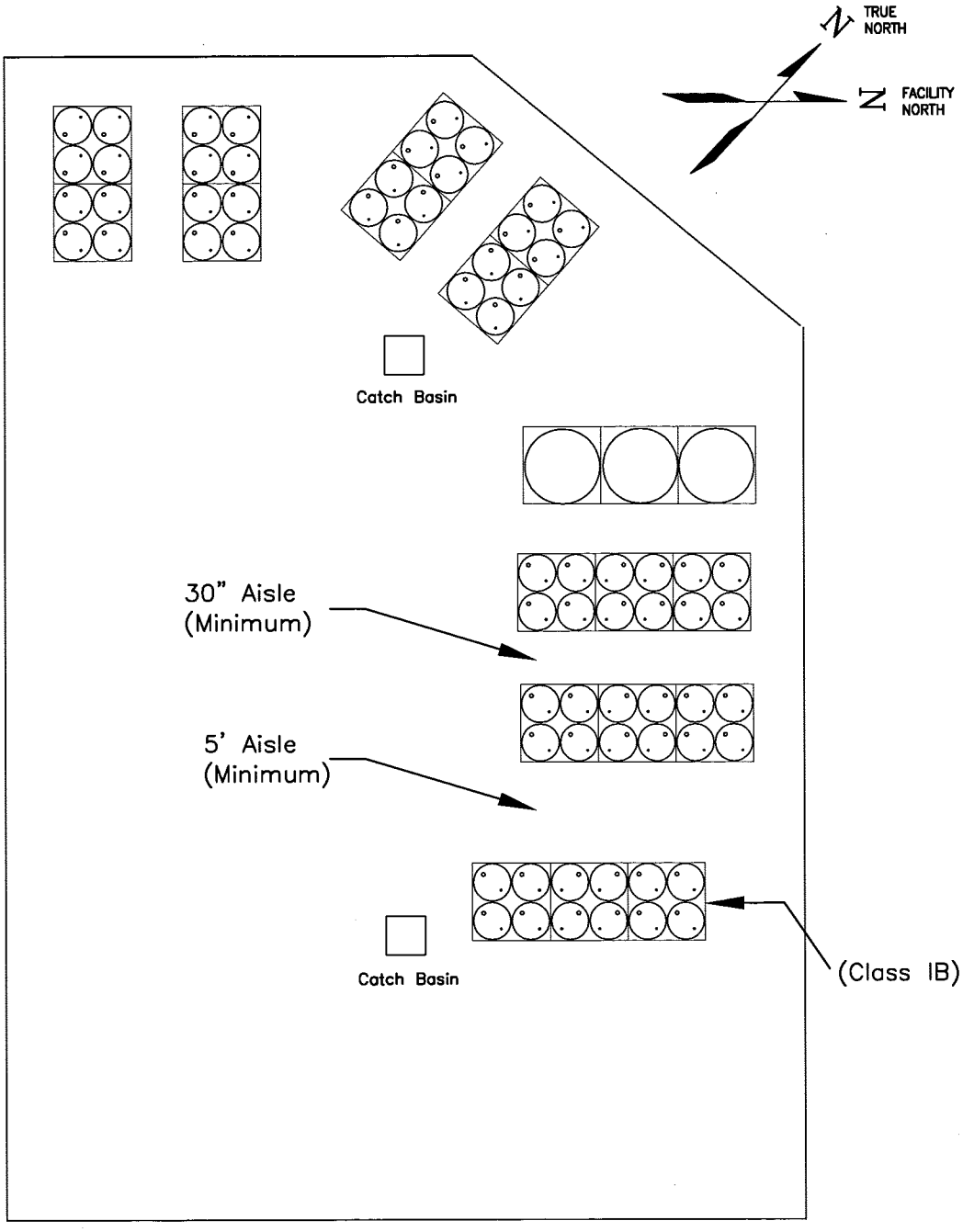
Tacoma, Washington 98421

FIGURE D-25
LOADING DOCK
CONTAINER LAYOUT

FILE NO: LD-STAGE	DATE: Aug. 18, 2009	SCALE: NTS



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE D-25
LOADING DOCK
CONTAINER LAYOUT

FILE NO: LD-STAGE	DATE: Aug. 18, 2009	SCALE: NTS

Part B

Section E

Releases from Solid Waste Management Units

TABLE OF CONTENTS

E. RELEASES FROM SOLID WASTE MANAGEMENT UNITS

E.1a Solid Waste Management Units.....1
SWMUs and Conclusions of the RFA.....1

Figure E-1: Solid Waste Management Units

E. RELEASES FROM SOLID WASTE MANAGEMENT UNITS

WAC 173-303-806(4)(a)(xxiv), 645, and 646
40 CFR Part 270.14(d)

E.1a Solid Waste Management Units

In December 1989, the United States Environmental Protection Agency (USEPA) performed a preliminary review (PR) and visual site inspection of the Emerald site. Subsequently, a RCRA Facility Assessment (RFA) for the site was conducted. The findings of that assessment are available in a report entitled *RCRA Facility Assessment PR/VSI Report – Chemical Processors, Inc. NW Processing, Inc., Sol-Pro, Inc., Chemical Processors, Inc. Parcel A; Tacoma, WA; February 1990 ("RFA").*

Based on the information contained in that documents, the following subsections identify Solid Waste Management Units (SWMUs) and potential releases at the Emerald facility. This information includes known and suspected significant releases of dangerous waste and/or dangerous waste constituents at and from each SWMU at the facility. The location of each release, and any information on actual or potential impacts to human health or the environmental is provided.

SWMUs and Conclusions of the RFA

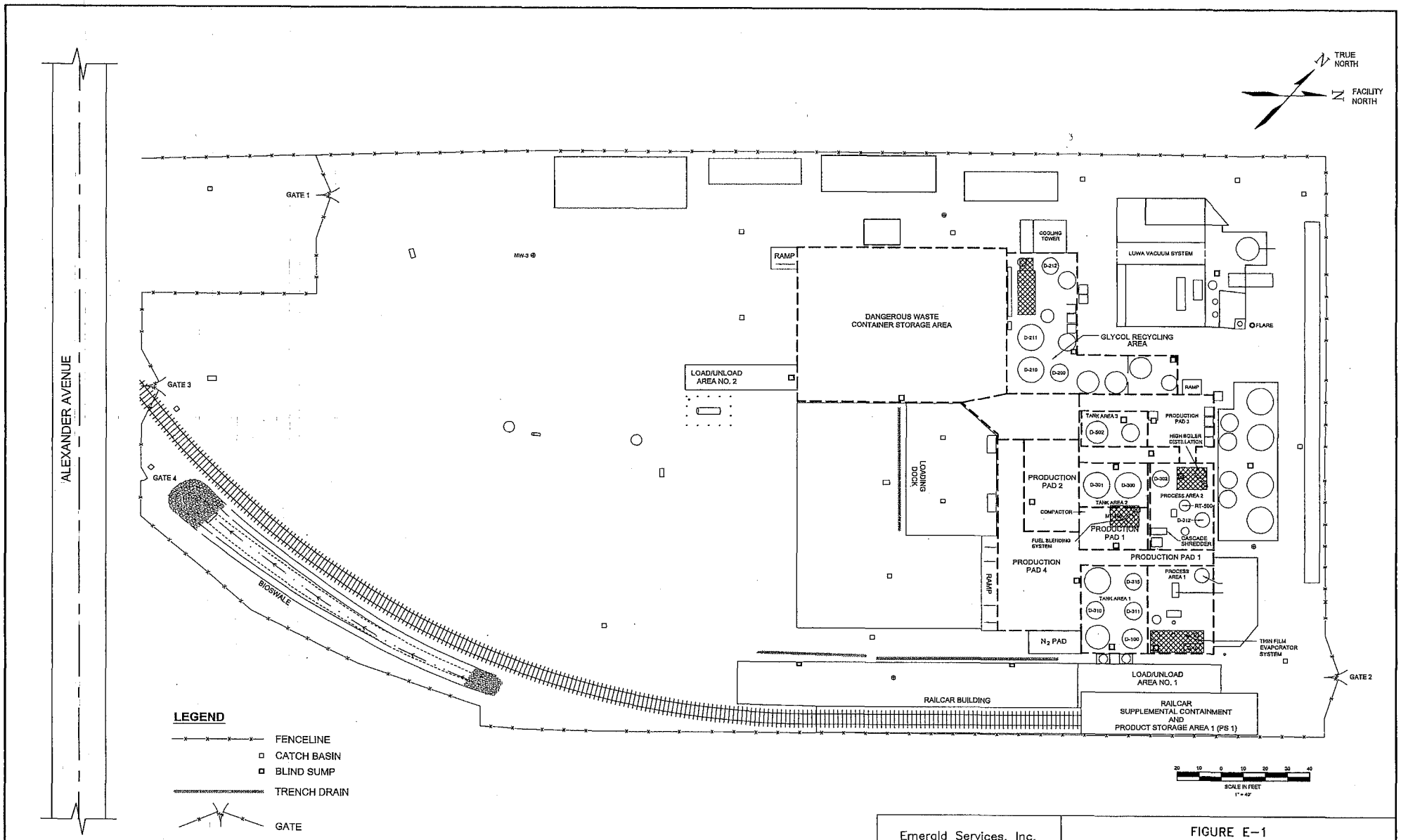
Solid Waste Management units and areas are identified in Figure E-1. The Emerald facility is situated adjacent to other facilities that have reported releases of dangerous constituents that are similar to those managed at the Emerald facility. According to the findings of the RFA document, of the four facilities, operations at Emerald are of the least concern. The Emerald facility is newer than the others, and was originally constructed with secondary containment for tanks and containers.

In 1991, under authority of §3008(h) of RCRA [42 U.S.C. §6928(h)], EPA agreed upon a consent order for the former Sol-Pro facility. This order was agreed upon between EPA Region 10 and Ralph Jeuris for Sol-Pro, Inc. and entered on November 18, 1991. It was subsequently amended on May 6, 1992 with an effective date of May 19, 1992.

In accordance with the conditions of the Consent Order, Sol-Pro prepared a RCRA Facility Investigation (RFI) work plan. This document is entitled *RCRA Facility Investigation – Site Characterization Work Plan for Sol-Pro, Inc., Tacoma Washington*, dated May 6, 1993. Among other things, the document contains an identification of SWMUs, a diagram of the location of each unit and a process flow diagram for the facility. The RFI Work Plan (as amended by submission dated June 3, 1993) was approved by EPA on July 28, 1993. The effective date of the approved plan was July 30, 1993.

Since that time, Emerald continued to work with Ecology on implementation of the RFI Work Plan. A schedule was prepared that identified specific steps of the RFI and any necessary corrective action. This program was developed in accordance with WAC 173-303 and the Model Toxics Control Act (MTCA).

The §3008(h) Order was rescinded by EPA following Emerald's 2003 Class 2 Permit modification. Emerald continues to work with Ecology to identify any corrective action that needs to be completed.



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE E-1
SOLID WASTE MANAGEMENT UNITS

FILE NO: SWMUE-1	DATE: Jan. 24, 2011	SCALE: 1"=40'

GROUNDWATER MONITORING SAMPLING AND ANALYSIS WORK PLAN

April 27, 2018

Project #: 46Y-001-002

SUBMITTED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

PREPARED FOR: Emerald Services, Inc.

1825 Alexander Avenue, Tacoma, WA 98421

Table of Contents

1.0 INTRODUCTION 1-1

2.0 GROUNDWATER MONITORING METHODS 2-1

2.1 Monitoring Well Inspection and Maintenance 2-1

2.2 Groundwater Level Measurements 2-2

2.3 Groundwater Quality Sampling 2-3

2.3.1 Sample Analyses 2-3

2.3.2 Groundwater Sampling Procedures 2-3

3.0 FIELD DOCUMENTATION AND SAMPLE MANAGEMENT 3-1

3.1 Field Documentation 3-1

3.2 Field Calibration Procedures 3-1

3.3 Sample Custody and Transport 3-1

3.3.1 Field Custody 3-2

3.3.2 Sample Transfer of Custody and Shipment 3-2

4.0 DECONTAMINATION PROCEDURES 4-1

4.1 Aqueous Sampling Equipment Decontamination 4-1

4.2 Decontamination of Workers and Personal Protective Equipment 4-1

4.3 Decontamination of Sample Containers 4-1

5.0 DISPOSAL OF INVESTIGATION-DERIVED WASTE 5-1

6.0 REPORTING 6-1

6.1 Reporting for Quarterly Events 6-1

6.2 Annual Reports 6-1

6.3 Report Distribution 6-2

List of Tables

1. Monitoring Well Construction Summary 2-2

2. Groundwater Monitoring Program Sampling Matrix 2-3

List of Figures

1. Site Location Map

2. Site Map and Monitoring Well Network

List of Appendices

A. FIELD FORMS

B. WELL LOGS

C. STANDARD OPERATING PROCEDURE FOR WATER LEVEL MEASUREMENTS

1.0 INTRODUCTION

This Groundwater Monitoring Sampling and Analysis Work Plan (SAP) was developed for the Emerald Services, Inc. Tacoma Facility (Emerald). The Emerald facility address is 1825 Alexander Avenue, Tacoma, Washington as shown in Figure 1. The facility layout is shown on Figure 2. This SAP includes site-specific inspections and maintenance procedures, field sampling procedures, field screening procedures, analytical requirements, quality control guidelines and reporting requirements.

The facility contacts are:

Greg Garman
Emerald Services, Inc. Tacoma Facility
Operations Manager, Tacoma
(206) 437-6315

or

Sheila Smith
Emerald Services, Inc.
Director, Environmental Compliance
(253) 370-7912

This SAP provides the information necessary to implement the periodic groundwater monitoring program for the Emerald facility groundwater monitoring network as required by the Permit for Storage of Dangerous Waste (Permit), Permit No. 981 769 110, Section 2 – Corrective Action and Attachment 1 - Well Construction, Maintenance, and Replacement. The effective date of this Permit was April 1, 2010 and the Permit will expire on April 1, 2020. Once approved in writing by the Washington State Department of Ecology (Ecology), this SAP becomes an enforceable part of the Permit.

The monitoring well network for the Emerald facility currently consists of four groundwater monitoring wells MW-1, MW-2R, MW-3R, and MW-4 (Figure 2). Monitoring wells MW-2R and MW-3R are replacement wells installed in March 2018 and October 2012, respectively. This SAP describes elements of the Emerald groundwater monitoring program. The schedule of elements is as follows:

Monitoring wells will be inspected quarterly. During the second and fourth quarters, water levels and total depth will be measured in each well during well inspection activities. The water level measurements will be coordinated with

measurement activities at Philip Services Corporation's (PSC) Tacoma Facility, which is located adjacent to the Emerald facility. Potential re-development of wells, if needed, will be completed during the second quarter of each year as noted in Section 2 (wells with a measured build-up of at least one foot of sediment).

Monitoring wells MW-1, MW-2R, MW-3R, and MW-4 will also be sampled during the second quarter of each year. Monitoring well MW-4 will be sampled again during the fourth quarter of each year, making the sampling interval for this well semiannual (in June and December). If there are unexpected exceedances of constituents of concern in monitoring wells MW-1, MW-2R, and MW-3R from the second quarter sampling event, those wells where exceedances were detected in the second quarter (June) will be sampled again during the fourth quarter sampling event (December). More frequent sampling may be necessary if there are unexpected detections of constituents above MTCA groundwater cleanup levels. The schedule for sampling, however, will continue until altered as a permit modification under WAC 173-303-830(3) and 40 CFR § 270.41, or as part of a remedial investigation, feasibility study, or cleanup action process.

2.0 GROUNDWATER MONITORING METHODS

Groundwater monitoring of the Emerald facility includes or may include the following three major elements:

1. Monitoring well inspection and maintenance
2. Groundwater level measurements
3. Groundwater quality sampling

The methodologies and procedures associated with these three groundwater monitoring elements are described in the sections that follow.

2.1 MONITORING WELL INSPECTION AND MAINTENANCE

Monitoring wells will be inspected quarterly and maintained in good working order. Well inspections are to be completed per Section 2 and Attachment 1 of the Permit. When periodic groundwater monitoring and sampling is scheduled, quarterly well inspections will occur at the same time. The inspections include the following items:

- Evaluate access to the monitoring wells, and improve if needed.
- Inspect the protective casing, cover, and bolts, repair or replace as needed.
- Evaluate whether wells are clearly labeled and re-label as necessary.
- Evaluate padlock operation, lubricate with graphite as needed, inspect padlocks for signs of corrosion, replace as needed.
- Inspect J-plug caps, especially the watertight seal, replace as needed.
- Inspect PVC well casing for cracks or signs of surface leakage such as staining inside of the well casing.
- Inspect measuring point, re-mark as needed.
- During the second and fourth quarters, measure static depth to water.
- During the second quarter, measure total well depth, compare to as-built depth, re-develop well if there is 1 foot or more of accumulated sediment in the well.

Well repairs that can be accomplished in the field at the time of inspection will be performed at that time. More involved maintenance or repairs such as well re-development or replacing protective covers will be scheduled and performed prior to the next scheduled monitoring event. If required by Chapter 173-160 WAC (Minimum Standards

for Construction and Maintenance of Wells) or Chapter 173-162 WAC (Regulation and Licensing of Well Contractors and Operators), more involved maintenance and repairs will be conducted by a licensed well driller. Ecology will be notified within 15 days, by telephone or in writing, of visual damage to or deterioration of wells.

Records of the monitoring well inspection and maintenance will be recorded on the Monitoring Well Inspection and Maintenance Form located in Appendix A Field Forms. Well logs for the wells installed at the Emerald facility are located in Appendix B.

2.2 GROUNDWATER LEVEL MEASUREMENTS

Water level elevations will be measured during the second and fourth quarters in all of the onsite monitoring wells following the standard operating procedures (SOP) described in Appendix C. Locations of the four wells currently comprising the monitoring well network are shown in Figure 2. Measuring point elevations, screened intervals, and total well depths are summarized in Table 1.

TABLE 1. MONITORING WELL CONSTRUCTION SUMMARY

Well Number	Ground elevation (ft-msl)	Top of casing elevation (ft-msl)	Screened Interval (ft-bgs)	Total Depth (ft-bgs)	Northing	Easting
MW-1	14.46	14.07	5 to 7.75	7.75	711899.042	1171268.103
MW-2R	14.23	13.79	4.45 to 8.2	8.2	711728.901	1171193.105
MW-3R	14.61	14.28	6 to 8	8	711723.306	1170938.621
MW-4	14.40	14.11	4 to 9	9	711901.447	1171062.468

Notes:
ft-msl – feet above mean sea level
ft-bgs – feet below ground surface
Vertical Datum – NAVD88
Horizontal Datum – NAD 83 (91)
Wells surveyed on March 29, 2018
Total Depths from well logs

Water level elevations in all onsite wells will be measured within a 60-minute period. These data will be used to construct a groundwater elevation contour map for the uppermost aquifer and to estimate the rate and direction of groundwater flow.

A water level indicator will be used to measure the depth to water (DTW) to the nearest 0.01 foot. The water level indicator will be decontaminated prior to each use and between each well by spray rinsing the probe and any part of the cable that was submerged with distilled water. If the probe becomes visibly contaminated, a spray rinse using a decontamination solution and distilled water may be used, followed by a distilled water rinse.

Nitrile gloves (or equivalent) will be worn when unlocking the protective well casing. A new pair of nitrile gloves will be put on prior to measuring the water level in order to avoid contaminating the well or probe. The DTW will be measured from the reference point (either the northern edge of the well casing or from a marked location on the well casing) to the static water level inside the well casing. The DTW measurement will be recorded along with the time (to the nearest minute) in the field logbook and in the Monitoring Well Inspection and Maintenance Form located in Appendix A Field Forms.

2.3 GROUNDWATER QUALITY SAMPLING

2.3.1 SAMPLE ANALYSES

During the second quarter of every year, MW-1, MW-2R, MW-3R, and MW-4 will be sampled and analyzed. During the fourth quarter of every year, MW-4 will be sampled and analyzed, making the sampling interval for this well semiannual (June and December). If there are unexpected exceedances of constituents of concern in monitoring wells MW-1, MW-2R, and MW-3R from the second quarter sampling event, those wells where exceedances were detected in the second quarter should be sampled again during the fourth quarter sampling event. The constituents, analytical methods, bottle types, and preservatives are summarized in Table 2.

TABLE 2. GROUNDWATER MONITORING PROGRAM SAMPLING MATRIX

Constituent Group	Analytical Method	Bottle Type	Preservative	Holding Time	Number of Samples
Arsenic and Lead (totals)	SW846 6010/6020	250 ml polyethylene	HNO_3	6 Months	5[1]
Diesel and Oil-range Total Petroleum Hydrocarbons (TPH)	NWTPH-Dx extended	1-liter amber glass (HCL)	Chill to 4°C	14 Days	5[1]
Volatile Organic Compounds (VOCs)	SW846 8260B	40-ml VOA vials	HCl, chill to 4°C	14 Days	6[2]

[1] Five samples: 4 field samples and 1 duplicate sample
[2] Six samples: 4 field samples, 1 duplicate, and 1 trip blank
°C: degrees Celsius

2.3.2 GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling procedures include well purging, collection of field parameter data during purging, and sample collection for laboratory analysis. Sampling procedures are listed in the following sections.

Well Purging

During the second and fourth quarters, groundwater elevation measurements must be collected from all wells to be sampled, prior to purging, and completed in as short a time as possible (within 60 minutes). Monitoring wells will then be purged prior to sampling using a peristaltic pump equipped with new disposable polyethylene tubing. The tubing will be placed downhole at a depth that is near the center of each well's screened interval. The rate of purging should be chosen so that the purge rate does not produce over 0.33 feet of drawdown in the water column during purging. The objective is to pump in a manner that minimizes stress (drawdown) to the system to the extent practical. Typically, flow rates on the order of 0.1 – 0.5 liters per minute (L/min) are used.

Purging will continue until parameters have stabilized or until a maximum of three casing volumes of water have been removed. Purge water will pass through a Horiba U-52 Water Quality Checker, or equivalent, and then discharged to a graduated cylinder (to measure purge rate) and then transferred to 5-gallon buckets. Purge water will be emptied into the onsite water treatment system.

The following equation will be used to calculate the volume of water to purge from each well prior to sampling:

$$V = (H)[\pi r^2) (7.48)] (3)$$

where:

V = Minimum volume of water to evacuate, in gallons.

H = Total well depth minus depth to water in feet.

r = Radius of well casing in feet.

7.48 = Conversion from cubic feet to gallons.

3 = Number of casing volumes

MW-3, now decommissioned, had a history of being purged dry. Given the proximity of MW-3 to MW-3R, it is likely that MW-3R will also run dry. If needed, the following procedure will be implemented at MW-3R:

- Lower the purge tubing to the bottom of the well and purge the well using a steady flow rate of approximately 0.1-0.3 L/min. Purge until field parameters have stabilized or until a maximum of one casing volume of water has been removed.
- Record field parameters during purging of all wells as described in the section below. Wells in which the static water level is at or below the bottom of the well screen will be considered dry, and will not be purged and sampled.

Field Parameters

Temperature, Oxidation/Reduction Potential (ORP), pH, specific conductance, dissolved oxygen, and the turbidity of the purged water will be measured and recorded in the field notebook at a time interval of approximately every three minutes. Depth-to-water and purge rate will also be measured and recorded in the field notebook when parameters are recorded. In addition, notes will be taken describing the appearance or odor of the water.

If the field parameters are within 10 percent of each other after three successive readings, no further purging will be required. If the field parameter results are not consistent to within 10%, purging will be continued until the parameters stabilize or three casing volumes (or 1 casing volume in the case of MW-3R) have been removed from the well, whichever occurs first. The total volume of water purged from each well will be recorded in the field notebook.

Groundwater Sample Collection

Groundwater samples will be collected using a peristaltic pump equipped with new single-use tubing. The tubing portion of each pump will be discarded after use (between each well). Gloves will be changed, at a minimum, between wells, following purging and before sample collection, and whenever the potential for cross-contamination is suspected.

Groundwater samples will be collected into laboratory-cleaned, pre-labeled sample bottles. Groundwater samples for total metals will not be filtered and will be placed in pre-preserved sample bottles. After collection, all samples will be placed in coolers with enough ice to in an effort to maintain an internal temperature of 4 degrees Celsius (°C) for the duration of the sampling and transportation period. Samples will be delivered to TestAmerica Laboratories in Tacoma, Washington, or another approved Ecology laboratory, for analysis after each day of sampling following standard chain of custody procedures. TestAmerica is accredited by Ecology under Chapter 173-50 WAC for the specific analyses to be conducted. TestAmerica's address is given below.

5755 8th St E
Tacoma, WA 98424
Contact: Ms. Cathy Gamble, (253) 922-2310

For the wells with low recovery, if the well runs dry during sample collection, discontinue sampling and discard the samples aliquots already collected. Collect each of the required sample aliquots for this well during the December sampling event when the water table and groundwater recharge rate are likely to be higher.

If requested by Ecology, Emerald must allow Ecology or its authorized representative to take split or duplicate samples of groundwater samples taken by Emerald. During groundwater monitoring inspections performed by Ecology, Ecology will allow Emerald to take split or duplicate samples unless it interferes with Ecology's sampling. Ecology will attempt to notify Emerald prior to any sample collection by Ecology.

Field Documentation

Groundwater sampling information will be recorded in the field notebook. Refer to Section 3.0 for information.

Field QA/QC Samples

Quality assurance and quality control (QA/QC) measures will be taken to evaluate laboratory precision. QA/QC procedures will be conducted in accordance with the requirements in WAC 173340-820, WAC 173-340-830, Ecology's ***Guidance on Sampling and Data Analysis Methods*** (Ecology Publication No. 94-49), and Ecology's ***Guidelines for*** *Preparing* ***Quality Assurance Project Plans for Environmental Studies*** (Ecology Publication No. 04-03-030). Field duplicate samples and trip blank samples will be the only types of sample collected as part of the field QA/QC program. Equipment blanks will not be obtained because all sampling equipment will be either dedicated or disposable.

The potential for cross-contamination and contamination from the ambient air will be evaluated using trip blank samples. One set of trip blanks is required for each sampling event. The trip blank will originate at the contract laboratory and be re-labeled upon arrival at this site. Trip blanks will be analyzed for VOCs only.

Laboratory precision will be evaluated by collecting blind field duplicate samples. The field duplicate sample will be collected from well MW-4 based on historical sampling results. One field duplicate sample will be collected per sampling event. The field duplicate sample will be collected under conditions as nearly identical as possible to the original sample. The field duplicate will be designated sample ERI-MW-50 and will be labeled like standard samples. The field duplicate sample will be distinguished as a duplicate only in the field notes and will be analyzed for the same constituent list as the original sample. Emerald will attempt to achieve detection limits that are low enough to determine whether MTCA groundwater cleanup levels are being exceeded.

Sample Identification Numbers

Each sample will be designated by a unique alpha-numeric identifier ("sample number") according to the following scheme:

ERI-MW-XX

where:

ERI = Location code for Emerald Services, Inc.

MW-XX = Monitoring well number

Character groups will be separated by a "-" dash. An example of a completed sample identification number is:

- ERI-MW-03R (Groundwater sample collected from monitoring well MW-3R at Emerald Services, Inc.)

Sample numbers will be recorded in the field notebook, on sample container labels, and chain-of-custody forms. Other information recorded on the sample container label includes:

- Time and date of sample collection
- Initials of sampler(s)
- Laboratory analyses to be performed
- Preservatives used

3.0 FIELD DOCUMENTATION AND SAMPLE MANAGEMENT

3.1 FIELD DOCUMENTATION

Groundwater sampling information that should be recorded in the field notebook includes the following:

- Date and time of sampling
- General condition of well (if noteworthy)
- Weather conditions
- Names of sampling personnel
- Static water level
- Total depth of well
- Manufacturer, model number, serial number, and calibration notes for any instrument used for
- static water level measurement, health and safety, or field parameter analysis
- Well purge volume calculations
- Well purge start time, finish time, and total volume purged
- Field parameter measurements
- Miscellaneous comments or observations

3.2 FIELD CALIBRATION PROCEDURES

Equipment failing calibration or becoming inoperable during use will be removed from service, sent for repair, and a replacement piece of equipment obtained. A standard Water Quality Instrument Calibration Form used by field personnel prior to each sampling event is located in Appendix A Field Forms.

Data collected with equipment that later fails re-calibration will be evaluated. If the data appear to have been affected, the results of the evaluation will be documented and the appropriate personnel notified.

3.3 SAMPLE CUSTODY AND TRANSPORT

Sample possession will be traceable from the time of sample collection until receipt of samples at the analytical laboratory. Sample possession will be documented following the chain of custody procedures outlined below. Chain

of custody procedures will be conducted consistent with the requirements in WAC 173-340-820, WAC 173-340-830, Ecology's Guidance on Sampling and Data Analysis Methods (Ecology Publication No. 94-49), and Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology Publication No. 04-03-030).

3.3.1 FIELD CUSTODY

Samples will be in the custody of the field sampler(s) from the time of sample collection until the samples are transferred or dispatched properly. Samples will be retained in coolers with sufficient ice in an effort to maintain an internal temperature of 4°C. The Project Manager will evaluate whether proper custody procedures were followed during the field work by reviewing the documentation and discussing procedures with sampling personnel. It will be the responsibility of the Project Manager to decide if additional samples are necessary.

3.3.2 SAMPLE TRANSFER OF CUSTODY AND SHIPMENT

Samples will be accompanied by a chain of custody record. When transferring custody of the samples, the individual relinquishing and receiving the samples will sign, date, and note the time of transfer on the chain of custody record. This record documents sample custody transfer from the sampler to the analyst at the laboratory.

Samples that are shipped will be packed in iced coolers with a separate chain of custody record accompanying each cooler. Coolers will be sealed with fiber tape and will have signed and dated custody seals attached to the cooler so that the cooler cannot be opened without breaking the custody seals. Two custody seals must be placed on each cooler, one at the front and one at the back. The method of shipment, courier name(s), and other pertinent information will be entered in the Remarks section of the chain of custody record.

Samples that are hand delivered to the laboratory may use one chain of custody record for all the coolers delivered. Hand delivered sample coolers do not need to be sealed with fiber tape or custody seals.
Documents will be distributed as follows:

- Ship with samples:
  - Chain-of-Custody Record (original)
- Send to Project Manager:
  - Field logbooks (at completion of the project)
  - Chain-of-Custody Record (copy)

- Return to project files:
  - Chain-of-Custody Record (copy)
  - Shipping records

4.0 DECONTAMINATION PROCEDURES

Purging and sampling equipment that comes into direct contact with sample media, sample containers, or the inside of a monitoring well will ideally be single-use disposable equipment that is replaced between each sampling event, or will be dedicated equipment, assigned to and used at only one well. If the sampling equipment is not single-use disposable equipment or dedicated, it will be decontaminated between each sampling event using the procedures described below.

4.1 AQUEOUS SAMPLING EQUIPMENT DECONTAMINATION

Aqueous sampling equipment decontamination procedures are as follows:

1. Wash in a solution of Liquinox (or equivalent) and potable tap water.
2. Rinse with potable tap water.
3. Rinse with 10 percent nitric acid[1] (trace metal or higher-grade HNO3).
4. Rinse with distilled water.
5. Rinse with reagent-grade isopropyl alcohol.
6. Rinse with distilled and deionized water (ASTM Type I or II).

4.2 DECONTAMINATION OF WORKERS AND PERSONAL PROTECTIVE EQUIPMENT

It is anticipated that all work will be conducted in modified Level D protection. Modified Level D protection includes:

1. Cotton or Tyvek coveralls
2. Steel-toed, steel-shank rubber boots
3. Hard hat
4. Safety glasses or equivalent
5. Nitrile inner and outer gloves

4.3 DECONTAMINATION OF SAMPLE CONTAINERS

All sample containers will be quality certified laboratory-prepared and pre-cleaned in accordance with U.S. EPA Specifications and Guidance for Contaminated-Free Sample Containers.

[1] Only if sample is to be analyzed for metals.

During water level measurements during the second and fourth quarters, nitrile gloves (or equivalent) will be worn when unlocking the protective well casing. A new pair of nitrile gloves will be put on prior to measuring the water level in order to avoid contaminating the well or probe.

5.0 DISPOSAL OF INVESTIGATION-DERIVED WASTE

Purged and extracted groundwater, steam-cleaner water, and other decontamination fluids will be placed in an accumulation drum and managed by Emerald. Solids will be collected in Department of Transportation-approved steel drums, tested, and disposed of appropriately at an approved facility by Emerald.

6.0 REPORTING

6.1 REPORTING FOR QUARTERLY EVENTS

Quarterly monitoring reports will be prepared and placed in the Emerald facility Operating Record per the requirements of Attachment 1 of the Permit. The quarterly groundwater monitoring reports will include, at a minimum:

- A short narrative describing the activities performed during the monitoring event and any notable deviations from the SAP.
- A table listing depth to water measurements, measuring point elevations, water level elevations, and measurement dates and times during the second and fourth quarters.
- Groundwater elevation contour map for the second and fourth quarter.
- Well inspection results and descriptions of any maintenance or repairs performed.
- Analytical results summary table (including final field parameters) for the second and fourth quarter sampling events.
- Laboratory data sheets for the second quarter and fourth sampling events.
- Copy of the chain of custody form for the second and fourth quarter sampling events.

6.2 ANNUAL REPORTS

An annual groundwater data analysis report will be submitted to Ecology during each year of the monitoring program per the requirements of the Permit, Section 2. The annual report will be submitted to Ecology on or before April 15th of each year. Additionally, the annual groundwater data report submitted to Ecology will also serve as the onsite Emerald facility fourth quarter report as referenced above.

The annual groundwater data analysis reports will include, at a minimum:

- A description of groundwater monitoring activities completed during the year.
- A description of groundwater monitoring activities planned for the next year.
- Occurrence of any problems, how problems were resolved, deviations from the sampling and analysis work plan, and a justification for all deviations.
- A summary of all significant findings, changes in personnel, and significant contacts with all federal, state and local governments, community and public interest groups.

- All laboratory analyses (in a mutually agreed upon electronic data format and as hard copies of the original laboratory data) in tabulated data format.
- All field measurements.
- Tables and graphs of groundwater data showing specific groundwater monitoring well, sample collection date, constituent concentrations, MTCA cleanup levels, and a summary of constituent concentrations which exceed MTCA cleanup levels.
- Groundwater level contour maps.
- Hydrographs for each groundwater monitoring wells showing date of measurement and groundwater elevation.
- Graphs of daily precipitations data from the facility or from the closest rain gauge monitoring station.
- Evaluations of the seasonal effect on the groundwater data, contaminant plume characteristics, constituents that are migrating offsite from the facility, and an estimate of the rate of transport and any revisions to the conceptual model.

Furthermore, the annual report will include all laboratory methods, detection limits, and Practical Quantitation Limits (PQLs) for all constituents analyzed pursuant to WAC 173-340-830. WAC 173340-830(2)(f) requires laboratories to achieve the lowest PQLs consistent with the selected method and WAC 173-340-707 (Analytical Considerations).

In addition to the annual report, Emerald will submit all sampling data according to Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements) and/or any subsequent procedures specified by Ecology for data submittals.

If both Emerald and Ecology agree that such a change is necessary, the requirement for submittal and frequency of the annual groundwater data analysis report may be revised. Revision of the requirement or the time interval for submittal of progress reports will not require a permit modification.

6.3 REPORT DISTRIBUTION

Copies of the quarterly memorandum will be distributed to the following:

Greg Garman
Operations Manager, Tacoma
Emerald Services, Inc. – Tacoma Facility
1825 Alexander Avenue
Tacoma, WA 98421

Sheila Smith
Director, Environmental Compliance
Emerald Services, Inc.
7343 East Marginal Way S.
Seattle WA 98108

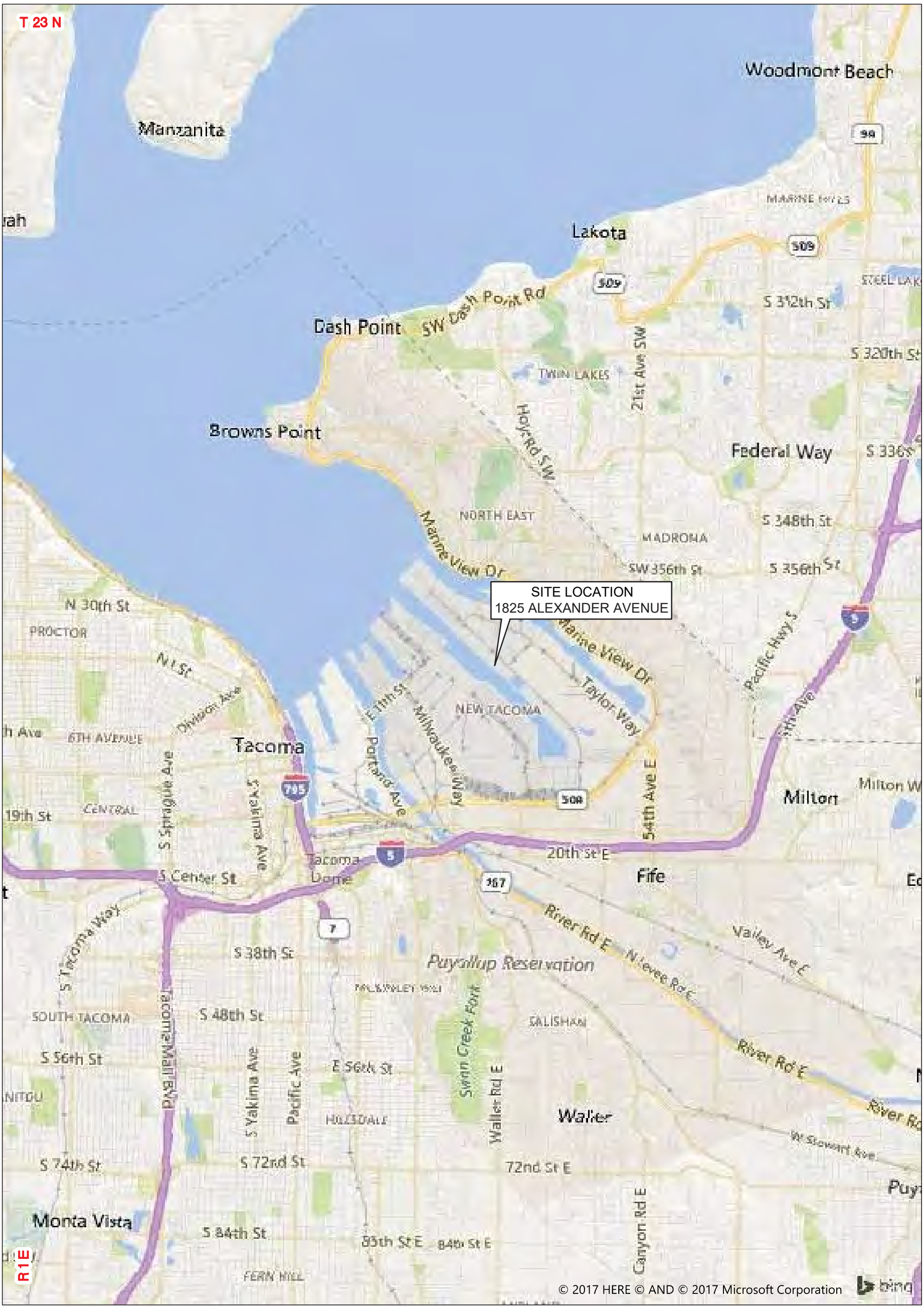
Copies of the annual report will also be submitted to the following:

Kaia Petersen (2 copies)
Ecology Site Manager
Washington State Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

William Beck
Senior Project Manager
PSC
18000 72nd Ave. S., Suite 217
Kent, WA 98032-1035

Bill Sullivan
Puyallup Tribe of Indians
3009 E. Portland Avenue
Tacoma, WA 98404

FIGURES



WASHINGTON

QUADRANGLE LOCATION

NOTE:
SITE LEGAL DESCRIPTION -
TOWNSHIP 23 NORTH,
RANGE 1 EAST, SECTION 27

N

0 1 MILE

Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

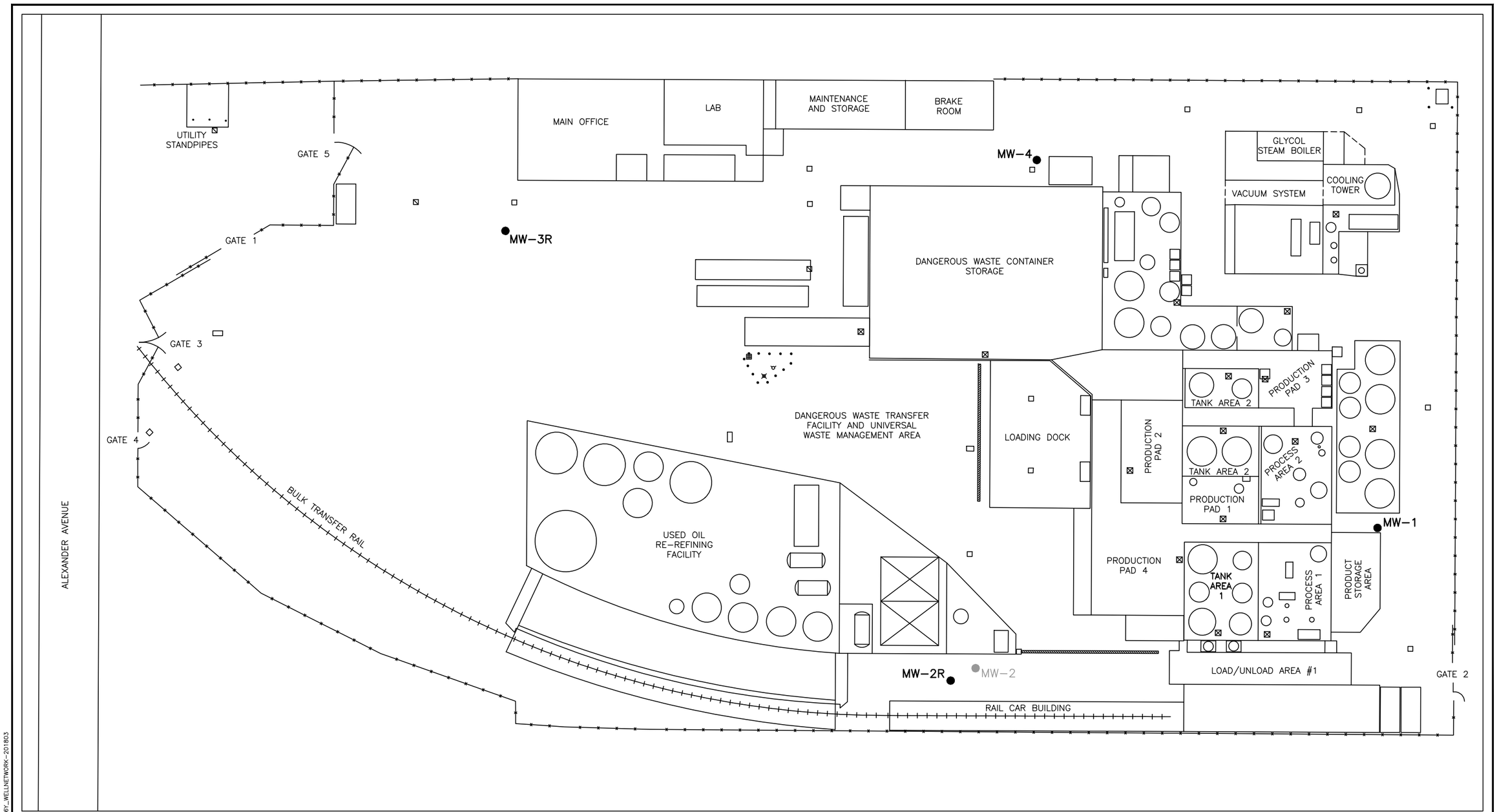
FIGURE 1

SITE LOCATION MAP

EMERALD SERVICES, INC.
1825 ALEXANDER AVENUE, TACOMA, WASHINGTON

Drawn By: JLP	Checked By: AF	Scale: 1" = 1 MILE	Date: 8/11/2017	File: 46Y_GWR-SITELOC-201708

M:\SK\TACOMA\CADD\GROUNDWATERREPORT\201708\46Y_GWR-SITELOC-201708



EXPLANATION

- MW-3R ● MONITORING WELL AND DESIGNATION
- ● ABANDONED MONITORING WELL
- ▧ CATCH BASIN
- ⊠ BLIND SUMP
- MANHOLE
- ▦ SUMP VENT
- ▦ SUMP VENT
- FIRE MAIN INDICATOR
- FIRE HYDRANT
- BOLLARD
- TRENCH DRAIN
- FENCELINE
- RAILROAD

N

0 100'

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FIGURE 2

SITE MAP AND MONITORING WELL NETWORK

EMERALD SERVICES, INC.
1825 ALEXANDER AVENUE, TACOMA, WASHINGTON

Drawn By: JLP	Checked By: AF	Scale: 1" = 100'	Date: 3/30/2018	File: 46Y_WELLNETWORK-201803

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APPENDIX A

FIELD FORMS

Trihydro

Monitoring Well Inspection and Maintenance Form

GENERAL INFORMATION

Project Name:	Emerald Services, Inc.	Date:	
Station:	MW-1	Time:	
Sample ID:		Field Team:	
Weather Conditions:		Temperature:	

WELL INFORMATION

Well Diameter (in):	2	Bottom Condition:	
As-Built Well Depth (ft):	7.75	Pump in Well:	no
Measured Well Depth (ft):		Well type:	Flush completion
Length of Tip (ft):	0.07		
Well Depth (ft):	-0.07		
Initial DTW (ft):			

WELL CONDITION:	Bolts:
	Gasket:
	J-plug:
	Lock:
	Label:
	Monument:
	Other:
REPAIRS NEEDED:	
REPAIRS PERFORMED:	
OTHER COMMENTS:	

Trihydro

Monitoring Well Inspection and Maintenance Form

GENERAL INFORMATION

Project Name:	Emerald Services, Inc.	Date:	
Station:	MW-2R	Time:	
Sample ID:		Field Team:	
Weather Conditions:		Temperature:	

WELL INFORMATION

Well Diameter (in):	2	Bottom Condition:	
As-Built Well Depth (ft):	8.2	Pump in Well:	no
Measured Well Depth (ft):		Well type:	Flush completion
Length of Tip (ft):	0.07		
Well Depth (ft):	-0.07		
Initial DTW (ft):			

WELL CONDITION:	Bolts:
	Gasket:
	J-plug:
	Lock:
	Label:
	Monument:
	Other:
REPAIRS NEEDED:	
REPAIRS PERFORMED:	
OTHER COMMENTS:	

Trihydro

Monitoring Well Inspection and Maintenance Form

GENERAL INFORMATION

Project Name:	Emerald Services, Inc.	Date:	
Station:	MW-3R	Time:	
Sample ID:		Field Team:	
Weather Conditions:		Temperature:	

WELL INFORMATION

Well Diameter (in):	2	Bottom Condition:	
As-Built Well Depth (ft):	8	Pump in Well:	no
Measured Well Depth (ft):		Well type:	Flush completion
Length of Tip (ft):	0.07		
Well Depth (ft):	-0.07		
Initial DTW (ft):			

WELL CONDITION:	Bolts:
	Gasket:
	J-plug:
	Lock:
	Label:
	Monument:
	Other:
REPAIRS NEEDED:	
REPAIRS PERFORMED:	
OTHER COMMENTS:	

Trihydro

Monitoring Well Inspection and Maintenance Form

GENERAL INFORMATION

Project Name:	Emerald Services, Inc.	Date:	
Station:	MW-4	Time:	
Sample ID:		Field Team:	
Weather Conditions:		Temperature:	

WELL INFORMATION

Well Diameter (in):	2	Bottom Condition:	
As-Built Well Depth (ft):	9	Pump in Well:	no
Measured Well Depth (ft):		Well type:	Flush completion
Length of Tip (ft):	0.07		
Well Depth (ft):	-0.07		
Initial DTW (ft):			

WELL CONDITION:	Bolts:
	Gasket:
	J-plug:
	Lock:
	Label:
	Monument:
	Other:
REPAIRS NEEDED:	
REPAIRS PERFORMED:	
OTHER COMMENTS:	

APPENDIX B

WELL LOGS

Boring Log and Construction Data for Monitoring Well B-1/MW-1

Geologic Log

Depth in feet

Approx. Ground Surface Elevation in Feet

0

Medium dense, moist, gray brown, slightly silty, gravelly, fine SAND.

Medium dense, moist to wet, black, slightly silty, fine to medium SAND.

5

Soft, wet, gray SILT.

Wet, black PEAT.

10

Soft, wet, gray brown SILT with mixed organics.

Bottom of Boring at 9.0 Feet. Completed 11/22/88.

15

20

25

Sample N

S-0 24

S-2.5 16

S-5 15

S-8 4

Monitoring Well Design

Casing Stickup in Feet

Top of PVC in Feet 0.00

ATD

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. Ground water level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

J-2282 11/88

Figure A-2

Well ID: MW-2R

WELL COMPLETION LOG

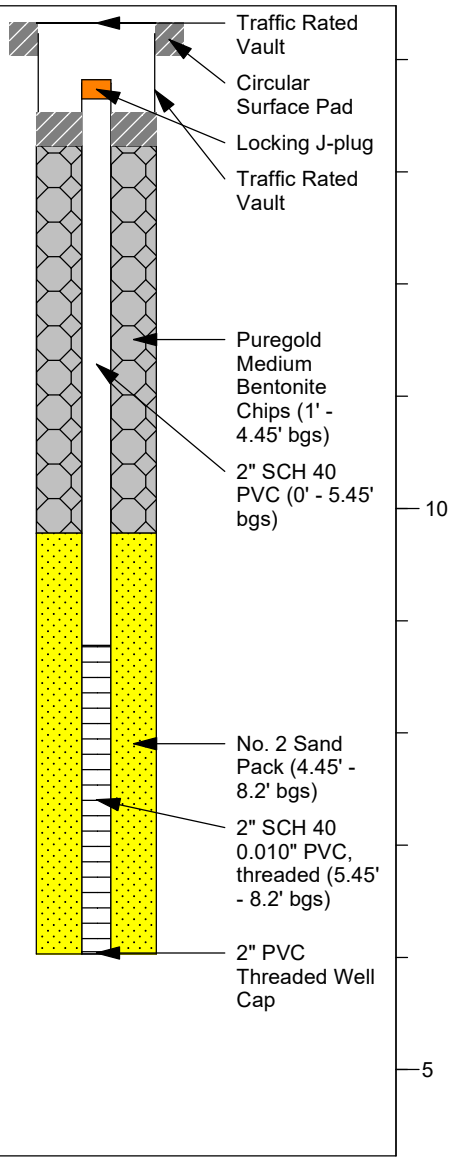
Client: Emerald Services, Inc.
Project Number: 46Y-001-002
Logged By: Katie Mitchell
Well Location: NW of Rail Building
Sample Type: Acetate Liner

Contractor: ESN
Driller: Brian Bowes
Drilling Method: Hollow Stem Auger
Drilling Rig: Geoprobe 7800
Borehole Diameter: 8.25

Date Started: 3/28/2018
Date Completed: 3/28/2018
Total Depth Drilled: 10 ft-bgs
Total Depth of Well: 8.2 ft-bgs

Measuring Point Elevation: 13.79 ft amsl
Ground Surface Elevation: 14.23 ft amsl
Easting (ft): 1171193.105
Northing (ft): 711728.901
Depth of First Encountered Water: 3.75 ft bgs
Water Level in Completed Well: 2.92 ft bgs

Depth (ft-bgs)	Lithologic Description	USCS	PID (PPM)	DTW	Elev. (ft-amsl)
0	Asphalt				
	Gray-brown GRAVELLY SAND, some silt, fine sand, sand mostly subrounded, gravel up to 1" diameter, gravel subangular to subrounded, mostly subrounded, poorly sorted, medium dense, moist	SW	157.4		
	Black-gray SAND, minor gravel, fine sand and gravel, subrounded gravel, poorly sorted, soft, moist	SW		▼	
	Gray SILT, slightly clayey, woody plant matter, low plasticity, dense, wet at 3.75 feet	ML	345	▽	
5	Black-gray SAND, trace silt, fine to medium sand, poorly sorted, mostly fine, subrounded, loose, wet	SW			
	Gray SILTY SAND, fine sand, loose, wet	SM	323		
	Black-gray SAND, trace silt, fine to medium sand, poorly sorted, mostly fine, subrounded, loose, wet	SW			
	Gray SILTY SAND, fine sand, loose, wet	SM			
	Black-gray SAND, trace silt, fine to medium sand, poorly sorted, mostly fine, subrounded, loose, wet	SW			
	Gray SILTY SAND, fine sand, loose, wet	SM	75.1		
10	Gray-black SILTY SAND with approx. 60% WOODY ORGANIC MATTER, fine sand, firm, moist	OL			



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1252 Commerce Drive
Laramie, WY 82070
Phone: (307) 745-7474
Fax: (307) 745-7729

NOTES: - ft bgs - feet below ground surface
- ft amsl - feet above mean sea level
- Horizontal Datum - NAD 83 (91)
- Vertical Datum - NAVD 88
- Well was developed on March 28, 2018 by removing 5-casing volumes and purging until field parameters stabilized.

CH2MHILL

Well Number: MW-3R

Client: Emerald Services
Project: MW-3 Well Replacement
Location: Tacoma, WA
Project Number: 425942.12.GW

Driller: Boart Longyear
Drilling Method: HSA
Sampling Method: STP
Logged by: Mario Lopez Ramos
Start/Finish Date: 6/19/2012 - 6/19/2012

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface			
0				**AC** Asphalt Concrete	0		Concrete Mix up to 14"
							3/4" Bentonite Chips (1 bag)
		5-5-5		**SW** Light gray, gravelly, fine to medium SAND with silt and trace woody debries (loose, damp)	2		2" SCH 40 PVC Riser
	1	1-1-1		**SM** Dark gray, silty, fine to medium SAND, with silty seams (very loose, moist)	4		Sample Collected at 11:45 (MW-3R-4-5.5)
5							Depth to Water during Drilling Activities (1145)
		0-0-0		**SM** Dark gray , fine to medium silty SAND, with silty seams (very loose, wet)	7		10/20 Colorado Silica Sand (4 bags)
							0.010 Slot SCH40 PVC Screen (2" by 2')
				End of Exploration	9		
10							
15							
20							

ENVIRONMENTAL PARTNERS INC

Boring/Well Designation: MW-4

Client: Emerald Services, Inc.
Drilling Contractor: Cascade Drilling, Inc.
Logged By: Jerry Sawetz
Method: Hollow Stem Auger
Date of Drilling: 9/13/04
Drill Rig: CME-75
Location: 1825 Alexander Ave., Tacoma, WA
Borehole: 8" nominal diameter

Depth	SUBSURFACE PROFILE: Log	USCS Code	Description	SAMPLE: Interval	Recovery	Blows per 6"	Sample	PID (ppm)	Sheen	Well Data	Comments
0			Ground Surface								Flush-mount monument
0			***Asphalt***								
1		SP	***Poorly-Graded Sand*** Dark brown; moist; mostly fine to medium sand with trace silt; no odor.								Concrete (0' - 2')
2											Hydrated Bentonite Chips (2' - 3')
3						6,8,9		6.7			#2/12 Sand filter pack (3' - 9')
4			Becomes gray with increased moisture.			7,6,5		2.4			0.010 Screen (4' -9')
5											Water level ATD
6			Becomes saturated.			7,4,5		1.2			
7						2.2.3		2.7			
8											
9		SM	***Silty Sand*** Grayish-brown; saturated; mostly fine to medium sand with some light brown silt; no odor.			1		1.1			Flush-threaded PVC end cap
10			End of Borehole								
11											
12											
13											
14											
15											

Project No.: 43507.0

APPENDIX C

STANDARD OPERATING PROCEDURE FOR WATER LEVEL MEASUREMENTS

APPENDIX C. STANDARD OPERATING PROCEDURE
WATER LEVEL MEASUREMENTS

The ability to develop accurate groundwater contour maps is dependent upon accurate monitoring of water levels within wells. The following procedures outline the steps necessary in measuring water levels within monitoring wells.

Equipment

- Health and Safety Plan
- Field log book and water levels/well inspection log form
- Permanent ink pen
- Water level indicator and/or dual-phase meter with a minimum 100-foot tape; the tape should have graduations in increments of 0.01 feet
- Decontamination equipment (e.g., decontamination solution, DI water, paper towels)
- Latex or Nitrile disposable gloves
- 5-gallon bucket with lid for IDW
- Toolbox
- PID and calibration gas

Procedures

1. Don nitrile gloves prior to gauging water levels. Upon arrival at well, inspect well-head and completion for tampering or damage. Note any water within the vault and if it is running into the well. Remove any water from vault before removing cap or plug from the monitoring well casing.
2. Use a PID to screen the vapors at the well-head and record the reading.
3. Don a new pair of nitrile gloves just before gauging well. Turn on the water level indicator or dual phase meter and verify that it is functioning properly. Slowly lower the probe into the well until the probe just contacts the water surface; the unit will respond with a tone or light signal. Note the depth from the reference point (either the northern edge of the well casing or from a marked location on the well casing).
4. Continue lowering the probe the total depth of the well. Note the time, date, total well depth, and depths of all fluids on the water level/well inspection form.
5. Retrieve the probe. Spray with liquinox (or similar) and water solution followed by deionized water to clean the probe.
6. Repeat procedure on any part of the measuring tape that came into contact with fluid in the well. Wipe with paper towels and ensure that all product residue is gone before inserting the probe into another well.
7. After decontamination, don new gloves and discard dirty materials to prevent cross-contamination within wells.

Part B

Section F

Inspection Plan

TABLE OF CONTENTS

F. PROCEDURES TO PREVENT HAZARDS/INSPECTION PLAN

1. Introduction 1
2. Security 1
3. Inspection Plan 2
   - 3.1 Introduction 2
   - 3.2 General Inspection Requirements 3
   - 3.3 Summary of Items to be Inspected 4
   - 3.4 General Evaluation, Corrective Action Procedures, and Inspection Frequencies 5
   - 3.5 Employees Responsible for Inspection Plan Implementation 9
   - 3.6 Inspection Plan Records 10
   - 3.7 Specific Corrective Action for Tank Systems 10
   - 3.8 Air Emissions Control and Detection – Inspections, Monitoring, and Corrective Actions 11
4. Preparedness and Prevention Requirements 20
   - 4.1 Equipment Requirements 20
   - 4.2 Isle Space 21
5. Preventive Procedures, Structures, and Equipment 21
   - 5.1 Prevent hazards and contain spills during unloading/ Loading 21
   - 5.2 Run-Off and Run-On Prevention 23
   - 5.3 Contamination of Water Supplies 23
   - 5.4 Equipment Failure and Power Outage Mitigation 23
   - 5.5 Prevention of Exposure to Dangerous Waste 24
6. Prevention of Reaction of Ignitable, Reactive, and/or Incompatible Wastes 25
   - 6.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste 25
   - 6.2 Precautions for Handling Ignitable or Reactive Waste and Mixing Incompatible Waste 26

TABLES

1 Summary of Inspection Items and Frequency 14
2 LDAR Categories and Frequency of Inspection 19

Section F – Procedures to Prevent Hazards/Inspection Plan Appendices

Appendix I – Forms:

- Daily Inspection Log
- Daily Inspection Log – Tank Systems and Process Units
- Weekly Inspection Log
- Monthly Inspection
- Work Order/Re-Inspection Form
- Spill Log

F. PROCEDURES TO PREVENT HAZARDS/INSPECTION PLAN

WAC 173-303-806(4)(a)(iv), (v), (vi), (viii), (ix), 310, 320, 340

1. Introduction

1.1. This section outlines the procedures Emerald has in place that are designed to ensure safe and secure storage and processing of dangerous waste.

1.2. This section also includes the Inspection Plan, which identifies specific inspection items, the criteria for determining corrective action, and timelines for corrective action.

2. Security

WAC 173-303-806(4)(a)(iv), 310 (2)

2.1. Emerald has installed several security devices that are designed to eliminate the possibility of unauthorized entry onto the facility.

2.1.1. The first of these is a 6-foot high chain link fence that is capped with three strands of barbed wire that surrounds the entire facility perimeter. This fence is inspected weekly to ensure it is in good condition.

2.1.2. There are four access gates to the facility (Figure D-24). The two main gates (Gates 1 and 2) are kept closed when not in active use. Gate 1 is the main vehicle access gate and is a security gate. Visitors are required to use Gate 1 and must check in at the main office prior to conducting any activities on-site. Gate 2 is occasionally used for bulk loading or off-loading. Gates 1 and 2 are kept closed and monitored during hours of operation to ensure security. Gate 3 is used by Tacoma Beltline Railway during railcar movement, and is otherwise kept locked. Gate 4 is not used during normal operations and is kept locked. All four access gates are locked when the facility is not in operation. Gate locks consist of chains and padlocks. All gates are inspected every operating day to ensure they are kept secure as specified in Table 1. During non-operating days security for all gates is observed as described in subsection 2.1.4.

2.1.3. Perimeter lighting provides nighttime security. Streetlights along Alexander Avenue illuminate the southern portion of the facility. Production area lighting illuminates the northern portion of the facility.

2.1.4. Emerald has a security system designed to detect movement along the facility perimeter. The system consists of a series of cameras which can be viewed by facility personnel (both on-site and remotely). The cameras can be adjusted to view non-perimeter areas of the facility if needed. During non-operational hours, the system is monitored by Sonitrol, who contacts designated Emerald personnel whenever there is on-site movement or other suspicious activity. Sonitrol also does a remote daily inspection of all operational areas on days for which an Emerald inspector is unavailable. For the remote inspection, Sonitrol uses the remote pan-tilt to evaluate all operational areas for security, catastrophic failures of tanks and/or containers, signs of trespassing, tipping of containers in container management areas, and flashing alarms. Any non-conformance is reported immediately to an Emerald Emergency Coordinator. The remote inspection report is provided to Emerald electronically and documentation that the inspection occurred each non-operational day is included in the operating record.

2.2. Emerald has posted signs at each entrance indicating "DANGER – UNAUTHORIZED PERSONNEL KEEP OUT." The signs are visible from any approach to the facility and are legible from a distance of at least 25 feet.

3. INSPECTION PLAN

WAC 173-303-806(4)(a)(v), 320, 340, 395(d), 630(6), 640(6), 640(7), 690-692

3.1. Introduction

3.1.1. Per requirements of WAC 173-303-806(4)(a)(v), WAC 173-303-320, and WAC 173-303-340, Emerald Recycling (Emerald) is required to have an Inspection Plan that is

designed to prevent malfunctions, deterioration, operator errors, and discharges which may cause or lead to the release of dangerous waste constituents to the environment or to a threat to human health. The Emerald inspection program is designed to provide early warning of the potential for such events in order to make timely corrections and/or take preventive actions.

3.1.2. Included in this Inspection Plan are the following items:

- Containers (including labeling);
- Container management areas;
- Tank systems (including labeling);
- Tank containment areas;
- Waste load/unload areas;
- Facility security;
- Safety and emergency equipment; and,
- Monitoring devices.

3.1.3. This Inspection Plan has been prepared in accordance with Ecology guidance and outlines the following:

- General inspection requirements;
- Inspection schedules and log sheets;
- Procedures for remedial action to correct problems;
- Specific process inspection requirements;
- Record keeping requirements; and,
- Inspection of air emission control and detection systems.

3.2. General Inspection Requirements 173-303-320

3.2.1. Inspections of the above items are performed according to a schedule that has been developed based on operational experience and regulatory requirements. During each inspection, inspectors evaluate and assess each inspection item for compliance with the criteria noted on the inspection logs (see Appendix I) and in Table 1, Summary of Inspection Items and Frequency.

3.2.2. Should any spill, or circumstance that may prompt implementation of the Contingency Plan, be noted during a

regular inspection, procedures outlined in the Contingency Plan will be followed. When Emerald discovers spilled wastes in secondary containment areas they will remove it and clean affected containment areas promptly using general procedures outlined in the contingency plan (section G). This will be done even when the spill is below the volume that requires full implementation of the contingency plan.

3.2.3. In addition to the checklist criteria, inspectors also evaluate each inspection item for other unanticipated problems that could lead to potential malfunctions, equipment deterioration, or operator error.

3.2.4. All items in non-compliance with the criteria as well as other unanticipated problems that pose a threat to human health or the environment are noted in the inspection report.

3.2.5. A Work Order is prepared for each of the non-compliance items that is not corrected at the time of inspection. Specific criteria and schedules for the inspections and inspection items are provided in detail in later sections of this Inspection Plan.

3.3. Summary of Items to be Inspected
WAC 173-303-806(4)(a)(v), 320, 340, 630(6), 640(6)

3.3.1. The items for inspection and specific criteria for each item are listed below in Table 1, Summary of Inspection Items and Frequency.

3.3.1.1. Inspection items were identified based on the requirements of WAC 173-303-806, 320, 340, 630 and 640 and standard facility operations.

3.3.1.2. Inspection frequency are based on requirements in WAC 173-303-806(4)(a)(v), 320, 630, and 640. In accordance with WAC 173-303-320(2)(c), Emerald inspects areas subject to spills daily when in use. (Use includes storing wastes in tanks and containers).

3.3.1.3. Emerald conducts a detailed technical assessment of all permitted secondary containment systems every six months. This inspection includes a thorough evaluation

of all the cracks and coatings and it results in a brief report outlining the findings. The inspection is performed by a Emerald personnel qualified to evaluate technical aspects of secondary containment integrity. Substandard conditions are corrected as outlined in subsection 3.4.

3.3.2. Forms used for inspections are included in Appendix I of this Inspection Plan.

3.3.2.1.1. These forms are living documents and may change in format, or inspection criteria may be added. That type of change will not be considered a Permit modification.

3.3.2.1.2. Emerald will ensure that any revisions incorporate all of the items for inspection, inspection frequencies, and criteria for acceptable conditions outlined in Table 1, Table 2, and Appendix I of this Inspection Plan.

3.3.2.1.3. Reducing requirements for inspections including corrective action procedures will require a permit modification.

3.4. General Evaluation, Corrective Action Procedures, and Inspection Frequencies

WAC 173-303-320(3)

3.4.1. General evaluation of non-compliance is performed to determine the severity of the non-compliance, as well as the manpower or equipment required to complete required corrective action. Based on the evaluation, corrective action timelines are identified. The criteria for establishing corrective action timelines is outlined below.

3.4.2. Unsatisfactory conditions or non-compliance with the above criteria which do not require significant repairs, such as label replacement, removal of stormwater from sumps[1],

[1] During rain events, Emerald removes all stormwater from sumps as soon as possible and no later than the end of the shift following initial accumulation in the sumps. Pumping of rainwater from sumps continues at a frequency of at least once each shift until the rain event is over.

or facing of drums to allow inspection, will be considered routine, and will be corrected within 24 hours of inspection.

3.4.2.1. For these types of corrective action items, the inspector will note the time and date of the inspection on each inspection form.

3.4.2.2. A work order request form will then be completed for the deficiencies, and be marked as Corrective Action Category "Routine." The work order request form will identify the specific location of the deficiency, the specific corrective action requested, and also the requested corrective action completion date.

3.4.2.3. Once the work identified in the work order request form has been completed, operations personnel initial the form, then return the form to the inspector. The inspector verifies that the work was completed by performing a re-inspection, then signs off on the work order request form as complete.

3.4.3.Other non-compliance that cannot be corrected within 24 hours of inspection, such as items that require assistance from contractors or the purchase of replacement parts, will have corrective action timelines identified based on risk potential. All inspectors will be adequately trained to ensure they are capable of determining the risk potential of items of non-compliance that may be found while performing routine inspections. To determine the risk potential, the inspector will consider the following:

- Potential for injury to personnel;
- Potential for release of dangerous waste to the environment;
- Potential for release of dangerous waste to containment;
- Potential for damage to facility equipment or property; and,
- Other miscellaneous potential hazards that could result from the non-compliance.

3.4.4. Based on these considerations, inspectors will assign a corrective action category to the deficient items. Corrective action categories are as follows:

3.4.4.1. Category 1: Category 1 Corrective Action is the most serious, and deficiencies assigned this category pose an imminent threat to human health or the environment (WAC 173-303-320(3)). Any loss of integrity, such as structural cracks in containment greater than 0.01 inches wide, or other breaches in containment are considered a Category 1. A leak in a tank, lack of emergency response equipment, security breach, or inoperable air emission control system would also be considered Category 1 Corrective Action[2].

3.4.4.2. Category 2: Category 2 Corrective Action is for significant deficiencies that do not pose an immediate threat to human health or the environment. Coating defects in containment or defects in sealants where there is a water stop below the joint are examples of Category 2 Corrective Action. Damaged or faded warning signs, and lack of surplus on-site emergency response equipment would also be considered Category 2 Corrective Action.

3.4.4.3. Category 3: Category 3 Corrective Action is for the least serious non-routine deficiencies such as minor defects in the containment system with localized chips or blisters in the surface coating, early signs of concrete erosion, or drying cracks less than 0.01 inches wide. Localized deterioration in the security fence or equipment approaching its serviceable life would also be considered Category 3 Corrective Action.

3.4.5. The timeline for corrective action of deficiencies will depend on the category assigned. Categories for deficiencies will be specified on the inspection logs and work

[2] Leaking or unsealed containers, spills into secondary containment, bulging container, and similar issues require immediate action and are addressed by the facility Contingency Plan (see subsection 3.2.2 of this section and section G).

orders. Timelines for different categories are identified as follows:

3.4.5.1. Category 1: A Category 1 Corrective Action is initiated immediately and closely monitored until completion due to an immediate threat to human health or the environment. When Category 1 Corrective Action deficiencies are identified, the inspector will note an immediate date for initiation of corrective action on the work order request form. If corrective action will entail several different processes for completion, the inspector will also identify target timelines for completion of the different processes that must be completed to achieve corrective action. For Category 1 Corrective Action, normal operations in the affected area will cease until corrective action has been completed.

3.4.5.2. Category 2: A Category 2 Corrective Action is scheduled within a week and implemented as soon as practicable as the deficiency does not pose an immediate threat to human health or the environment. Lead times for parts or materials, or scheduling of contractors may determine when corrective action can be completed. A schedule for completion of a Category 2 Corrective Action will be identified in the work order request form and inspectors will monitor corrective action until it has been completed. Normal operations in areas identified for Category 2 Corrective Action may continue during the corrective action period.

3.4.5.3. Category 3: A Category 3 Corrective Action is for deficiencies that do not pose an immediate threat to human health or the environment and also do not require short-term scheduling or action. Some Category 3 Correction Action deficiencies may be scheduled for completion during good weather or during equipment shutdowns. Some may also be identified as conditions requiring further observation or monitoring to determine if the condition worsens. The schedule for completion of Category 3 Corrective Action will be identified in the

work order request form and inspectors will monitor correction action until it has been completed. Normal operations in areas identified for Category 3 Corrective Action may continue during the corrective action period.

3.4.6. The frequency of inspection is determined based on the rate of possible deterioration of equipment and the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected. Inspection frequencies are specifically identified for each item regulated under this Inspection Plan in Table 1.

3.4.7. If Emerald does not complete corrective action for a deficiency as outlined in this subsection (subsection 3.4), they will report that as an incidence of noncompliance with their dangerous waste permit.

3.4.7.1. Such reporting will be according to requirements in WAC 173-303-810(14)(f) or (g), depending on the threat of the deficiency.

3.4.7.2. This reporting requirement is in addition to other notification and reporting requirements in Sections G of this permit.

3.5. Employees Responsible for Inspection Plan Implementation

3.5.1. Management-level staff are responsible for implementation of, and training according to, the Inspection Plan. These staff may include the Facility General Manager, the facility Environmental Manager, or a staff member within the corporate Environmental Group. At the time of the Permit Application submittal, the Environmental Coordinator from within the Environmental Group has oversight for the facility Inspection Plan. Responsibility for this oversight may change and will not be considered a Permit modification. Inspectors may be either facility operations personnel, or personnel who have responsibilities within the corporate Environmental Group. All inspectors shall have the appropriate training as outlined in the Training Plan.

3.5.2. Inspection checklists and inspection work orders are completed by inspectors then distributed to the Facility General Manager at a minimum. The completed checklists may also be distributed directly to other facility personnel at the request of the Facility General Manager. The Facility General Manager has overall responsibility for ensuring the appropriate corrective action is completed for items of non-compliance noted in the inspection checklists. Complete corrective action is verified by facility inspectors prior to sign-off of the work order request form.

3.6. Inspection Plan Records
WAC 173-303-320(2)(d)

3.6.1. All completed inspection forms, reports, and work orders will be maintained as part of the facility operating record for a minimum of five years. Examples of blank forms that may be used for the inspection are included in Appendix I and are discussed in subsection 3.3. Completed forms will include, at a minimum, the date and time of inspection, the printed name and handwritten signature of the inspector, a notation of observations made, the category of any deficiency, and the date and nature of any repairs and remedial actions taken.

3.6.2. All inspection forms and work orders will be kept in a log book. Daily and weekly inspection records may be maintained in separate books due to volume. Monthly and annual inspection records may be kept in the same book, but will be separated within the book for organizational purposes. All records will be maintained in a manner that allows easy reference to inspection reports and work orders.

3.7. Specific Corrective Action for Tank Systems
WAC 173-303-640(6); (7)

3.7.1. Inspection of dangerous waste storage tanks is performed daily. The inspection criteria are outlined in Table 1 and on the example inspection forms. Due to the potential for

significant damage to human health or the environment in the event of a leak or spill from a tank system, appropriate corrective action (Category 1) must be implemented immediately and closely monitored. At a minimum, Emerald will conduct the following in the event of a leak or spill from a tank system:

- Stop flow of waste into the system;
- Remove waste from the tank and its ancillary equipment within 24 hours;
- Remove waste from containment areas and clean affected containment areas promptly;
- Contain any visible releases to the environment;
- Report any non-exempted leaks or spill according to applicable regulations;
- Close and repair the system, and provide secondary containment; and,
- Ensure major repairs are certified before the tank system is returned to service.

3.7.2. Other applicable procedures outlined in the Contingency Plan will be followed as needed. All spills, regardless of quantity, are recorded on a Spill Log, which is maintained as part of the facility operating record (see sample Spill Log included in Appendix I, Forms).

3.8. Air Emissions Control and Detection – Inspections, Monitoring, and Corrective Actions
WAC 173-303-690-692

3.8.1. Emerald conducts inspections and monitoring of air emission control devices and closed vent systems according to the requirements of WAC 173-303-690 through 692 (40 CFR Part 264 Subparts AA, BB, and CC). The program under which these inspections are performed is typically referred to as leak detection and repair, or LDAR. Due to the complexity of the program, records of inspections, monitoring, and corrective action conducted under the

program are maintained separately from other inspection records in the facility operating record.

3.8.2. LDAR records and reports are reviewed on a monthly basis to ensure that scheduled monitoring has been completed. Categories of LDAR components that are checked, along with their inspection frequencies, are provided in Table 2 and section D of this permit.

3.8.3. Each individual process component subject to LDAR is tagged with a unique identification number based on the area is located and the type of component (i.e., valve, flange, vent, etc.). A complete listing of specific LDAR components is located in the facility operating record. This list includes both components subject to LDAR and components exempted from LDAR.

3.8.4. Documentation of LDAR inspections will be maintained in the facility operating record. This documentation includes:

- Monthly Equipment Calibration Log;
- LDAR Monitoring Record including monitoring date, results for each component, and the need for repairs; and,
- Repair Record Log.

3.8.5. All deficiencies noted during LDAR inspections will be categorized as a Category 1 Corrective Action and monitored closely until corrective action is completed. Per WAC 173-303-690 through 692 (40 CFR Part 264 Subparts AA, BB, and CC), many LDAR repairs must be completed within 24 hours of detection. Emerald will establish corrective action timelines for LDAR related repairs based on requirements of 40 CFR Part 264.

3.8.6. LDAR inspections will be conducted by personnel who have been trained in the identification of LDAR related deficiencies as well as in the use of the appropriate monitoring equipment. This training will be in addition to the standard training provided for other general facility inspections. Emerald will typically use a portable flame ionization detector (FID) for detecting leaks in process components and equipment. Monitoring equipment will always be

calibrated according to manufacturer's recommendations prior to use.

TABLE 1
SUMMARY OF INSPECTION ITEMS AND FREQUENCY

Inspection Item	Subcategory	Criteria	Inspection Frequency
Dangerous Waste Containers and Dangerous Waste Container Management Areas (Dangerous Waste Container Storage Area, Production Pads, Process Areas, Loading Dock) – Including Labeling	Labeling/Marking	Marker and DOT label on upper 1/3 of container and facing outward for inspection	Daily
		All non-applicable markings obliterated	Daily
		Legible	Daily
		Major risks identified	Daily
	Container Condition	Free of excessive dents or rust	Daily
		No structural defects	Daily
		No appearance of other deterioration or excessive pressure (bulging or swelling)	Daily
	Stacking	Stacking no more than two pallets high (no more than two-85 gallon drums in height when including pallets)	Daily
		Stacks are stable and meet minimum set back distance, volume restrictions, and other conditions in section D	Daily
		Storage in permitted areas only.	Daily
	Aisle Space	Minimum of five feet or 30 inches between aisles (dependent upon fire code class and conditions in section D)	Daily
		Piles are no more than two drums wide	Daily
	Closed unless in-use	Open containers attended at all times and only open during sampling, adding, or removing contents	Daily
	Containment, including sumps	No cracks, gaps, or chips in containment or containment coating	Weekly

TABLE 1
SUMMARY OF INSPECTION ITEMS AND FREQUENCY

		No evidence of leaks, spills, or accumulated liquids in containment or containment sumps.	Daily
		Separate containment for incompatible waste streams.	Daily
		Container storage volume below permitted capacity.	Daily
		Detailed inspection of secondary containment system.	Every 6 months
		Valve from loading dock to dangerous waste container storage area is closed unless accumulated stormwater is in the process of being drained to dangerous waste container storage area.	Daily
Dangerous Waste Tank Systems and Dangerous Waste Tank Containment Areas – Including Labeling, Piping, Flexible Hoses, and Ancillary Equipment	Labeling/Marking	NFPA labels legible at 50 feet	Weekly
	Tank Condition	No corrosion, weld breaks, punctures, or visible release of waste.	Daily
		Tank gauges indicate tank is operating properly.	Daily
		Tank level gauges indicate tank is full to within allowable volume limitations (10% freeboard).	Daily
		Independent tank integrity assessment	Every 5 years, or more frequently if required for a specific tank
	Piping, Flexible Hoses, and Ancillary Equipment Condition	No leaks, punctures, or visible deterioration.	Daily
	Leak Detection Equipment	Check for proper and current operation	Daily

TABLE 1
SUMMARY OF INSPECTION ITEMS AND FREQUENCY

	Integrity of Containment, including sumps	No cracks, gaps, or chips in containment or containment coating.	Weekly
		No evidence of leaks, spills, or accumulated liquids in containment or containment sumps	Daily
		Detailed inspection of secondary containment system.	Every 6 months
	Overfill Protection Devices	Check for proper operation	Daily
	Annual Fire Inspection	Ensure annual inspection is performed by the Fire Marshall (WAC 173-303-395(1)(d), including annual service and flow check of fire hydrants.	Annually
Facility Security	Entry and exit gates	Rail car gate (Gate 3) locked unless rail car switch-out in progress.	Daily
		Bioswale gate (Gate 4) locked unless maintenance or repairs are being conducted in bioswale area.	Daily
		Gates 1 and 2 closed during periods of normal operation and locked when. facility is non-operational.	Daily
	Fence line	Fence line and barbed wire fully intact around 100% of facility perimeter.	Weekly
	Warning signs	Main facility warning signs posted at Gates 1 and 2 and legible from distance of 25 feet.	Weekly
		Warning signs located every 25 feet of fence line that is within 200 feet of dangerous waste management units.	Weekly
	Security system	Verify proper operation at main system control.	Weekly

TABLE 1
SUMMARY OF INSPECTION ITEMS AND FREQUENCY

Safety and Emergency Equipment	Personal protective equipment, including Tyvek suits, boots, gloves, rain gear, eye protection, respirators, respirator cartridges, and hard hats.	Verify that all operations personnel have at least one of each of the items on the list and that spare equipment is available if needed.	Weekly
	First aid supplies: gauze, tape, bandages, ointments, splints, emetic anesthetics, eyewash stations, emergency showers, fire blanket, and stretcher.	Verify first aid supplies are available in laboratory and adjacent to Production Pad 4. Verify eyewash stations and emergency showers are operational. Verify other equipment is available in locations noted on Figure G-5.	Weekly
	Spill control equipment including pumps, shovels, brooms, recovery drums, floor dry, and absorbent pads	Verify supplies are available in locations noted on Figure G-5 of the Contingency Plan.	Weekly
	Fire extinguishers	Verify that fire extinguishers are adequately pressurized, that they are accessible, and that they are in the locations noted on Figure G-5.	Weekly
	Fire suppression system	Verify adequate water supply and that system has been inspected per schedule of manufacturer or as recommended by company performing inspection.	Monthly

TABLE 1
SUMMARY OF INSPECTION ITEMS AND FREQUENCY

	Lighting	Check for adequate illumination during shifts conducted in darkness.	Monthly
	Air horns	Verify air horns are operable in locations noted on Figure G-5.	Weekly
	Communication systems (public address system, cell phones)	Internal communication system must be capable of notifying onsite employees of providing immediate emergency instruction to facility personnel. External communication system must be capable of summoning emergency assistance from local policy, fire, or state or local emergency response teams.	Weekly
	Wind socks	Check for material wear.	Monthly
Monitoring Devices	Combustible gas indicator meter	Verify that annual maintenance is conducted and that meter is properly calibrated.	Monthly
	Flame Ionization Detector meter	Calibrate prior to each use. Send in to manufacturer for maintenance as needed or as specified in the manufacturer maintenance schedule.	As needed
Leak Detection and Repair Devices	Each individual process component subject to LDAR (see Table 2)	Ensure no leaks are detected from LDAR process components.	See Table 2

TABLE 2[3] [4]
LDAR CATEGORIES AND FREQUENCY OF INSPECTION

Component Usage	Monitoring Frequency
Pumps in light liquid service	• Weekly visual • Monthly OVA
Pumps in heavy liquid service	• No fixed frequency • OVA 5 days after visual sign of leakage
Valves in light liquid or gas service	• Monthly OVA if a leak is detected • Quarterly OVA if no leak is detected for two consecutive months
Valves in light liquid or gas, designated as "Difficult to Monitor"	• Annual OVA
Pressure relief valves (PRV) in gas service other than Level 1 conservation vents	• No fixed frequency • OVA five days after a PRV release
Conservation vents on Level 1 tanks	• Annual inspection for visible defects
Pressure relief valves in light liquid service	• OVA five days after evidence of liquid leak
Subpart AA vent system: Pressure side hard piping or bolted flange connections	• Initial OVA test • Annual visual inspection
Subpart AA vent system: Pressure side non-bolted pipe connections	• Annual OVA test
Subpart AA vent system: vacuum side fittings	• Annual inspections for visible defects
Subpart AA control devices: flare and carbon adsorber	• Hourly record of vent stream to control device
Flanges in light liquid service	• No fixed frequency • OVA five days after evidence
Flanges in gas service (other than Subpart AA vent system)	• No fixed frequency • OVA five days after evidence of gas leak
Flanges or 2nd valve on blind pipe ends	• No monitoring

[3] See also Tables D-19 through 23 in section D for regulatory references and other relevant information.

[4] This table does not repeat specific detailed information from the regulations on all compliance requirements (for example, for responses to leak, compliance schedules, monitoring methods, and others). Emerald will comply with relevant requirements in the regulation section cited in the column labeled "RCRA Citation Part 264" for each "Component Usage" in Table D-20 of Section D.

4. Preparedness and Prevention Requirements
WAC 173-303-806(4)(a)(vi), (viii), (ix), 340

This section outlines the preparations and preventive measures Emerald will follow to avoid or mitigate the possibility of fire, explosion, or any unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, or surface water that could threaten human health or the environment (see also Contingency Plan, Section G).

4.1. Equipment Requirements
WAC 173-303-340 (1), (2)

4.1.1. The Emerald facility is equipped with all the emergency equipment necessary to summon help and respond to emergency situations, including the following:

- Internal communications and alarm systems;
- Telephones;
- Portable fire extinguishers, fire control equipment, and CO_2 systems, spill control equipment, eye wash stations, emergency showers and decontamination equipment; and,
- Water for fire control.

4.1.2. Fire hydrants are located within 40 feet of the southwest corner of the facility and 100 feet from the northeast corner of the facility. Each hydrant is capable of providing approximately 500-gpm fire water flow at adequate pressure for fire suppression. Emerald also has a fire suppression system under the dangerous waste canopy with a system demand rating of 1076 gallons per minute at 66.9 psi.

4.1.3. The Contingency Plan in Section G of this Permit Application shows specific locations of the internal communications and alarm systems (air horns), personal protective equipment, first aid supplies, fire fighting equipment, spill control equipment, monitoring

equipment, and decontamination supplies. Personnel have immediate access to communication and alarm devices as required by WAC 173-303-340(2)(a) and (b).

4.2. Aisle Space
WAC 173-303-340 (3)

Sufficient aisle space is maintained in all areas of the facility to allow for unobstructed movement of personnel, fire protection equipment, or spill control equipment to any area of the facility. All aisle space is maintained per requirements of the current fire code. A description of aisle space specifications, unit layouts, and buffer zones is provided in Section D, Process Information.

5. Preventive Procedures, Structures, and Equipment
WAC 173-303-806 (4)(a)(viii)

5.1. Prevent hazards and contain spills during unloading/loading

5.1.1. The Emerald facility is designed to prevent hazards associated with loading and unloading of containers and bulk liquids. Loading and unloading is performed in secondary containment areas specifically designed for the transfer of dangerous waste to and from containers, trucks, tanks, and railcars. The following procedures are followed when a load of dangerous waste arrives at the facility:

5.1.1.1. Operations personnel direct vehicle to the designated area;

- Driver is instructed on the proper positioning of the vehicle;
- The vehicle is checked for any signs of leakage;
- Truck is off-loaded by Emerald operations personnel in designated off-loading areas (loading dock, load/unload area 2, and Production Pad 4 for containers, load/unload area 1 or 2 for bulk loads, and glycol unloading area for

bulk glycol loads). Each off-loading area is equipped with secondary containment;

- All loads, both bulk and non-bulk are properly bonded and grounded to prevent accumulation of static discharge;
- Non-bulk containers are checked for integrity during check-in procedures and prior to storage. All damaged or unsuitable containers are overpacked;
- Containers are not staged outside of a permitted storage area for more than 24 hours;
- All connections and valves are checked prior to any bulk transfer;
- All connections, valves, and hoses are kept within concrete secondary containment during any bulk transfer with the exception of antifreeze transfers.
- Approximately three feet of the antifreeze transfer operation occurs over a stormwater management area, with a majority of the transfer occurring over containment. The containment for the transfer area itself consists of a steel containment pan described in D1.2.3.1. All connections and valves are kept within the glycol containment pan or within concrete secondary containment during transfer. In addition to the daily inspection requirements for this area, Emerald also ensures that any stormwater accumulated in the antifreeze transfer area containment pan is removed prior to using the containment area for transfers.
- Operations personnel closely monitor tank volumes before and during bulk transfer to avoid overfilling; and,
- Operations personnel attend to transfer operations at all times.

5.1.2. All dangerous waste management areas are constructed with a concrete base and perimeter walls with impermeable coating. All containment volumes have been calculated, and Emerald maintains storage volumes within permit limitations.

5.1.3. Areas where containers are stored or staged are designed and constructed to facilitate easy movement of

equipment and containers. Ramp width and slopes are designed and constructed to allow safe and relatively easy movement with a forklift. Forklifts have special adapters to hold, lift, and transport the various sizes and shapes of containers. Aisle space is maintained in accordance with the current fire code and section D of the dangerous waste permit application.

5.2. Run-Off and Run-On Prevention

5.2.1. All precipitation that falls into dangerous waste management areas drains to collection sumps within containment and is treated as contact water in accordance with requirements of Emerald's Industrial Wastewater Discharge Permit with the City of Tacoma.

5.2.2. All sumps are inspected on a regular basis for integrity and cleaned whenever they have accumulated residue or if there has been a spill within the adjacent containment area.

5.2.3. Berms around dangerous waste management areas prevent run-on from both stormwater management areas and from off-site.

5.3. Contamination of Water Supplies

The Emerald facility is located within an industrial area of Tacoma. The nearest surface water supply is located in the Green River watershed, which is many miles northeast of the facility property. In addition, the nearest surface water body is Blair Waterway which is a marine industrial waterway and is not used as a domestic water supply.

5.4. Equipment Failure and Power Outage Mitigation

5.4.1. In the event of equipment failure or power outage, Emerald operations personnel will initiate shutdown procedures for the affected operation. Process-specific operations are not adversely affected by equipment failure or power outage. All processes including the Thin Film

Evaporator, High Boiler Distillation Unit, and Fuel Blending System can be manually shut down without the need for instrumentation control or electrical power. Pumps used for liquid transfer are air-operated, utilizing air from a pressurized supply tank. Storage tanks are protected by non-electrically operated safety valves. Nitrogen is supplied from a nitrogen supply tank. Dangerous wastes can also be transferred using a vacuum truck that does not rely on external electrical power.

5.4.2. For power outages after sunset, operations personnel use flashlights and vehicle headlights to provide temporary lighting while equipment shutdown is being conducted.

5.5. Prevention of Exposure to Dangerous Waste

5.5.1. All operations personnel are issued a hard hat, safety glasses, safety shoes, respirators, and gloves. Other personal protective equipment, such as goggles and face shields, are available for use during specific process operations where additional precautions are needed. Each employee receives instruction in the proper use of their personal protective equipment (PPE) in accordance with the Emerald Training Plan (see Section H).

5.5.2. Visitors are provided with appropriate PPE and safety equipment prior to entering operational areas of the facility. Visitors and contractors are accompanied by Emerald staff at all times until they have received the minimum training outlined in Section 3.1 of the Training Plan.

5.5.3. Activities not directly involved with receipt, storage, and processing of dangerous wastes (i.e., administrative, maintenance, vehicle parking) are located away from dangerous waste management operational areas.

6. Prevention of Reaction of Ignitable, Reactive, and/or **Incompatible** Wastes

WAC 173-303-806 (4)(a)(ix)

The Emerald Waste Analysis Plan (see Section C of this Permit Application) specifies the sampling and analysis that is performed for each waste stream received and generated at Emerald to ensure that management of the waste stream at the Emerald facility will be performed safely. Completion of the Waste Analysis Plan requirements along with the design of the operational units and their proper operation combine to prevent accidental ignition or reaction of ignitable waste.

6.1. Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

6.1.1. The entire Emerald facility is designated as a non-smoking area and "No Smoking" signs are located at each facility gate. All dangerous waste management units are at least 50 feet from the facility fence line. There are also signs placed along the facility perimeter in areas within 200 feet of dangerous waste management units informing passersby of the potential hazards related to the facility. Only non-sparking tools are used, and operations personnel ensure that all containers and vehicles holding ignitable waste streams are grounded prior to performing any type of transfer operation.

6.1.2. Hot work is conducted in a safe location away from facility operations, processes, container, and tank systems in accordance with requirements of the hot work permit. Hot work permits are renewed annually with the Tacoma Fire Department. If cutting and/or welding are necessary in the vicinity of a dangerous waste storage or processing area, the precautionary measures outlined in the applicable fire code, OSHA, and other applicable regulations are followed. Such measures include removing any ignitable contents from a storage tank and/or inerting a tank before welding.

6.1.3. All electrical components in the individual units meet National Electrical Code explosion-proof requirements.

6.1.4. Incompatible waste streams are not commingled on-site; rather, they are accepted for storage only within containment areas approved for such storage by the Washington State Department of Ecology.

6.2. Precautions for Handling Ignitable or Reactive Waste and Mixing Incompatible Waste

Key engineering design and safety features associated with waste management systems at the facility are described below.

6.2.1. Distillation Units

6.2.1.1. The Thin-Film Evaporator and High Boiler Distillation Unit are designed for the purpose of *safe*, efficient distillation of ignitable waste. Each unit utilizes instrumentation and alarm systems which indicate process upset or operational problems that could cause ignition. Alarms indicate pressure and temperature conditions, as well as liquid levels.

6.2.1.2. Each distillation unit is designed for adequate vacuum to eliminate the possibility of equipment implosion due to high vacuum conditions. In addition, each unit is provided with safety relief devices to safeguard *against* over pressure. Feed tanks to the distillation units are purged with inert nitrogen to reduce the possibility of ignition due to oxygen levels exceeding explosive limits.

6.2.1.3. Electrical equipment associated with each unit conforms to national codes and local *regulations*. Explosion proof electrical equipment is installed in areas where this classification is warranted. In addition, the distillation units as well as all ancillary equipment are electrically bonded and grounded to prevent accidentally ignition from the accumulation of static charges.

6.2.2.Fuel Blending System

6.2.2.1. The Fuel Blending System is designed to perform blending of dangerous waste fuels in a safe and controlled manner. The components of the system are designed in accordance with local building and fire codes to ensure a sound installation and include safeguards to prevent accidental ignition of ignitable waste.

6.2.2.2. Safeguards include a nitrogen purging system coupled with oxygen analyzers to prevent the accumulation of explosive mixtures. In addition, a CO_2 fire suppression system is installed with a remote pressure switch and audible alarm trigger. The control scheme includes interlocks between oxygen sensing devices and motor starter controls, as well as nitrogen purge flow. Hopper doors are also interlocked with the nitrogen feed system, pumps, and motor starters for added protection.

6.2.3.Glycol Recycling System

The Glycol Recycling System utilizes instrumentation and alarm systems which indicate process upset or operational problems. Alarms indicate pressure and temperature conditions, as well as liquid levels, including high level alarms. The distillation tower is designed for full vacuum to eliminate the possibility of equipment implosion due to high vacuum conditions. In addition, it is provided with safety relief devices to safeguard against over pressure. Electrical equipment conforms to national codes and local regulations.

6.2.4.General Tank System

6.2.4.1. Each dangerous waste management unit has been designed and installed in accordance with nationally recognized standards to ensure safe operation. In addition, an independent professional engineer periodically performs a thorough visual inspection of

dangerous waste storage tanks to identify evidence of leaks or corrosion, signs of potential collapse, rupture, or failure, and also certify the integrity of each tank system.

6.2.4.2. Dangerous waste tank systems are provided with additional safeguards including bonding and grounding of the tank and its ancillary equipment to prevent static charge accumulation. Pressure and vacuum relief devices are also installed to prevent over pressure or implosion of the tank system. Nitrogen blanketing is incorporated to reduce the possibility of ignition due to explosive mixtures in the headspace of each tank permitted for dangerous waste storage.

6.2.5. Incompatible Waste in Containers and Tanks

Emerald conducts compatibility testing at the frequency outlined in the Waste Analysis Plan for all waste streams that will be commingled on-site. Waste streams that fail the compatibility test are not pumped into tanks for processing. Waste streams that appear to be unsuitable for commingling at the time of profiling, or that fail the compatibility test will be approved for storage only.

Part B

Section F

Inspection Plan
Appendix I - Forms:

Daily Inspection Log,
Daily Inspection Log – Tank Systems and Process Units,
Weekly Inspection Log,
Monthly Inspection,
Work Order/Re-Inspection Form,
Spill Log

DAILY INSPECTION LOG – GENERAL (Page 1 of 2)			
Inspector Name:		Signature:	
Date of Inspection: (month/date/year)	Time:	Title:	
Refer to Table 1 of Inspection Plan for additional information on inspection criteria. Inspection Criteria (**Facility Security - Gates**): Ensure gates 3 and 4 are locked; check gates 1 and 2 for operability during hours of operation (gates 1 and 2 must be locked during non-operational hours). Inspection Criteria (**Containment - Sumps**): Check each sump in the dangerous waste containment areas – Sumps will be dry or contain less than 1 inch of water at any one time except in uncovered areas during rain events. Any spilled waste/product must be pumped and cleaned out promptly. Loading dock containment valve will be closed unless contact stormwater is actively being drained to DW container storage area.		Inspection Criteria (**Containers** (including process containers)): Check for leaks, spills, corrosion, excessive pressure, and external damage. Ensure labels are correct, and not obscured or unreadable. Check for proper setbacks, aisle space between piles, proper stacking of containers, and that the number of containers is below the permitted capacity. All containers must be closed when not in use, in an area where storage or staging is permitted, and in appropriate containment. Inspection Criteria (**Railcars**): Ensure hatches are closed and secured, check for general external damage, corrosion, and cracks for railcars in spots 1-7. Check that no spills exist in track containments at spots 1-2. During loading/unloading at spots1-2, ensure bottom cover is off.	

Item	Inspection Element	Status / Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)
		Sat	Unsat	N/A		
Facility Security - Gates						
Gate 1 - Front	See criteria above					
Gate 2 - Back	See criteria above					
Gate 3 - Rail	See criteria above					
Gate 4 - Bioswale	See criteria above					
Containment - Sumps						
DW Cont. Area	See criteria above					
Prod. Pad 1	See criteria above					
Prod. Pad 2	See criteria above					
Prod. Pad 3	See criteria above					
Prod. Pad 4	See criteria above					
Loading Dock	See criteria above					

DAILY INSPECTION LOG - GENERAL (Page 2 of 2)							
Date:					Inspector (initials):		
Containment - Sumps							
Item	Inspection Element	Status / Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)	
		Sat	Unsat	N/A			
Process Area 1	See criteria above						
Process Area 2	See criteria above						
Tank Area 1	See criteria above						
Tank Area 2	See criteria above						
Tank Area 3	See criteria above						
Railcar Building	See criteria above						
Railcar Supplemental Containment	See criteria above						
Glycol Recycling Area (2 sumps)	See criteria above						
Antifreeze Transfer Area Containment Pan	See criteria above						
Load/Unload Area 2	See criteria above						
Containers							
DW Cont. Area	See criteria above						
Prod. Pad 1	See criteria above						
Prod. Pad 2	See criteria above						
Prod. Pad 3	See criteria above						
Prod. Pad 4	See criteria above						
Proc. Area 1	See criteria above						
Proc. Area 2	See criteria above						
Loading Dock	See criteria above						
Railcars							
Spot 1	See criteria above						
Spot 2	See criteria above						
Notes:							

DAILY INSPECTION LOG - TANK SYSTEMS AND PROCESS UNITS

Inspector Name:		Signature:
Date of Inspection: (month/date/year)	Time:	Title:

Inspection Criteria: Check external shells for corrosion, weld cracks, punctures, and general external damage. Check connection ports, seals, piping, and hoses for evidence of leaks or damage. Check that NFPA labels are legible at a distance of 50 feet. Check for overflow releases from tank/unit. Ensure conservation vents and tank gauges are functioning properly. Lids must be tightly sealed and gate valve closed on all process units. High level alarms must be operational.

Item	Inspection Element	Status / Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)
		Sat	Unsat	N/A		
High level alarms	Operational					
Tank Area 1						
Tank D-100	See criteria above					
Tank Area 2						
Tank D-300	See criteria above					
Tank D-301	See criteria above					
Tank Area 3						
Tank D-502	See criteria above					
Process Areas 1 and 2						
Tank D-101	See criteria above					
Tank RT-500	See criteria above					
Tank D-302	See criteria above					
Thin Film Evaporator	See criteria above					
High Boiler Distillation Unit	See criteria above					
Production Pad 1						
Tank MT-500	See criteria above					
Fuel Blending System	See criteria above					
Cascade Shredder	See criteria above					
Compactor	See criteria above					
Glycol Recycling System						
Tank D-210	See criteria above					
Tank D-211	See criteria above					
Tank D-212	See criteria above					
Notes:						

WEEKLY INSPECTION LOG (Page 1 of 3)		
Inspector Name:		Signature:
Date of Inspection: (month/date/year)	Time:	Title:

Inspection Criteria (**Security**): See individual inspection elements below.

Inspection Criteria (**Safety and Emergency Equipment**): Check accessibility (unrestricted access), adequate supply, proper storage and signs of deterioration and damage. All PPE, fire extinguishers, and First Aid Supplies shall be in locations indicated on current facility diagrams. Eye wash stations and emergency showers are to be flushed weekly during inspection.

Inspection Criteria (**Containment Systems, including sumps**): Check for cracks in protective coating and concrete foundation and berm walls, deterioration of coating. Containment and sumps must be sufficiently free of dirt and other materials to allow adequate inspection.

Inspection Criteria (**LDAR**): Check for visual signs of leakage.

Item	Inspection Element	Status/Response			If Unsat, Specify Reason and Identify Correction Action Category	Corrected (Initials/Date)
		Unsat	Unsat	Unsat		
Security						
Fence	No breaches or damage, warning signs legible and present.					
Plant Lighting	Operational					
Alarm system (air horns)	Adequate sound					
Communication System (PA system / cell phone)	General operability / Charged battery					

WEEKLY INSPECTION LOG (Page 2 of 3)						
Date:				Inspector (initials):		
Item	Inspection Element	Status/Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)
		Sat	Unsat	N/A		
Safety and Emergency Equipment						
Tyvek suits	See criteria above					
Boots	See criteria above					
Gloves	See criteria above					
Rain gear	See criteria above					
Eye protection	See criteria above					
Respirator cartridges	See criteria above					
Hard Hats	See criteria above					
First Aid kits	See criteria above					
Eye Wash Stations	See criteria above					
Emergency Showers	See criteria above					
Fire Extinguishers	See criteria above					
Containment System						
DW Container Area	See criteria above					
Loading Dock	See criteria above, ensure containment valve is functioning					
Prod. Pad 1	See criteria above					
Prod. Pad 2	See criteria above					
Prod. Pad 3	See criteria above					
Prod. Pad 4	See criteria above					
Process Area 1	See criteria above					
Process Area 2	See criteria above					
Tank Area 1	See criteria above, plus inspect double wall leak pipe for leakage.					

WEEKLY INSPECTION LOG (Page 3 of 3)						
Date:			Inspector (initials):			
Item	Inspection Element	Status/Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)
		Sat	Unsat	N/A		
Tank Area 2	See criteria above, plus inspect double wall leak pipe for leakage					
Tank Area 3	See criteria above, plus inspect double wall leak pipe for leakage					
Railcar Building	See criteria above, plus inspect double wall leak pipe for leakage					
Railcar Supplemental Containment	See criteria above					
Load/Unload Area 1	See criteria above					
Load/Unload Area 2	See criteria above					
Glycol Recycling Area (2 sumps)	See criteria above					
Antifreeze Transfer Area Containment Pan	See criteria above					
LDAR						
Pumps in Liquid Light Service	See criteria above					
Notes:						

MONTHLY INSPECTION LOG (Page 1 of 2)		
Inspector Name:		Signature:
Date of Inspection: (Month/Date/Year)	Time:	Title:

Inspection Criteria: (**General**): See Individual inspection elements below.

Inspection Criteria (**Fire Control**): Check pressure gauge of fire extinguishers for full charge indication, seals, to ensure no one has used prior, and inspection tag to ensure annual maintenance by outside fire service is up to date. Verify adequate water supply for fire suppression system, and also that inspection has been completed per schedule of manufacturer or as recommended by inspector.

Inspection Criteria (**Spill Supplies**): Check accessibility, adequate supply, proper storage, and signs of deterioration and damage. All equipment shall be in locations indicated on current facility diagrams.

Item	Inspection Element	Status / Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)
		Sat	Unsat	N/A		
General Facility						
Wind Sock	Material wear					
Fire Control						
DW Cont Area – 3 ext	See Criteria above					
Loading Dock – 2 ext	See Criteria above					
Prod Pad 1 – 2 ext	See Criteria above					
Prod Pad 2 – 2 ext	See Criteria above					
Prod Pad 3 – 1 ext	See Criteria above					
Prod pad 4 – 4 ext	See Criteria above					
Process Area 1 – 3 ext	See Criteria above					
Process Area 2 – 2 ext	See Criteria above					
Rail Car Area – 3 ext	See Criteria above					
Load/Unload Area 1 – 1 ext	See Criteria above					

MONTHLY INSPECTION LOG (Page 2 of 2)							
Date:					Inspector (initials):		
Item	Inspection Element	Status / Response			If Unsat, Specify Reason and Identify Corrective Action Category	Corrected (Initials/Date)	
		Sat	Unsat	N/A			
Glycol Process Area – 2 ext	See Criteria above						
Oil Heating Tank/Boiler House Area – 6 ext	See Criteria above						
Boiler House Breezeway – 1 ext	See Criteria above						
Steam Boiler Area – 1 ext	See Criteria above						
Oil Tank Area – 1 ext	See Criteria above						
Buildings (lab, office, etc.) – 13 ext	See Criteria above						
Fire Suppression Areas	See Criteria above						
Spill Supplies							
Pumps	See Criteria above						
Shovels	See Criteria above						
Brooms	See Criteria above						
Recovery drums	See Criteria above						
Floor dry	See Criteria above						
Absorbent	See Criteria above						
Gas detector – LEL and FID	General operability / Charged battery						
Spill kits	See criteria above						
LDAR							
LDAR Record Review	Scheduled monitoring complete (see Table 2 of Inspection Plan						
Notes:							

Emerald SERVICES, INC.

WORK ORDER/RE-INSPECTION FORM

Date:

REMEDIAL WORK ORDER

Routine ☐
Completed within 24 hrs.

Category 2 ☐
Scheduled within one week

Category 1 ☐
Immediate action required

Category 3 ☐
Date to be set

Corrective Action Assigned to: _____ _____
Name Title

Equipment Item:

Location:

Inspection Element/Type of Problem:

Required Remedial Response: _____

_____

_____

_____

Work to be Completed by:

_____
Signature of Inspector

WORK COMPLETION REPORT

Completed on: ____/____/____

By: _____
Initials

COMMENTS: _____

_____

_____

RE-INSPECTION REPORT

Observations:

Comments:

_____
Signature of Inspector

Date ____/____/____

(Year) SPILL LOG

Emerald Services
1825 Alexander Ave., Tacoma, WA

Report # and Date	Time (24hr)	Operator	Description of spill	Material Spilled	Qty	Area Affected by Spill	Primary Cause/Corrective Action[1]	Date ECY Initial Report	Date NRC Report	Date Final Report

[1] Provide an analysis of the incident including specific cause(s), effectiveness of immediately response, and actions taken to prevent reoccurrence of a similar incident.

Report # and Date	Time (24hr)	Operator	Description of spill	Material Spilled	Qty	Area Affected by Spill	Primary Cause/Corrective Action[1]	Date ECY Initial Report	Date NRC Report	Date Final Report

[1] Provide an analysis of the incident including specific cause(s), effectiveness of immediately response, and actions taken to prevent reoccurrence of a similar incident.

Part B

Section G

Contingency Plan

TABLE OF CONTENTS

G. CONTINGENCY PLAN

1. INTRODUCTION 1
2. GENERAL INFORMATION 2
   - 2.1. Plan 2
   - 2.2. Purpose 2
   - 2.3. General Facility Information 2
     - 2.3.3. Location Information 3
     - 2.3.4 Environmental Setting 4
     - 2.3.5 Facility Operations 4
       - 2.3.5.6. Solvent Recycling 5
       - 2.3.5.7. Glycol Recycling 5
       - 2.3.5.8. Fuel Blending 6
       - 2.3.5.9. Dangerous Waste Storage 6
       - 2.3.5.10. Wastewater Treatment 7
       - 2.3.5.11. Virgin and Recycled Product Storage 7
   - 2.4. Wastes Handled at Facility 7
   - 2.5. Types of Potential Emergencies 7
3. EMERGENCY COORDINATORS 8
   - 3.1. Notification Action Summary 8
     - 3.1.1. Emergency Coordinator 8
     - 3.1.2. Emerald Environmental 8
     - 3.1.3. National Response Center 9
     - 3.1.4. Spill Response Contractor – NRC Environmental 9
     - 3.1.5. Emergency Assistance 9
   - 3.2. Emergency Coordinator Qualifications 10
   - 3.3. Emerald Responsibilities and Personnel 11
4. IMPLEMENTING THE CONTINGENCY PLAN 12
   - 4.1. Circumstances Prompting Implementation 12
   - 4.2. Implementation of Response Procedures/Activities 13
   - 4.3. Incident Assessment and Decision Process 14
   - 4.4. EC Responsibilities 15
   - 4.5. Implementation of the Contingency Plan 16
   - 4.6. Additional Contacts 17
   - 4.7. Annual Review 18
5. EMERGENCY RESPONSE PROCEDURES 18
   - 5.1. Emergency Response Contractor 18
   - 5.2. Containment and Control Activities 18
     - 5.2.4. General Procedures 19
     - 5.2.5. Fire and/or Explosion Control 22
     - 5.2.7. Hazardous Material Release Control 24

5.2.8. Removing or Isolating Containers 26
5.2.9. Personnel Response Activities 27
5.3. Process Specific Procedures 28
5.4. Damaged/Unacceptable Shipment 29
5.4.1. Damaged Containers 29
5.4.1.3.1. Capacity 55 Gallons or Less 29
5.4.1.3.2. Capacity Greater than 55 Gallons (Totes, Tank Trucks) 30
5.4.1.3.3. Railroad Tank Cars 30
5.4.2. Unacceptable Waste 30
6. NOTIFICATION 31
6.1. Notification of Site Personnel 31
6.2. Notification of State/Local Agencies 31
6.3. Notification of Emergency Response Contractor 32
7. IDENTIFICATION OF HAZARDOUS MATERIALS 32
7.1. Identification of Waste and Hazard Assessment 32
7.2. Extent of Contamination 32
7.2.1. Release in Secondary Containment Area 32
7.2.2. Release in Stormwater Management Area 34
7.2.3. Release to the Ground 34
7.2.4. Release to the Air 35
8. HAZARD ASSESSMENT AND REPORT 35
8.1. Hazard Assessment 35
8.2. Criteria for Evacuation and Notification of Authorities 36
9. PREVENTION OF RECURRENCE OF SPREAD OF FIRES, EXPLOSIONS OR RELEASES 36
9.1. Prevention of Recurrence 36
10. POST EMERGENCY ACTION 37
10.1. Post-emergency Procedures 37
10.2. Treatment and Disposal of Released Materials and Cleanup Residue 37
10.2.3. Equipment Decontamination and Maintenance 38
10.2.4. Facility Repairs or Closures 38
10.3. Reactivation of Activities in Affected Area 38
10.4. Personnel Debriefing and Retraining 39
10.5. Mitigation and Control 39
11. EMERGENCY EQUIPMENT 40
11.1. Available Emergency Equipment 40
11.2. Alarm and Communication Systems 40
11.3. On-Site Equipment 41
11.3.1. Personal Protective Clothing and Equipment 41
11.3.2. First Aid Supplies 41
11.3.3. Fire Fighting Trucks or Equipment 42

11.3.4. Spill Control and Cleanup Equipment 43
11.3.5. Monitoring Equipment 44
11.3.6. Decontamination Equipment 44
11.3.7. Contractor Supplied Equipment 45
11.3.8. Emergency Lighting 45
12. COORDINATION AGREEMENTS 45
12.1. Arrangements with Authorities and Other Resources 45
12.1.5. Emergency Response Authorities 45
12.1.5.1. Fire Department 45
12.1.6. Local Hospitals 46
12.1.7. Emergency Spill Response 46
12.1.8. Casualty Control Authority 46
13. EVACUATION PLAN 47
13.1. Evacuation Plan 47
13.2. Site Access and Egress 47
13.3. Evacuation Procedures 48
13.4. Re-occupancy of Facility 49
14. REQUIRED REPORTS, RECORDKEEPING, AND CERTIFICATIONS 50
14.1. Assessment Report 50
14.2. Local Emergency Plan Notifications 51
14.3. Report on Implementation of Contingency Plan 51
14.4. Contingency Plan Amendments 51
15. REQUIREMENTS FOR TANK SYSTEMS 52
16. RECORDS 53

TABLES

G-1 General Site Information 3
G-2 List of On-Site Emergency Response Equipment (minimum available on-site) 20

Section G – Contingency Plan
List of Figures

Figure G-1: Facility Location Map
Figure G-2: Facility Layout Diagram
Figure G-3: General Vicinity Map
Figure G-4: Response Activities
Figure G-5: Emergency Equipment Locations and Evacuation Routes
Figure G-6: Locations and Maximum Volumes of Dangerous Materials

Section G – Contingency Plan
List of Appendices

Appendix I: Information on Identification of Waste Materials
Appendix II: Emergency Response Correspondence
Appendix III: Coordination Agreements
Appendix IV: Contingency Plan Implementation Checklist

G.CONTINGENCY PLAN
WAC 173-303-145, 340, 350, 360, 630(2), 640(7), 806(4)(a)(vii)

1.Introduction

1.1.This document is the Contingency Plan (Plan) required by WAC 173-303-350(2), including associated emergency procedures, which will be activated in the event of an emergency or a significant unplanned release of dangerous waste at the Emerald Services, Inc. facility in Tacoma, Washington.

1.1.1.Pursuant to State of Washington and U.S. Environmental Protection Agency requirements, this facility will maintain the Contingency Plan.

1.1.2.The Plan includes procedures to lessen the potential impact to human health and the environment in the event of an emergency circumstance, including a fire, explosion, or unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or groundwater.

1.1.3.A copy of the Contingency Plan will be kept at the facility.

1.2.This Contingency Plan provides a description of the response procedures to be implemented immediately in an emergency situation. The facility has various structural and operational measures in place which are designed to minimize the possibility of such an emergency situation occurring.

1.3.For purposes of this plan, the content of all spills will be referred to as "material," whether the spill originally consisted of product or waste.

2.GENERAL INFORMATION
WAC 173-303-340, 350, 360

2.1.Plan

2.1.1.This plan meets the requirements for a written Contingency Plan for use at the Emerald Services, Inc. (Emerald) facility located in Tacoma, Washington, as specified by WAC 173-303-350, Contingency Plan and Emergency Procedures, and WAC 173-303-360, Emergencies.

2.2.Purpose

2.2.1.The purpose of this Contingency Plan (Plan) is to specify the emergency procedures that will be implemented in the event of an emergency that threatens public health and the environment.

2.2.2.The Plan has been designed to lessen the potential impact to human health and the environment in the event of an emergency circumstance, including a fire, explosion, or unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or groundwater. If such an event occurs, the actions in this Plan are to be carried out immediately.

2.2.3.The Plan also specifies actions to be taken in the event of receipt of a damaged shipment of dangerous waste that presents a hazard to human health or the environment, and cannot be accepted at the facility.

2.2.4.The Plan also addresses response requirements for spills, releases and other events that do not trigger formal implementation of all aspects of this contingency plan but do require a timely response to protect worker safety, and prevent threats to the environment.

2.3.General Facility Information

2.3.1.The Emerald facility is regulated under the Resource Conservation and Recovery Act (RCRA), and the Washington State Department of Ecology (Ecology) Dangerous Waste Regulations as a dangerous waste management facility (treatment storage and disposal facility - TSDF), a hazardous

waste transfer facility, used oil transfer facility, universal waste large quantity handler, solid waste management facility (MRW), and a large quantity generator of dangerous waste.

2.3.2. The facility is designed, constructed, maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, or surface or ground water which could threaten public health or the environment. This plan describes preparations and preventive measures which help avoid or mitigate such situations.

2.3.3. Location Information

2.3.3.1. As shown in Figure G-1, Facility Location Map, the Emerald facility is situated in the industrial port area of Tacoma, Washington.

2.3.3.2. It is located north of the intersection of Alexander Avenue and Lincoln Avenue, between the Hylebos and Blair waterways. These waterways are part of the larger geographic area typically called Commencement Bay Nearshore Tideflats area. Figure G-3, General Vicinity Map, provides a map illustrating the Blair and Hylebos waterways and identifies the location of the Emerald facility.

2.3.3.3. Table G-1 provides the facility address and general site information. The Emerald facility occupies approximately 2.5 acres and is zoned for industrial use.

Table G-1
General Site Information

Facility Name	Emerald Services, Inc.
Facility Operator	Emerald Services, Inc. and Clean Harbors Environmental Services, Inc.
Facility Address	1825 E. Alexander Ave., Tacoma, WA 98421
Telephone Number	253-533-6073
County	Pierce
Latitude/Longitude	47°16'13" North and 122°23'05" West
Elevation	Approximately 10 feet above mean sea level
EPA/State ID Number	WAD 981769110

2.3.4.Environmental Setting

2.3.4.1.The Emerald site can be characterized as a flat plot that is underlain by a one-foot thick layer of dense silty, sandy gravel fill followed by 6 to 9 feet of loose sandy and silty sand fill. The sand fill is underlain by 4 to 5 feet of soft clay followed by dense sand to an undetermined depth.

2.3.4.2. The depth to groundwater ranges from 1 to 4 feet below ground surface. Natural vegetation includes shrubs and grasses. The Hylebos and Blair waterways are the only surface water bodies near the site.

2.3.5.Facility Operations

2.3.5.1.Emerald is primarily a recycling facility that receives waste streams from off-site generators and processes those waste streams for subsequent reuse or energy recovery. Certain waste streams may also be stored at the facility prior to shipment to a permitted TSDF. The processed waste streams are shipped to customers or temporarily held in storage tanks and containers. Currently, four primary waste management operations occur at the facility:

- solvent recycling,
- glycol recycling,
- fuel blending, and
- dangerous waste storage.

The facility offices are located at the west side of the site in a modular building. The layout of the facility is shown in Figure G-2, Facility Layout Diagram. The Emerald facility normally operates on a six day per week, 24 hours per day schedule. However, at times, operations can occur 7 days per week, 24 hours per day as needed. Additionally, the adjacent Re-Refinery Control Room is staffed 7 days per week, 24 hours per day. Re-Refinery Control Room operators are fuly trained according to requirements of this Contingency Plan.

2.3.5.2. At least one employee who is qualified to serve as an Emergency Coordinator is either on the facility premises or on-call by telephone at all times. For incidents that occur during non-operational hours, signs posted at facility gates direct response personnel to contact the Emerald Emergency Coordinator.

2.3.5.3. The facility consists of container receiving and staging/storage areas, tank areas, and production areas where fuel blending and recycling operations are performed. The tanks are used to store dangerous waste streams suitable for recycling or fuel blending, products from these operations, and dangerous waste and wastewater generated at the facility. Materials arrive at the facility via trucks in various DOT containers or in bulk form and are unloaded at waste unloading areas.

2.3.5.4. All container management areas, tanks, and process equipment are situated in concrete containment structures with sumps to collect any leaks or spills. Canopies covering the production and process areas provide protection from rainfall.

2.3.5.5. The area outside of containment is covered by blacktop, and stormwater is managed in accordance with the facility's Industrial Stormwater General Permit. Emerald also maintains a Spill Prevention, Control, and Countermeasures Plan due to used oil and oil storage operations that occur at the site.

2.3.5.6.Solvent Recycling

Solvent recycling is performed in distillation units where recyclable solvent is fed from a feed tank, directly from containers, or directly from tank cars. The solvent is then vacuum distilled using non-contact hot oil as a heat transfer media. The distilled product is condensed, sent to storage, and subsequently packaged for re-sale.

Vacuum emissions from the high-boiler and low-boiler distillation systems are sent through the Facility's Flare System.

2.3.5.7.Glycol Recycling

The Glycol Recycling System is a skid mounted, ultra filter membrane unit and vacuum distillation unit designed to process used antifreeze and glycol based coolants to a maximum of 98% glycol. Normal product operating ranges of concentrations are from 50% to 98% glycol. This unit consists of an ultra filter skid for emulsified oil removal, a forced circulation evaporator and distillation tower, packaged cooling tower for condensing and product cooling, and variable rate feed and product pumps. The unit is designed to process 4,000 gallons per day of pretreated used antifreeze of a nominal concentration of 30% glycol.

Air emissions from the process vent on the glycol recycling system are controlled in accordance with WAC 173-303-690.

2.3.5.8.Fuel Blending

The Fuel Blending System includes a hopper, mix tank, blender, and associated pumps, piping, and filters. A high BTU waste stream is introduced and blended until it becomes homogeneous. Waste streams with high solids content may be shredded in the Cascade Shredder prior to commingling with liquid high BTU waste streams. The blended fuel is transferred to a storage tank or a railcar.

Emissions from the Cascade Shredder are controlled by a blower that evacuates fugitive VOC emissions thru a system

of ducts. The emissions that are captured are routed to two activated carbon beds and adsorbed.

Waste to be shipped off-site is transported in containers or railcars. Containers are staged on-site for shipment via flat bed trucks and semi-tractor trailers. Bulk blended fuel product is pumped into railroad tank cars situated on the northeast side of the facility. When the railcar is full, it is shipped off-site to a third party permitted TSDF.

2.3.5.9. Dangerous Waste Storage

Dangerous waste arrives on site in bulk shipments, containers, and totes. Bulk shipments are unloaded in load/unload areas and pumped to waste storage tanks. The tanks are used to store dangerous waste streams suitable for recycling or fuel blending, products from these operations, and dangerous waste and wastewater generated at the facility.

Containers and totes of waste which are accepted from offsite or accumulated from on-site operations are transferred to permitted dangerous waste management areas. Storage arrangements are such that a minimum 30″ of aisle space is maintained at all times, and stacks are maintained in accordance with applicable NFPA requirements.

All tanks, process equipment and storage areas are situated in concrete containment structures with sumps to collect any leaks or spills.

2.3.5.10. Wastewater Treatment

Wastewater is generated on-site from rainfall entering containment areas, operator hand washing, equipment cleaning, and other on-site operations. The wastewater is recirculated through canisters containing activated carbon to remove organic contamination.

2.3.5.11. Virgin and Recycled Product Storage

Recycled and virgin products are stored on-site in various containers including 55-gallon drums, 350-gallon totes, and tanks.

2.4. Wastes Handled at Facility

The Emerald facility accepts a variety of solvent based, high BTU waste streams for recycling and fuel blending. Other general waste types include ignitable (flammable/combustible) solvents, halogenated solvents, paint wastes, inks, asphalts, tars, spent antifreeze, DOT Class 6.1 poisons, corrosives (as subsidiary hazard class to flammable), and other regulated material that does not conform to a specific DOT hazard class.

2.5. Types of Potential Emergencies

The potential for an emergency exists due to operational activities at the facility and the types of wastes managed. Potential emergencies that could result from facility operations are described in Section 4.1. In addition, weather events (such as high winds, heavy rain, or snowfall) could severely damage structures and equipment that might cause a threat to human health or the environment. Natural disasters (such as earthquakes, or volcanic activity) could create emergency situations that must be appropriately managed. Spills from the overfilling of tanks, puncturing of drums, and tipping over of totes can result in emergency action.

3. EMERGENCY COORDINATORS
WAC 173-303-350(3)(d), 360(1)

3.1.Notification Action Summary

3.1.1.Emergency Coordinator

Name	Position of Responsibility	Phone	Address	Home Phone
Primary EC Paul Davis	Facility General Manager	253-617-8171	513 Callendar Street NW, Orting WA 98360	Cell only
Alternate EC Justin Sharpe	Facility General Manager, Re-Refinery	253-337-0070	28122 241st Ave SE, Maple Valley WA 98038	Cell only
Control Room – 24 hours	Control Room Operator[1]	253-533-6073	1825 Alexander Ave., Tacoma WA 98421	n/a

[1] At least one Control Room Operator is on-site at all times during hours of operation.

The Primary or Alternate Emergency Coordinator (hereafter called emergency coordinator or EC) will be on call 24 hours a day, 365 days per year.

3.1.2.Emerald Environmental

Name	Position of Responsibility	Work Phone	Address	After Hours
Sheila Smith	Director, Environmental Compliance	253-370-7912 (Cell)	413 Melcher Street, Port Orchard, WA 98366	Home:360-895-2052

3.1.3. National Response Center

Even if no outside assistance is required, and facility personnel are able to respond adequately, the EC (or designee) will notify the National Response Center (800-424-8802) if a reportable quantity of a hazardous substance has been released to the environment, or if the incident could threaten human health or the environment (WAC 173-303-360(2)(d)(ii)).

3.1.4. Spill Response Contractor - Clean Harbors

Activity	Telephone
Spill Response Only (24 hour)	(800) 645-8265

3.1.5. Emergency Assistance

Organization	Function	Telephone
Tacoma Fire Department	Contact for all non-emergency fires, explosion, spills, and medical emergencies	911 or (253) 591-5733
Tacoma Police Department	Traffic control and evacuation assistance	(253) 591-5952
Pierce County Health Department	Exposure to toxic fumes and gases	(253) 798-6500
St. Joseph's Medical Center	Ambulance and emergency room	(253) 627-4101
Tacoma General Hospital	Ambulance and emergency room	(253) 552-1000
Poison Control Center	Assist with ingestion of poisonous materials	(253) 594-1414
Dept of Transportation	Material packaging and vehicle placarding	(206) 442-1263
Puget Sound Clean Air Agency	Assist with emissions and air quality issues	(800) 552-3565
Department of Ecology	On-scene support	(360) 407-6300
Tacoma Beltline Railway	Movement of railcars	(253) 593-8031

3.2.Emergency Coordinator Qualifications
WAC 173-303-360(1)

3.2.1.All Emerald emergency coordinators are thoroughly familiar with all aspects of this contingency plan, all operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout. In addition, the emergency coordinators are authoritized to commit resources needed to carry out the contingency plan.

3.2.2.All Emerald emergency coordinators receive eight hours of Supervisor's training in Hazardous Waste Operations and Emergency Response.

3.2.2.1.This training includes:

- the topics required under 29 CFR 1910.120,
- training in the facility safety and health program,
- the employee training program,
- the personal protective equipment program,
- the spill containment program, and
- the medical monitoring program.

3.2.2.2.The training is provided by an instructor who is qualified in the subject matter outlined in the WAC 296-843-20015 and -20035. This training ensures that managers have the necessary information to manage an emergency response situation.

3.2.3.All Emerald emergency coordinators are fully trained for their Position of Responsibility according to Emerald's training plan.

3.3.Emerald Responsibilities and Personnel

Area of Responsibility	Requisite Skills and Qualifications	Responsibilities	Training Requirements
Emergency Coordinator – On-Site	Minimum AA degree or higher or equivalent experience. Knowledge of safety, PPE, spill prevention requirements. Extensive knowledge of facility operations and processes. Knowledge of emergency spill and incident reporting requirements with respect to EPCRA, Ecology, Fire Dept., Stormwater Mgmt, and Industrial Wastewater.	Direct personnel and other emergency response operations in the event of a spill to containment, release to the environment, or on-site incident involving injuries. Act as on-site contact for facility incidents. Act as regulatory agency contact during facility incidents in absence of Emerald Environmental personnel.	8-hour OSHA HAZWOPER Supervisor OJT 40-hour HAZWOPER ERT&S Orientation Current on all training specified in the Dangerous Waste Permit Training Plan for "Position of Responsibility."
Emerald Environmental	Minimum AA degree or higher or equivalent experience. Knowledge of emergency spill and incident reporting requirements with respect to EPCRA, Ecology, Fire Dept., Stormwater Mgmt, and Industrial Wastewater.	Notify appropriate agencies as necessary in the event of spill to containment or release to the environment. Act as primary regulatory agency contact during facility incidents. Provide incident follow-up as needed, including reporting, ensuring proper management of any recovered waste, and corrective action. Act as on-site liaison between on-site emergency coordinator and facility personnel in the event that the on-site emergency coordinator is unavailable.	8-hour OSHA HAZWOPER Supervisor OJT 40-hour HAZWOPER ERT&S Orientation

4. IMPLEMENTING THE CONTINGENCY PLAN
WAC 173-303-350(1) and (2), 360(1) and (2)

4.1. Circumstances Prompting Implementation

4.1.1. Fire/Explosion

4.1.1.1. Any fire or explosion at the facility.

4.1.1.2. Any fire or explosion that could spread to or otherwise affect operations at the facility.

4.1.2. Release of Dangerous Waste or Hazardous Substance

4.1.2.1. A sudden or non-sudden spill, release, or other discharge of a dangerous waste or hazardous substance which poses a threat to human health or the environment, regardless of quantity.

4.1.2.2. A spill, release, or other discharge which has the potential for contamination of soil, surface water, or groundwater, regardless of size. Examples are spills or releases to soil and releases of organic solvents to asphalt.

4.1.2.3. An uncontrolled spill, release, or other discharge originating from a damaged shipment which has arrived at the facility in such a condition.

4.1.2.4. A spill, release, or other discharge of a dangerous waste or hazardous substance greater than 100 pounds (12 gallons) or the "reportable quantity" established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) when any portion of the release extends beyond secondary containment.

4.1.2.5. A release of gas to the air originating from an unplanned reaction of materials.

4.1.2.6. Emissions to the air from a spill, release, or other discharge (including to secondary containment) of a dangerous waste or hazardous substance when:

4.1.2.6.1. The spill or release is greater than 100 pounds (12 gallons) or a reportable quality in the most recent version of 40 CFR 302 Table 302.4 (whichever is less), and

4.1.2.6.2. Any constituents in the dangerous waste or hazardous substance has a Henry's Law constant of at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-

in-the-liquid-phase at 25 degrees Celsius or is a volatile organic compound detected by SW 846 Method 8260B. Note that Appendix VI in 40 CFR 265 has a list of compounds known to have a Henry's law constant value less than the cutoff level.

4.1.3. A spill, release, or other discharge or potential for release of dangerous waste or hazardous substance caused by a natural disaster including but not limited to:

4.1.3.1. Earthquake or severe flooding conditions which damage equipment, foundations, structures, or tanks.

4.1.3.2. Severe storm involving high winds or lightning which damage or overturn tanks, containers or other equipment.

4.1.4. Damaged/Unacceptable Waste Shipment

4.1.4.1. A container(s) of dangerous waste arriving at the facility is damaged so as to present a hazard to public health and the environment.

4.1.4.2. The shipment cannot be transported because the containers are damaged to such an extent, or the waste is in such a condition, as to present a hazard to the public health or the environment in the process of further transportation.

4.2. Implementation of Response Procedures/Activities

4.2.1. The purpose of this section is to describe the actions which facility personnel will take to comply with WAC 173-303-350 and -360.

4.2.1.1. If an event requires implementation of the Contingency Plan, response activities are initiated following observation of the event.

4.2.2. In the event of any imminent or actual emergency situation, the person discovering the incident will take immediate response action to abate the situation (e.g., close valve or turn off process) if that presents no threat to his/her health and safety. That person will then directly proceed to an area that is safe from being involved with the situation and immediately contact his/her supervisor.

4.2.2.1.The employee is then responsible for notifying the Emergency Coordinator (EC).

4.2.2.2.The EC may be contacted at the contact numbers listed in the Notification Action Summary (see Section 3.1).

4.2.3.The EC is on call at all times.

4.2.3.1.If the primary EC is unreachable, the caller will contact the first alternate or continue down the list until an alternate EC has been contacted.

4.2.3.2.A description of the duties and responsibilities of the EC is provided in Section 4.4.

4.2.4.When a decision has been made to implement the Contingency Plan, the EC (or alternate) will:

- Activate internal alarms (facility air-horns) or communications systems (i.e., telephones, intercom, megaphone and radio) to notify all facility personnel.
- Contact the Tacoma Fire Department.

4.3.Incident Assessment and Decision Process

4.3.1.A logic diagram of initial response activities leading to implementation of the Contingency Plan is shown on Figure G-4, Response Activities.

4.3.1.1.Should an incident be of a minor or controllable nature, which presents no potential hazard to human health or the environment, the EC will

4.3.1.1.1.Implement the post-emergency procedures described in Section 10 (Post-Emergency Procedures) and

4.3.1.1.2.Complete the necessary reporting described in Section 14 (Required Reports).

4.3.1.2.An example of a minor incident which would not prompt implementation of the Contingency Plan include:

4.3.1.2.1.A spill onto concrete secondary containment that can readily be cleaned up using equipment available on-site unless it meets any of the criteria for "Circumstances Prompting Implementation" in section 4.1.

4.3.1.2.2.A spill outside of secondary containment onto the blacktop which does not reach a catch basin and enter

the stormwater system unless it meets any of the criteria for "Circumstances Prompting Implementation" in section 4.1.

4.3.1.2.3. Facility personnel will conduct timely responses to address such minor incident, to maintain compliance with environmental permits, protect worker safety, and prevent threats to the environment. Responses to control or eliminate potential incidents may include, but are not be limited to:

- Temporarily stopping processes or operations.
- Closing valves.
- Repairing equipment.
- Sampling, if necessary.
- Promptly cleaning containment surfaces and emptying sumps.
- Other appropriate response procedures in section 5, 7, and 10.

4.4. EC Responsibilities

WAC 173-303-360(1)

4.4.1. The EC is responsible for the coordination of emergency response measures.

4.4.1.1. He/she is thoroughly familiar with all aspects of this Contingency Plan, operations and activities at the facility, the location and properties of all wastes handled, the location of all records within the facility, and the facility layout.

4.4.1.2. The EC (or alternate) has the direct authority to commit the resources necessary to carry out the Contingency Plan.

4.4.2. The EC will set up and maintain an Incident Command Base as close to the emergency as is practical, and take control of the affected area including resources until the emergency has been eliminated and necessary clean up is completed.

4.4.2.1. He/she will also keep Emerald Environmental advised of the conditions and status of the emergency.

4.4.3. The EC will direct the following activities to the extent that they can be accomplished without further endangering human health:

4.4.3.1.Ensure that fires, explosions, or releases do not occur, recur, or spread to other dangerous wastes at the facility.

4.4.3.1.1. This action would include, where applicable, stopping processes and operations, such as the Fuel Blending System, the distillation units, transfer of liquids to containers or tanks, and removing or isolating containers.

4.4.4.The EC will assess the situation, including the following of the released material:

- character (liquid, vapor),
- exact source (tank, container, process),
- amount,
- areal extent (impact to other processes, discharge outside containment structures),and
- the need for PPE by responders.

4.4.4.1.The assessment will include direct, indirect, immediate, and long-term effects to human health and the environment (see Section 8, Hazard Assessment and Report).

4.4.4.2.Evaluation criteria used by the EC to determine if the Contingency Plan is to be implemented are presented in Section 4.1

4.4.5.The EC will activate and direct the Contingency Plan activities in accordance with the procedures described in Section 4.5.

4.5. Implementation of the Contingency Plan

When a decision has been made to implement the Contingency Plan, the EC (or alternate) will:

4.5.1.Activate internal alarms (facility air-horns) or communications systems (i.e., telephones, intercom, megaphone and radio) to notify all facility personnel.

4.5.2.Contact the Fire Department (see Section 3.1.5).

4.5.3.Initiate containment and control procedures, as described in Section 5.2

4.5.4.Account for all facility personnel/visitors by head count and from sign-in/sign-out forms.

4.5.5.Notify appropriate state or local agencies with designated response roles, provide an assessment of the situation, and

request assistance if their help is needed. The list of contacts can be found in the Notification Action Summary (Section 3.1.5).

4.5.6. Coordinate first aid activities if injuries are involved, and notify the Tacoma Fire Department (see Notification Action Summary, Section 3.1.5, for telephone numbers).

4.5.7. Evacuate the facility in accordance with the Evacuation Plan as described in Section 13.

4.5.8. Determine if an evacuation of local areas is advisable; if so, the EC (or designee) will immediately notify the Tacoma Police Department and be available to assist with the decision to evacuate.

4.5.9. Initiate response action (i.e., direct appropriate vehicles, and personnel to the site).

4.5.10. Deploy any additional resources needed to clean up the spill site and remove the contaminated material.

4.5.11. Coordinate with the Tacoma Fire Department to establish work zones.

4.5.12. If the EC determines that the facility has had a release, fire, or explosion that could threaten human health or the environment, he/she will immediately notify Ecology as required in Section 6.2. Additionally, notification will be made to the National Response Center as well as the appropriate government official as described in Sections 3.1.3. Information to be included in the notification is listed in Section 14, Required Reports.

4.6. Additional Contacts

Additional contacts may be required during an emergency. Names and telephone numbers are listed in the Notification Action Summary in Section 3.1. All personnel reporting information to an outside response group will do so after the EC indicates the need. The person making such notification will REMAIN CALM and provide the following information in a clear and concise manner:

- Name of person calling and telephone number
- Name and address of facility
- Time and type of incident (e.g., discharge, fire)

- Name and quantity of material(s) involved, to the extent known
- Extent of injuries, if any
- Possible hazards to the environment and human health outside the facility.

4.7. Annual Review

As required in WAC 173-303-330(1)(b), facility personnel will participate in an annual review of dangerous waste handling procedures. This will include a review of the contingency plan, the site emergency response plan, and an implementation drill of the contingency plan including evacuation of the site and hazard evaluation of the simulated emergency.

5. EMERGENCY RESPONSE PROCEDURES

WAC 173-303-340, 350(3)(a) and (b), 360(2) (a), (b), and (c)

5.1. Emergency Response Contractor

Emerald personnel will primarily perform response activities. Emerald may also use the personnel and equipment resources of NRC Environmental to provide assistance in emergency response activity. If the emergency involves spilled hazardous materials, the EC (or designee) may call NRC Environmental to request assistance with the emergency. The phone numbers for NRC Environmental are listed in the Notification Action Summary (Section 3.1). NRC Environmental has a wide variety and large volume of spill response equipment available at all times.

5.2. Containment and Control Activities

5.2.1. The facility's operational systems are designed to minimize the potential hazards to facility personnel, contain released materials, and prevent their movement off-site.

5.2.2. Operational features and response activities are presented in section 5.2.4, including

- the responsibilities of the EC,
- who is in charge of emergency response, and
- the duties of other key individuals providing assistance.

These general procedures apply to all areas of the facility.

5.2.3.Procedures to properly handle arriving shipments that include damaged containers, or unacceptable wastes, are in Section 5.4, Damaged/Unacceptable Waste Shipment.

5.2.4.General Procedures

5.2.4.1.In the event of an emergency that calls for the implementation of the Contingency Plan, site specific procedures will be followed as carefully as possible.

5.2.4.1.1.Any deviation from these procedures will be at the discretion of the EC. If the EC finds that the emergency requires action that deviates from the Contingency Plan to properly protect human health and the environment, the EC will attempt to discuss the deviation with Ecology prior to implementation. If such discussion is not possible, the EC will inform Ecology as soon as practical of the deviation.

5.2.4.2.Table G-2 below provides a list of minimum spill control and cleanup equipment available on site.

Table G-2
List of On-Site Emergency Response Equipment
(minimum available on-site)

Item	Quantity		Item	Quantity
Personal Protective Equipment			*Spill Control Equipment*	
Disposable tyvek suits	10		Air diaphragm pump	1
Chemical resistant boots	8		Shovels	2
Chemical resistant gloves	12		Brooms	2
Chemical resistant rain gear	8		30-gallon recovery drums	5
Hard hats	8		55-gallon recovery drums	5
Chemical resistant goggles	8		85-gallon recovery drums	5
Half-face respirators	8		Spill skid	1
OVA Cartridges	8 pr		Floor dry	8 bags
First Aid Supplies[1]			Standard industrial absorbent pads	1 bundle
Gauze pads and rolls*	1		*Monitoring Equipment*	
Adhesive tape*	1		Combustible gas indicator	1
Butterfly bandages*	1 box		Flame ionization detector	1
Band aids*	1 box		*Fire Extinguishing Equipment*	
Antibacterial ointments*	1		CO_2 Fire Suppression	2 systems
Local and topical anesthetics*	1		Dry Chemical Fire Extinguishers:	
Eyewash bottles and solution*	1		2A6BC	2
Fire blanket*	1		2A10BC	10
Stretcher*	1		3A40BC	4
[1] *Four first aid kits are present on-site. Supplies marked with * are present in each.*			4A60BC	11
Alarm and communication system			4A80BC	1
Air horns	9		10A60BC	4
Wind socks	2		20A120BC	7
Intercom System	1		Halon Fire Extinguishers	
Vehicles			10BC	4
Forklifts	2		2A40BC	1
Vacuum Truck	1			

5.2.4.3.The general procedures applicable to major releases of liquid wastes are as follows:

5.2.4.3.1.Assess the size of the spill and attempt to halt any further release. If the employee is unsure of the material involved, and/or unsure of appropriate safety procedures, the employee should not take action to mitigate the situation.

5.2.4.3.2.Remove all unnecessary persons from the hazard area (Section 13 describes evacuation procedures).

5.2.4.3.3.Identify and use the proper personal protective equipment (PPE). Spill response requires at a minimum the following PPE:

- Steel toed chemical resistant boots
- Coveralls;
- Tyvek if contact with hazardous material is possible;
- Hard hat;
- Safety glasses; and,
- Chemical resistant gloves

5.2.4.3.4.If ignitable wastes are involved, immediately remove all ignition sources and use spark- and explosion-proof equipment.

5.2.4.3.4.1.If there are Volatile Organic Compounds (VOC's) present, percent oxygen and percent lower explosive limit (LEL) will be monitored with the portable gas monitor to ensure adequate oxygen and a non-explosive atmosphere. If the alarm is activated, indicating <19.5% oxygen, or >10% LEL, workers will leave the area, the area will be coroned off with Caution tape, and the levels monitored.

5.2.4.3.4.2.Solvent vapor concentration will be measured with the Flame Ionization Detector (FID). If levels reach the permissible exposure limit (PEL), the Emergency Coordinator will determine whether respirator useage will provide adequate respiratory protection.

5.2.4.3.5.Contain the spill; under the direction of the EC, properly trained and equipped personnel will ensure

that spills are contained or an isolation area around the spill will be established. Small spills will be collected using absorbents. Section 11.1 lists equipment available for use in the spill response.

5.2.4.3.6. Remove all surrounding materials that could react with the released material.

5.2.4.3.7. Use absorbent pads, booms, soil, sandbags, sand, and other inert materials to contain, divert, and clean up a spill if it has not been contained by a concrete containment. Spills contained within dikes and sumps may be pumped back into an appropriate container, vacuum truck, or portable tank.

5.2.4.3.8. Place all containment and cleanup materials in containers for proper disposal.

5.2.4.3.9. Place all recovered wastes in DOT specification containers.

5.2.4.3.10. Dispose of or decontaminate all equipment used in emergency response actions.

5.2.5. Fire and/or Explosion Control

5.2.5.1. In the event of an explosion or fire, emphasis will be placed on preventing the fire from spreading to surrounding areas.

5.2.5.1.1. Emerald personnel will carry out the initial fire fighting effort if the fire is small and the available fire fighting equipment (e.g. extinguishers) is capable of handling the situation until outside assistance (i.e., Tacoma Fire Department) has arrived.

5.2.5.1.2. Upon arrival, the Tacoma Fire Department will evaluate the situation and determine appropriate response. The Tacoma Fire Department has appropriate and available vehicles with sufficient pumping capability, and water storage capacity to properly respond to fire and explosion at the facility.

5.2.5.1.3. Fire hydrants are located along Alexander Avenue to the south and 100 feet north of the facility.

5.2.5.2. Production and process areas as well as loading, unloading and storage areas are all readily accessible to fire

fighting and other emergency response vehicles and equipment.

5.2.5.2.1. Container storage is performed following International Fire Code requirements taking into account adequate aisle spacing and stacking heights.

5.2.5.2.2. Emerald also complies with container storage and staging restrictions in section D, Process Information, of their dangerous waste permit application.

5.2.5.2.3. In accordance with WAC 173-303-340(3), all aisle ways are kept clear and free from obstruction for emergency equipment access.

5.2.6. The following actions will be taken in areas affected by the fire or explosion:

5.2.6.1. Work in affected areas will be shut down immediately,

5.2.6.2. Feed lines and additional recycling equipment and electrical sources will be shut down as necessary and practical,

5.2.6.3. Areas will be cleared of all personnel not actively involved in fighting the fire. These persons will report to the designated assembly area for accountability. Evacuation routes are described in Section 13, Evacuation Plan.

5.2.6.4. Injured persons will be removed to a safe location, and initial first aid will be administered,

5.2.6.5. The affected area will be inspected to determine whether gas or heat buildup is occurring and whether this could lead to further fire or explosion,

5.2.6.6. Non-essential vehicular traffic in the area will cease until the fire is contained and safety is restored,

5.2.6.7. Hazardous and/or ignitable materials will be moved to other locations as practical,

5.2.6.8. The affected area and all surrounding areas will be monitored for leaks and ruptures, in process equipment, piping systems, containers, tanks, rail road tank cars, etc.

5.2.6.9. On-site fire fighting equipment as outlined in Section 11 Emergency Equipment, will be used as is practical for controllable situations.

5.2.6.10. Use of motor vehicles within this area will be restricted or eliminated to avoid ignition of the vapor that can cause flashback to the source. If the chances of an impending explosion are high, as determined by the EC, the entire facility will be evacuated in accordance with the Evacuation Plan (see Section 13). Personnel are trained in evacuation procedures and means of exit from their respective work areas. If a fire is involved and is concentrated at the source, the entire facility will be evacuated. Fire fighting will not be done at the risk of injury to the person(s) involved, however, early containment of fires can significantly reduce adverse impacts.

5.2.6.11. In the event of a fire or explosion, the Tacoma Fire Department will be notified immediately by dialing 911 on a telephone. When the Fire Department arrives, all Emerald emergency response team efforts will cease and control will be given to the Fire Department. Response team members will stand by to assist as needed. Non-essential personnel will be instructed to stay in their respective work areas and be ready to evacuate on the announcement from the EC.

5.2.6.12. If toxic fumes are released as a result of a fire, the EC will view the windsock to determine wind direction and announce evacuation to one of the three assembly areas.

5.2.7. Hazardous Material Release Control

5.2.7.1. The following general procedures will be used for rapid, safe response and control of the emergency situation.

5.2.7.1.1. For releases from a tank, pipeline, pump, etc., close the appropriate valve and shut-off any affected pumps, if possible.

5.2.7.1.2. Isolate the area and keep all persons upwind of the spill and restrict access to the affected area to reduce the possibility of spreading the material.

5.2.7.1.3. Contain spilled or leaking materials. If there is a risk of fire, remove any containers of ignitable materials from the area, or provide cooling by water spray.

5.2.7.1.4.Place temporary spill prevention barriers on any storm drains that could be impacted.

5.2.7.1.5.If an ignitable material is involved, remove all ignition sources, and use spark and explosion-proof equipment, where necessary.

5.2.7.1.6.Obtain first aid for any injured person(s) and call the hospital or dial 911.

5.2.7.1.7.Monitor nearby process equipment, piping systems, tankers, trucks, railroad tank cars, and containers for leaks or ruptures, pressure buildup and/or gas generation.

5.2.7.1.8.If possible, try to stop the leak. Several options are available:

- Draw down the tank or container below the leak point;
- Use a plugging device;
- Place any leaking container into an overpack container.
- For an uncontrollable or large spill, the EC may use the services of the Emergency Spill Contractor. Telephone numbers are provided in the Notification Action Summary (Section 3.1). Reporting requirements are provided in Notification Sections 6.2 and 6.3)

5.2.7.2.Mitigation and control (WAC 173-303-145(3)).

5.2.7.2.1.The person responsible for a spill or nonpermitted discharge must take appropriate immediate action to protect human health and the environment (e.g., diking to prevent contamination of state waters, shutting of open valves).

5.2.7.2.2.In addition, the person responsible for a spill or discharge must:

5.2.7.2.2.1.Clean up all released dangerous wastes or hazardous substances, or take such actions as may be required or approved by federal, state, or local officials acting within the scope of their official responsibilities. This may include complete or partial removal of released dangerous wastes or hazardous substances as may be justified by the nature of the released dangerous wastes or

hazardous substances, the human and environmental circumstances of the incident, and protection required by the Water Pollution Control Act, chapter 90.48 RCW;

5.2.7.2.2.2. Designate and treat, store or dispose of all soils, waters, or other materials contaminated by the spill or discharge in accordance with this chapter 173-303 WAC. Ecology may require testing in order to determine the amount or extent of contaminated materials, and the appropriate designation, treatment, storage, or disposal for any materials resulting from cleanup; and

5.2.7.2.2.3. If the property on which the spill or discharge occurred is not owned or controlled by the person responsible for the incident, restore the area impacted by the spill or discharge, and replenish resources (e.g., fish, plants) in a manner acceptable to Ecology.

5.2.7.2.3. Where immediate removal, temporary storage, or treatment of spilled or discharged dangerous wastes or hazardous substances is necessary to protect human health or the environment, Ecology may direct persons to:

5.2.7.2.3.1. Remove it without a manifest, by transporters who do not have EPA/state identification numbers;

5.2.7.2.3.2. Temporarily store it at sites that are protective of human health and the environment and are secure from access by the public; and/or

5.2.7.2.3.3. Treat it to reduce or control the hazards, under WAC 173-303-170.

5.2.7.3. Nothing in WAC 173-303-145 eliminates any obligations to comply with reporting requirements which may exist in a permit or under other state or federal regulations.

5.2.8. Removing or Isolating Containers

5.2.8.1. If containers must be removed or isolated from the emergency, they will be removed in a safe manner when it is practical to do so.

5.2.8.1.1. If the containers are on the ground, hand trucks, pallet jacks or forklifts will be used. The containers will be placed in an area that does not block access ways to emergency responders and does not cause other problems or hazards.

5.2.8.1.2. If the containers are located in a truck trailer with a tractor attached, the trailer will be repositioned to a safe area.

5.2.8.2. If a reactive or incompatible waste must be temporarily removed from a truck, containers are placed on portable spill skids. These spill skids (or containment pallets) are constructed of polyethylene and meet the requirements of WAC 173-303-630(7) for secondary containment of hazardous materials.

5.2.8.2.1. Spill skids awaiting off-site shipment will be segregated from other wastes and placed in the northwest corner of the Dangerous Waste Container Area away from any incompatible materials

5.2.9. Personnel Response Activities

5.2.9.1. Facility personnel's primary responsibility will be for their own safety.

5.2.9.1.1. Other responsibilities include equipment shutdown for processes operating in their work areas, if possible and necessary, by following appropriate shutdown procedures. Equipment that may become a hazard if left running will be shutdown if at all possible.

5.2.9.1.2. Other duties may be assigned by the EC such as clearing areas of obstructions or guiding emergency response personnel to the scene.

5.2.9.2. If the EC has ordered an evacuation of the facility, employees will evacuate their work area when the alarm sounds. They will not

- block fire lanes;
- wait for friends;
- be casual;
- panic; or
- smoke.

They will follow the assigned evacuation routes shown in Section 13, Evacuation Plan.

5.2.9.3. After leaving his/her work area, an employee will move to his/her designated assembly area unless it is downwind of the emergency. It is very important to assemble at an assigned assembly area so that emergency responders can account for all employees and visitors.

5.2.9.3.1. If toxic fumes are released due to fire, the wind direction will be determined by viewing the windsocks located on the south end of the boiler house roof and the north end of the Railcar Secondary Containment Area.

5.2.9.4. Regardless of which evacuation route is used, each employee will report to their supervisor in their designated assembly area, and will report missing or injured persons.

5.2.9.5. No Emerald employee or visitor is allowed to leave the assigned assembly area until the EC or the on-site Emergency Commander gives approval. Employees will not return to their work areas or leave the designated assembly areas until specific instructions have been given.

5.3. Process Specific Procedures

5.3.1. In the event of a fire, explosion or major release of hazardous materials, if process equipment is in operation, the EC will perform an assessment to determine if shutdown of the process equipment is required.

5.3.2. The EC will consider the following for determining if a shutdown is necessary:

- Process unit involvement in the emergency.
- Spreading of fire near a process unit.
- Additional hazards caused by not shutting down a process unit.
- Potential imminent danger for explosion to occur.
- Potential for a spill or release of hazardous materials in the area of a process unit to cause danger to human health or the environment if the process unit is left running.
- Potential for process equipment or piping system failure to cause groundwater contamination.

5.4. Damaged / Unacceptable Shipment

Procedures for handling shipments that include damaged containers, or wastes that are unacceptable are described in Sections 5.4.1 (Damaged Containers) and 5.4.2 (Unacceptable Waste).

5.4.1. Damaged Containers

5.4.1.1. Containers that are damaged upon receipt, or during handling or storage, will be evaluated.

5.4.1.1.1. If the container can be safely moved, the container will be moved promptly into the Dangerous Waste Containment Area. If the EC determines that Emerald personnel and equipment are unable to safely or effectively handle the situation, the Spill Response Contractor will be contacted for assistance (see Section 3.1.4).

5.4.1.1.2. Any release from the damaged containers will be evaluated under Sections 4 and 6.2 to determine any need to implement the contingency plan, notify proper agencies, etc.

5.4.1.2. Any waste shipped off site will be packaged in a container that meets all applicable DOT regulations.

5.4.1.3. If a container is bulging or if there is other evidence of excessive pressure, the container must be vented to release any pressure. A technician will slowly open the closure, allowing any pressure to escape slowly. Proper PPE includes safety goggles or face shield, chemical resistant gauntlet gloves, Tyvek coveralls, chemical resistant boots, a respirator with the appropriate cartridges for the material, and hard hat.

5.4.1.3.1. Capacity 55 Gallons or Less

5.4.1.3.1.1. Containers of 55 gallon or less capacity will be either transferred to an undamaged container compatible with the waste, or overpacked in a 85 gallon compatible overpack drum.

5.4.1.3.1.2. Any waste released will be handled in accordance with the procedures in Section 5.2, Containment and Control Activities

5.4.1.3.2. Capacity Greater than 55 Gallons (Totes, Tank Trucks)

5.4.1.3.2.1. If the container is larger than 55 gallons (totes, tank trucks), efforts will be made to stop or reduce leakage from the container. Waste can also be transferred to other available tanks/totes.

5.4.1.3.2.2. Tank trucks will be located in Load/Unload Area 1 to assure proper containment of any spilled waste.

5.4.1.3.3. Railroad Tank Cars

5.4.1.3.3.1. If a tank car is leaking, drip pans will be used to contain the leak, and collected waste will be pumped to other containers/tanks that will be stored in contained areas on site.

5.4.1.3.3.2. The Tacoma Rail will be notified upon discovery of a leak that cannot be stopped promptly and appropriate incident response requires that the car be moved promptly (see Section 3.1.5, Emergency Assistance); other authorities will be notified as required after evaluation of any release or health hazards.

5.4.2. Unacceptable Waste

5.4.2.1.1. If a waste is delivered to the site that is assigned waste codes which Emerald is not permitted to accept, this waste will be clearly marked so the waste will not be processed or shipped off-site without proper manifesting.

5.4.2.1.2. Emerald will use in-company resources, or the Emergency Response contractor (NRC Environmental, see section 3.1.4) to assure proper identification, shipment and disposal.

5.4.2.1.3. Containerized waste will be stored in an area (drum jail) reserved for wastes requiring further information before manifesting for off-site disposal.

5.4.2.1.4. Bulk shipments that require segregation under this section will be kept in the original tank in which it was shipped. If this is not possible, Emerald will propose a suitable dangerous waste storage tank to Ecology for

temporary storage and obtain approval from Ecology prior to transfer.

6.NOTIFICATION
WAC 173-303-360(2)(a)

6.1.Notification of Site Personnel
Site personnel will be notified of an imminent or actual emergency by air horns located throughout the site (see Figure G-5). Two long blasts of the air horn notify personnel of an imminent or actual emergency situation.

6.2.Notification of State/Local Agencies
6.2.1.Emerald shall immediately notify Ecology and other appropriate authorities when any one of the following occurs:

6.2.1.1.A fire or explosion at the facility, or any fire or explosion that could spread to or otherwise affect operations at the facility.

6.2.1.2.An incidence of noncompliance with this Permit that could threaten human health or the environment. Any natural disaster at the facility that could threaten human health or the environment.

6.2.1.3.In accordance with WAC 173-303-145(2) and WAC 173-303-360(2)(a), a sudden or non-sudden release of a dangerous waste or hazardous substance which poses a threat to human health or the environment, regardless of quantity.

6.2.1.4.A spill, release, or other discharge of dangerous waste or hazardous substance greater than 10 pounds (1.2 gallons) or the "reportable quantity" established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) outside of secondary containment.

6.2.1.5.A spill, release, or other discharge of dangerous waste or hazardous substance greater than 100 pounds (12 gallons) or the "reportable quantity" established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) inside secondary containment.

6.2.1.6.Any incident that causes implementation of the Contingency Plan (Section 4.1)

6.2.2.Appropriate State and Local agencies will be notified as directed by the EC. See Emergency Assistance, Section 3.1.5 for listing of duties and phone numbers

6.3.Notification of Emergency Response Contractor

6.3.1.NRC Environmental is available on-call, 24-hours a day to provide personnel, equipment, materials, services and facilities to perform emergency hazardous material spill response.

6.3.2.The Emergency Spill Response Contractor will be notified by the EC (or designee), and provide necessary emergency response equipment and personnel to assist the EC with the emergency.

7.IDENTIFICATION OF HAZARDOUS MATERIALS
WAC 173-303-360(2)(b)

7.1.Identification of Waste and Hazard Assessment

7.1.1.As soon as possible, the EC will determine the character, source, and extent of any released materials. The EC will accomplish this by visual inspection and reference to manifests, waste profile sheets (including laboratory analytical data), or other available sources of information, and by talking to any witnesses to the incident.

7.1.2.In addition to the above, the EC will identify the hazardous materials by using the guidance provided in Appendix I of this plan, Information on Identification of Hazardous Materials.

7.2.Extent of Contamination

7.2.1. Release in Secondary Containment Area

7.2.1.1.Consistent with good management for abatement of initiating cause and prudent consideration of health and safety risks to personnel, Emerald will remove spilled or leaked waste within secondary containment immediately upon detection. For this requirement, "immediate removal" occurs when clean-up actions begin upon the discovery of the spill or leak and proceeds continuously until completion.

7.2.1.1.1.Each discharge of dangerous waste or hazardous substance greater than 10 pounds (or 1.2 gallon) but less than 100 pounds (12 gallons) or the "reportable quantity" established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) to the secondary containment system shall be entered into the operating record if not removed from the secondary containment system immediately.

7.2.1.1.2.Each discharge of dangerous waste or hazardous substance greater than 100 pounds (12 gallons) or the "reportable quantity" established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) to the secondary containment system shall be entered into the operating record without exception.

7.2.1.2.Information in the operating record required by section 7.2.1.1.1 and 7.2.1.1.2 shall include all of the following:

- Identification of equipment involved and location of spill or leak,
- Description of materials spilled or leaked,
- Actions taken to correct the cause of the spill or leak, and
- Date and time of the occurrence and of the action taken to correct cause of the spill or leak.

7.2.1.3.The Permittee shall operate the facility to avoid any routine or systematic release of dangerous waste to a secondary containment system.

7.2.1.3.1.The Permittee shall repair any equipment that has resulted in a release of dangerous waste to a secondary containment system immediately pursuant to procedures in the "Inspection Plan."

7.2.1.3.2.Until repairs required by 7.2.1.3.1, above, can be completed, the Permittee shall implement a system to collect any drips or discharges of dangerous waste to prevent further contact of dangerous waste with secondary containment coating or structure.

7.2.1.4.If the release occurs in a secondary containment area, waste will be rinsed to the containment sumps, and the rinsate pumped into drums, totes or waste tanks pending analysis and profiling of the waste for treatment or

disposal. Residual waste will be removed with absorbent material.

7.2.2.Release in Stormwater Management Area

7.2.2.1.If the release occurs in the stormwater management area,

7.2.2.1.1.Gate valves isolating the several drainage areas will be closed to prevent downstream contamination of the stormwater system.

7.2.2.1.2.The emergency shut off will also be activated for the pumps in the stormwater vault.

7.2.2.2.Before allowing wastewater to enter the stormwater vault following the incident, water samples will be collected from the stormwater system above the closed gate valve and analyzed for contaminants of concern. If contamination is detected, the contents of the vault will also be sampled and analyzed, and acceptable results received, before any vault water is discharged to the swale..

7.2.2.3.If contamination prevents discharge of the vault water, the contaminated wastewater will be pumped into on site storage tanks or directly into vacuum trucks for transport off-site for disposal.

7.2.3.Release to the Ground

7.2.3.1.If the incident results in a release to the ground,

7.2.3.1.1.Emerald would attempt to establish berms to minimize off site spreading of contamination.

7.2.3.1.2.Emerald would then prepare a sampling/analysis plan that would be presented to Ecology for approval prior to taking any off-site samples or corrective action.

7.2.3.2.This will most likely occur due to a spill from the railcars, or an overflow of the stormwater management system, probably from large volumes of water from fire fighting operations.

7.2.4.Release to the Air

7.2.4.1.A release to the air would occur in case of a fire involving solvents, or a spill of solvents that could not be readily contained or recovered promptly to secure storage. Releases to the air that require full implementation of the contingency plan are described in section 4.1.

7.2.4.2. In the event of such an incident, an evaluation of the amount of such release would be reported to Ecology and the Puget Sound Clean Air Agency (PSCAA).

8.HAZARD ASSESSMENT AND REPORT

WAC 173-303-360(2)(c), (d) and (e)

8.1.Hazard Assessment

8.1.1.The EC will assess possible hazards, including direct, indirect, immediate, and long-term effects to human health and the environment, and the appropriate response to such hazards.

8.1.2. The hazard assessment will be based upon:

- The character of the release (e.g. liquid, or vapor)
- Analytical information contained on waste profiles (e.g. contaminant concentration, pH, BTU value)
- The exact source of the released material (e.g. tank, container, process)
- The amount of the release
- A determination of the aerial extent of the released material (e.g. any impact to soil, groundwater, or surface water)
- Possible hazards to human health and the environment (e.g. TLV, PEL, or toxicity).

8.1.3.Because Emerald handles dangerous wastes that are usually mixtures or blends of many different organic compounds, NFPA symbols indicating flammability, reactivity, and health hazards are placed on all tanks and process units to enable emergency responders to identify potentially direct, indirect, immediate and long term effects of the contents.

8.1.4.Material Safety Data Sheets (MSDS) are a major source of chemical information. It is the key document used to provide hazard information to employees and can become an invaluable tool for emergency personnel involved in a chemical emergency.

8.1.4.1.MSDS binders are located in mailboxes located by both the front and rear gate of the facility at 1825 Alexander Avenue.

8.1.4.2.The MSDS can be referenced to help determine the possible direct, indirect, immediate, and long-term effects to human health and the environment.

8.2.Criteria for evacuation and notification of authorities

8.2.1.See Section 13.1, Evacuation Plan

8.2.2.Notification requirements are listed in Notification (Section 6)

8.2.3.Contact numbers are found in Notification Action Summary (Section 3.1)

9.PREVENTION OF RECURRENCE OF SPREAD OF FIRES, EXPLOSIONS OR RELEASES

WAC 173-303-360(2) (f) and (g), 630(2), 640(7)

9.1.Prevention of Recurrence

9.1.1.The EC will take all necessary steps to ensure that a secondary release, fire, or explosion does not recur after an initial incident. The following procedures will be carried out in the affected area:

- Monitoring for pressure buildup.
- Inspection for leaks or ruptures in valves, pipes, tanks, or containers.
- Inspection for gas generation.
- Isolation of all residual waste materials.

9.2.Where monitoring or inspection is required to ensure that a secondary incident does not occur, the EC will designate at least one appropriately trained individual to perform the required monitoring or inspection.

9.3.The EC will specify the frequency of monitoring or inspection on the basis of the nature of the initial emergency incident, the types of wastes or products involved, the process involved, and the likelihood of a secondary incident.

10.POST EMERGENCY ACTION

WAC 173-303-360(2)(h), (i) , (j), and (k), 640(7)

10.1.Post-emergency Procedures

Post-emergency procedures are designed to prevent recurrence, cleanup and dispose of residuals, decontaminate equipment, and provide for personnel debriefing.

10.2.Treatment and Disposal of Released Materials and Cleanup Residue

10.2.1.Once the emergency situation has ended, the EC will initiate cleanup, storage, and disposal of the residues, including recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion. This will occur as soon as possible to avoid further contamination.

10.2.1.1.Released materials within containment areas (e.g., tanks or container storage) will be collected and secured in appropriate DOT certified containers.

10.2.1.2.Leaking containers will be immediately segregated and repackaged.

10.2.1.3. All recovered dangerous waste including liquids, solids, contaminated soils, surface water, or any other materials that are involved in a fire, explosion, or release will be placed into DOT approved containers and moved to areas unaffected by the emergency situation.

10.2.1.3.1.The containers will be properly labeled, and protected from accidental ignition or reaction.

10.2.1.3.2.The containers of waste will be sampled, analyzed, characterized, and tracked in accordance with the facility Waste Analysis Plan (Section C of this Permit application).

10.2.1.3.3.If the container contents are regulated as dangerous waste, the waste will be properly treated and/or disposed at approved facilities.

10.2.2.The EC will ensure that, in the affected areas of the facility, no waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed.

10.2.3.Equipment Decontamination and Maintenance

10.2.3.1.All equipment listed in this Contingency Plan and used during emergency response and cleanup will be decontaminated and readied for future use before operations are resumed.

10.2.3.1.1.All site personnel will remove contaminated clothing and perform personal decontamination activities, as necessary.

10.2.3.1.2.Fire extinguishers will be recharged, personal protective equipment replaced, and absorbent materials restocked.

10.2.3.1.3.Following an emergency event, all equipment and materials used in the response will be cleaned so that they are fit for their intended use before normal operations are resumed, and disposable response materials will be properly disposed of and replaced.

10.2.3.1.4.An inspection of all safety equipment will be conducted before operations are resumed.

10.2.4.Facility Repairs or Closures

10.2.4.1.If a hazardous waste storage tank system has been exposed to the fire, explosion, or release or has been the cause of the fire, explosion or release, it will be taken out of service until repaired.

10.2.4.2.If a secondary containment system used for container storage or tank storage of dangerous waste has been damaged by fire or explosion, it will be taken out of service until repairs are completed.

10.3.Reactivation of Activities in Affected Area

10.3.1.Emerald will perform cleanup of any secondary containment structure that was impacted by the emergency by removing any residual liquids and incompatible wastes. The affected concrete surfaces and mechanical equipment will then be restored to pre-emergency operational status, and on-site emergency equipment will be prepared for use.

10.3.2.Upon completion of these cleanup activities, Emerald will notify Ecology and appropriate local authorities in accordance

with the provisions described in Section 14 (Required Reports, Recordkeeping, and Certifications).

10.3.3. The affected area may be reoccupied, equipment that was initially shut down in response to the incident will be reactivated and wastes that are compatible with the released material may be processed.

10.3.4. For any affected soils that were impacted by the emergency, Emerald will perform post-emergency cleanup procedures as described in Section 10.5 (Mitigation and Control).

10.4. Personnel Debriefing and Retraining

10.4.1. The EC will conduct debriefings of site supervisory and operations personnel and local authorities to assess preparedness and prevention activities, response activities, casualty control, and evacuation procedures. The debriefing will include a root cause analysis of the events to find the reason (or reasons) for the event to have occurred.

10.4.2. Based upon this review, corrective actions will be identified, and suggestions for revisions to the Contingency Plan will be made to facility management.

10.4.3. Personnel will be retrained, if necessary.

10.5. Mitigation and Control

10.5.1. Emerald will complete those actions as may be required or approved by federal, state, or local officials acting within the scope of their official responsibilities. This may include complete or partial removal of released dangerous wastes or hazardous substances as may be justified by the nature of the released dangerous wastes or hazardous substances, the human and environmental circumstances of the incident, and protection required by the Water Pollution Control Act, chapter 90.48 RCW.

10.5.2. In addition, Emerald will designate and treat, store or dispose of all soils, waters, or other materials contaminated by the spill in accordance with the requirements of WAC 173-303.

10.5.3. If Emerald does not own or control the property on which the spill or discharge occurred, Emerald will restore the area

impacted by the spill or discharge, in a manner consistent with Ecology requirements.

11.EMERGENCY EQUIPMENT
WAC 173-303-340(1), 340(2), 350(3)(e)

11.1.Available Emergency Equipment

11.1.1.The facility maintains an alarm system, communications system, emergency response equipment, and decontamination equipment. Additional off-site resources are available. On-site equipment will enable facility personnel to react and respond to the majority of emergency incidents that may arise. However, if needed, supplemental emergency equipment and supplies will be obtained from outside sources. The equipment maintained by Emerald is described further in the following subsections. All equipment will be tested and maintained to assure its proper operation in time of emergency. The locations are shown in Figure G-5.

11.2.Alarm and Communication Systems

11.2.1.In the event of an emergency, Emerald employees will use internal communications systems including air horns, megaphone, and telephone to notify personnel within the facility of the situation. Telephones are used to communicate with local authorities and other support groups outside the facility.

11.2.2.Access to communications or alarms. Personnel must have immediate access to the signaling devices described in the situations below:

11.2.2.1.Whenever dangerous waste is being poured, mixed, spread, or otherwise handled, all personnel involved must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee.

11.2.2.2.If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone or a hand-held,

two-way radio, capable of summoning external emergency assistance.

11.2.3. Site Security is provided by a fence and monitored 24 hours per day by a Sonitrol security system. Cameras record activity at both gates, and most of the site (outside of the buildings) is under observation. The images are available for viewing via the internet, and can be observed on on-site monitors as well as off-site by authorized managers. When the site is not occupied, Sonitrol staff actively monitor activity at the gates and on site, and notify the plant manager, fire or police department as necessary.

11.3. On-Site Equipment

The facility is supplied with various types of equipment for use in emergency situations. A list of that equipment is provided in Table G-2 of this plan. That equipment includes personal protective clothing and equipment, first aid supplies, fire-fighting equipment, spill and control equipment, monitoring equipment, and decontamination supplies.

11.3.1. Personal Protective Clothing and Equipment

11.3.1.1. Personal protective clothing and equipment are provided to protect employees during emergency situations.

11.3.1.1.1. Hard hats, protective eye wear such as safety glasses or chemical resistant goggles, and steel-toed boots are the minimum protective clothing required by Emerald operations personnel who are responding to emergency situations.

11.3.1.1.2. Other protective clothing and equipment maintained on-site is listed in Table G-2.

11.3.1.2. Protective clothing and equipment is located in the storage Conex at the northwest corner of the site. Additional PPE and equipment for spill response is located in the Emergency Response Conex by the front gate.

11.3.2. First Aid Supplies

11.3.2.1. A list of first-aid supplies is provided in Table G-2. Those supplies are located in the Main Office.

11.3.2.2.Portable eyewash stations locations are specified in Figure G-5. Emerald will ensure these are operable at all times, including during periods of subfreezing temperatures.

11.3.3.Fire Fighting Trucks or Equipment

11.3.3.1.Fire extinguishing systems include hard piped fire water systems over process systems located underneath canopied areas of the facility, fire extinguishers, CO2 systems, and fire hydrants (outside property line).

11.3.3.1.1.Facility fire extinguishers are dry chemical, carbon dioxide or Halon.

- Type A is capable of extinguishing fires involving ordinary combustible materials such as wood, cloth, paper, rubber and many plastics.
- Type B is capable of extinguishing fires involving flammable liquids, oils, greases, tars, base paints, lacquers, and flammable gases.
- Type C is capable of extinguishing fires involving energized electrical equipment.

11.3.3.1.1.1.All of the extinguishers comply with National Fire Code standards for portable fire extinguishers and are inspected monthly by a certified fire service. Extinguishers are recharged after each use and at manufacturer specified intervals by a certified fire service. Records of these inspections are located on tags attached to each fire extinguisher.

11.3.3.2.Fire hydrants are located off-site along Alexander Avenue and in the parking lot located on the northeast end of the facility.

- One of these fire hydrants is located 50 feet from the southwest corner of the Emerald facility and
- the other fire hydrant is located 100 feet from the northeast corner of the facility.

11.3.3.2.1.Each hydrant will deliver approximately 500 gpm of water.

11.3.3.3. Pull type fire alarm systems (air horns) are located in the Production Pads, near the storage tanks, outside the walk-way entry to the main electrical room, and near both main gates.

11.3.3.4. A fire blanket is located in the Laboratory. Two windsocks are available to help determine wind direction; one is located on top of the northwest side of the Railcar Area and the other on top of the south end of the Boiler House.

11.3.4. Spill Control and Cleanup Equipment

11.3.4.1. Table G-2 provides a list of minimum spill control and cleanup equipment at the Emerald facility. The facility has spill control systems in place to minimize the effects of any accidental spill or leak of hazardous materials. The waste management units are all equipped with secondary containment devices such as berms, sumps or are completely enclosed by concrete secondary containment dikes.

11.3.4.2. Equipment for use in containing and cleaning up spills of hazardous materials are stored at locations specified in Figure G-5. The equipment and material maintained for response are listed in Table G-2.

11.3.4.3. Emerald can use their regular processing equipment to help respond to emergencies. Portable air diaphragm pumps are capable of moving 30 to 90 gallons of liquid per minute and can be used throughout the facility. The forklift is equipped with special container handling attachments and is capable of moving containers quickly to a safe location. Containers available for clean up include steel, 30- and 55-gallon containers and 85-gallon overpack containers.

11.3.4.4. Industrial absorbents available include floor dry and absorbent pads or similar. Floor dry is capable of absorbing its own weight in liquid material. Inventories of containerized floor dry are maintained throughout the facility. The absorbent pads are capable of absorbing their own weight in liquid material. Absorbent pads are stored in

the spill kits throughout the facility, as well as in the boiler house and PPE storage container.

11.3.4.5.A vacuum truck capable of handling 2,000 gallons of liquids is available at the facility. In addition, equipment for a larger-scale response is available from other Emerald divisions, and NRC Environmental on a 24-hour basis.

11.3.5.Monitoring Equipment

11.3.5.1.A combustible gas analyzer is available for use at the facility for identification of explosive atmospheres, as well as percent oxygen levels required for confined space entry. The combustible gas detector can be used to identify lower explosive limits (LEL) for confined space entry and spill response.

11.3.5.1.1.The combustible gas analyzer is calibrated annually. Calibration and maintenance records are maintained on site.

11.3.5.1.2.The combustible gas analyzer undergoes a self-check at each start-up. If a problem is reported, corrective action will be taken prior to using the meter.

11.3.5.2.A Flame Ionization Detector (FID) is used to determine the vapor concentration of volatile organic compounds (VOCs). These measurements are used to avoid exposure to higher vapor concentrations than the permissable exposure limit (PEL), and to assure that vapor concentrations do not exceed the allowable levels for the respirator cartridge in use.

11.3.5.2.1.The FID is calibrated prior to each use with a calibration gas appropriate for the concentrations being measured. Calibration and maintenance records are maintained on site.

11.3.5.2.2.The FID is returned to the manufacturer annually for routine maintenance and calibration adjustment as needed.

11.3.6.Decontamination Equipment

The facility maintains a wide variety of equipment to decontaminate personnel and equipment used to respond to emergency situations.

This includes brushes, detergent cleaning solutions, pans and absorbents. A list of minimum decontamination equipment is provided in Table G-2.

11.3.7.Contractor Supplied Equipment

Additional emergency response equipment for larger spill and incident response is available from NRC Environmental.

11.3.8.Emergency Lighting

In the event of an emergency in which facility lighting fails, Emerald will make use of headlights on trucks parked at the facility.

12.COORDINATION AGREEMENTS

WAC 173-303-350(3)(c), 340(4)

12.1.Arrangements with Authorities and Other Resources

12.1.1.Emerald has attempted to make arrangements with the local and regional authorities and other support groups to coordinate emergency services and assist in any emergency situation at the facility (see Appendix II, Emergency Response Correspondence).

12.1.2.Agreements that have been obtained from the local police department, fire department, hospitals, and contractors to provide emergency services are provided in Appendix III, Coordination Agreements.

12.1.3.In accordance with WAC 173-303-350(4), a copy of this Contingency Plan is provided to each of these organizations. Any changes to the Plan will be provided upon issuance. Emerald also holds discussions with that organization to review specific involvement and coordination responsibilities.

12.1.4. A description of the Coordination Agreements is provided below and a copy of the appropriate correspondence is included as Appendix II, Emergency Response Correspondence, and Appendix III, Coordination Agreements.

12.1.5.Emergency Response Authorities: The following outlines outside emergency response agency responsibilities and actions that will be taken in the event of an emergency at the facility.

12.1.5.1.Fire Department: Following notification of an emergency, the Tacoma Fire Department, Station #12, Unit 44 Hazardous Materials Team, will perform the following activities:

- Obtain information regarding type of emergency involving hazardous materials.
- Identify special equipment that may be necessary
- Dispatch a properly equipped emergency response team to the site and coordinate with the EC.

12.1.6. Local Hospitals

Local hospitals include Tacoma General Hospital and St. Joseph's Hospital. Upon notification of the emergency, the hospital will accomplish the following:

- Provide medical assistance
- Obtain information on possible chemical exposure
- Ensure that injured victim(s) are decontaminated prior to ambulance or hospital entry.

12.1.7. Emergency Spill Response

12.1.7.1. Both Emerald's Field Services Division and NRC Environmental are available to provide additional personnel, equipment, materials, services and facilities to perform emergency hazardous material spill response, on an on-call basis, 24 hours a day.

12.1.7.2. The Emergency Spill Response Contractor will be notified by the EC (or designee), and provide necessary emergency response equipment and personnel to assist the EC with the emergency.

12.1.8. Casualty Control Authority

Following notification of an emergency, the Tacoma Police Department will:

- Obtain information regarding type of incident, location, and materials involved
- Dispatch patrol units to the emergency site.
- Clear public roadways and facility entrances for emergency response vehicle access
- Direct incoming emergency response personnel to the EC

- Contact EC for information regarding hazards, and, as necessary, evacuate the immediate hazard area and establish perimeter control.
- Provide access to facility areas.

12.1.9. Figure G-6 specifies the maximum amount and general type of dangerous materials in each location of the facility to ensure local and regional authorities with coordinated agreements have current information.

13. EVACUATION PLAN
WAC 173-303-350(3)(f), 355

13.1. Evacuation Plan

13.1.1. All emergencies require prompt and deliberate action. In emergencies requiring implementation of this Plan, the EC is the only person authorized to call for complete evacuation of the facility in response to an emergency situation that threatens the health and safety of facility personnel. The EC may take this action based upon his/her analysis of the situation, or at the request of the on-scene coordinator (e.g., Sheriff, or Fire Chief).

13.1.2. Upon determining that an emergency has potential to threaten the safety of personnel at the facility, the EC will notify the Tacoma Fire Department. The EC and Tacoma Fire Department would operate from the Incident Command Post from which all emergency communications would come. The Police Department, in coordination with the EC, provide security to the facility and around the area of the incident.

13.2. Site Access and Egress

13.2.1. The plant is designed and operated to facilitate access to all points across the site for inspection and emergency response. Processing areas are designed for emergency response and evacuation.

13.2.1.1.The evacuation routes for the facility are provided in Figure G-5, Emergency Equipment Locations and Evacuation Routes.

13.2.1.2.Where several routes exist, the location of the fire, explosion, or spill and wind direction within the facility will be the determining factor in choosing the best route.

13.2.2.Facility access is restricted.

13.2.2.1.During an emergency, security will continue to be maintained, except for persons assisting in the response efforts.

13.2.2.2.To maintain security, access points to the site utilized during an emergency situation will be continuously manned. Procedures for evacuation of the site are described below.

13.3.Evacuation Procedures

13.3.1.If the EC determines that an emergency situation endangers, or is likely to endanger, human health or the environment, he will initiate an evacuation of the area immediately affected by the emergency or an evacuation of the entire facility. The following actions will be taken to evacuate the site:

13.3.1.1.The EC (or designee) will immediately notify the local authorities, reporting any injuries and arranging for their emergency care. The EC will coordinate activities with police, fire department, or other public emergency services to help appropriate officials decide whether surrounding local areas should be evacuated.

13.3.1.2.The EC (or designee) will determine which gates will be used depending upon the location of the incident, wind direction, and personnel location.

13.3.1.3.Air horns, megaphones or intercom will be used to initiate evacuation of facility areas. In addition to these systems, the internal telephone system will be used to notify office personnel (during office hours) as to the nature of the emergency and recommended plan of action. When the evacuation signal is heard and/or an announcement is made, all facility personnel (with the exception of those individuals who are directly involved in responding to the

emergency) will expeditiously evacuate their work area and immediately go to the assigned assembly area.

13.3.1.4. All personnel, visitors, and contractors will immediately leave through the exit gates and check-in at a designated assembly area. No further entry of visitors, contractors, or trucks will be permitted. All vehicle movement within the area will cease to allow the safe evacuation of personnel and access by emergency equipment.

13.3.1.5. Departure from the site will proceed as follows:

13.3.1.6. If downwind of incident, evacuate perpendicularly to wind direction over the most accessible route.

13.3.1.7. If upwind of incident, evacuate in upwind direction.

13.3.1.8. Personnel will assemble at the designated assembly area locations listed below and shown on Figure G-5.

- ASSEMBLY AREA 1 - Outside front gate (Gate 1)
- ASSEMBLY AREA 2 - Outside rear gate (Gate 2)
- ASSEMBLY AREA 3 - Intersection of Alexander Ave. and Lincoln Ave. This location will only be used if the nature of the emergency or the emergency response operations prohibits safe use of Assembly Areas 1 and 2.

13.3.2. No persons shall remain at or re-enter the facility unless specifically authorized by the EC. Those personnel within the emergency area will normally include only fire department personnel, or emergency teams.

13.3.3. All persons will be accounted for by their immediate supervisors and will leave the area if directed by the EC. A designee will ensure that personnel stay together and proceed to a safe location. The accounting of all personnel will be made by the safest method using two-way radio, verbal communications or messenger vehicle, once outside of the danger area.

13.4. Re-occupancy of Facility

13.4.1. The determination of when the facility may be safely re-occupied will be made by the EC in consultation with responding emergency response organizations.

13.4.2. The re-occupancy of the facility will only be initiated after the emergency has passed and the facility is safe and secure to enter and resume operation.

13.4.3. Procedures for reactivating operations in the affected area are described in Section 10.3 (Reactivation of Activities in Affected Area).

14. REQUIRED REPORTS, RECORDKEEPING, AND CERTIFICATIONS

WAC 173-303-350(5), 360(2)(e), 360(2)(j), 360(2)(k), 640(7)(d), 640(7)(f)

Emerald will provide the notification reports as described below:

14.1. Assessment Report

14.1.1. If the EC determines that the facility has had a release, fire, or explosion which could threaten human health or the environment, or otherwise fulfills the notification requirements of Section 6.2 the EC will immediately notify and then follow-up by providing an assessment report to Ecology. Should other government agencies need to be contacted according to the criteria outlined in Sections 3.1.5 and 4.5, an assessment report will be provided to them at that time. In accordance with WAC 173-303-360(2)(e), the assessment report will include the following:

- Name and telephone number of reporter.
- Name and address of facility.
- Time and type of incident (e.g., release, fire).
- Name and quantity of material(s) involved, to the extent known.
- The extent of injuries, if any.
- The possible hazards to human health or the environment outside the facility.

14.1.2. In accordance with WAC 173-303-360(2)(j), before resuming facility operations, Emerald will notify Ecology and appropriate local authorities of the following:

- Only wastes that are compatible with the released material are treated, or stored until the cleanup procedures have been completed, and
- Emergency equipment is cleaned and fit for its intended use.

14.2.Local Emergency Plan Notifications

For spills or discharges onto the ground or into groundwater or surface water, Emerald will notify the Department of Ecology and all local authorities identified in Section 3.1.5, Emergency Assistance. For spills or discharges which result in emissions to the air, Emerald will also notify the Puget Sound Clean Air Agency

14.3.Report on Implementation of Contingency Plan

14.3.1.Following the release and control of a hazardous materials emergency that requires implementation of the Contingency Plan, Emerald will note in the operating record the time, date, and details of any incident that requires implementation of the Contingency Plan. Appendix IV of this Contingency Plan includes a sample checklist that may be used by Emerald personnel to ensure all necessary information is recorded.

14.3.2.Within 15 days after the release, Emerald will submit a written report on the incident to Ecology. In accordance with WAC 173-303-360(2)(k), the report will include the following:

- Name, mailing address, and telephone number of the owner or operator.
- Name, address, and telephone number of the facility.
- Date, time, and type of incident.
- Name and quantity of material(s) involved.
- The extent of any resultant injuries, if any.
- An assessment of actual or potential hazards to human health or the environment, where this is applicable.
- Estimated quantity and disposition of recovered material that resulted from the incident.
- Cause of the incident.
- Description of corrective action taken to prevent reoccurrence of the incident including the root cause analysis described in Section 10.4.1.

14.3.3.A copy of this notification report will be placed in the Emerald operating record.

14.4.Contingency Plan Amendments

WAC 173-303-350(5)

14.4.1.This Plan will be reviewed and amended whenever the following occurs:
- 14.4.1.1.Applicable regulations are revised,
- 14.4.1.2.Changes to the facility permit require the Plan to be changed,
- 14.4.1.3.The Plan fails in an emergency,
- 14.4.1.4.The facility changes (in design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency,
- 14.4.1.5.The list of emergency coordinators changes, or
- 14.4.1.6.The list of emergency equipment changes.

14.4.2.Emerald will submit proposed revisions to the plan to Ecology in compliance with WAC 173-303-830.

14.4.3.The facility layout, process equipment and structures shown in this Contingency Plan are representative of the layout that will exist at the time the Part B Permit is issued. Following issuance of the final Part B Permit, this Contingency Plan will be amended as necessary when construction of any new unit or structure is complete.

15.REQUIREMENTS FOR TANK SYSTEMS

Reporting and Certifications for Tank Systems

WAC 173-303-640(7)

15.1.If a hazardous material storage tank system releases a dangerous waste or hazardous substance as described in Section 6.2., Emerald will notify Ecology and other appropriate authorities immediately. A written report will be submitted to Ecology as described in WAC 173-303-640(7)(d)(i).

15.2.If a hazardous material storage tank system has in any way been exposed to the fire, explosion, or release or itself, been the cause of the fire, explosion or release, it will be taken out of service immediately in accordance with the requirements in WAC 173-303-640(7) until appropriate repairs, replacement or re-installation of the system is completed.

15.3. Tanks will be inspected by an independent, certified tank testing firm to assess the possible damage and integrity of the tank. If the tank is repairable, it will be repaired in accordance with the appropriate local, state and federal standards as well as appropriate ASME (American Society of Mechanical Engineers) and API (American Petroleum Institute) standards where they apply.

15.3.1. Upon completion of the tank repair, it will be inspected and certified by an independent, qualified, registered, professional engineer in accordance with WAC 173-303-640(7)(f) and WAC 173-303-810(13)(a) who will certify that the tank is capable of handling hazardous materials without release for the intended life of the tank.

15.3.2. These certification documents will be submitted to the Department of Ecology within seven days after returning the tank system to use.

15.4. If the tank is rendered unfit-for-use, the tank will be decommissioned and closed in accordance with procedures contained in the facility Closure Plan.

16. RECORDS

WAC 173-303-350(4)(a), 360(2)(k), 380(1)(d), 640(7)

16.1. A copy of the Contingency Plan is kept in the main office on site. There are also copies of the Contingency Plan in weatherproof boxes located at Assembly Areas 1 and 2 to assure that a copy is available for emergency response use.

16.2. Emerald must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan.

16.3. Incidents that require notification are outlined in Section 6.2, Notification of State/Local Agencies

16.4. Incidents that require record keeping are outlined in Section 14, Required Reports, Recordkeeping and Certifications.

16.5. Assessment reports are required as outlined in Section 14.1, Assessment Report.

- Name, mailing address, and telephone number of the owner or operator.
- Name, address, and telephone number of the facility.
- Date, time, and type of incident.
- Name and quantity of material(s) involved.
- The extent of any resultant injuries, if any.
- An assessment of actual or potential hazards to human health or the environment, where this is applicable.
- Estimated quantity and disposition of recovered material that resulted from the incident.
- Cause of the incident.
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14.4.1.5. The list of emergency coordinators changes, or

14.4.1.6. The list of emergency equipment changes.

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14.4.3. The facility layout, process equipment and structures shown in this Contingency Plan are representative of the layout that will exist at the time the Part B Permit is issued. Following issuance of the final Part B Permit, this Contingency Plan will be amended as necessary when construction of any new unit or structure is complete.

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15.3.2. These certification documents will be submitted to the Department of Ecology within seven days after returning the tank system to use.

15.4. If the tank is rendered unfit-for-use, the tank will be decommissioned and closed in accordance with procedures contained in the facility Closure Plan.

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16.4. Incidents that require record keeping are outlined in Section 14, Required Reports, Recordkeeping and Certifications.
16.5. Assessment reports are required as outlined in Section 14.1, Assessment Report.

Section G – Contingency Plan
List of Figures

Figure G-1: Facility Location Map
Figure G-2: Facility Layout Diagram
Figure G-3: General Vicinity Map
Figure G-4: Response Activities
Figure G-5: Emergency Equipment Locations and Evacuation Routes
Figure G-6: Locations and Maximum Volumes of Dangerous Materials

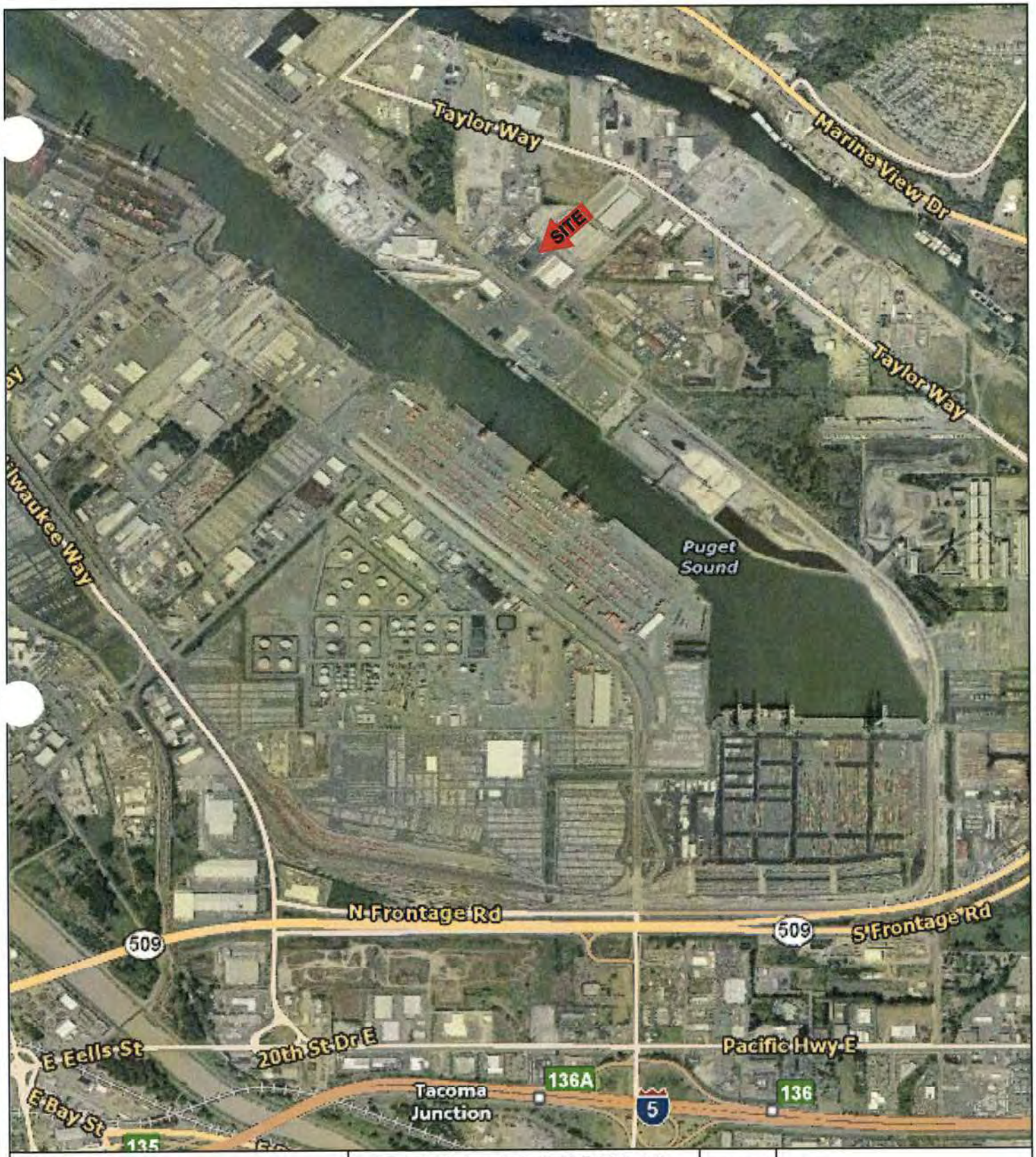
Section G – Contingency Plan
List of Appendices

Appendix I: Information on Identification of Waste Materials
Appendix II: Emergency Response Correspondence
Appendix III: Coordination Agreements
Appendix IV: Contingency Plan Implementation Checklist

Part B

Section G

Contingency Plan
Figures G-1 thru G-6



KEY:

AERIAL SOURCE: MAPQUEST

EPI ENVIRONMENTAL PARTNERS INC

295 NE Gilman Boulevard, Suite 201
Issaquah, Washington 98027

FIGURE G-1

FACILITY LOCATION MAP

PROJECT	43507.3		
PREPARED FOR	EMERALD SERVICES, INC.		
LOCATION	1825 ALEXANDER AVENUE TACOMA, WASHINGTON		
SHEET 1 of 1	DRAWN BY MMM	REVIEWED BY JD	DATE 09/28/09

TABLE OF CONTENTS

G. CONTINGENCY PLAN

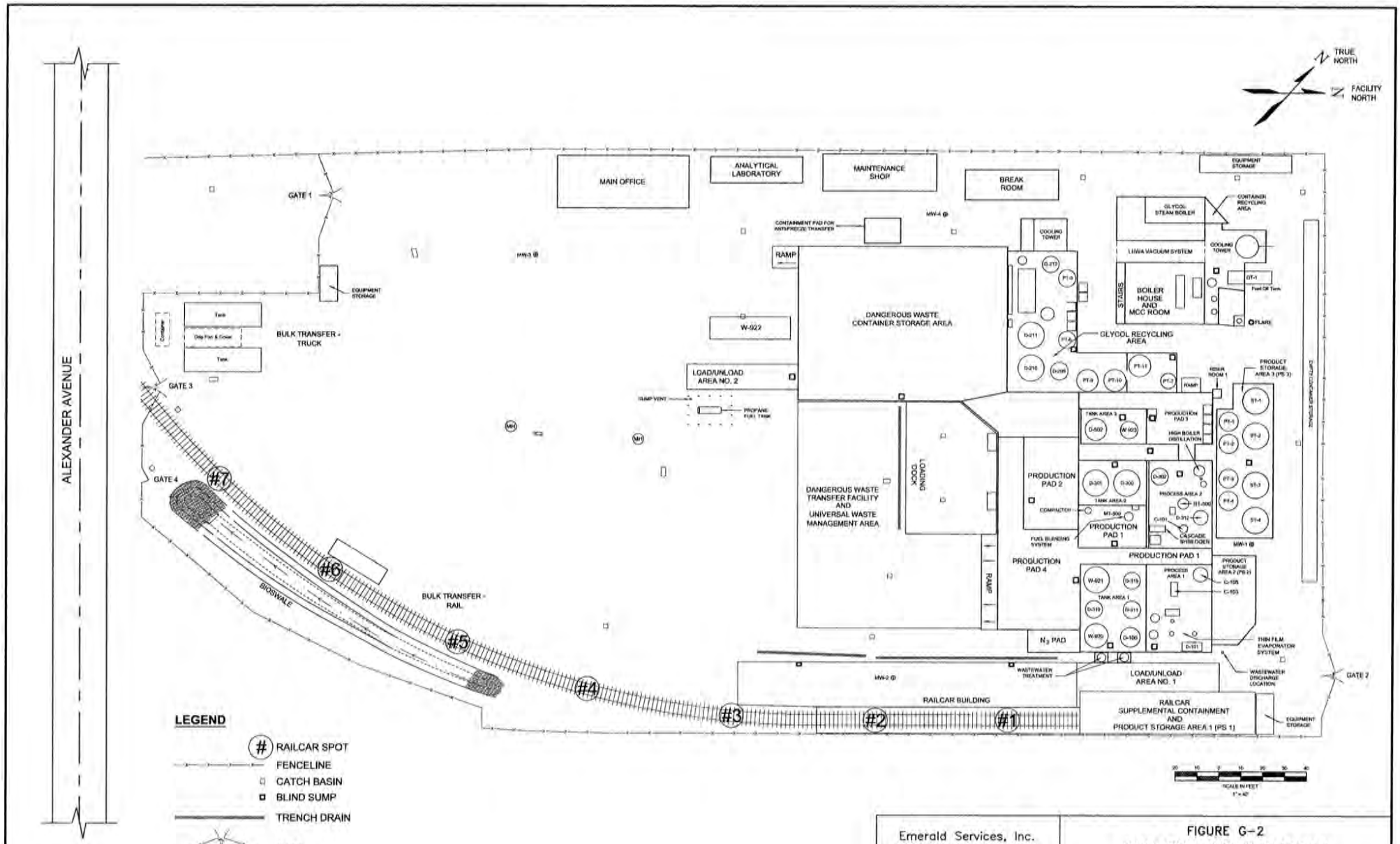
1. INTRODUCTION 1
2. GENERAL INFORMATION 2
   2.1. Plan 2
   2.2. Purpose 2
   2.3. General Facility Information 2
      2.3.3. Location Information 3
      2.3.4 Environmental Setting 4
      2.3.5 Facility Operations 4
         2.3.5.6. Solvent Recycling 5
         2.3.5.7. Glycol Recycling 5
         2.3.5.8. Fuel Blending 6
         2.3.5.9. Dangerous Waste Storage 6
         2.3.5.10. Wastewater Treatment 7
         2.3.5.11. Virgin and Recycled Product Storage 7
   2.4. Wastes Handled at Facility 7
   2.5. Types of Potential Emergencies 7
3. EMERGENCY COORDINATORS 8
   3.1. Notification Action Summary 8
      3.1.1. Emergency Coordinator 8
      3.1.2. Emerald Environmental 8
      3.1.3. National Response Center 9
      3.1.4. Spill Response Contractor – NRC Environmental 9
      3.1.5. Emergency Assistance 9
   3.2. Emergency Coordinator Qualifications 10
   3.3. Emerald Responsibilities and Personnel 11
4. IMPLEMENTING THE CONTINGENCY PLAN 12
   4.1. Circumstances Prompting Implementation 12
   4.2. Implementation of Response Procedures/Activities 13
   4.3. Incident Assessment and Decision Process 14
   4.4. EC Responsibilities 15
   4.5. Implementation of the Contingency Plan 16
   4.6. Additional Contacts 17
   4.7. Annual Review 18
5. EMERGENCY RESPONSE PROCEDURES 18
   5.1. Emergency Response Contractor 18
   5.2. Containment and Control Activities 18
      5.2.4. General Procedures 19
      5.2.5. Fire and/or Explosion Control 22
      5.2.7. Hazardous Material Release Control 24

5.2.8. Removing or Isolating Containers 26
5.2.9. Personnel Response Activities 27
5.3. Process Specific Procedures 28
5.4. Damaged/Unacceptable Shipment 29
5.4.1. Damaged Containers 29
5.4.1.3.1. Capacity 55 Gallons or Less 29
5.4.1.3.2. Capacity Greater than 55 Gallons (Totes, Tank Trucks) 30
5.4.1.3.3. Railroad Tank Cars 30
5.4.2. Unacceptable Waste 30
6. NOTIFICATION 31
6.1. Notification of Site Personnel 31
6.2. Notification of State/Local Agencies 31
6.3. Notification of Emergency Response Contractor 32
7. IDENTIFICATION OF HAZARDOUS MATERIALS 32
7.1. Identification of Waste and Hazard Assessment 32
7.2. Extent of Contamination 32
7.2.1. Release in Secondary Containment Area 32
7.2.2. Release in Stormwater Management Area 34
7.2.3. Release to the Ground 34
7.2.4. Release to the Air 35
8. HAZARD ASSESSMENT AND REPORT 35
8.1. Hazard Assessment 35
8.2. Criteria for Evacuation and Notification of Authorities 36
9. PREVENTION OF RECURRENCE OF SPREAD OF FIRES, EXPLOSIONS OR RELEASES 36
9.1. Prevention of Recurrence 36
10. POST EMERGENCY ACTION 37
10.1. Post-emergency Procedures 37
10.2. Treatment and Disposal of Released Materials and Cleanup Residue 37
10.2.3. Equipment Decontamination and Maintenance 38
10.2.4. Facility Repairs or Closures 38
10.3. Reactivation of Activities in Affected Area 38
10.4. Personnel Debriefing and Retraining 39
10.5. Mitigation and Control 39
11. EMERGENCY EQUIPMENT 40
11.1. Available Emergency Equipment 40
11.2. Alarm and Communication Systems 40
11.3. On-Site Equipment 41
11.3.1. Personal Protective Clothing and Equipment 41
11.3.2. First Aid Supplies 41
11.3.3. Fire Fighting Trucks or Equipment 42

11.3.4. Spill Control and Cleanup Equipment 43
11.3.5. Monitoring Equipment 44
11.3.6. Decontamination Equipment 44
11.3.7. Contractor Supplied Equipment 45
11.3.8. Emergency Lighting 45
12. COORDINATION AGREEMENTS 45
12.1. Arrangements with Authorities and Other Resources 45
12.1.5. Emergency Response Authorities 45
12.1.5.1. Fire Department 45
12.1.6. Local Hospitals 46
12.1.7. Emergency Spill Response 46
12.1.8. Casualty Control Authority 46
13. EVACUATION PLAN 47
13.1. Evacuation Plan 47
13.2. Site Access and Egress 47
13.3. Evacuation Procedures 48
13.4. Re-occupancy of Facility 49
14. REQUIRED REPORTS, RECORDKEEPING, AND CERTIFICATIONS 50
14.1. Assessment Report 50
14.2. Local Emergency Plan Notifications 51
14.3. Report on Implementation of Contingency Plan 51
14.4. Contingency Plan Amendments 51
15. REQUIREMENTS FOR TANK SYSTEMS 52
16. RECORDS 53

TABLES

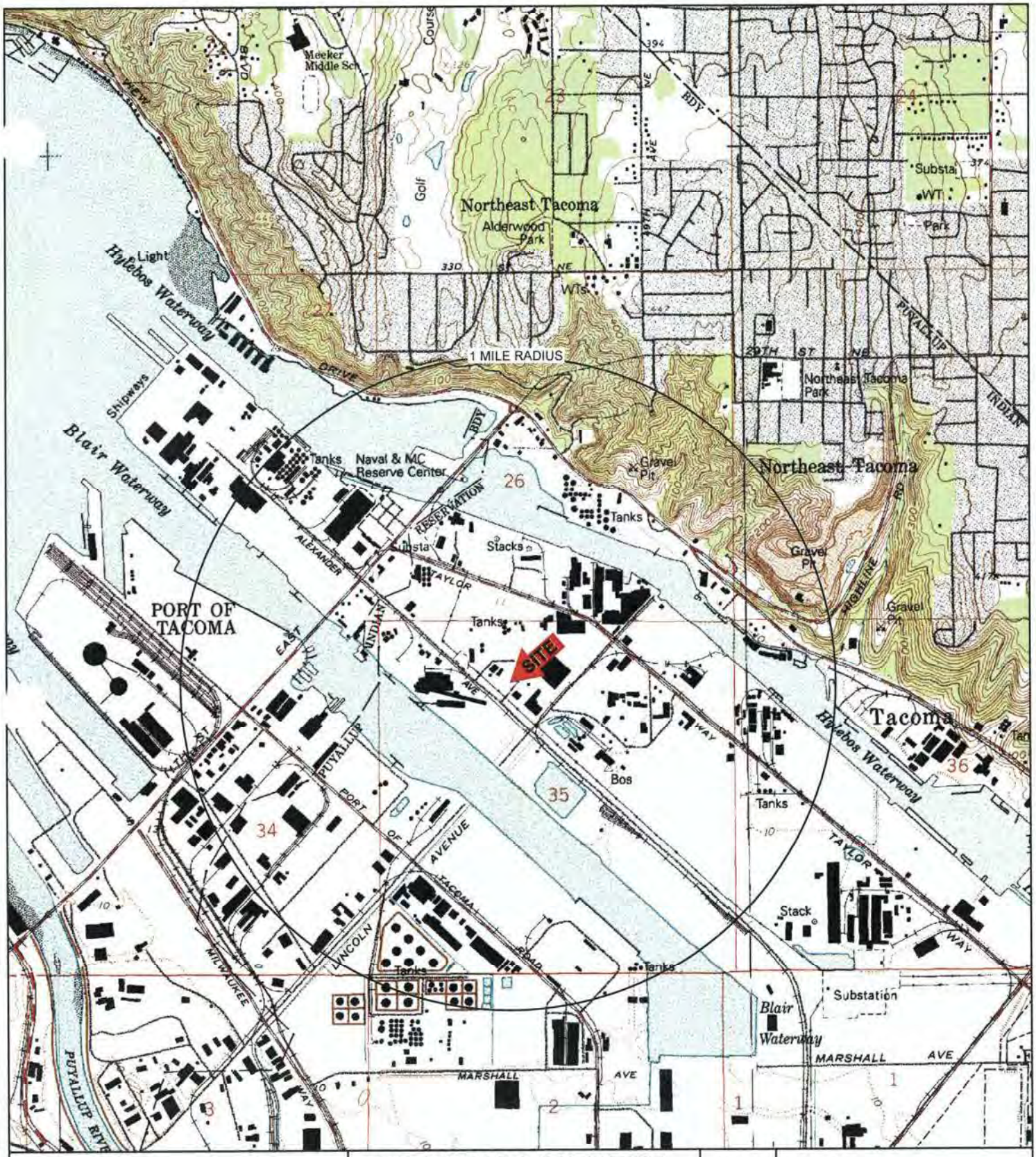
G-1 General Site Information 3
G-2 List of On-Site Emergency Response Equipment (minimum available on-site) 20



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE G-2
FACILITY LAYOUT DIAGRAM

FILE NO: FLDG-2	DATE: Jan. 6, 2011	SCALE: 1"=40'



KEY:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)

TACOMA NORTH, WA
1957; REVISED 1994

POVERTY BAY, WA
1957; REVISED 1994

SCALE = 1:24,000

ENVIRONMENTAL PARTNERS INC
295 NE Gilman Boulevard, Suite 201
Issaquah, Washington 98027

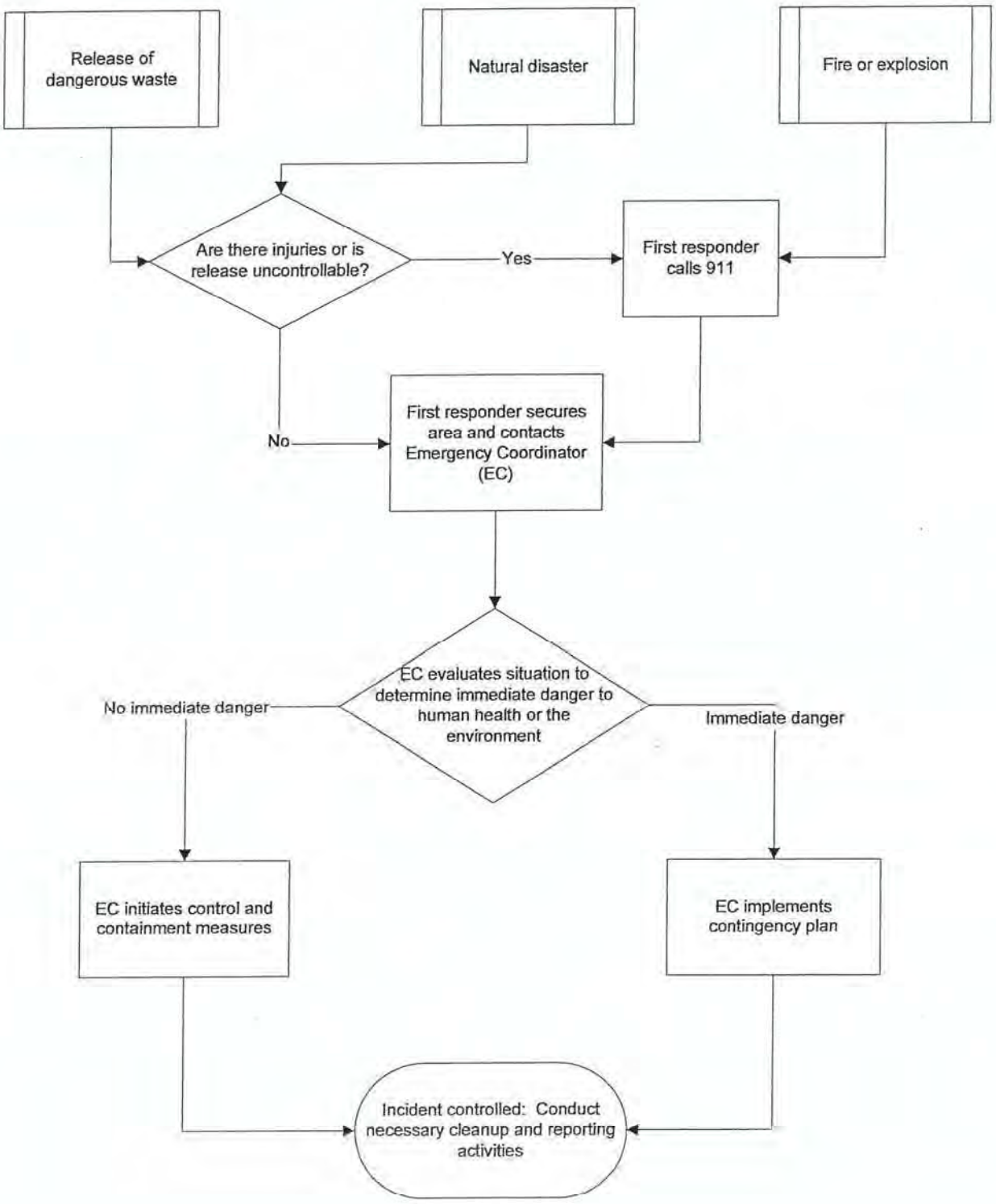
FIGURE G-3

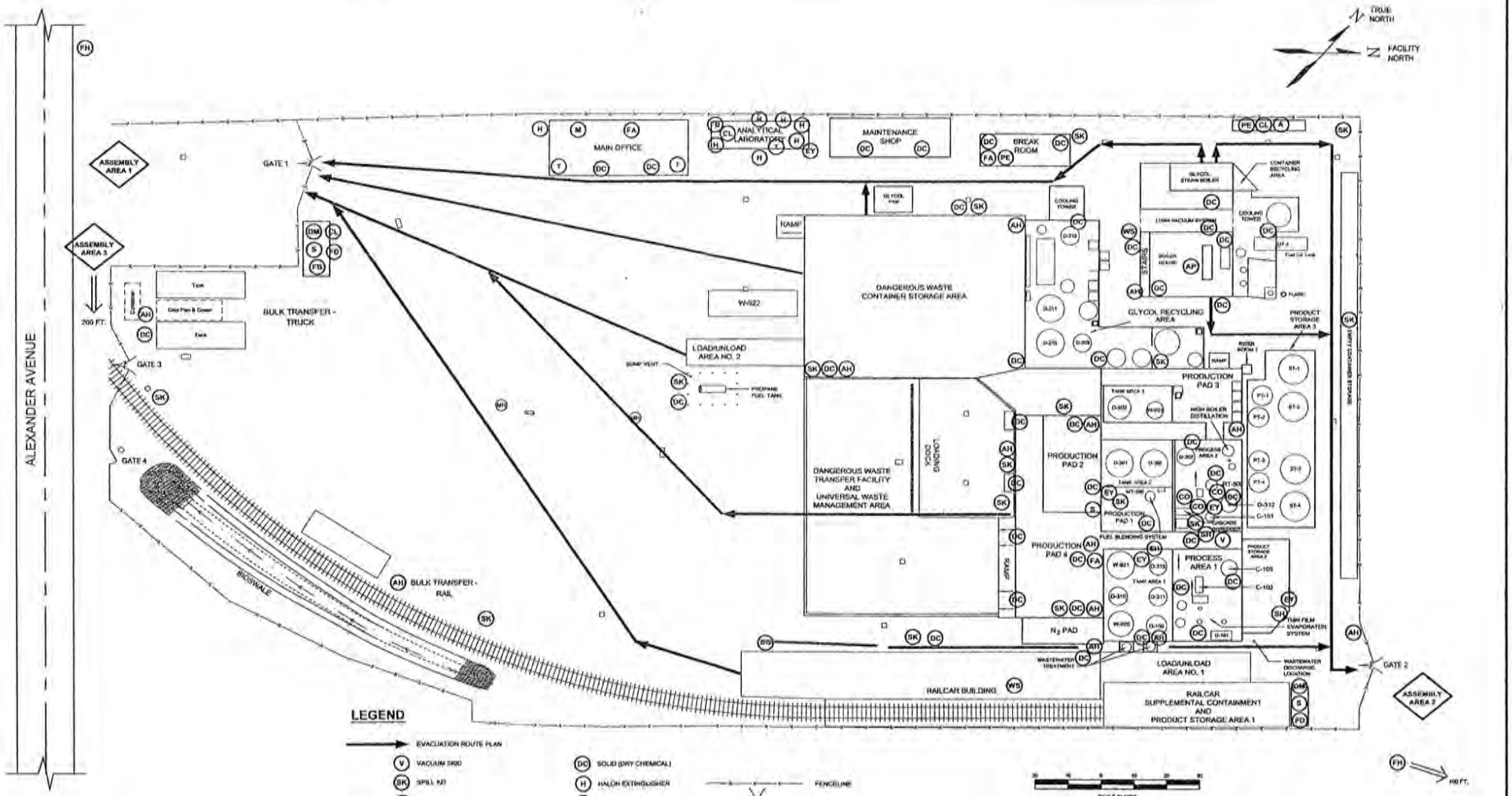
GENERAL VICINITY MAP

PROJECT	43507.3
PREPARED FOR	EMERALD SERVICES, INC.
LOCATION	1825 ALEXANDER AVENUE TACOMA, WASHINGTON

SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	MMH	JLD	09/28/09

Figure G-4 - Response Activities



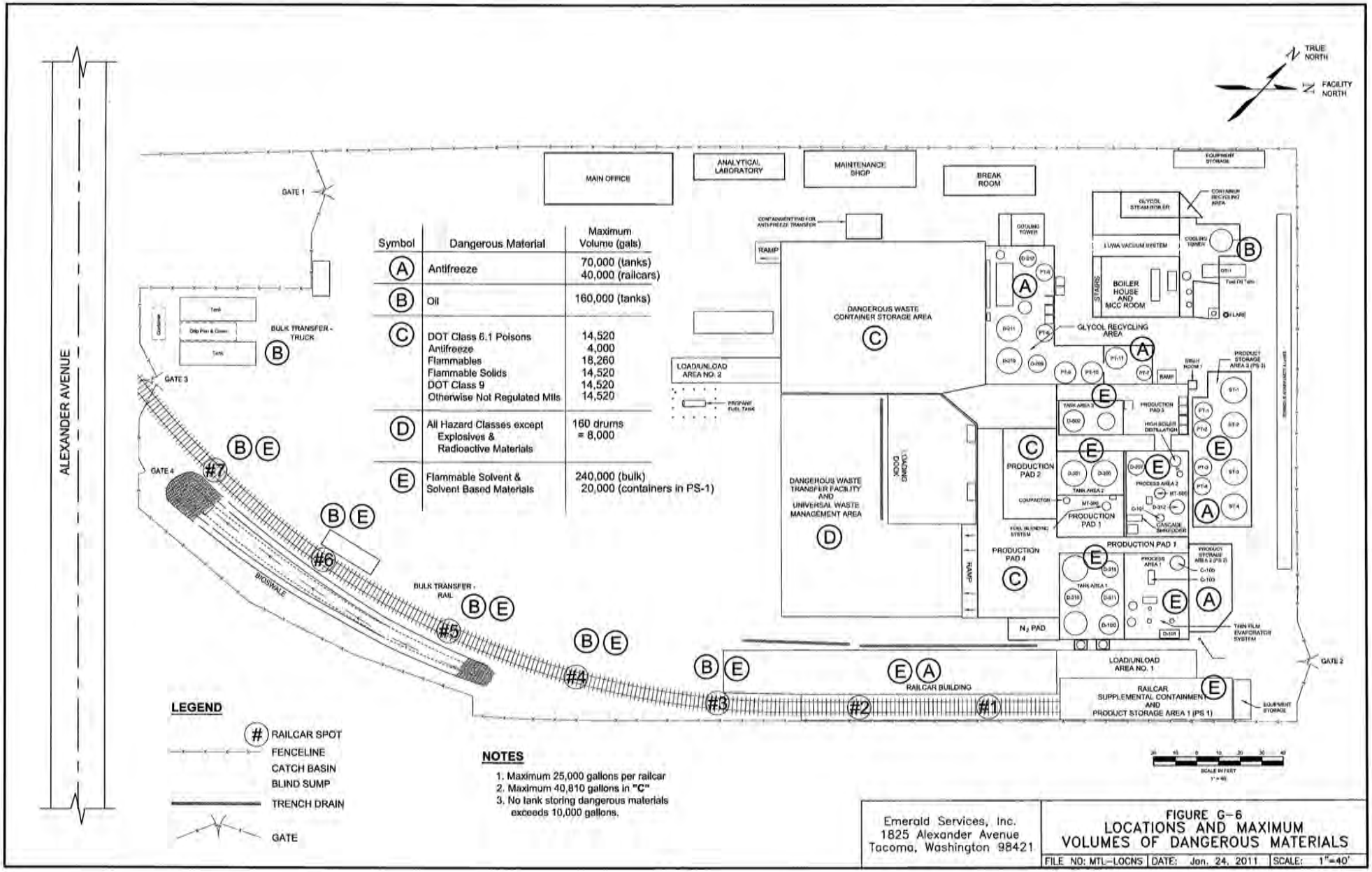


NOTES:
1) FACILITY ARRANGEMENT AS ANTICIPATED AT TIME OF PERMIT ISSUANCE
2) 2-WAY RADIO AVAILABLE ON LEAD PERSONNEL
3) FIRE EXTINGUISHERS ALSO LOCATED ON TANK TRUCK, TRUCK W/TRAILER AND FORK LIFT
4) VARIOUS EXTINGUISHER TYPES ARE ON-SITE; A, B, C, AND WET & DRY
5) DW TANKS AND PRODUCT STORAGE CONTAIN FLAMMABLE MATERIALS

Emerald Services, Incorporated
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE G-5
EMERGENCY EQUIPMENT LOCATIONS AND EVACUATION ROUTES

FILE NO: EELER G-5 | DATE: Jan. 12, 2011



Symbol	Dangerous Material	Maximum Volume (gals)
A	Antifreeze	70,000 (tanks) 40,000 (railcars)
B	Oil	160,000 (tanks)
C	DOT Class 6.1 Poisons	14,520
	Antifreeze	4,000
	Flammables	18,260
	Flammable Solids	14,520
	DOT Class 9	14,520
	Otherwise Not Regulated Mils	14,520
D	All Hazard Classes except Explosives & Radioactive Materials	160 drums = 8,000
E	Flammable Solvent & Solvent Based Materials	240,000 (bulk) 20,000 (containers in PS-1)

LEGEND

- (#) RAILCAR SPOT
- FENCELINE
- CATCH BASIN
- BLIND SUMP
- TRENCH DRAIN
- GATE

NOTES

1. Maximum 25,000 gallons per railcar
2. Maximum 40,810 gallons in "C"
3. No tank storing dangerous materials exceeds 10,000 gallons.

Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE G-6
LOCATIONS AND MAXIMUM VOLUMES OF DANGEROUS MATERIALS

FILE NO: MTL-LOCNS | DATE: Jan. 24, 2011 | SCALE: 1"=40'

Part B

Section G

Contingency Plan
Appendix I
Information on Identification of Waste Materials

Information on Identification of Waste Materials

Location of the Incident

The location of the incident will give an indication of the hazardous material that might be involved in a fire, explosion or release.

➢ Markings/Colors

The facility uses a color scheme on piping systems throughout the facility to assist in identifying their contents. They are as follows:

- RED - Fire systems
- GRAY - Hazardous waste
- WHITE - Recycled solvents
- TAN - Hot or cold heat transfer oil
- ORANGE- Vacuum system containing small amounts of recycled solvent
- GREEN - Air for facility
- BLUE -Cooling water

Note - Hot oil piping is insulated with an aluminum covering wrapped around the insulation.

Transportation vehicles use DOT markings, including identification (ID) numbers. Identification numbers, located on both ends and both sides, are required on all cargo tanks, portable tanks, rail tank cars, and other packages that carry hazardous materials. Upon acquisition of ID numbers, you can identify a hazardous material by referring to the "North American Emergency Response Guidebook" and/or "Hazardous Materials, Substances, & Waste Compliance Guide".

A nationally recognized marking system designed by the National Fire Protection Association (NFPA) is used throughout the facility on tanks and process units. The NFPA marking system identifies hazardous materials but does not provide product-specific information. The system uses a diamond divided into four quadrants. Each quadrant represents a different consideration: the left, blue section refers to health; the top, red quarter pertains to flammability; the right, yellow area is for reactivity; and the bottom, white quadrant highlights special information. In addition, a number from (0) through (4) indicates the relative risk of the hazard with (0) being the minimum risk.

➢ Placards/Labels

Placards and labels convey information by use of colors, symbols, Hazard Communication Standards, American National Standard Institute (ANSI) Standards for Precautionary Labeling of Hazardous industrial Chemicals, United Nations Hazard class numbers, and either hazard class wording or four-digit identification numbers. Placards are used when hazardous materials are in bulk, such as in cargo tanks; labels designate hazardous materials on small packages.

➢ Shipping and Other Papers

Shipping papers such as Hazardous Waste Manifests and Bill of Ladings have information that can help in identifying hazardous materials. They should provide the shipping name, hazard class, ID number, and quantity and may indicate "waste" or "poison". Manifests and Bill of Ladings can be found in the Shipping Receiving area, or on the truck.

Profiles which are referenced on Hazardous Waste Manifests and on Container tops via a numbering system, can be located in the ES laboratory. These WPQ forms contain information relating to the waste (example: physical characteristics, composition, and reportable quantities).

➢ Other information

Material Safety Data Sheets (MSDS) and existing chemical analyses of wastes can be used to determine potential identity and risks of the hazardous material(s). MSDS can be found in the facility office and in the laboratory. If for some reason the material cannot be identified and the situation is appropriate, samples can be obtained and sent to the ES laboratory or an off-site certified laboratory for chemical analysis.

It is important that any and all available clues are used in the process of hazardous materials identification, especially the most obvious, such as the information provided on a label or in shipping papers (NOTE: shipping papers should remain at the incident scene for use by other response personnel). Identifying the hazardous materials involved and obtaining information on their physical characteristics and toxicity are steps that are vital to the effective management of the incident. Since each compound has its own unique set of physical and toxicological properties, early and accurate identification of the hazardous material(s) involved in the incident allows the emergency responders and others to initiate appropriate scene management steps.

Container Marking and Contents

NFPA symbols indicating flammability, reactivity, and health hazards are placed on all tanks and process units to enable emergency responders to identify potentially direct, indirect, immediate and long-term effects. The following explains, in general, the NFPA hazardous materials classification system

➢ HEALTH (BLUE)

In general, health hazard in fire fighting is that of a single exposure which may vary from a few seconds up to an hour. The physical exertion demanded in fire fighting or other emergency conditions might be expected to intensify the effects of any exposure. Only hazards arising out of an inherent property of the material are considered. The following explanation is based upon protective equipment normally used by firefighters.

Health Rating of 4
Materials too dangerous to health to expose firefighters. A few whiffs of the vapor could cause death or the vapor or liquid could be fatal on penetrating the firefighters normal full protective clothing. The normal full protective clothing and breathing apparatus available to the average fire department will not provide adequate protection against inhalation or skin contact with these materials.

Health Rating of 3
Materials extremely hazardous to health but areas may be entered with extreme care. Full protective clothing -- including self- contained breathing apparatus, coat, pants, gloves, boots, and bands around legs, arms, and waist -- should be provided. No skin surface should be exposed.

Health Rating of 2
Material hazardous to health, but areas may be entered freely with full-faced mask self-contained breathing apparatus, which provides eye protection.

Health Rating of 1
Materials slightly hazardous to health. It may be desirable to wear self-contained breathing apparatus.

Health Rating of 0
Materials, which on exposure under fire conditions, would offer no hazard beyond that of ordinary combustible material.

➢ FLAMMABILITY (RED)

Susceptibility to burning is the basis for assigning degrees within this category. The method of attacking the fire is influenced by this susceptibility factor.

Flammability Rating of 4
Extremely flammable gases or volatile flammable liquids. Shut off flow and keep cooling water streams on exposed tanks or containers.

Flammability Rating of 3
Materials which can be ignited under almost all normal temperature conditions. Water may be ineffective because of the low flash point.

Flammability Rating of 2
Materials which must be moderately heated before ignition will occur. Water spray may be used to extinguish the fire because the material can be cooled below its flash point.

Flammability Rating of 1
Material that must be preheated before ignition will occur. Water may cause frothing if it gets below the surface of the liquid and turns to steam. However, water fog gently applied to the surface will cause a frothing which will extinguish the fire.

Flammability Rating of 0
Materials that will not burn.

➢ REACTIVITY (STABILITY) (YELLOW)

The assignment of degrees in the reactivity category is based upon the susceptibility of materials to release energy either by themselves or in combination with water. Fire exposure was one of the factors considered along with conditions of shock and pressure.

Reactivity Rating of 4
Materials which (in themselves) are readily capable of detonation or of explosive decomposition or explosive reaction at normal temperatures and pressures. Includes materials which are sensitive to mechanical or localized thermal shock. If a chemical with this hazard rating is in an advanced or massive fire, the area should be evacuated.

Reactivity Rating of 3
Materials which (in themselves) are capable of detonation or of explosive decomposition or of explosive reaction which require a strong initiating source which must be heated under confinement before initiation. Includes materials which are sensitive to thermal or mechanical shock at elevated temperatures and pressures or which react explosively with water without requiting heat or confinement. Fire fighting should be done from an explosive- resistant location.

Reactivity Rating of 2
Materials which (in themselves) are normally unstable and readily undergo violent chemical change but do not detonate. Includes materials which can undergo chemical change with rapid release of energy at normal temperatures and pressures or which can undergo violent chemical change at elevated temperatures and pressures. Also includes those materials which may react violently with water or which may form potentially explosive mixtures with water. In advanced or massive fires, fire fighting should be done from a safe distance or from a protected location.

Reactivity Rating of 1
Materials which (in themselves) are normally stable but which may become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently. Caution must be used in approaching the fire and applying water.

Reactivity Rating of 0
Materials which (in themselves) are normally stable even under fire exposure conditions and which are not reactive with water. Normal fire fighting procedures may be used.

Material Safety Data Sheets

Note: Depending upon the date that the MSDS was written, the sections outlined below may differ in the section description and content. Each MSDS should contain most of the information outlined below but may be located in a different section of the MSDS.

SECTION 1 - Suppliers Information
Section 1 identifies the material by product or trade name and chemical name. It is the product or trade name that is usually found on the container labels although the chemical name is also required by some states. Section 1 will also contain the manufacturer's name, address, and telephone number and an emergency telephone number.

SECTION 2 - Hazardous Ingredients / Identity Information
Section 2 lists the chemical ingredients of the material if they are known or suspected to be hazardous. Hazardous materials which are not carcinogens must be reported if they represent 1.0 percent or more of the product. Carcinogens must be reported and identified as such if their levels are 0.1 percent or higher.

SECTION 3 - Hazardous Identification
Section 3 outlines the potential health effects that may be encountered if the chemical is exposed to the eyes, skin, swallowing or inhalation. Symptoms of exposure, target organs, developmental information and cancer information may be found.

SECTION 4 - First Aid Measures
Section 4 outlines first aid measures that should be followed in the event a victim is exposed by the chemical entering the eyes, skin or by swallowing or inhalation.

SECTION 5 - Fire Fighting Measures
Section 5 gives information regarding flash point, explosive limits and auto ignition temperatures. This section also outlines fire fighting measures that may be used and the extinguishing media that would be most effective in fighting a fire. NFPA ratings may also be fisted in this section.

SECTION 6 -Accidental Release Measures
Section 6 lists information on the steps to be taken in the event of a small or large spill occurs.

SECTION 7 – Handling and Storage
Section 7 describes the proper handling techniques that should be used and proper storage of the chemical. This section also may fist hazards associated with the unsafe handling or storage of the hazardous material.

SECTION 8 - Exposure Controls l Personal Protection
Section 8 contains information regarding the proper personal protective equipment (PPE) necessary to handle the product in a manner which will minimize exposure. It may include skin protection equipment and respiratory protection. Ventilation practices may also be listed in this section. Also included in this section are Threshold Limit Values (TLV) and OSHA Permissible Exposure Limit (PEL).

SECTION 9 - Physical and Chemical Properties
Section 9 provides physical data about the product that can be utilized for proper identification. Included are specifics such as color, odor, specific gravity (weight), vapor pressure, pH and boiling point.

SECTION 10 – Stability and Reactivity
Section 10 This section contains information on the stability and reactivity of the product. It will list other chemicals which, when mixed with the product, will result in a chemical reaction. If a product is water reactive it will be noted in this section. Also, hazardous decomposition products such as carbon monoxide and other hazardous gases formed and emitted during chemical reactions or during fires are listed. It is imperative that this section be carefully noted by firefighters.

SECTION 11 - Toxicological Information
Section 11 may include any toxicological data that is known about the hazardous material.

SECTION 12 - Ecological data
Section 12 may include any known information on the possible ecological effects that the hazardous material may cause.

SECTION 13 - Disposal Considerations
Section 13 contains information as to the proper disposal methods to be used.

SECTION 14 - Transport Information
Section 14 outlines Department of Transportation (DOT) information and may list the reportable quantity of the particular chemical.

SECTION 15 – Regulatory Information
Section 15 outlines federal regulations such as TSCA (Toxic Substances Control Act), CERCLA and SARA Title III information.

A Material Safety Data Sheet can aid in making the right decisions on health and safety issues in an emergency. Yet, it must be noted that it is but one of many references that should be used to make final determinations. MSDS are offered by manufacturers for identification and verification and are not the last word on safety and health practices.

Part B

Section G

Contingency Plan
Appendix II
Emergency Response
Correspondence

EMERALD RECYCLING
a division of Emerald SERVICES INC.
www.emeraldnw.com
1-888-832-3008

Recycling & Recovery

Marine & Industrial Cleaning

Recycled Products

ste Treatment & Disposal

Automotive Fluids Management

Construction Services

Transportation Services

Vacuum Truck Services

Portable Storage

August 11, 2009

City of Tacoma Fire Department
415 Tacoma Ave. S
Tacoma, WA 98402
Attn: Asst. Chief Jeff Johnson

Re: Request for Coordination Agreement Signature

Dear Chief Johnson:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

WAC 173-303-340 requires that Emerald attempt to make arrangements (coordination agreements) with local authorities that may be called upon to assist with an emergency at the Emerald Tacoma facility. In order to respond to the regulatory requirement for coordination agreements, I have outlined below the activities your agency would be expected to perform in case of an emergency. Please review and confirm the accuracy of those activities. If your organization will provide this support upon request in an emergency, please sign the enclosed copy of this letter and return it in the enclosed envelope. I have included a copy for you to keep for your records.

Fire Department Activities:

Evaluate the situation and determine appropriate response for all fires, explosions, spills, and medical emergencies.

Assist with establishing work zones.

Obtain information regarding type of emergency involving hazardous materials.

Identify special equipment that may be necessary.

Dispatch a properly equipped emergency response team to the site and coordinate with the on-site Emergency Coordinator.

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

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Automotive Fluids Management

Construction Services

Transportation Services

Vacuum Truck Services

Portable Storage

August 11, 2009

Office of Chief of Police
930 Tacoma Avenue South
Tacoma, WA 98402
Attn: Room 239, LESA Communications

Re: Request for Coordination Agreement Signature

To whom it may concern:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

WAC 173-303-340 requires that Emerald attempt to make arrangements (coordination agreements) with local authorities that may be called upon to assist with an emergency at the Emerald Tacoma facility. In order to respond to the regulatory requirement for coordination agreements, I have outlined below the activities your agency would be expected to perform in case of an emergency. Please review and confirm the accuracy of those activities. If your organization will provide this support upon request in an emergency, please sign the enclosed copy of this letter and return it in the enclosed envelope. I have included a copy for you to keep for your records.

City of Tacoma Police Department Activities:

Provide traffic control and evacuation assistance.

Obtain information regarding the type of incident, location and materials involved.

Dispatch patrol units to the emergency site.

Clear public roadways and facility entrances for emergency response vehicle access.

Direct incoming emergency response personnel to the Emergency Coordinator (EC).

Contact EC for information regarding hazards, and, as necessary, evacuate the immediate hazard area and establish perimeter control.

Provide access to facility areas as necessary.

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

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Transportation Services

Vacuum Truck Services

Portable Storage

August 11, 2009

St. Joseph's Medical Center
1717 South J Street
Tacoma, WA 98405
Attn: Ms. Eileen Newton, Disaster Coordinator

Re: Request for Coordination Agreement Signature

Dear Ms. Newton:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

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St. Joseph's Medical Center Activities

Provide emergency and non-emergency medical assistance (as necessary), including ambulance services.

Obtain information on possible chemical exposure.

Ensure that injured victim(s) are decontaminated prior to ambulance or hospital entry.

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

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Automotive Fluids Management

Construction Services

Transportation Services

Vacuum Truck Services

Portable Storage

August 11, 2009

Pierce County Health Department
3629 South D Street
Tacoma, WA 98418
Attn: John Sherman, Env. Health Liaison

Re: Request for Coordination Agreement Signature

Dear Mr. Sherman:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

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Pierce County Health Department Activities:

Provide community safety services to prevent exposure to toxic fumes and gases.

Provide available health information.

Provide waste management services as needed

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

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Automotive Fluids Management

Construction Services

Transportation Services

Vacuum Truck Services

Portable Storage

August 11, 2009

Multicare Health System
409 South J Street
Tacoma, WA 98416
Attn: Ms. Shawn McCallister, Emergency Management Director

Re: Request for Coordination Agreement Signature

Dear Ms. McCallister:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

WAC 173-303-340 requires that Emerald attempt to make arrangements (coordination agreements) with local authorities that may be called upon to assist with an emergency at the Emerald Tacoma facility. In order to respond to the regulatory requirement for coordination agreements, I have outlined below the activities your agency would be expected to perform in case of an emergency. Please review and confirm the accuracy of those activities. If your organization will provide this support upon request in an emergency, please sign the enclosed copy of this letter and return it in the enclosed envelope. I have included a copy for you to keep for your records.

Tacoma General Hospital Activities:

Provide emergency and non-emergency medical assistance (as necessary), including ambulance services.

Obtain information on possible chemical exposure and treat accordingly.

Ensure that injured victim(s) are decontaminated prior to ambulance or hospital entry.

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

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August 11, 2009

Tacoma Rail
2601 SR 509 North Frontage Rd..
Tacoma, WA 98421
Attn: T.J. Shilley, Manager of Safety and Compliance

Re: Request for Coordination Agreement Signature

Dear Mr. Shilley:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

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Tacoma Beltline Railway

Emergency movement of railcars.

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

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Vacuum Truck Services

Portable Storage

November 3, 2009

NRC Environmental Services
9520 Kent Ave. S., # 150
Seattle, WA 98108
Attn: Jason Potts, Emergency Response Coordinator

Re: Request for Coordination Agreement Signature

Dear Mr. Potts:

Emerald Services is renewing our Part B Dangerous Waste Permit.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

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NRC Environmental Activities:

Obtain information regarding type of emergency involving hazardous materials.

Evaluate the situation and determine the appropriate response.

Identify special equipment that may be necessary.

Dispatch a properly equipped emergency response team to the site.

Coordinate activities with the on-site Emergency Coordinator.

Your prompt response and support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds /PM

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____

Signature Date

_____

Printed Name and Title

_____

Agency or Organization Name

Part B

Section G

Contingency Plan
Appendix III
Coordination Agreements

Tacoma | Pierce County
Health Department
Healthier. Safer. Smarter.

John Sherman, REHS
Environmental Health Liaison
Environmental Health Programs
253 798-6528

jsherman@tpchd.org
www.tpchd.org
Fax: 253 798-6498

3629 South D Street, MS: 301 • Tacoma WA 98418-6813

RECEIVED
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TACOMA-PIERCE COUNTY
HEALTH DEPT.

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P -ble Storage

August 11, 2009

Pierce County Health Department
3629 South D Street
Tacoma, WA 98418
Attn: John Sherman, Env. Health Liaison

Re: Request for Coordination Agreement Signature

Dear Mr. Sherman:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

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Pierce County Health Department Activities:

Provide community safety services to prevent exposure to toxic fumes and gases.

Provide available health information.

Provide waste management services as needed

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

HEALTH'S RESOURCES will be TASKED AS NECESSARY THROUGH PARECOMM (EXISTING EMERGENCY RESPONSE/DISPATCH PROCESS. NO S.O.P. OR DIRECT REFERRALS SHOULD BE NECESSARY.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

_____ _____
Signature Date

_____
Printed Name and Title

_____
Agency or Organization Name

EMERALD RECYCLING
a division of Emerald SERVICES INC.
www.emeraldnw.com
1-888-832-3008

August 11, 2009

City of Tacoma Fire Department
415 Tacoma Ave. S
Tacoma, WA 98402
Attn: Asst. Chief Jeff Johnson

Re: Request for Coordination Agreement Signature

Dear Chief Johnson:

In early May, 2000 your office received a letter that included a "Request for Coordination Agreement Signature". This request was required under our Permit for Storage of Dangerous Waste (Permit). Emerald Services, Inc. (Emerald) and the Washington State Department of Ecology are currently revising our Permit for renewal, and a similar request is required.

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Fire Department Activities:

Evaluate the situation and determine appropriate response for all fires, explosions, spills, and medical emergencies.

Assist with establishing work zones.

Obtain information regarding type of emergency involving hazardous materials.

Identify special equipment that may be necessary.

Dispatch a properly equipped emergency response team to the site and coordinate with the on-site Emergency Coordinator.

Your prompt response and continued support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

Signature

8/14/09
Date

JEFF JENSEN, DEPUTY FIRE CHIEF.
Printed Name and Title

TACOMA FIRE DEPT.
Agency or Organization Name

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Transportation Services

Vacuum Truck Services

Portable Storage

November 3, 2009

NRC Environmental Services
9520 Kent Ave. S., # 150
Seattle, WA 98108
Attn: Jason Potts, Emergency Response Coordinator

Re: Request for Coordination Agreement Signature

Dear Mr. Potts:

Emerald Services is renewing our Part B Dangerous Waste Permit.

Enclosed is a copy of the revised Contingency Plan, which is part of the renewed Permit. This Contingency Plan was prepared in accordance with Washington State Department of Ecology regulations WAC 173-303-145, 340, 350, 360, 630(2), 640(7), and 806(4)(a)(vii). These regulations require that Emerald provide a copy of the Contingency Plan plus all revisions to emergency response teams that may be called upon to provide emergency services. This Contingency Plan addresses the responsibilities and activities for emergency response at the facility in the event of an accident involving hazardous materials.

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NRC Environmental Activities:

Obtain information regarding type of emergency involving hazardous materials.

Evaluate the situation and determine the appropriate response.

Identify special equipment that may be necessary.

Dispatch a properly equipped emergency response team to the site.

Coordinate activities with the on-site Emergency Coordinator.

Your prompt response and support are appreciated. If you should have any questions, please contact me at 206-832-3031

Sincerely,

Marc McReynolds / PM

Marc McReynolds, General Manager
Industrial Sales and Operations
Emerald Services, Inc.

Enclosures: Emerald Services, Inc. Tacoma Facility Contingency Plan
Emerald Self-Addressed, Stamped Return envelope
Copy of letter

Acknowledgment:

Signature

11/3/09
Date

JASON POTTS REGIONAL EMERGENCY RESPONSE MANAGER
Printed Name and Title

NRC ENVIRONMENTAL SERVICES
Agency or Organization Name

Part B

Section G

Contingency Plan
Appendix IV
Contingency Plan
Implementation Checklist

CONTINGENCY PLAN IMPLEMENTATION CHECKLIST

INCIDENT DATE_____

DESCRIPTION OF INCIDENT_____

_____

EMERGENCY COORDINATOR_____

Apply to Incident?		Plan Reference	NOTIFICATION REQUIREMENT	ACTION TAKEN	DATE
Yes	No				
		3.1.3	If RQ released, or a threat to human health and the environment, EC to notify NRC		
		4.2.4; 4.5.2	If implementation of the Contingency Plan, EC to notify the Tacoma Fire Department		
		4.5.5	If implementation of the Contingency Plan, EC to notify appropriate state and local agencies		
		4.5.8	If EC advises evacuation of the local area, EC will notify Tacoma Police Department		
		4.5.12	If an incident that could threaten human health or the environment, EC will immediately notify Ecology and the NRC		
		5.2.6.11	In event of fire or explosion, EC will call 911 to notify the Fire Department		
		6.2.1.1	Incidence of non-compliance with permit, Emerald to immediately notify Ecology		
		6.2.1.2	If implementation of the Contingency Plan, EC to immediately notify Ecology		
		6.2.2	For 6.2.1.1 and 6.2.21.2, other agencies will be		

Apply to Incident?		Plan Reference	NOTIFICATION REQUIREMENT	ACTION TAKEN	DATE
Yes	No				
			notified as directed by the EC		
		12.1.7.2	EC will notify the Emergency Spill Response Contractor if necessary		
		13.1.2	Notify Tacoma Fire Dept. if a threat to public safety		
		14.1.2	Before resuming facility operation after an incident, Emerald will notify Ecology about waste compatibility and storage, and emergency equipment suitability		
		14.2	For a spill/discharge onto ground, groundwater or surface water, Emerald will notify Ecology and applicable local authorities		
		14.2	For a spill/discharge which results in air emissions, Emerald will notify the Puget Sound Clean Air Agency		
		15.1	If a release from a haz mat storage tank occurs, Ecology and other appropriate agencies will be notified immediately		
			REQUIRED REPORTS		
		5.2.7.3	Emerald must comply with the requirements of WAC 173-303-145, and also with reporting requirements of other permits or under other state or federal laws		
		7.2.3.1.2	After a release to the ground, a sampling /analysis plan must be presented to Ecology		
		7.2.4.2	After a release to the air, an evaluation must be presented to Ecology and PSCAA		
		14.1.1	After an incident, a follow up assessment report is due to Ecology, and also to NRC if NRC received an initial report		
		14.3.2	Within 15 days of an incident, Emerald must provide a report to Ecology		
		15.1	If a release from a haz mat storage tank occurs due		

Apply to Incident?		Plan Reference	NOTIFICATION REQUIREMENT	ACTION TAKEN	DATE
Yes	No				
			to tank failure, a written report will be submitted to Ecology		
		15.3.2	After a release from a haz mat storage tank, a certificate of fitness for service will be provided to Ecology within 7 days of return to service		
			REQUIRED RECORDS		
		7.2.1.2	Discharge of dangerous waste or hazardous substance at greater than specified quantities requires documentation in the site operating record		
		14.3.3	The 15 day report must be placed in the operating record		
		16.2	If implementation of the Contingency Plan, information must be entered in the operating record (also required in 14.3.1)		

Part B

Section H

Training Plan

TABLE OF CONTENTS

H. TRAINING PLAN

1. Introduction 1
2. Training Program Overview 1
3. Contingency Plan – Emergency Response Training and Safety Orientation 5
4. On-The-Job Training 6
5. 40-Hour Hazardous Waste Operations and Emergency Response 7
6. 8-Hour Supervisory Training – Hazardous Waste Operations and Emergency Response 8
7. 8-Hour Refresher Training 9
8. Facility-Specific Training 9
   - 8.1. DOT Training 9
   - 8.2. Generator Knowledge, Waste Designation, and Waste Analysis Plan Training 10
   - 8.3. Inspection Plan Training 10
   - 8.4. Part B Permit 11
   - 8.5. First Aid and CPR 11
9. Documents and Records Retention 11

Figures and Tables

Figure 1: Tacoma Facility Organizational Chart
Table 1: Job Titles, Functions, and Requisite Skills and Qualifications
Table 2: Required Training and Frequency

List of Appendices

Appendix I: On the Job Training Checklist
Appendix II: On the Job Training Module

Emerald Services, Inc.
Tacoma Facility
Training Plan

H. TRAINING PLAN

WAC 173-303-806(4)(a)(xii), 330

1. Introduction

1.1. Emerald Services, Inc. is the legal owner of the facility and is a wholly owned subsidiary of Safety-Kleen Systems, Inc., which is a wholly owned subsidiary of Clean Harbors, Inc. hereafter referred to as "Emerald".

1.2. Training is essential to the safe and efficient operation of the Emerald Services, Inc. (Emerald) facility. A good training program provides thorough and effective training in all areas of dangerous waste operations and emergency response.

1.3. Emerald operates a permitted treatment, storage, disposal and recycling facility (Part B Facility), as well as a Used Oil Re-Refinery, on the Emerald site. This Training Plan primarily addresses training for employees dedicated to the Part B Facility. In cases where Used Oil Re-Refinery employees are conducting operations within the Part B Facility, such as the roles of Emergency Coordinator, Processing Operators, or Receiving Chemists, requirements outlined in this Training Plan for the specific job function apply.

1.4. The training plan curriculum will train employees to perform their duties in a way that ensures the facility is in compliance with WAC 173-303, the dangerous waste permit, and other applicable state and federal regulations. This ensures that employees know how to respond to emergency situations, know how to handle dangerous waste properly, and know how to perform their duties in a safe manner on a day-to-day basis.

1.5. The purpose of this document is to outline the training program which will be provided by Emerald in accordance with requirements outlined in WAC 173-303-330.

1.6. Emerald will review the personnel and responsibilities outlined in the Plan every six months. Any updates identified during this review will be distributed as required by the Part B Permit.

1.7. Should incidents of non-compliance indicate that this Training Plan is ineffective, the applicable training module will

be repeated, the associated training curriculum will be modified, or a new training module will be added.

2. Training Program Overview

WAC 173-303-330

2.1. Emerald employs a small office staff, several operations personnel, and a small management/supervisory staff, who ensure Emerald operates safely and efficiently. At a minimum, all Emerald personnel will meet the requisite skills and qualifications for their position as outlined in Table 1 and according to WAC 173-303-330(2)(a).

2.1.1. Training for facility staff is monitored by the Clean Harbors Training Department with local oversight and administration at the Emerald facility. No Emerald employee shall be allowed or required to perform any task or specific operation unless they have successfully completed the specific training requirements for their positions. Employees must also demonstrate their proficiency with trained supervisors. Required training by position is found within the software system PeopleSoftHR and reflects current job specific training requirements, including those required under this Training Plan. The Director, Environmental Compliance is responsible for ensuring compliance with this section.

2.1.2. Once hired, all personnel receive training in emergency procedures and an overview of the facility's Dangerous Waste Permit and DOT requirements for management of dangerous waste. The depth of training in each of these topics varies depending on the employee's job assignment.

2.1.2.1. Part B Facility processing operators, supervisors, and managers receive a minimum of three days (24-hours) of On-the-Job training.

2.1.2.2. Part B Facility processing operators, supervisors, and managers receive 40-hour training in hazardous waste operations and emergency response (40-Hour

HAZWOPER), along with the annual hazardous waste operations refresher training.

2.1.2.3. Facility-specific emergency response refresher training is provided quarterly.

2.1.2.4. Additional 8-hour supervisory hazardous waste operations and emergency response training is provided to emergency coordinators to ensure their ability to supervise any potential emergency situations.

2.1.2.5. Other facility-specific training is provided to personnel based on specialized job duties. This training is outlined in Table 2 and Appendix II.

2.2. An outline of each type of training is provided below. Also attached are Tables 1 and 2, and Appendices I and II.

2.2.1. The Tables and Appendices provide more detailed descriptions of specific training topics for On the Job Training, as well as position titles, descriptions of position responsibilities, required training for each position, and the timeline for training completion.

2.2.2. Names of personnel filling each position are maintained in the operating record.

2.3. Initial training is conducted either at the time of initial employment or within six months of position assignment.

2.3.1. Pursuant to WAC 173-303-330(1)(c), new employees and employees performing positions of responsibility for which they are not fully trained must be supervised until they complete the required training for that position of responsibility. Table 2 and Appendix II specify training required for personnel to perform job functions independently.

2.4. All of the training topics outlined in Table 2, Required Training and Frequency and Appendix II, On-The-Job Training Module are required every year except for the following:

2.4.1. Emergency Response refresher training is conducted quarterly, and

2.4.2. DOT refresher training is required every three years.

2.4.3. First Aid/CPR Training is required every two years.

2.5. Some courses may be repeated more frequently if inspections or drills indicate that an increased frequency is needed.

2.6. Training folders are prepared for each employee upon assignment to the Emerald facility. These training folders consist of documentation of any previous training the employee has received which can be substituted for training required at Emerald and documentation of training conducted upon employment by Emerald.

2.7. Training documentation for required training will consist of one of the following:

- 2.7.1. A copy of the training certificate from a course with regulatorily specified criteria (i.e., 40-Hour Hazardous Waste Operations and Emergency Response, DOT, etc); or,
- 2.7.2. A copy of a sign-in sheet with a copy of a completed course test and course curriculum summary.

2.8. A qualified instructor knowledgeable in the subject matter conducts all training

- 2.8.1. If any training is computer-based or relies on videos, a qualified trainer will be available to respond to any questions.
- 2.8.2. For classroom training, the instructor will be either an acknowledged expert in the field, or otherwise highly qualified.
- 2.8.3. For On-The-Job Training, the instructor shall be a person who is fully trained for his/her "Position of Responsibility" according to this training plan and skilled in the current methods of performing the task.

2.9. For training that is conducted by a third-party instructor, employees are required to obtain a certificate of completion signed by the instructor.

2.10. For Emerald-provided training, all employees are required to demonstrate knowledge of the subject matter by either successfully performing a specific task under the supervision of a facility supervisor or manager who was previously trained in the task, or by satisfactorily completing a test at the end of each required training session.

2.11. For Emerald provided training:

2.11.1. The trainer will be fully trained for his/her "Position of Responsibility" and experienced in the current methods of performing tasks which are topics of the training course or module.

2.11.2. The Clean Harbors Training Department will review and approve the qualifications of the prospective trainer to ensure that person is qualified in the subject matter to train the specific course or module. This approval will be documented in the operating record.

2.12. Documentation of the completion of On-The-Job Training will be in the form of a completed On-The-Job Training checklist.

2.13. Copies of certificates of completion, tests, and On-The-Job Training checklists are maintained in the facility operating record, and will be kept up to date in accordance with WAC 173-303-330(2)(c) and (3).

2.14. Curricula for the Training Modules for Facility-Specific Training described in Section 8 and On-the Job Training in Appendix II are maintained in the site Operating Record and is available for review upon request.

2.15. An Emerald employee trainer's file will specify the qualifications for their specific training responsibilities. If the trainer is a consultant or contractor a statement of qualifications will be placed in the operating record and provided upon request.

2.16. Overall, this Training Plan is designed to ensure that all employees with dangerous waste responsibilities are trained to the level necessary to perform their jobs in a competent, safe manner and that other personnel working on-site are trained to the level necessary that they can respond appropriately to emergencies related to dangerous waste operations and job specific functions including operating the High Boiler Distillation System (SIVA).

3. Contingency Plan - Emergency Response Training and Safety Orientation

WAC 173-303-330(1)(d)
29 CFR 1910.120(p)
WAC 296-843-200

3.1. Prior to beginning any activity on the Emerald premises, all new employees are trained in the contingency plan, including emergency procedures, the location and use of emergency equipment, evacuation routes, and emergency systems that relate to their area of responsibility.

3.2. Processing Operators, Receiving Chemists, laboratory staff, Operations Supervisors, Facility Foreman, and the Facility Operations Manager II – Part B Facility receive additional training in specific emergency procedures required in their work area which includes, but is not limited to:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
- Key parameters for automatic waste feed cut-off systems;
- Communications or alarm systems;
- Response to fires or explosions;
- Response to ground-water contamination incidents;
- Operation shutdown;
- Use of facility emergency equipment; and,
- Response to flammable liquid spills.

3.2.1. Initial training is generally provided by the employee's immediate supervisor, who has been trained in the subject matter, and is also familiar with the employee's immediate work area.

3.2.2. Additional training needed for operations personnel is provided by an instructor familiar with emergency response protocol for incidents involving flammable liquids.

3.2.3. The length of this training varies based on an employee's existing knowledge of the subject matter and job assignment and will be documented on the On-The-Job Training checklist, or in the form of a sign-in sheet.

3.2.4. Other Emerald personnel who utilize the site, such as drivers or operations personnel from other divisions of the company, or contractors must receive minimum training as outlined in Section 3.1, above, prior to working on-site independently.

3.3. At least annually a drill based on the Contingency Plan will be conducted to evaluate facility readiness and provide additional training based on possible emergencies (see Section G).

4. On-The-Job Training

WAC 173-303-330(1)(c)

4.1. At a minimum, during their first three days of employment (24-hour equivalent), technicians, supervisors, managers, and other personnel with responsibilities working in dangerous waste operational areas at Emerald remain under direct supervision of a trained, experienced supervisor or manager.

4.1.1. Initial on-the-job training is conducted during this period to ensure the employee has basic information necessary to perform their initial tasks safely.

4.1.2. As new employees learn more about facility operations, additional responsibilities may be added.

4.1.3. The employee will be directly supervised for a job function or position of responsibility until they complete the training required for that function or responsibility (WAC 173-303-300(1)(c)).

4.2. For each additional responsibility, corresponding training will be provided on-the-job to ensure the employee has the information necessary to perform their new duties in a manner that ensures facility compliance and safe operations. Topics range from emergency response equipment use to forklift operation and railcar loading.

4.3. The checklist used for the completion of On-The-Job Training is included as Appendix II.

4.3.1. All portions of this checklist may not be completed within an employee's first three days of employment as

the employee must demonstrate competency on specific tasks prior to being approved to work independently.

4.3.2. Personnel may only work unsupervised on specific tasks once the supervisor and training director have signed-off on all topics listed in Table 2 and Appendix I for that specific task and job function.

4.3.3. Specific task On-The-Job Training will be completed for each employee within six months of job assignment.

5. 40-Hour Hazardous Waste Operations and Emergency Response

WAC 173-303-330(1)
29 CFR 1910.120(p)
WAC 296-843-200

5.1. Due to their exposure potential and periodic use of respiratory protection, technicians receive 40 hours of training as outlined in WAC 296-843-200 prior to working unsupervised.

5.2. Managers, supervisors, and personnel who routinely perform work in dangerous waste management areas also receive this 40 hours of training to ensure they are qualified to perform their site responsibilities in a safe manner. Table 2 identifies personnel who receive this training.

5.3. Employees who can provide written documentation of prior training may submit this documentation to Emerald as a substitute for training required by Emerald. For these employees, Emerald provides the supplemental training necessary to meet the requirements for 40-Hour Hazardous Waste Operations and Emergency Response Training.

6. 8-Hour Supervisory Training – Hazardous Waste Operations and Emergency Response

WAC 173-303-330(1)(d)
29 CFR 1910.120(p)
WAC 296-62-30415

6.1. All Emerald emergency coordinators receive eight hours of Supervisor's training in Hazardous Waste Operations and Emergency Response prior to assuming that responsibility.

6.1.1. This training includes:

- Topics required under 29 CFR1910.120,
- Training in the facility safety and health program,
- The employee training program,
- The personal protective equipment program,
- The spill containment program,
- The medical monitoring program,
- The contingency plan (Section G), and
- An overview of the facility operations.

6.1.2. The training is provided by an instructor who is qualified in the subject matter outlined in the WAC 296-843-200.

6.1.3. This training, along with other required training for emergency coordinators, ensures that emergency coordinators:

- Have the necessary information to manage an emergency response situation,
- Will ensure compliance with the facility's Part B Permit as well as other plans, and
- Participate in modifying these plans as necessary to agree with actual operations while still maintaining compliance with applicable regulations.

7. 8-Hour Refresher Training

WAC 173-303-330(1)(d)
29 CFR 1910.120(p)
49 CFR 172.704(c)

All personnel required to be certified in 40-Hour Hazardous Waste Operations and Emergency Response according to this Plan receive eight hours of refresher training annually. The subject matter consists of a review of topics covered during initial Emergency Response Training and 40-Hour Hazardous Waste Operations and Emergency Response.

8. Facility-Specific Training

WAC 173-303-330(1) and (2)(b)

Emerald personnel will receive facility-specific training related to their specific job duties. This training ensures that personnel are capable of performing their job duties in full compliance with applicable regulations and in accordance with facility permits. Additional clarification regarding mandatory courses for each job function is provided in Table 2. Curricula for each training module are maintained in the site operating record. The following training is provided in addition to the Facility-Specific On-The-Job Training addressed in Section 4, above, and in Appendix I and II.

8.1. DOT Training

49 CFR 172.704

8.1.1. Personnel with transportation related responsibilities will receive training as outlined in 49 CFR 172.704.

8.1.2. At a minimum, DOT training will be conducted such that employees with responsibilities impacted by DOT requirements have general awareness of DOT requirements that enables them to recognize and identify hazardous materials in accordance with hazard communication standards.

8.2. Generator Knowledge, Waste Designation, and Waste Analysis Plan Training

8.2.1. Personnel who have responsibilities that require them to determine adequacy of generator knowledge, proper waste designation, and suitability of waste streams for management at the Emerald facility, receive training in each of these topics within 90 days of job assignment.

8.2.1.1. Until completion of this training, personnel are supervised pursuant to WAC 173-303-330(1)(c).

8.2.1.2. This training is provided to personnel with responsibilities in the areas of waste acceptance and profile approval.

8.2.1.3. This training provides the information necessary for employees to determine proper and safe management of waste streams that may potentially be accepted at the Emerald facility.

8.3. Inspection Plan Training

8.3.1. Prior to performing permit-required inspections of the Emerald facility, inspection plan training is provided to prospective facility inspectors.

8.3.1.1. This training consists of

8.3.1.1.1. On-the-job training with an inspector knowledgeable in inspection plan requirements (qualified inspector), and

8.3.1.1.2. Review of the inspection plan and inspection plan requirements.

8.3.1.2. Inspectors must demonstrate their ability to conduct complete facility inspections by performing at least one acceptable inspection under the supervision of a qualified inspector. An acceptable inspection is one in which the inspector demonstrates the ability to recognize conditions that do not meet facility performance standards or permit conditions.

8.4. Part B Permit

All staff working onsite will receive training with respect to the Part B Permit. A general Permit operational overview is provided, which includes, but is not limited to, a review of each of the different sections of the Permit and a summary of permitted activities. The depth of this training varies based on the area of responsibility. The curriculum for this training is maintained in the facility operating record.

8.5. First Aid and CPR

8.5.1. Training will be provided by an American Red Cross certified Instructor

8.5.2. The facility operations manager, all supervisors, and check-in and production technicians will receive training in their first year of employment.

8.5.3. At least half (50%) of staff will have current First Aid and CPR certification

9. Documents and Records Retention

WAC 173-303-330(2)(c) and (3)

9.1. Table 1 provides a listing of positions of responsibility, job functions, and requisite skills and qualifications required for the position.

9.1.1. Specific names for each position are part of the facility operating record.

9.2. OSHA-required training will be conducted in accordance with requirements of 29 CFR 1910.120.

9.2.1. A training certificate signed by the instructor will be used to demonstrate that the employee has completed OSHA-required training.

9.3. Documentation of On-The-Job Training will consist of the completed On-The-Job Training checklist.

9.4. For training provided by Emerald, training records will consist of a sign-in sheet, a copy of the employee's completed test, and a copy of the curriculum. For training conducted by a

third party instructor, a certificate of completion signed by the instructor is required.

9.5. Training records will be maintained for each employee and checked every six months by the Training Director or designee to verify that employees are current with their training requirements. In addition, the Training Director will document in the operating record when a new employee or an existing employee performing a new job functions is allowed to work without supervision because their training for that job function is complete. The Facility Operations Manager II – Part B Facility fulfills the responsibilities of Training Director.

9.6. Employee training folders will consist of records listed above and will also include documentation of any previous training the employee has received which can be substituted for training required at Emerald.

9.7. Records of each trainer's qualifications will be documented. Qualifications for each Emerald employee providing training will be kept in the employee's (trainer's) file. If the trainer is a contractor or consultant, a statement of qualification will be recorded in the operating record. The Training Director's approval for each trainer will be recorded.

9.8. Curricula for Emerald On-The-Job training and facility-specific training is maintained in the site operating record.

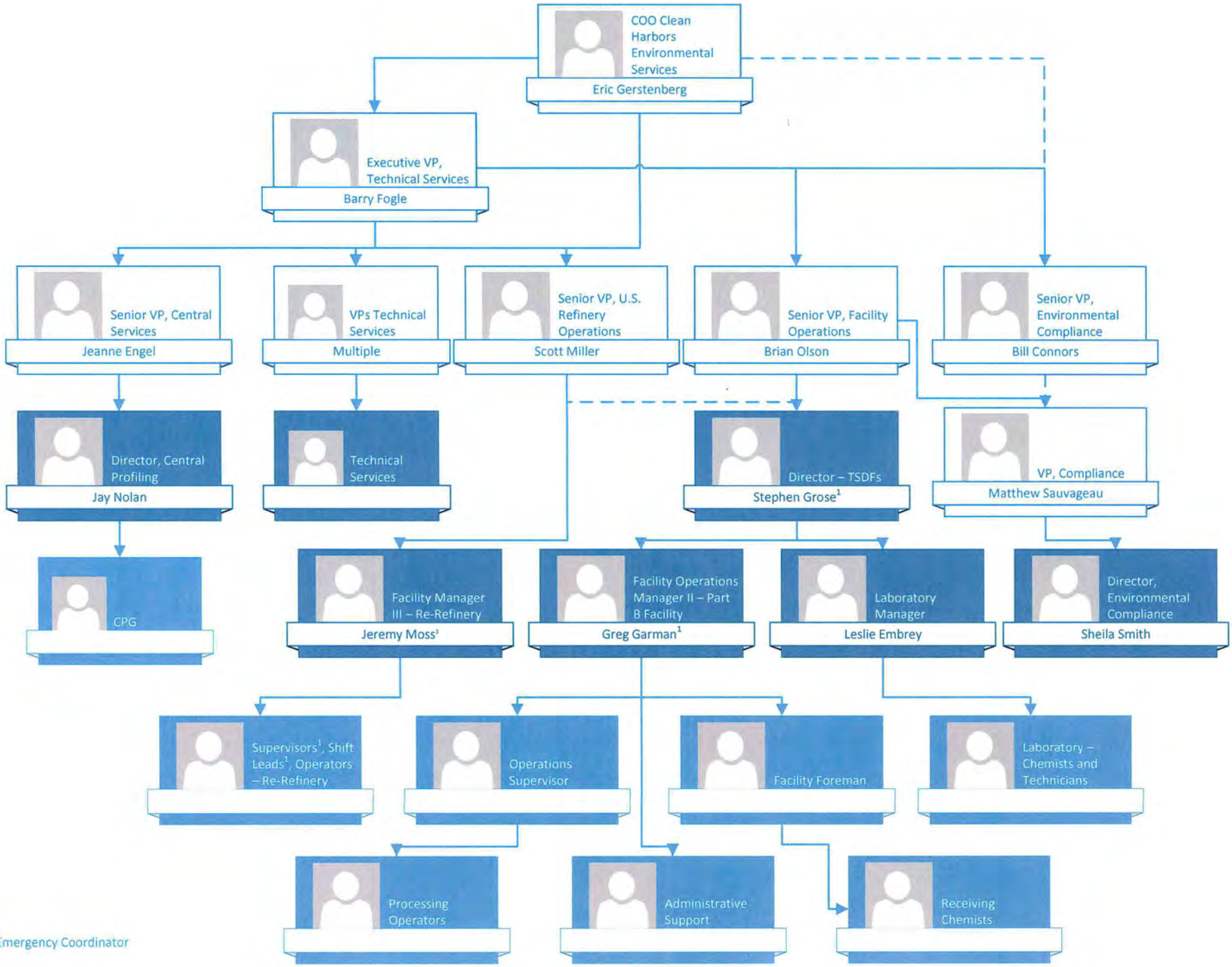
9.9. All training records are kept until facility closure, or three years following the date the employee last worked at the Emerald facility, whichever is earlier.

9.10. Training course curricula will be kept in the training files and the facility operating record.

Part B

Section H

Training Plan Figure and Tables



[1] Emergency Coordinator

Table 1 - Job Titles, Functions, and Requisite Skills and Qualifications - Part B Facility Personnel

Position of Responsibility	Job Function	Requisite Skills and Qualifications
Director, TSDF Operations	• Primary or alternate Emergency Coordinator • Responsible for ensuring facility operates within limitations of permits and applicable regulations at all times. • Direct management oversight to all facility personnel. • Manages large scale solvent recycling contracts. • Schedules all production related activities • Profile approval - process review. • Oversees capital projects	• At least four years experience in hazardous waste management industry. • Minimum AA degree or higher or equivalent experience. • Knowledge of safety, PPE, spill prevention and reporting requirements. • Knowledge and experience in dangerous waste management procedures, including labeling, packaging, and shipping. • Extensive knowledge of facility operations and processes.
Director, Environmental Compliance	• Provides regulatory direction and support to Director, Re-Refinery and Operations Manager - Part B Facility. • Oversees implementation of facility Inspection Plan and Training Plan • Profile approval - regulatory • Regulatory support for emergencies - notifications, follow-up and reporting • Provide training for Tacoma facility personnel as qualifications allow. • Other regulatory support for facility.	• Minimum AA degree or higher or equivalent experience. • At least four years experience in hazardous waste management industry with focus on regulatory compliance. • Knowledge of safety, PPE, spill prevention and reporting requirements. • Knowledge and experience in dangerous waste management procedures, including labeling, packaging, and shipping. • Familiarity with laboratory analysis protocol including sampling, testing, reporting, and QA/QC. Actual experience preferred.

Table 1 - Job Titles, Functions, and Requisite Skills and Qualifications - Part B Facility Personnel

Position of Responsibility	Job Function	Requisite Skills and Qualifications
Facility Operations Manager II - Part B Facility	• Primary or alternate Emergency Coordinator • Ensures equipment is maintained and operates efficiently and within design parameters. • Oversees day to day aspects of Industrial Wastewater Discharge Permit. • Manages all facility rail activity related to dangerous waste. • Acts as Director, Re-Refinery in absence of existing Director of Re-Refinery • Ensure day-to-day regulatory compliance of facility operations.	• Knowledge of dangerous waste management procedures including labeling, packaging, and shipping. • Capable of performing production-related activities. • Experience in equipment maintenance for equipment similar to that operated by Emerald. • Minimum 4-Year Degree or equivalent experience with 2 years experience in hazardous waste industrry and strong knowledge of RCRA and state Dangerous Waste regulations, as well as other applicable regulations.
	• Ensures inspections are conducted in accordance with requirements of Inspection Plan. • Profile approval - process review • Review employee training records every six months to determine upcoming required training. • Provide training for personnel as qualifications allow, or schedule training for personnel as directed by Director, Re-Refinery.	• Knowledge of safety, PPE, spill prevention requirements.

Table 1 - Job Titles, Functions, and Requisite Skills and Qualifications - Part B Facility Personnel

Position of Responsibility	Job Function	Requisite Skills and Qualifications
Central Profiling Group	• Profile approval - regulatory and process review.	• Minimum AA degree or higher or equivalent experience with strong knowledge of RCRA and state Dangerous Waste regulations. • Knowledge and experience in dangerous waste management procedures, including labeling, packaging, and shipping. • Extensive knowledge of facility operations and processes according to the permit.
Operations Supervisor	Oversee and perform the following operations: • Formulate products • Operate fuel blend equipment and recycling units; • Complete required production logs, operation logs, and compliance work orders as assigned; and, • Review product work orders and assign personnel; • Set recycle schedule; • Review and ensure quality control of products. • Pump waste for recycle or fuel blend, fill product containers as needed.	• Minimum high school diploma, GED, or equivalent experience. • Mechanical and operational skills. • Extensive knowledge of facility operations and processes according to the permit.
Facility Foreman	Oversee and perform the following operations: • Conduct initial inspection of incoming waste to ensure agreement between waste container description and manifest description, suitability of container for shipment and/or re-use, and sludge percentage. • Conduct representative sampling as required by facility Waste Analysis Plan.	• Minimum AA degree or higher or equivalent experience. • Knowledge of pertinent environmental regulations. • Knowledge of dangerous waste management procedures including labeling, packaging, and shipping.

Table 1 - Job Titles, Functions, and Requisite Skills and Qualifications - Part B Facility Personnel

Position of Responsibility	Job Function	Requisite Skills and Qualifications
	• Ensure transfer wastes are shipped to next destination within 10 days of arrival at Tacoma transfer facility. • Maintain universal waste operation in accordance with WAC 173-303-573 • Maintain all appropriate logs to document transfer facility activity. • Act as link between facility operations and administrative functions. This may involve, but is not limited to: sampling and/or sorting waste streams, labeling containers, and ensuring proper packaging for shipment.	• Capable of performing production-related activities.
Laboratory Manager	• Oversees laboratory operations to ensure compliance with facility Waste Analysis Plan and standard laboratory best management practices.	Minimum BS Chemistry or related field (or equivalent experience) with 2 years experience in laboratory operations and strong knowledge of test methods related to RCRA and state Dangerous Waste regulations. • Experience in laboratory analysis including sampling, testing, reporting, and QA/QC, or related experience.
Laboratory - Chemists and Technicians	• Perform all required confirmation testing for waste which may be accepted at Emerald facility as outlined in the facility Waste Analysis Plan. • Perform all required verification testing for waste received at the Emerald facility as outlined in facility Waste Analysis Plan. • Ensure all QA/QC is completed in accordance with established methods and facility Waste Analysis Plan. • Notify Operations personnel of any discrepancies between waste descriptions and confirmation or verification results.	• Minimum AA degree or higher or equivalent experience. • Experience in laboratory analysis including sampling, testing, reporting, and QA/QC, or related experience.

Table 1 - Job Titles, Functions, and Requisite Skills and Qualifications - Part B Facility Personnel

Position of Responsibility	Job Function	Requisite Skills and Qualifications
Receiving Chemist	• Conduct initial inspection of incoming waste to ensure agreement between waste description and manifest description, suitability of container for shipment and/or re-use, and sludge percentage. • Conduct representative sampling as required by facility Waste Analysis Plan. • Act as link between facility operations and administrative functions. This may involve, but is not limited to: sampling and/or sorting waste streams, labeling containers, and ensuring proper packaging for shipment. • Conduct initial inspection of incoming bulk waste to ensure agreement between waste description and manifest description.	• Minimum high school diploma, GED, or equivalent experience. • Knowledge of pertinent environmental regulations. • Knowledge of dangerous waste management procedures including labeling, packaging, and shipping. • Capable of performing production-related activities.
Processing Operator	• Blend products as directed by Production Supervisor • Operate fuel blend equipment and recycling units • Complete required production logs, operation logs, and compliance work orders as assigned; and,	• Minimum high school diploma, GED, or equivalent experience. • Mechanical and operational skills.
Administrative Support	• Review all inbound manifests for completeness. • Ensure inbound loads have been checked per internal requirements prior to sign-off on manifest. •Prepare all tracking information for Check-In personnel.	• Minimum AA degree or higher or equivalent experience. • Data entry and computer skills.
Technical Services	• Assist generators with waste designation and prepare profiles in accordance with applicable regulations and Tacoma facility Waste Analysis Plan requirements.	• Minimum AA degree or higher or equivalent experience. • Knowledge of pertinent environmental regulations. • Knowledge of dangerous waste management procedures including labeling, packaging, and shipping.

Table 1 - Job Titles, Functions, and Requisite Skills and Qualifications - Part B Facility Personnel

Position of Responsibility	Job Function	Requisite Skills and Qualifications
Facility Manager III, Re-Refinery, Re-Refinery Supervisors, Re-Refinery Shift Leads	• Alternate EC when on-shift (24-hour first responder (Control Room)).	• Minimum high school diploma, GED, or equivalent experience. • Mechanical and operational skills. • Knowledge of facility operations and processes according to the permit.

Table 2 - Required Training and Frequency

Position of Responsibility	Contingency Plan - Emergency Response Training and Safety Orientation	On-the Job Training (see OJT Module)	40-Hour HAZWOPER	8-Hour Supervisory Training (HAZWOPER)	DOT Training	Generator Knowledge, Waste Designation, and Waste Analysis Plan[5]	Inspection Plan Training	Part B Permit[5]	First Aid and CPR
Director, TSDF Operations	1	2	2	1	3	2	2	3	6
Director, Environmental Compliance	1	2	2	NR	3	2	2	3	6
Facility Operations Manager II - Part B Facility	1	2	2	1	3	2	2	3	6
Operations Supervisor	1	2	2	NR	4	2	NR	3	6
Facility Foreman	1	2	2	1	4	2	NR	3	6
Laboratory Manager	1	2	2	NR	4	2	NR	3	6
Laboratory - Chemists and Technicians	1	2	2	NR	4	2	NR	3	6
Processing Operators, Receiving Chemists	1	2	2	NR	4	2	NR	3	6
Administrative Support	1	2	NR	NR	3	2	NR	3	6
Central Profiling/Technical Services	NR*	NR	NR	NR	3	2	NR	3	NR
Emergency Coordinator	1	NR	1	1	3, 5	3	1	3	6

1 = Training required at time of initial employment/assignment.
2 = Training required prior to unsupervised work.
3 = Training required within six months of job assignment.
4 = Training required, but topics are addressed in OJT, rather than a certified training class.
5 = Extent of training will vary based on level of responsibility
6 = 50% of staff working on-site must have current First Aid/CPR Training
NR = Not required

** - Not required - Personnel are not currently physically located at Emerald Tacoma facility.*

Refresher training for all training modules including On-the-Job Training specified in Appendix B will be provided annually with the following exceptions:

DOT Training is every three years.
Contingency Plan - Emergency Response Training and Safety Orientation is quarterly (except implementation drill of the contingency plan is annual)
First Aid/CPR is every two years.
8-Hour Supervisory Training (HAZWOPER) - one-time prior to Emergency Coordinator Assignment

Annual refresher training for the 40-Hour Hazwooper module is the 8 Hour Annual Refresher Course.

Frequency of refresher training may be increased if job performance or inspection results indicate it is necessary.

Training required according to this Table is based on a required level of competence necessary to perform job functions independently. All facility personnel must have a baseline level of understanding of facility operations (Contingency Plan - Emergency Response Training and Safety Orientation) to ensure they can complete their assigned responsibilities safely.

Part B

Section H

Training Plan
Appendix I
On the Job Training Checklist

Emerald Services, Inc.
Tacoma Facility
ON-THE-JOB TRAINING CHECKLIST
FOR OPERATIONS PERSONNEL

Employee: _____

Date of Employment: _____

Position: _____

Training may be provided by the Environmental Manager, Facility Operations Manager – Part B Facility, or employee's immediate supervisor who is familiar with area of training.

1. Safety and Personal Protective Equipment

a. Location and use of safety and emergency equipment.
b. Protective Clothing: Solvent resistant gloves, glove liners, chemical resistant boots, tyvek suits, rain suits, safety goggles and glasses, splash shields, respirators (half and full face), chemical cartridges, dust masks, hard hards.
c. First Aid Station and supplies.
d. Emergency eye wash.
e. Safety gear locker.
f. Warning signs

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

2. General Operations

a. Contact water.
b. Stormwater (including shut-off procedures).
c. Electrical room.
d. Maintenance shop.
e. Tank farms.
f. Double diaphragm pump operations..

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

3. Container Handling

a. Drum dolly usage.
b. Drum de-heading.
c. Securing containers/opening containers.
d. Proper container moving techniques.
e. Acceptable vs. unacceptable container condition.
f. Plugging and stopping leaks.
g. Drum washing.
h. Over-packing containers.
i. Grounding and bonding.
j. Container placement on pallets.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

4. Container Management

a. Container facing.
b. Container labeling and de-labeling.
c. Container stacking.
d. Label and marker placement.
e. Container tracking overview (scanners).
f. Container storage, staging, and process operations.
g. Drum jail.
h. Emissions control.
i. Tracking logs.
j. Fire prevention measures.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

5. Forklift Operations

a. Loading and off-loading operations.
b. Proper drum sling practices.
c. Use of drum tilt.
d. Backing up and load carrying procedures.
e. Traffic priorities.
f. Inspection of lift trucks.
g. Product container movement outside of containment.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

6. Housekeeping

a. Work area.
b. Tools.
c. Grounds.
d. Elimination of ignition sources.
e. Trip and fall hazards.
f. Spill prevention.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

7. Sampling

a. Demonstration of different sampling techniques.
b. Sampling devices.
c. Logging samples and submission of samples to the laboratory.
d. Rail car sampling.
e. Waste analysis plan requirements.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

8. Tank Truck Operations

a. Unloading/loading tank truck (dangerous).
b. Unloading/loading tank truck (non-dangerous or product).
c. Overfill prevention.
d. Emergency shut-off operations.
e. Control of ignition sources.
f. Proper spotting and securing of trucks.
g. Tracking logs.
h. Emissions controls

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

9. Bulk Receiving

a. Driving on the facility.
b. Spotting trailers.
c. Where to load/unload.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

10. Rail Car Management

a. Loading and unloading rail cars (dangerous waste and non-regulated).
b. Overfill prevention.
c. Securing valve, removing bottom valve cap.
d. Removing and securing dome hatch.
e. Preparing rail car for shipment (sealing, bottom bung, paperwork).
f. Placarding rail cars.
g. Emissions controls.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

11. Drum Crusher/Compactor

a. Operation of Crusher
b. Safety concerns
c. Definition of empty containers.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

12. Compressor and Boiler Operations (licensed boiler operators only)

a. Orientation on steam boiler, oil heater, all pressure vessels.
b. Boiler logs

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

13. **Thin Film Evaporator**

a. Charging evaporator
b. Initial settings
c. Controlling addition of waste
d. Controlling vacuum and temperature
e. Shut down procedures
f. Safety and emergency procedures
g. Emissions controls
h. Production logs

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

14. **High Boiler Distillation**
    a. Charging distillation pot
    b. Initial settings
    c. Controlling addition of waste
    d. Controlling vacuum and temperature
    e. Hot drop procedures
    f. Shut down procedures
    g. Safety and emergency procedures
    h. Emissions controls
    i. Production logs
    j. Partial clean closure requirements for used oil recycling

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

15. **Glycol Distillation**
    a. Charging system
    b. Initial settings
    c. Controlling addition of waste
    d. Controlling vacuum and temperature
    e. Shut down procedures
    f. Safety and emergency procedures
    g. Emissions controls
    h. Production logs

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

16. **Flare**
    a. Monitoring flare operation
    b. Start-up/shut down procedures
    c. Flare data recording
    d. Safety and emergency procedures

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

17. Bulk Liquid/Shredder/Dispersion System
    a. Operation of shredder and dispersion system
    b. Common problems with operation
    c. Housekeeping
    d. Safety and emergency procedures
        i. Carbon Dioxide fire suppression system
    e. Emissions controls
    f. Production logs

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

18. **Fuel Blending**
    a. Requirements for fuel blending feed stock
    b. Operaton of skid vac
    c. Transfer of waste to rail car
    d. Safety and emergency procedures
    e. Emissions controls
    f. Production logs

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

19. Dangerous Waste Storage
    a. Restrictions on waste storage – containers and tanks
    b. Labeling requirements
    c. Waste Handling Review
    d. Waste Tracking
    e. Level Limit Switches
    f. Compatibility requirements.

Trainer(s) Signature: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

Part B

Section H

Training Plan
Appendix II
On the Job Training Module

ON-THE-JOB TRAINING MODULE

	TRAINING[1]	JOB TITLE[2]														
		Dir of Fac and Prod	Part B Facility Ops Mgr	Check In Super	Prod Super	Recyc Super	Trans Coord	Check-In Tech	Prod Tech	Envir Mgr	Sr. Envir Mgr	Envir Spec	Envir Gen	Lab – Mgr, Chemists, Techs	Admin Asst	Prof Prep
1	Safety and PPE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	General Operations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NR
3	Container Handling	NR	X	X	X	X	X	X	X	X	X	X	X	X	NR	NR
4	Container Mgmt	X	X	X	X	X	X	X	X	X	X	X	X	X	NR	NR
5	Forklift Operations	NR	X	X	X	X	X	X	X	NR	NR	NR	NR	NR	NR	NR
6	Housekeeping	X	X	X	X	X	X	X	X	X	X	X	X	X	NR	NR
7	Sampling	NR	X	X	X	X	NR	X	X	X	NR	X	NR	X	NR	X
8	Tank Truck Ops	NR	X	NR	X	X	NR	X	X	NR	NR	NR	NR	NR	NR	NR
9	Bulk Receiving	X	X	X	X	NR	NR	X	X	X	X	X	X	NR	X	NR
10	Rail Car Mgmt	NR	X	NR	X	NR	NR	X	X	NR	NR	NR	NR	NR	NR	NR
11	Drum Crusher	NR	X	NR	X	X	NR	NR	X	NR	NR	NR	NR	NR	NR	NR
12	Compressor/Boiler	NR	X	NR	X	X	NR	NR	X	NR	NR	NR	NR	NR	NR	NR
13	Thin Film Evap	NR	X	NR	X	X	NR	NR	X	NR	NR	NR	NR	NR	NR	NR
14	High Boiler Distill	NR	X	NR	X	X	NR	NR	X	NR	NR	NR	NR	NR	NR	NR
15	Glycol Distillation	NR	X	NR	X	X	NR	NR	X	NR	NR	NR	NR	NR	NR	NR
16	Flare	NR	X	NR	X	X	NR	NR	X	NR	NR	NR	NR	NR	NR	NR
17	Bulk Liquid/ Shredder/Dispersion	NR	X	NR	X	X	NR	X	X	NR	NR	NR	NR	NR	NR	NR
18	Fuel Blending	NR	X	NR	X	X	NR	X	X	NR	NR	NR	NR	NR	NR	NR
19	Dangerous Waste Storage	NR	X	X	X	X	NR	X	X	X	X	X	X	X	NR	NR

[1] Training modules referenced with an "X" are the training modules that will be provided based on job title. The training modules refer to "job functions" at the facility. Personnel will be required to complete individual training modules prior to being allowed to independently perform the job function referenced.

[2] All personnel, even those not required to take a training module, are required to have a basic familiarity with operations in order to conduct their responsibilities safely. The training identified in this table is required before personnel can perform the jobs described in the associated job function (Table 1) unsupervised.

NR = Not Required

Part B

Section I

Closure Plan

TABLE OF CONTENTS

I. CLOSURE PLAN AND FINANCIAL ASSURANCE

1.0 Introduction to Closure Plan 2
1.1 Facility Contact Information 2
1.2 Facility Description 3
1.3 Facility History, Function, Location, and Layout 3
1.4 Products and Production Processes 4
1.5 Dangerous Waste and Recycling Units 5
1.6 Unit Description 5
Thin Film Evaporator – Solvent Recycling 6
High Boiler Distillation – Solvent Recycling 6
Glycol Distillation 7
Fuel Blending 7
Future Storage 8
1.6.1 Maximum Waste Inventory 11
2.0 Closure Performance Standard 11
2.1 Constituents of Concern 12
2.2 Clean Closure Levels 14
2.3 Decontamination of Equipment and Concrete 14
2.4 Contingencies for Concrete Structures 14
2.5 Soil Sampling 15
3.0 Closure Activities 15
3.1 Health and Safety 15
3.2 Removal of waste and waste residues 16
3.3 System and containment inspection prior to decontamination . 17
3.4 Decontamination of the system and containment areas 17
3.4.1 Decontamination of Concrete Secondary Containment Structures 18
3.4.2 Decontamination of Tanks, Piping, and Ancillary Equipment 18
3.4.3 Decontamination of Concrete Surfaces, Roadways, and Sumps 19
3.5 Identifying and Managing Contaminated Environmental Media 20
3.6 Confirming Clean Closure 21
3.7 Sampling and Analysis Plan and Constituents to be Analyzed 22
3.7.1 Methodology 23
3.7.2 Sample Handling 24
3.7.3 Constituents to Be Analyzed 24
3.7.4 Revisions to the Sampling and Analysis Plan and Constituents to Be Analyzed 25
3.8 Role of the Independent Qualified Registered Professional Engineer 25
3.9 Certification of Clean Closure 26

3.10 Conditions That Will Be Achieved When Closure is Complete 27
4.0 Closure Schedule and Timeframe 27
4.1 Closure Schedule 27
5.0 Cost of Closure 28
5.1 Closure Cost Estimate 28
5.2 Financial Assurance for Closure 28
5.3 Financial Assurance for Liability 29

TABLES

I-1 Tanks and Equipment Subject to Closure Thin Film Evaporator 9
I-2 Tank and Equipment Subject to Closure High Boiler Distillation 9
I-3 Tanks and Equipment Subject to Closure Glycol Distillation 9
I-4 Tanks and Equipment Subject to Closure Fuel Blending 10
I-5 Containment Areas Subject to Closure 10
I-6 Piping and Multi-Use Tanks Subject to Closure 11
I-7 Constituents of Concern 12
I-8 Random and Bias Sampling Frequencies 22

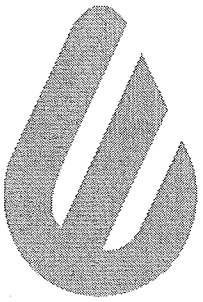
List of Figures

Figure I-1: Dangerous Waste Containment Layout
Figure I-2: Facility Layout Diagram
Figure I-3: Subsurface Soil Bias Sample Locations

Closure Cost Estimate

List of Appendices

Appendix I: Certificate of Liability Insurance
Appendix II: Possible Constituents of Concern



EMERALD

An Environmental Company

CLOSURE PLAN AND FINANCIAL ASSURANCE

WAC 173-303-806(4)(a)(xiii), (xv), (xvii), 610, 620, 120(3)

Emerald Services, Inc.
1825 Alexander Ave.
Tacoma WA 98421
WAD 981769110

November 2009
Modified February 2015

1.0 Introduction to Closure Plan

WAC 173-303-806(a)(xiii), 610(3), (12), 120(3)

This Closure Plan (Plan) addresses the steps Emerald Services, Inc. will undertake to obtain clean closure of its recycling and dangerous waste storage facility located at 1825 Alexander Ave., Tacoma, Washington, 98421. This facility is owned and operated by Emerald Services, Inc.(Emerald. Solvent and antifreeze recycling are conducted at the site per WAC 173-303-120, in addition to dangerous waste storage per WAC 173-303-280. For these operations, a Closure Plan, Closure Cost Estimate, and Financial Assurance are required per WAC 173-303-120 and WAC 173-303-610. The Site ID number for this Emerald facility is WAD981769110.

Emerald operates a used oil re-refinery at this site per WAC 173-303-515, and a separate Closure Plan and Closure Cost Estimate have been prepared for that operation. As noted in Sections 1.4 and 1.5, below, there is some overlap between Emerald dangerous waste operations and used oil re-refinery operations in that the high boiler distillation unit can be utilized for distillation of solvent as well as distillation of light ends from the used oil re-refining operation. When the high boiler distillation unit is taken out of dangerous waste service for the purposes of used oil service, Emerald conducts a partial clean closure on the unit in order to ensure a clear separation of applicable regulatory criteria for the unit.

1.1 Facility Contact Information

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1.2 Facility Description

The following describes the facility and facility operations. All tanks, containment areas, and equipment subject to the closure plan requirements are identified and described. The maximum amount of waste inventory is also included.

1.3 Facility History, Function, Location, and Layout

The site of the Emerald facility was originally a wetland. Beginning in 1967, owners of the property began filling the wetland with a variety of solids. Other than the filling process, there were no operations at the site until SolPro purchased the land in 1986. Sol Pro initially operated a solvent recycling facility under a Part A Permit, then obtained its Part B Permit in 1999. Shortly thereafter, in May of 2000, Emerald Services, Inc. purchased the facility from SolPro. Shortly thereafter, Emerald has made several site improvements, including paving of the site areas not designated for dangerous waste management, improvement to the stormwater management system, and addition of a glycol recycling operation. In 2012, Emerald constructed and then initiated operations for a used oil re-refining operation.

The Emerald facility is located between the Hylebos and Blair waterways in an area typically known as the Commencement Bay Nearshore Tide Flats. This area is zoned for heavy industrial use. Properties in the vicinity of the Emerald facility typically conform to the heavy industrial classification. The Emerald site occupies approximately 2.5 acres.

Emerald utilizes the site as an antifreeze and solvent recycling facility, a dangerous waste storage facility, and a used oil re-refining facility. Closure of the used oil re-refining facility is addressed under a separate Closure Plan. Emerald's solvent recycling processes produce recycled solvent and recycled glycol that are marketed through the northwest and Midwest regions of the United States. Solvents recycled are organic in nature and include standard blends for parts washing and paint gun washing, as well as customer-specific blends. The glycol recycling operation is similar to the solvent recycling operation in that both standard blends and customer specific blends are produced. In 2006, Emerald recycled over one million gallons of antifreeze and solvent.

The dangerous waste management areas subject to this Closure Plan and Closure Cost estimate are designated on Figure I-1, and include all areas where recycling operations and dangerous waste storage occur.

The facility is situated such that the main transportation in and out of the facility occurs at the south gate (Gate 1). Trucks enter through this gate, check-in at the office, then stage their truck for off-loading prior to departing through the same gate. Trucks also enter

through the north gate (Gate 2) for bulk loading or off-loading. There is also a gate located on the rail spur at the north end of the facility, which is used solely for movement of rail cars (Gate 3). The main operational areas are located in the northern half of the facility and include the dangerous waste container storage area, the glycol processing and storage area, Production Pads 1, 2, 3, and 4, Process Areas 1 and 2, Tank Areas 1, 2, and 3, Load/Unload Areas #1 and #2, the Loading Dock, the Railcar Building containment, and the Railcar Supplemental containment. There are product storage areas located in the vicinity of the main operational areas. Locating product storage near the operational areas allows for easy access to product storage following recycling of wastes. The stormwater management areas surround the dangerous waste management areas and encompass a majority of the south end of the facility. The south end of the facility is where the 90,000 gallons stormwater vault and stormwater bioswale are located. See Figure I-2 for a scale diagram of the facility operational areas.

1.4 Products and Production Processes

As indicated above, the Emerald dangerous waste facility recycles glycol (spent antifreeze) and solvent, and also stores dangerous waste that is compatible with other wastes in storage.. The glycol is recycled to standard product specifications, such as 50/50 blend, or to a customer-specific standard. Solvent recycling is managed in a similar way. Emerald has several standard products that are marketed throughout the Northwest (Region 10) and the Midwest. These include automotive parts washer solvent, paint gun wash solvent, and several others. Emerald also has customers who request specific solvent blends custom-designed for their operations. Waste streams with an acceptable Btu value that are not suitable for recycling are consolidated onsite prior to off-site shipment by rail for energy recovery.

Depending on market demand, one of Emerald's distillation units, the high boiler distillation unit, may be utilized for distillation of light ends from the used oil re-refining operation. This process creates a light ends product of higher market value than the non-distilled light ends, and the distillated product is more suitable for distribution within the Northwest.

All recycling is conducted using distillation technology. This technology allows Emerald to fraction off the desirable (clean) solvent, light ends, or glycol. Clean solvent, light ends, or glycol is collected off the recycling units, then packaged for sale. Non-reusable solvents, light ends, and tank bottoms are accumulated on-site as dangerous waste prior to shipment and fuel blending off-site.

Dangerous waste stored at the Emerald facility consists of waste streams that are compatible with the recyclable waste streams, but not suitable for recycling. Waste

streams destined for fuel blending must have, at a minimum, sufficient Btu for a burner to recover energy from the waste stream. The specific Btu varies depending on the burner who will be accepting the waste stream. The minimum Btu value must be met at the point of waste stream generation in order to meet the requirements for boilers and industrial furnaces.

Emerald conducts other storage of waste streams that are compatible with the recyclable and fuel blend waste streams. These waste streams are shipped off-site to a suitably permitted third party disposal facility.

Waste streams destined for fuel blending that are pumpable are pumped from bulk and non-bulk containers to railcars for transportation to a permitted burner for energy recovery. Non-pumpable waste streams, or waste streams that are designated as "storage only" are generally stored until a full container load is accumulated. These are then transported off-site by truck to a permitted burner for energy recovery or other permitted TSDF for further fuel blend processing. For non-pumpable high Btu waste streams, Emerald also has the capability of creating pumpable waste streams by using the cascade shredder and dispersion system. The cascade shredder can be used to reduce the size of solids in a waste stream. From the cascade shredder, the shredded waste stream is transferred to the dispersion system where it is blended with other low viscosity liquids to generate a pumpable waste stream.

Prior to any processing or storage, all waste streams are checked in to ensure they can be managed at the Emerald facility. Loads of waste glycol are checked and also tested for glycol content prior to off-loading. All dangerous waste streams undergo a check-in process as required under the facility's Waste Analysis Plan (Section 3 of this Part B Permit Application). This check-in process is designed to ensure that waste streams managed at the Emerald facility are compatible with other waste streams managed onsite, and also that the dangerous waste properties of the waste stream are within the limitations of the Emerald Part B Permit.

1.5 Dangerous Waste and Recycling Units

Emerald has three recycling units and one fuel blending unit. These are the glycol distillation unit, the thin film evaporator unit (also known as the LUWA), and the high boiler distillation unit (also known as the SIVA). Emerald also utilizes the cascade shredder and dispersion system as needed for processing of waste streams with high solids content that are not suitable for recycling.

Waste streams destined for management in each of these units are typically stored in on-site tanks, or in containers in the Dangerous Waste Container Area, Production Pad 2,

Production Pad 3, or Production Pad 4. As described below in Section 1.6, Unit Description, each of the units encompasses a system of pipes, equipment, tanks and containment, all of which are regulated for purposes of this Closure Plan and Closure Cost Estimate.

1.6 Unit Description

Emerald units subject to this Closure Plan and Closure Cost Estimate include all permitted dangerous waste storage areas, all recycling units and associated ancillary piping and equipment, and the fuel blending unit and associated ancillary piping and equipment. Permitted dangerous waste storage tanks utilized to store waste streams prior to recycling or processing are also subject to this Closure Plan and Closure Cost Estimate. Tables I-1, I-2, I-3, I-4, I-5, and I-6 below provide specific information regarding which tanks, equipment, and containment areas are subject to this Closure Plan and Closure Cost Estimate. The following provides a brief description of each of the processes conducted by Emerald.

Thin Film Evaporator - Solvent Recycling

The thin film evaporator system (also known as the LUWA) is a distillation process specifically designed for solvents with a boiling point range of up to 400°F. The system consists of an agitated thin film evaporator with ancillary pumps, piping, a vacuum vessel, vacuum pump, feed tank, condenser, receiving tanks, and emission control equipment. The tanks typically utilized in this system are located in Tank Area 1 (Tank D-100,) and Process Area 1 (Tank D-101) (Table I-1). Subject to requirements of the dangerous waste permit, other tanks may be utilized depending on the tanks available for dangerous waste storage and the processing schedule (see Table I-6). Tanks D-310 (formerly C-100), D-311 (formerly C-801), and D-315 (formerly C-802) are proposed for future use under this Permit and will be brought into the Closure Plan through a Permit modification. The thin film evaporator process equipment is located in Process Area 1. Dedicated piping and tanks are also used for transfer and storage of product out of this system. However, they are not subject to the requirements of this Closure Plan and Closure Cost Estimate.

For recycling in the thin film evaporator system, dangerous waste suitable for recycling (feed stock) is pumped from containers or tanker trucks into a dangerous waste permitted feed tank. While in operation, the thin film evaporator receives feed stock from a feed tank on a continuous basis through dedicated piping. The feed stock is vacuum distilled using non-contact hot oil as a heat transfer media. The distilled feed stock is condensed, transferred to product storage tanks, and subsequently packaged for re-sale. Still bottoms generated from the process are recovered and transferred to the fuel blending system for

further processing and subsequent transportation to and disposal at a permitted third party disposal facility.

High Boiler Distillation – Solvent/Used Oil Recycling

The high boiler distillation unit (SIVA) is designed to distill solvents with a boiling point range of up to 500°F. The unit utilizes a "pot still" equipped with an advanced electronic materials technology and support system. The process equipment and feed tanks typically used for this system are located in Process Area 2 (D-302 (formerly D-800)) (Table I-2). Tanks D-312 (formerly C-102) and D-314 (formerly C-104) are proposed for future use under this Permit and will be brought into the Closure Plan through a Permit modification. Subject to requirements of the dangerous waste permit, other tanks may be utilized depending on the tanks available for dangerous waste storage and the processing schedule (see Table I-6 for the list of current multi-use tanks).

The high boiler distillation unit consists of a feed tank, ancillary pumps, piping, condensers, product tanks, and emission control equipment. Dangerous waste suitable for recycling (feed stock), or used oil from the used oil re-refining operation is fed to the high boiler distillation unit on a batch basis from the feed tank. Feed stock may also be transferred directly to the high boiler distillation unit from containers if the quality of the waste stream is suitable.

The feed stock is vacuum distilled using non-contact hot oil as a heat transfer media. The distilled feed stock is condensed, then transferred to containers or tanks for storage prior to re-sale. Still bottoms generated from the process are transferred to the fuel blending operation for further processing and subsequent transportation to and disposal at a permitted third party disposal facility.

Glycol Distillation

The glycol distillation unit is designed to distill glycol-based coolants with a boiling point of approximately 400°F. The glycol distillation unit utilizes process tanks, filters, an evaporator, vacuum distillation tower, cooling tower, ancillary pumps and piping, and condensers.

The system consists of tank(s) (D-210, D-211 and D-212), a filter and vacuum distillation unit, and supporting equipment designed to process used antifreeze and glycol-based coolants to a maximum of 98% glycol (Table I-3). Normal product ranges for concentrations of glycol are between 50% and 98%. The glycol distillation unit consists of multiple tanks and filters for emulsified oil removal, a forced circulation evaporator and distillation tower, packaged cooling tower for condensing and product cooling, and

variable rate feed and product pumps. All glycol distillation activities are conducted in the glycol processing area.

Waste streams generated in the glycol distillation unit include equipment washout water and scale. A portion of these waste streams have adequate Btu for fuel blending and are transferred to the fuel blending system. The remainder is transferred to containers prior to off-site shipment for management at a third-party permitted disposal facility.

Fuel Blending

The processing equipment used for fuel blending includes tanks (D-502, RT -500, and MT-500), other components of the dispersion system, the cascade shredder, and bulk liquid blending (Table I-4). Each of these is designed to process waste streams of various viscosities.

The dispersion system is designed to process solid and viscous materials that are suitable as a blended fuel (sufficient Btu for energy recovery). The cascade shredder is used to shred solids in preparation for the dispersion system or for container consolidation. The bulk liquid mixing system is designed to blend low viscosity wastes using a pump designed specifically for mixing. The dispersion system is located on Production Pad 1, the cascade shredder and bulk liquid blending equipment is located in Process Area 2.

The dispersion system includes a hopper, chute, mix tank, blender, and associated ancillary equipment such as pumps, piping, and filters. Solid and viscous waste streams are introduced into the mix tank through the hopper and chute located above the mix tank. Other low viscosity liquid waste streams are introduced and thoroughly blended until they become a homogeneous fuel. The blended fuel is then transferred to a railroad tank car. Emerald may also transfer the blended fuel to a dangerous waste storage tank or directly to a tanker truck. The blended fuel is ultimately transported off-site for disposal at a permitted third-party disposal facility for use as a fuel.

Waste streams with high solids content or contained in smaller containers, such as lab packs, may be shredded in the cascade shredder. The cascade shredder consists of a hopper, shredder, and auger. Waste streams with high solids content or that are contained in smaller containers are shredded to obtain a uniform waste stream prior to transfer to the dispersion unit or consolidated into containers. When the shredded waste stream is introduced into the dispersion unit, it is blended with other viscous waste streams. Waste streams with high solids content may also be stored in containers in the permitted dangerous waste container storage areas for containerized shipments off-site, rather than undergoing processing the cascade shredder and dispersion unit.

Waste streams brought to the Emerald facility in bulk form are processed through the bulk liquid blending system. This system consists of filters, blend pumps, and associated ancillary equipment including piping. Bulk waste streams are pumped from the truck through a filter and then blended using the pump. The blended waste stream is then pumped directly to railcars or to storage tanks prior to transportation off-site to a permitted, third party disposal facility.

Future Storage

Emerald plans to expand its tank storage capabilities in the future. Tanks D-310 (formerly C-100), D-311 (formerly C-801), D-312 (formerly C-102), D-314 (formerly C-104), and D-315 (formerly C-802) will be used for bulk storage of dangerous waste, supporting the recycling processes. Upon approval of these tanks for storage by the Washington State Department of Ecology, closure costs to include management and disposal of the associated waste streams and equipment will be incorporated into this Closure Plan and Closure Cost Estimate as appropriate.

Table I-1 - Tanks and Equipment Subject to Closure
Thin Film Evaporator

Primary Use	Unit Type	Unit Number	Diameter (in feet)	Height (in feet)	Total Capacity (gallons)	Construction
Thin Film Evaporator – Solvent Recycling	Tanks	D-100	8.9	7.7	3,581	Carbon Steel
		D-101	3.9	8.5	755	Carbon Steel
	Equipment	Thin Film Evaporator T-100				
		Diaphragm pumps P-100, P-101, and P-103				
		Condenser/Heat Exchangers E-100 and E-600				
		Liquid Ring Supply Vessel Pump P-600				
		Vacuum Pump VP-600				

Table I-2 – Tank and Equipment Subject to Closure
High Boiler Distillation

Primary Use	Unit Type	Unit Number
High Boiler Distillation – Solvent and Used Oil Recycling	Equipment	High Boiler Distiller T-800
		Heat Exchangers E-800 and E-801
		Centrifugal Pump P-800
		Vacuum Pump VP-800

Table I-3 – Tanks and Equipment Subject to Closure

Glycol Distillation

Primary Use	Unit Type	Unit Number	Diameter (feet)	Height (feet)	Total Capacity (gallons)	Construction
Glycol Distillation	Tanks	D-210	11.5	12.8	10,000	Carbon Steel
		D-211	11.5	14.0	11,000	Carbon Steel
		D-212	7.5	14.5	4,500	Carbon Steel
	Equipment	Evaporators T-1 and T-2				
		Carbon Adsorbers V-3 and V-4				
		Heat Exchangers E-1, E-2, E-3, E-4, E-5				
		Distillation Towers T-3, E-6				
		Pumps P-210, P-214, P-215, P-216, P-217, P-218, P-219, P-222				
		Vacuum receiver V-1				
		Vacuum pump C-1				
		Cooling tower CT-1				

Table I-4 – Tanks and Equipment Subject to Closure
Fuel Blending

Primary Use	Unit Type	Unit Number	Diameter (feet)	Height (feet)	Total Capacity (gallons)	Construction
Fuel Blending	Tanks	D-502	10.5	11	9,230	Carbon Steel
		RT-500	5	7	1,100	Carbon Steel
		MT-500	4.3	3	300	Carbon Steel
	Equipment	Skid Vac S-80				
		Hoppers H-500 and H-501				
		Chutes CH-500 and CH-501				
		Mixer M-500				
		Cascade Shredder S-500				
		Filters F-500 and F-501				
		Blend Pump P-500				
		Pumps P-501, P-502, P-503, P-504				
		Slide Gate SG-500				

Table I-5
Containment Areas Subject to Closure

Description of Unit	Construction
Dangerous Waste Container Storage Area	Concrete with impervious coating (see Exhibit D-2 of Part B Permit Application for concrete specifications for containment areas, and Exhibit D-4 for coating information).
Production Pad 1	
Production Pad 2	
Production Pad 3	
Production Pad 4	
Process Area 1	
Process Area 2	
Tank Area 1	
Tank Area 2	
Tank Area 3	
Load/Unload Areas #1 and #2	
Loading Dock	
Railcar Building Containment	
Railcar Supplemental Containment	
Glycol Processing Area	Concrete with impervious coating system (see Exhibit D-4 of Part B Permit Application for coating information and Exhibit D-10 for Glycol System structural design information).

Table I-6
Piping and Multi-Use Tanks Subject to Closure

Primary Use	Unit Type	Unit Number	Diameter	Height/Length (feet)	Total Capacity (gallons)	Construction
Multi-Use	Tanks	D-300[a]	10'	16	10,000	Carbon Steel
		D-301[b]	10'	16	10,000	Carbon Steel
		D-302[c]	7.7'	18	6,250	Stainless Steel
	Piping	n/a	1"	55	2.2	
		n/a	1.5"	13	1.4	
		n/a	2"	262	44.5	
		n/a	3"	596	226.5	
		n/a	4"	50	33.0	

[a] Tank previously identified as D-500
[b] Tank previously identified as D-501
[c] Tank previously identified as D-800

1.6.1 Maximum Waste Inventory

WAC 173-303-610(3)(a)(iii)

The maximum amount of dangerous waste in containers and tanks that may be on-site at any one time with the currently permitted dangerous waste tanks and container storage is 107,526 gallons. This volume includes 66,716 gallons for all current dangerous waste storage tanks, and the permitted volume of 40,810 gallons for containerized dangerous waste storage. Product storage tanks and industrial wastewater treatment units and tanks are not included. Specific tank volumes for tanks subject to closure are provided in Tables I-1 thru I-4, and Table I-6, above.

2.0 Closure Performance Standard

WAC 173-303-610(2)

The intent of this plan is to ensure Emerald has a plan to obtain clean closure as required in WAC 173-303-610(2)(a) in that it describes how Emerald will:

- Minimize the need for further maintenance.
- Control, minimize, or eliminate to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, ground water, or the atmosphere
- Return the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity
- Remove all waste and waste residues and properly dispose of them off-site
- Decontaminate all tanks, piping, and other equipment that make up the dangerous waste management systems to achieve the "clean debris surface" decontamination performance standard.
- Decontaminate the concrete secondary containment systems by meeting the "clean debris surface" decontamination performance standard.
- Perform soil sampling and analysis to ensure soils beneath all dangerous waste management units meet clean closure standards in WAC 173-303-610(2)(b)(i).

This plan also describes how Emerald will conduct partial clean closure in the event that the high boiler distillation unit is used to distill light ends as a used oil processing unit under WAC 173-303-515. For the partial clean closure of the unit, Emerald describes how it will:

- Remove all waste and waste residues and properly dispose of them off-site
- Decontaminate all tanks, piping, and other equipment that make up the dangerous waste management systems to achieve the "clean debris surface" decontamination performance standard.

2.1 Constituents of Concern

Specific constituents of concern will be identified in the Sampling and Analysis Plan submitted upon facility Closure. The basis for the identification of constituents of concern will be waste acceptance records. At a minimum, and for purposes of this Closure Plan and Cost Estimate, based on expected waste receipts Emerald will analyze for glycol (ASTM D-2982) and metals (SW-846 Methods 6010) in areas that managed spent antifreeze, and volatiles (8260), semi-volatiles (SW-846 Methods 8270), and metals (SW-846 Methods 6010) in all areas managing solvents for recycling and high Btu waste

streams. TPH analysis (NWTPH) will be performed on samples collected from the northeast perimeters of the Glycol Recycling and Dangerous Waste Container areas, and at a frequency of every fifth random sample collected as identified in Table I-8. Additional constituents of concern will be identified in the Sampling and Analysis Plan submitted to Ecology upon notification of intent to close at least 45 days prior to beginning closure. Based on previous waste stream receipt history, along with anticipated changes in operations, Table I-7 below lists the constituents of concern for wastes that Emerald expects to receive throughout the duration of the Permit. See Appendix II, Table of Possible Constituents of Concern, for information regarding additional waste codes Emerald is permitted to accept and constituents of concern that are associated with those codes.

Table I-7
Constituents of Concern

Waste Category	Waste Code	Constituent of Concern
Characteristic Waste	D001	Ignitability
	D002	pH/Corrosivity
	D004	Arsenic
	D005	Barium
	D006	Cadmium
	D007	Chromium
	D008	Lead
	D009	Mercury
	D010	Selenium
	D011	Silver
	D018	Benzene
	D019	Carbon tetrachloride
	D024	m-cresol
	D025	p-cresol
	D026	Cresols (total)
	D028	1,2-dichloroethane
	D035	Methyl ethyl ketone
	D038	Pyridine
	D039	Tetrachloroethylene
	D040	Trichloroethylene
Washington State Only Dangerous Waste	WT01	Toxicity
	WT02	Toxicity
	WP01	Halogenated organic compounds
	WP02	Halogenated organic compounds

Waste Category	Waste Code	Constituent of Concern
Listed Waste	F001	Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-Trichloroethane, Carbon Tetrachloride
	F002	Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-Trichloroethane, Chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, o-Dichlorobenzene, Trichlorofluoromethane, 1,1,2-Trichloroethane
	F003	Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, methanol
	F004	Cresols/cresylic acid, nitrobenzene
	F005	Toluene, methyl ethyl ketone, carbon disulfide, isobutyl alcohol, pyridine, 2-nitropropane
Commercial Chemicals	U002	Acetone
	U004	Acetophenone
	U080	Methylene chloride
	U154	Methanol
	U159	Methyl Ethyl Ketone
	U210	Tetrachloroethylene
	U220	Toluene
	U239	Xylenes (mixed isomers)

2.2 Clean Closure Levels

All dangerous waste, waste residues, equipment, liners, soils, or other media or materials contaminated with dangerous waste or waste residue will be removed or decontaminated.

In accordance with WAC 173-303-610(2)(b)(i), for soils, groundwater, surface water, and air, the clean closure levels will be the numeric clean-up levels calculated using unrestricted use exposure assumptions according to the Model Toxics Control Act (MTCA) Cleanup Regulation (WAC 173-303-340) that is current at the time of closure. These will be numeric clean-up levels calculated according to MTCA Method B, although MTCA Method A may be used as appropriate.

2.3 Decontamination of Equipment and Concrete

For tanks and process equipment, clean closure is achieved when surfaces meet the clean debris standard. For decontamination of concrete bases, clean closure is achieved when at least 0.6 centimeter of the surface layer has been removed and concrete surfaces have met the clean debris surface standard.

2.4 Contingencies for Concrete Structures

For concrete structures, if a clean debris surface is not achieved after removing the first 0.6 centimeter of the surface layer, then an additional amount of surface concrete will be removed to achieve a clean debris surface, or the concrete will be removed and disposed of as dangerous waste.

Consistent with regulations and guidance at the time of closure, Emerald may chose to propose an alternative method to decontaminate concrete (e.g., steam cleaning followed by an evaluation criteria to confirm that decontamination was successful). This change would be made using a permit modification. For cost estimating in this current closure plan, Emerald assumes they will achieve the clean debris surface standard by removal of 0.6 centimeter of concrete.

2.5 Soil Sampling

Soil sampling will be conducted to characterize the aerial and vertical extent of possible contamination at and/or released from the closing unit(s) and to confirm the effectiveness of closure activities. Knowledge of past management practices at Emerald will help determine the most appropriate amount and type of sampling.

3.0 Closure Activities

WAC 173-303-610(3), (5), (6), (12)

This section addresses activities that will be completed during closure of the recycling and fuel blending units and the associated storage areas. The following activities are described:

- Removal of waste and waste residues
- System and containment inspection prior to decontamination
- Decontamination of the system and containment areas
- Identifying and managing contaminated environmental media
- Confirming clean closure
- Sampling and analysis plans and constituents analyzed
- Role of the independent registered professional engineer
- Closure certification
- Conditions that will be achieved when closure is complete
- Partial clean closure of the high boiler distillation unit

3.1 Health and Safety

Prior to conducting any fieldwork for the implementation of this Closure Plan, a site-specific Health and Safety Plan (HASP) will be prepared in accordance with 29 CFR 1910.120. The HASP will describe the health and safety requirements, responsibilities, and training requirements that will apply to personnel implementing the Closure Plan. It will also describe the potential hazards present during field work, emergency response procedures, the minimum personal protective control measures, establishment of work zones, confined space entry procedures, and decontamination procedures. The HASP will also address the requirements for ambient air monitoring by specifying the PID/FID levels at which respirators will be donned. The HASP will be made available for review by appropriate agencies.

3.2 Partial Clean Closure

Emerald utilizes the high boiler distillation unit for dual purposes; for distillation of dangerous waste solvents as well as distillation of light ends from the used oil re-refining operation. Prior to transitioning the unit from solvent recycling to used oil recycling, Emerald conducts a partial clean closure of the unit to ensure a separation of regulatory applicability of the unit. Note that this is not considered a final closure of the unit. Once

Emerald intends to fully close the unit, Emerald will adhere to all other requirements of this Closure Plan.

For partial clean closure, Emerald removes all waste from the high boiler distillation unit, piping, and ancillary equipment. Emerald then decontaminates the recycling unit, piping, and ancillary equipment as outlined in Section 3.5.2, below. Once the first cycle of decontamination is complete, the high boiler distillation unit is inspected to verify a "clean debris surface" under 40 CFR § 268.45. Since the ancillary equipment will not be dismantled as part of this partial clean closure activity, Emerald will establish a standard decontamination protocol in association with an independent qualified registered professional engineer (PE). Protocol will be established by conducting testing on rinsate following the first decontamination event. A solvent flush of the unit will be conducted following decontamination, and rinsate samples will be collected from before and after the flush. Samples will be analyzed for F-listed solvents. Results for the samples will be compared to demonstrate that no additional contamination is being removed from the equipment once decontamination is complete, and the equipment therefore meets the criteria for a "clean debris surface". The standard decontamination protocol can then be used by the PE, and engineers inspecting the unit at the PE's direction, to verify partial clean closure during future decontamination events. Should the unit or ancillary equipment not meet standards for a clean debris surface, decontamination will be repeated until the clean debris surface is achieved.

Solvent rinsate is collected into containers, then profiled under requirements of Emerald's Waste Analysis Plan prior to being fuel blended on-site as dangerous waste. Records of partial clean closure, waste generated, and waste tracking will be maintained in the facility operating record.

Emerald provides 45 days notice to Ecology prior to each partial clean closure event. A partial clean closure certification prepared by an independent qualified registered professional engineer is submitted to Ecology within 60 days of each partial closure event.

3.3 Removal of waste and waste residues

Emerald will begin closure activities by removing all dangerous waste inventory in a sequenced approach. Any dangerous waste that can be recycled using on-site distillation units (glycol distillation, high boiler distillation, and thin film evaporator) will be processed whenever possible to reclaim re-useable product and reduce the total amount of waste for off-site disposal. Recycling will be conducted as outlined in Section D of this Permit application.

If dangerous waste is considered recyclable, but cannot be recycled on-site, a third party solvent and/or antifreeze recycler will be used whenever possible. Emerald will ensure that all remaining dangerous waste on-site has an approved profile with a permitted TSDF. Profiles will then be created for any dangerous waste that is not currently profiled. Antifreeze and solvents that are not recycled in on-site units will be transferred to tanker trucks or railcars for outbound shipment and disposal. Dangerous waste which is destined for fuel blending, including containerized high Btu waste streams, still bottoms remaining in the distillation systems and other high Btu tank residues, will be transferred to rail cars for outbound shipment and disposal. Poisons and corrosives will remain in their containers until shipment to an appropriately permitted third-party TSDF. Any other non-pumpable solids, including the dust generated from scarification of containment surfaces, will be transferred to drums or cubic yard boxes and shipped by truck for outbound shipment and disposal. All outbound shipments will be in accordance with the appropriate DOT specifications. The general sequence for removal of waste inventory will be as follows:

- Distill all recyclable waste streams
- Remove residuals from the applicable tanks and distillation systems
- Fuel blend all waste streams with sufficient Btu for energy recovery
- Designate waste streams in accordance with WAC 173-303-070
- Prepare profiles for third-party disposal of bulk and containerized waste streams as outlined in Section C of this Permit application, Waste Analysis Plan.
- Prepare manifests for hazardous waste shipment
- Transport product and residual wastes off-site

All rinse water generated from decontamination activities will be treated for discharge to the POTW if it can be treated to the limitations of the industrial wastewater discharge permit. Rinse water from the decontamination of the glycol distillation unit cannot be effectively treated to discharge limits and will be shipped off-site to a permitted third-party disposal facility.

Although Emerald plans to treat dangerous waste and rinse water onsite with existing equipment when that is possible, in accordance with WAC 173-303-620(3)(a) cost estimating assumes the maximum dangerous waste inventory and rinse water will be transported offsite and treated by a third party.

3.4 System and containment inspection prior to decontamination

Following removal of all residues from processing units, storage units, and equipment (the system), Emerald will visually inspect the system and containment to identify and record cracks and other openings through which waste, debris, or decontamination media

such as rinsate or wash water could be released. If cracks or other openings are located in the containment, Emerald will evaluate these cracks or openings to determine if releases or potential releases of dangerous waste may have occurred at or from the closing unit. . The record and evaluation of releases and potential releases will be included in a revised sampling and analysis plan submitted to Ecology when Emerald sends Ecology written notification of intent to close at least 45 days before beginning final closure. Additional sampling due to cracks or other openings in containment will be performed if requested by Ecology.

Emerald will maintain a record of the location and dimensions of any cracks or openings in containment as well as any cracks or other openings in the system identified during the system and containment evaluation. Any other potential spill or release items such as staining or other indication of spills or releases will also be noted. This information will be used by Emerald and by the independent, qualified, registered professional engineer to determine if there is a need for further soil sampling and analysis during closure. Emerald will include this information on cracks or openings and these additional samples in the Sampling and Analysis plan subject to Ecology review and approval at the time of closure (section 3.7). Records of determination for additional sampling locations will be maintained in Emerald's operating record.

Once the containment inspection and, if necessary, investigation, is complete, Emerald will seal or repair all cracks or other openings in the system or containment. This will prevent releases prior to and during decontamination.

3.5 Decontamination of the system and containment areas

The independent qualified registered professional engineer retained by Emerald to assist with closure certification will be present during decontamination activities described below to confirm, by visual inspection, decontamination of surfaces. Test results will confirm the engineer's visual observations.

3.5.1 Decontamination of Concrete Secondary Containment Structures

Concrete secondary containment structures are subject to debris standard closure, in which the contaminated layer of debris is removed using an Ecology-approved physical extraction method. This results in a "clean debris surface," defined by US EPA as a surface that, "when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be presented provided that such staining and waste and soil

in cracks, crevices, and pits shall be limited to no more than 5 percent of each square inch of surface area." (40 CFR § 268.45 Table 1, Footnote 3).

All concrete secondary containment structures will be decontaminated in the same manner. Equipment and/or removable objects will be removed, and the areas will be swept to clear away loose debris. Each secondary containment structure will then be decontaminated. Decontamination will be accomplished using physical extraction technology, which will include either abrasive blasting or scarification, or a combination of the two. The process will result in removal of at least 0.6 centimeters of surface. All debris generated during decontamination will be swept away, then transferred to cubic yard boxes for testing and waste characterization.

For characterization purposes, the debris generated from decontamination activities will be sampled and tested for TCLP volatiles (SW-846 Methods 1311 and 8260), TCLP semi-volatiles (SW-846 Methods 1311 and 8270), and TCLP metals (SW-846 Methods 1311 and 6010) to determine applicable waste codes prior to disposal. Additional analyses will be added if waste acceptance records indicate acceptance of waste streams with constituents that are not included in these analyte lists. One representative sample will be obtained for each cubic yard box of debris accumulated during decontamination activities. Following receipt of analytical results, cubic yard boxes will be relabeled as necessary, then profiled and transported for disposal at a permitted third-party disposal facility.

3.5.2 Decontamination of Tanks, Piping, and Ancillary Equipment

Tanks and piping will be decontaminated using an Ecology approved combination of physical and chemical extraction method resulting in a "clean debris surface." First, tank, piping, and equipment contents will be physically removed. For fuel blending equipment, this may require an initial "chipping away" of solids that have accumulated on equipment such as the shredder and dispersion unit. Once equipment is cleared of all contents, then the contaminated surfaces will be decontaminated.

Decontamination for the tanks, piping, and ancillary equipment related to fuel blending, will be conducted using liquid phase solvent extraction. Recycled solvent that is available on-site, and is also capable of dissolving the contamination remaining in the fuel blend tanks, piping, and equipment, will be used. All solvent from decontamination activities will be collected and containerized for proper characterization and disposal. Solvent generated from this decontamination activity will be sampled and tested for flashpoint (ASTM Method D-93), TCLP volatiles (SW-846 Methods 1311 and 8260), TCLP semi-volatiles (SW-846 Methods 1311 and 8270), and TCLP metals (SW-846 Methods 1311 and 6010) to determine applicable waste codes prior to disposal.

Additional analyses will be added if waste acceptance records indicate other waste streams whose constituents are not included in these analyte lists have been managed in tanks on-site.

For all other tanks, piping, and ancillary equipment (thin film evaporator, high boiler distillation, and glycol recycling), the interior surfaces of each tank will be washed using a high solvent wash. Piping and other equipment will be washed using solvent to the extent practicable. All solvent from decontamination activities will be collected and containerizedprior to fuel blending in railcars on-site or at a suitably permitted third party facility.
If the clean debris surface standard is not met initially, wash cycles will be repeated until the standard is met. If it appears the clean debris surface standard will not be met, Emerald will dispose of the tank system as hazardous debris.

All tank systems will be removed from the facility at closure and either sold for reuse, or properly disposed of as either non-hazardous or hazardous debris.

3.5.3 Decontamination of Concrete Surfaces, Roadways, and Sumps

Concrete surfaces and sumps are subject to clean closure, in which the contaminated debris is removed using an Ecology-approved physical and chemical extraction method resulting in a "clean debris surface." Closure of all concrete surfaces is outlined in Section 3.3.1, above.

All sumps will be treated in the same manner as the concrete containment structures. Equipment and/or removable objects will be removed, and the areas will be swept to clear away loose debris. Each secondary containment structure will then be decontaminated. Decontamination will consist of removal of at least 0.6 centimeters of surface using physical extraction technology which will include either abrasive blasting or scarification, or a combination of the two. All debris generated during scarification will be swept away, then transferred to a cubic yard boxes (the same boxes holding the debris from the concrete secondary containment decontamination) for testing and waste characterization.

For characterization purposes, the debris generated from decontamination activities will be sampled and tested for TCLP volatiles (SW-846 Methods 1311 and 8260), TCLP semi-volatiles (SW-846 Methods 1311 and 8270), and TCLP metals (SW-846 Methods 1311 and 6010) to determine applicable waste codes prior to disposal. If the debris does not designate for RCRA waste codes, the TCLP results will be evaluated by Emerald to determine if more testing is necessary to ensure proper management of the debris. Other parameters may be added if dangerous waste toxicity data should be obtained, or if waste

acceptance records indicate acceptance of other waste streams with constituents that are not included in these analyte lists.

One representative sample will be obtained for each cubic yard box of debris accumulated during decontamination activities. Following receipt of analytical results, cubic yard boxes will be relabeled as necessary, then profiled and transported for disposal at a permitted third-party disposal facility.

3.6 Identifying and Managing Contaminated Environmental Media

All storage, recycling and fuel blending activities have been conducted within containment since operation of this facility was initiated by SolPro. Since that time, Emerald has applied new layers of impervious coating to keep dangerous waste contamination from adhering to the concrete containment surface. Any contamination of environmental media is expected to be minimal. However, cracks or gaps in need of repair present a risk of contamination to soil, and ultimately, to groundwater. Areas in containment where a crack or gap appears to have penetrated the concrete containment systems are not present at this time. This statement is supported by results of routine containment inspections, which have identified only chips in containment that will be repaired during the next dry season. Sampling and analysis of any cracks or gaps identified during the System and Containment Inspection required under this Closure Plan will be addressed as necessary during the System and Containment Inspection, in the updated sampling and analysis plan submitted to Ecology at closure notification, or as requested by Ecology.

3.7 Confirming Clean Closure

WAC 173-303-610(3)(a)(v), (5)

For the dangerous waste management units at the Emerald facility, clean closure will be achieved by meeting the "clean debris surface" decontamination performance standard. A "clean debris surface" is defined by the EPA as a surface that, "when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be presented provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5 percent of each square inch of surface area." (40 CFR § 268.45 Table 1, Footnote 3).

Treatment to a clean debris surface will be accomplished by first removing waste residues, and second by decontaminating the concrete secondary containment areas, tanks

and tank systems, concrete surfaces, roadways, and sumps. The decontamination will be conducted using a combination of Ecology approved physical and/or chemical extraction technologies of abrasive blasting, scarification, high pressure wash, liquid phase solvent extraction, and detergent wash (see also "Decontamination of the System and Containment Areas"). Through these methods, the contaminated layer of debris will therefore be removed using an Ecology approved physical extraction method resulting in a "clean debris surface".

In addition to meeting the "clean debris surface" standards, clean closure of the facility will be demonstrated by sampling and analysis of the environmental media potentially affected by facility operations. This will be accomplished by using focused (bias) and random sampling.

Focused sampling will be conducted adjacent to containment sumps, to the extent practical, in all dangerous waste management areas.

Other focused sampling will be conducted in the vicinity of cracks and gaps identified in containment surfaces at the time of closure. The additional locations based on cracks and gaps will be identified in the Sampling and Analysis Plan that will be submitted upon Closure notification. Currently, there are no dangerous waste management areas with identified cracks and gaps. Locations of proposed focused sampling (16 samples) are identified in Figure I-3.

In addition to bias sampling, Emerald will conduct random soil sampling beneath every separate waste management area at a sampling density of one sample per 3,000 square feet.

Table I-8
Random and Bias Sampling Frequencies

Secondary Containment Area	Area (ft^2)	Estimated number of random samples (1/3000 ft^2)	Estimated number of bias samples
Load/Unload Area 1	834	1	1
Load/Unload Area 2	575	1	1
Production Pad 1	990	1	1
Production Pad 2	825	1	1
Production Pad 3	987	1	1
Production Pad 4	2,260	1	1
Dangerous Waste Container Area	6,887	3	1
Process Area 1	1,200	1	1
Process Area 2	1,142	1	1
Tank Area 1	1,131	1	1
Tank Area 2	566	1	1
Tank Area 3	420	1	1
Railcar Area	1,259	1	1
Railcar Supplemental Containment Area	1,520	1	1
Glycol Recycling Area	2,899	1	1
Loading Dock	2,341	1	1
Total Soil Samples		18	16

An independent qualified registered professional engineer will be available to inspect and document the completion of decontamination and sampling of the concrete secondary containment structures, process and storage tanks, and clean debris surfaces. Observations and photos taken during the inspection will be provided to confirm that a clean debris surface has been achieved.

3.8 Sampling and Analysis Plan and Constituents to be Analyzed

The object of this Sampling and Analysis Plan is to verify that all contamination has been removed during decontamination activities. A revised Sampling and Analysis Plan will be submitted to Ecology when Emerald notifies Ecology of its intent to close at least 45 day before beginning closure. Parameters have been selected based on the potential for their presence in the collected environmental media. Unless otherwise indicated, samples will be grab. Sampling will be conducted to ensure any remaining contamination is identified (i.e., all visibly stained or discolored areas will be sampled if applicable). Analytical parameters have been selected based on the constituents that are known to have been present in glycol, recyclable solvent, fuel blend, and storage only waste streams managed at the facility. Additional analyses will be added if waste acceptance records indicate acceptance of other waste streams with constituents that are not included

in these analyte lists. The independent qualified registered professional engineer will oversee all Sampling and Analysis Plan activities to verify they are conducted as outlined in this Closure Plan.

3.8.1 Methodology

Subsurface soil samples (see Figure I-3), will be collected after decontamination of the containment areas has been completed. Subsurface soils samples will be collected in all dangerous waste management areas.

Subsurface soil samples will be collected by drilling through the concrete surface. Samples will be collected at one to six inches below the concrete surface, with volatiles samples collected and prepared according to EPA Method 5053A. Visible contamination, which is not expected due to Emerald's documented containment integrity, will result in collection of samples of increasing depth, at increments of six inches, until contamination is no longer visible. Each six inch increment would be collected in a separate sample container, and analyzed.

Following collection, the subsurface soil samples from all dangerous waste management areas with the exception of the Glycol Recycling System area will be analyzed for volatile and semi-volatile organics (SW-846 Methods 8260 and 8270) and metals (SW-846 Methods 6010). . The samples taken from the glycol processing areas will be analyzed for glycol (ASTM D-2982), volatiles (SW-846 Method 8260) and metals (SW-846 Method 6010). TPH analysis (NWTPH) will be performed on samples collected from the northeast perimeters of the Glycol Recycling and Dangerous Waste Container areas, and at a frequency of every fifth random sample collected as identified in Table I-8. Additional parameters may be added if there is evidence of spills of other contaminants in dangerous waste management areas, or if waste acceptance records indicate that waste streams managed in the area contained constituents that would not be identified in these methods. The subsurface soil samples will be collected in sufficient volume to achieve the required detection limits (sufficient boring diameter will be needed).

Subsurface soil samples will be labeled with a unique number that identifies the location of collection (i.e., PP1-1, PA1-3, etc.). Chalk or paint will be used to circle the area sampled and mark the area sampled with the corresponding sample identity. Results from this testing will be reviewed to ensure that clean closure has been achieved. If any contamination is greater than the applicable MTCA limit for unrestricted site use for soil, Emerald will consult with Ecology regarding further clean-up measures.

Remaining samples not consumed during analysis will be composited for disposal purposes. Results from the subsurface soil borings analysis outlined above will be used

for characterization. All data from all sample analyses will be provided with the final closure report.

3.8.2 Sample Handling

Samples will be collected and handled by personnel familiar with standard hazardous waste sampling and collection procedures and will be collected and managed under chain-of-custody procedures. All sampling and sample handling will be conducted while wearing fresh disposable nitrile gloves. Disposable sampling equipment will be properly disposed of after their dedicated use.

Samples will be collected in "clean certified" containers supplied by the analytical laboratory and sealed with Teflon-lined lids. Labels will be affixed to sample containers and contain the following information:

- Site name
- Corresponding sample identification number
- Collection date and time
- Requested sampling analysis
- Sampler's initials

Labeled samples will be immediately placed in ice chests and appropriately preserved with re-sealable plastic bags full of ice. The chain-of-custody form will be filled out and placed with the samples in a re-sealable plastic bag. Upon completion of field activities, samples will be picked up by a courier and delivered to the analytical laboratory.

Split samples may be obtained and provided if requested by Ecology.

3.8.3 Constituents to Be Analyzed

Samples will be submitted to a Washington State accredited laboratory for analysis. Analytical parameters will include those which will identify the presence of any compounds known to be typically present in glycol, recyclable solvents, and fuel blend waste streams managed by Emerald. Soil analyses will consist of volatile organics (SW-846 Method 8260), semi-volatile organics (SW-846 Method 8270), and metals ((SW-846 and 6010) for samples from areas managing solvents and other high Btu waste streams. Soil analyses for samples connected with the Glycol Recycling area will consist of metals (SW-846 Method 6010), glycol (ASTM D-2982), and volatiles (SW-846 Method 8260). TPH analysis (NWTPH) will be performed on soil samples collected from the northeast perimeters of the Glycol Recycling and Dangerous Waste Container areas, and at a frequency of every fifth random sample collected as identified in Table I-8. For disposal

purposes, sample analyses will also include TCLP metals (SW-846 Methods 1311 and 6010) and appropriate organic analyses. Equivalent methods may be used if approved by Ecology in a final Sampling and Analysis Plan. These methods will have sufficiently low practical quantitation limits to determine compliance with clean closure standards and disposal requirements. Quality assurance and quality control procedures will be those outlined for the SW-846 methods used. All data will be provided to Ecology in the final summary report.

3.8.4 Revisions to the Sampling and Analysis Plan and Constituents to Be Analyzed

Revisions to this Sampling and Analysis Plan may be necessary based on changes in site operations, or unexpected results during closure activities. If changes in site operations occur that will impact the Sampling and Analysis Plan, Emerald will submit a revised Sampling and Analysis Plan within 90 days of completion of the site operation change. A revised sampling and analysis plan will be submitted to Ecology when Emerald sends Ecology written notification of intent to close at least 45 days before beginning final closure.

3.9 Role of the Independent Qualified Registered Professional Engineer

An independent qualified registered professional engineer (engineer) will be retained by Emerald to become familiar with Emerald's closure activities. The engineer will be responsible for observing field activities and reviewing records. At a minimum, this will include field observations and a review of records of the following activities:

- Removal of contaminated soil, waste (and removal of any unit components or other materials) and disposition of waste (and other materials removed) to ensure the removal was complete and materials were properly disposed;
- Decontamination procedures and results to ensure that the closure plan for decontamination was followed and the clean closure standard for decontamination was achieved – this will include inspecting metal tanks and concrete containment system after decontamination to confirm that a "clean debris surface" and other decontamination performance standards are achieved.
- Management of decontamination residuals to ensure management was properly carried-out.
- Sampling procedures and results.
- Locations of sampling to ensure locations were as specified in the sampling and analysis plan.
- Sample labeling and handling, including chain-of-custody procedures.

The engineer will record his/her observations and review of records in a written report. Emerald will place the engineer's report in their operating record.

3.10 Certification of Clean Closure

WAC 173-303-610(6)

Within 60 days of closure of the dangerous waste management units, Emerald will submit to Ecology, by registered mail, certification that the unit has been closed in accordance with this closure plan. The certification will be signed by Emerald's owner who will certify the following:

> *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing of violations.*

The closure certification also will be signed and stamped by an independent qualified registered professional engineer who is familiar with Emerald's closure activities.

Emerald will submit the following information to support its closure certification:

- All field notes and photographs related to closure activities, including the results of the inspection of the unit and containment system for cracks and other openings prior to decontamination.
- A description of any minor deviations from the approved closure plan and justification for these deviations.
- Documentation of the removal and final disposition of all dangerous wastes and dangerous waste residues, including contaminated media, debris, and all treatment residuals.
- Documentation that decontamination procedures were followed and those decontamination standards were achieved.
- All laboratory and/or field data, including sampling procedures, sampling locations, quality assurance/quality control samples, and chain of custody procedures for all samples and measurements, including samples and measurements taken to determine background conditions and/or determine or confirm clean closure.

- The engineer's report referenced in section 3.8 which identifies and describes observations made and data reviewed by the independent registered professional engineer
- Analytical results of samples taken to determine and confirm clean closure.
- A description of what the unit area looks like at completion of closure, including a description of what parts of the former unit, if any will remain after closure.

3.11 Conditions That Will Be Achieved When Closure is Complete

Emerald plans to completely decontaminate all recycling and dangerous waste management units and concrete containment structures. When closure is complete, all units and structures will remain on-site for potential future use in other activities.

4.0 Closure Schedule and Timeframe

WAC 173-303-610(3)(a)(vii) and (4)

4.1 Closure Schedule

Written notification of intent to close will be sent to Ecology at least 45 days before beginning final closure of the dangerous waste management units. A revised sampling and analysis plan addressing releases and potential releases of hazardous substances will be submitted to Ecology for review and approval when Emerald sends Ecology written notification of intent to close. Waste removal will be completed within 90 days. All remaining activities, including decontamination of equipment and containment, sampling and analysis for clean closure demonstration, and removal of waste generated during decontamination and sampling activities, will be completed within the following 90 days. Emerald will submit closure certification to Ecology within 60 days following completion of closure activities at each closing unit and/or completion of final facility closure. Should Emerald need additional time to complete any part of closure activities, an extension request will be submitted to Ecology at least 30 days prior to the applicable expiration date according to WAC 173-303-610(4)(c). The extension request would also demonstrate that all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements, have been and will be taken.

5.0 Cost of Closure

WAC 173-806(4)(a)(xv), 620(3)

5.1 Closure Cost Estimate

The closure cost estimate was developed in accordance with WAC 173-303-620(3). The following assumptions were used in development:

- A third party will be used for conducting all closure activities.
- The maximum dangerous waste volume will be present on site and managed during closure.
- Costs will be incurred for management of wastes handled during closure.
- Closure certification activities will be conducted by an independent qualified registered professional engineer registered in Washington State and a certification that closure has been done in accordance with the approved closure plan will be submitted to Ecology as required in WAC 173-303-610(6).

The closure cost estimate will be adjusted annually for inflation as specified in WAC 173-303-620(3)(c)(i) and (ii). Costs for closure labor, equipment, and analytical services are based on currently available rates. At the time of implementation of this Closure Plan, Emerald reserves the option to use any other appropriately-permitted facility for disposal or recycling of wastes.

The cost estimate for closure of the management units at Emerald is included for reference, along with a detailed breakdown of the cost estimates.

5.2 Financial Assurance for Closure

WAC 173-806(4)(a)(xv), 620(4), (10)

Emerald will continue to meet financial assurance requirements for closure as outlined in WAC 173-303-620(4) and (10). Currently, Emerald meets this requirement through an irrevocable letter of credit. The irrevocable letter of credit covers the cost of closure identified in the closure cost estimate. As the closure plan is adjusted for inflation purposes, the irrevocable letter of credit will also be adjusted accordingly.

Changes to the financial assurance mechanism must be approved by Ecology as specified in WAC 173-303-620(4).

WAC 173-806(4)(a)(xv), 620(4), (10)

Emerald will meet financial assurance requirements for closure outlined in WAC 173-303-620(4) and (10) through continual maintenance of an irrevocable letter of credit. The irrevocable letter of credit will cover the cost of closure identified in the closure cost estimate. As the closure plan is adjusted for inflation purposes, the irrevocable letter of credit will also be adjusted accordingly.

5.3 Financial Assurance for Liability

WAC 173-806(4)(a)(xvii), 620(8)

Emerald will meet the financial assurance requirements for liability outlined in WAC 173-303-620(8) through liability insurance (see Appendix I).

10/1/2007

Closure Cost Estimating Tool CCET

Version No. 1.3

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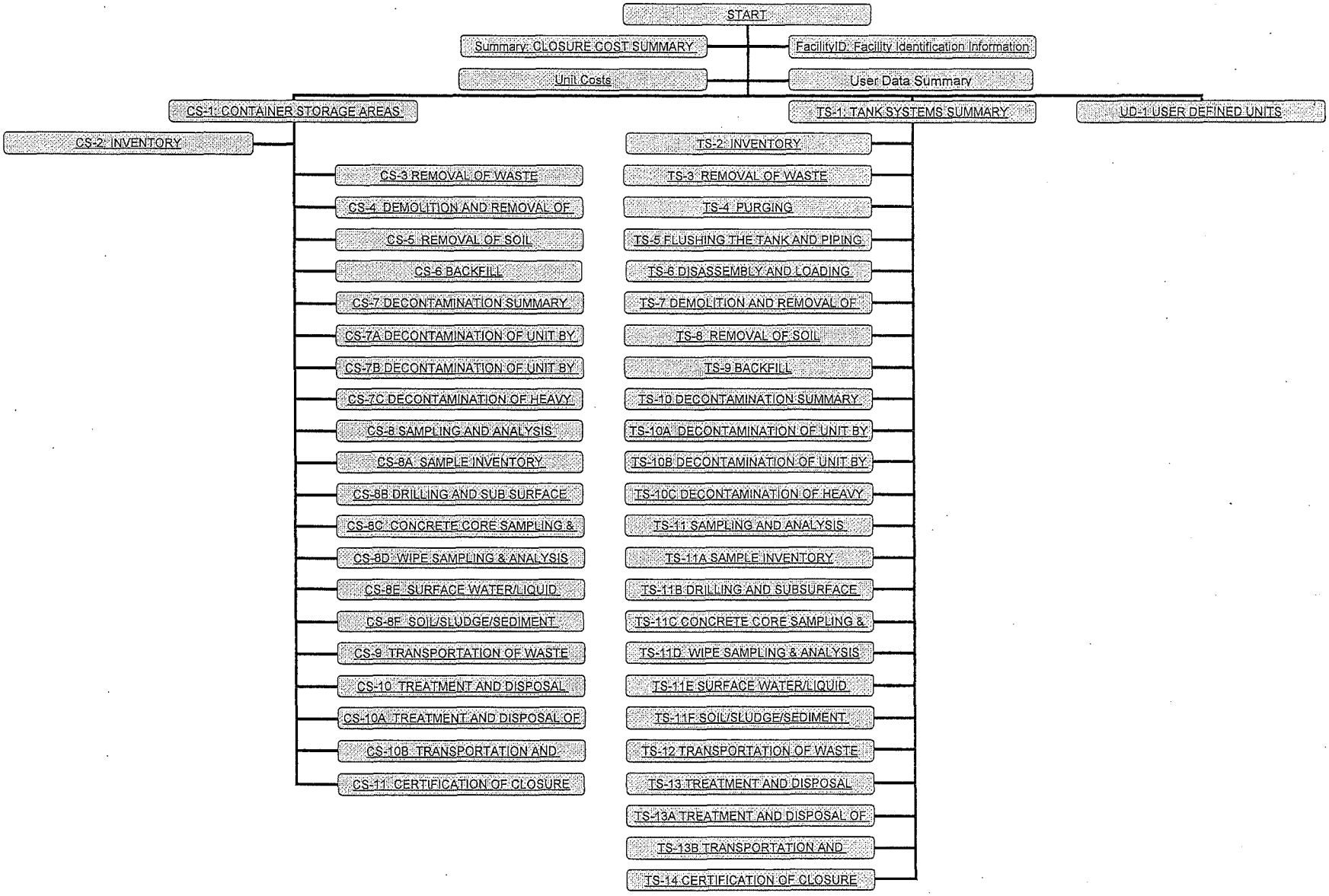

Facility Identification Information

Facility Information

Facility Name:	Emerald Services, Inc. - Tacoma Facility
Address1:	1825 Alexander Ave.
Address2:	
City	Tacoma
State	Washington
Zip	98421
Please enter first 3 digits of zip code to generate localization code	984

Closure Cost Estimate Creator Contact Information

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Closure Activity Questions

Does your facility store waste in containers?	Yes
Does your facility store waste in tanks?	Yes
Does your facility have a secondary containment system?	Yes
Will your facility need to do any sampling and analysis to perform or verify closure?	Yes
As part of closure, will you have to remove or decontaminate heavy equipment?	Yes
As part of closure, will you have to remove or demolish buildings or other structures?	No
As part of closure, will you have to remove or decontaminate soil?	No
As part of closure, will you use steam cleaning or pressure washing?	Yes
As part of closure, will you use sandblasting or scarification?	Yes
As part of closure, will you need to transport waste?	Yes
As part of closure, will you need to treat/dispose of waste?	Yes
As part of closure, will you need to decontaminate/dispose of a containment system?	No

FACILITY SUMMARY

				Localization Factor	1.03
	Unit	**Worksheet Reference**	**Cost to Close**	**Cost to Close with Localization Adjustment**	
1	Container Storage Areas	CS-1	126,236.81	130,023.92	
2	Tank Systems	TS-1	261,426.73	269,269.53	
3	User Defined Costs	UD-1	-817.94	-842.48	
	Subtotal		**386,845.60**	**398,450.97**	
	Enter Sales Tax Rate (default set at 8.9%) *a*		**9.30**	**9.30**	
	Sales Tax		**35,976.64**	**37,055.94**	
	Total Closure Costs Estimate		**422,822.24**	**435,506.91**	

Notes:

a Sales tax rates in Washington vary by local jurisdiction and may change over time. To look up the current sales tax rate for the facility location, click on the link below.
Department of Revenue Tax Rate Lookup Tool

Disclaimer

Conformance with this guidance does not release facility owners/operators from their obligations to notify Ecology prior to beginning the closure process, to submit closure plans for Ecology review and approval, or to in any other way comply with the requirements of Chapter 173-303 WAC. This guidance cannot be relied on by any person to create a right or benefit enforceable at law or equity. Ecology reserves the right to act at variance with this guidance at any time.

The methods described in this document do not represent the only methods acceptable to Ecology for demonstration of clean closure. Alternative methods to those presented here may be used during the closure plan approval process, subject to site specific review and approval by Ecology.

CS-1: CONTAINER STORAGE AREAS

SUMMARY WORKSHEET

	Some of the activities listed below are conducted routinely as part of closure of tank systems. The owner or operator, however, might intend or be required to conduct additional activities to effect closure at the unit. Worksheets for estimating the costs of such additional activities are listed in italic type.	**Worksheet Number**	**Cost ($)**
1	Removal of Waste	CS-3	3,805.79
2	*Demolition and Removal of Containment System*	CS-4	*0.00*
3	*Removal of Soil*	CS-5	*0.00*
4	*Backfill*	CS-6	*0.00*
5	Decontamination	CS-7	35,361.83
6	Sampling and Analysis	CS-8	9,164.94
7	Transportation	CS-9	13,500.00
8	Treatment and Disposal	CS-10	19,740.00
9	**Subtotal of Closure Costs (Add lines 1 through 8)**		**81,572.56**
10	Engineering Expenses (approximately 10% of closure costs, excluding certification of closure [Multiply line 9 by 0.10])		8,157.26
11	General Conditions (incl. personal protective equipment, labor supervision, insurance, temporary facilities, etc.) Approximately 10% of closure costs, excluding certification of closure. [multiply line 9 by 0.10]		8,157.26
12	Certification of Closure	CS-11	12,035.24
13	**Subtotal (add engineering expenses and costs of certification of closure to closure costs) (Add lines 9, 10, 11 and 12)**		**109,922.30**
14	Contingency Allowance (approximately 20% of closure costs, not including engineering expenses and costs of certification of closure) [Multiply line 9 by 0.20]		16,314.51
CONTAINER STORAGE AREAS: TOTAL COST OF CLOSURE (add lines 12 and 13)			**126,236.81**

CS-2: CONTAINER STORAGE AREAS
INVENTORY

1	**MAXIMUM STORAGE CAPACITY**				
	Determine the maximum capacity of the container storage area to determine the cost of waste disposal (for example, for a permitted facility, this would be the capacity listed on Part A of your permit)				
1.A	Volume of Waste	40,810.00	gal		
2	**SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD**				
	Decontamination or demolition of the secondary containment system pad is an activity that must be conducted at the time of closure. Calculate the surface area of the secondary containment system pad to determine the costs of decontamination or demolition of the pad.				
2.A	Length (excluding any curbs or berm)	122.95	ft		
2.B	Width (excluding any curbs or berm)	122.95	ft		
2.C	Surface Area of Containment System Pad (Multiply line 2.A by line 2.B)			15,116.70	ft2
2.D	Surface Area of Containment System Pad in yd2 (Divide line 2.C 2 by 9)			1,679.63	yd2
3	**VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD**				
	Removal of the secondary containment system pad is an activity that might be conducted if the owner or operator intends to remove the pad at the time of closure. Calculate the volume of the secondary containment system pad to determine the cost.				
3.A	**Thickness**		ft		
3.B	Thickness in yards (Divide line 3.A by 3)	0.00	yd		
3.C	Volume of Containment System Pad (Multiply line 2.D by line 3.B)			0.00	yd3
4	**SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM**				
	Decontamination of the secondary containment system berm is an activity that might be conducted at the time of closure. Calculate the surface area of the secondary containment system berm, or curbing, to determine the costs of decontaminating or demolishing the berm.				
4.A	Inside perimeter (multiply the sum of lines 2.A and 2.B by 2)	2,228.21	ft		
4.B	Height	0.80	ft		
4.C	Surface Area of Containment System Berm (Multiply line 4.A by line 4.B)			1,782.57	ft2
4.D	Surface Area of Containment System Berm in yd (Divide line 4.C 2 by 9)			198.06	yd2
5	**VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM**				
	Removal of the secondary containment system berm is an activity that might be conducted at the time of closure. Calculate the volume of the secondary containment system berm, or curbing, to determine the cost of removing the berm.				
5.A	Thickness		ft		
5.B	Thickness in yards (Divide line 5.A by 3)	0.00	yd		

5.C	Volume of Containment System Berm (Multiply line 4.D by line 5.B)		0.00	yd 3
6.A	**SURFACE AREA OF OTHER STRUCTURES (SPECIFY BY NAME)**			
	Decontamination of other structures is an activity that might be conducted at the time of closure. Calculate the surface area of all additional structures at the unit that will be decontaminated (for example, load/unload pads, ramps or sumps).			
	Name of First Structure	Sumps in Container Areas - LD, PPs, PAs, DWCS Pad		
1	Surface Area of Other Structures		161.27	ft2
2	Surface Area of Other Structures in yd2 (Divide line 6.A by 9)		17.92	yd 2
7.A	**VOLUME OF OTHER STRUCTURES**			
	Removal of other structures is an activity that might be conducted at the time of closure. Calculate the volume of all other structures to be removed.			
1	Volume of Other Structures			yd3
6.B	**SURFACE AREA OF OTHER STRUCTURES (SPECIFY BY NAME -- USE FOR SECOND STRUCTURE IF APPLICABLE)**			
	Decontamination of other structures is an activity that might be conducted at the time of closure. Calculate the surface area of all additional structures at the unit that will be decontaminated (for example, load/unload pads, ramps or sumps).			
	Name of Second Structure			
1	Surface Area of Other Structures			ft2
2	Surface Area of Other Structures in yd2 (Divide line 6.A by 9)		0.00	yd 2
7.B	**VOLUME OF OTHER STRUCTURES (USE FOR SECOND STRUCTURE IF APPLICABLE)**			
	Removal of other structures is an activity that might be conducted at the time of closure. Calculate the volume of all other structures to be removed.			
1	Volume of Other Structures			yd3
8	**VOLUME OF CONTAMINATED SOIL TO BE REMOVED**			
	Removal of contaminated soil is an activity that might be conducted at the time of closure. Calculate the volume of contaminated soil to be removed.			
8.A	Length	0.00	ft	
8.B	Width	0.00	ft	
8.C	Depth	0.00	ft	
8.D	Volume of Contaminated Soil to be Removed (Multiply line 8.A by line 8.B by line 8.C)		0.00	ft3
8.E	Volume of Contaminated Soil to be Removed in yd3 (Divide line 8.D by 27)		0.00	yd3

CS-3: CONTAINER STORAGE AREAS

REMOVAL OF WASTE

1	Maximum volume of waste to be removed from the unit (Enter from Worksheet CS-2, line 1.A)	40,810.00	gal	
2	Number of containers to be removed (Divide line 1 by 55; round up to the next whole number)	742.00	containers	
3	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
4	Labor and equipment cost per work hour *b*	205.16	$	
5	Work rate to remove containers of waste from the unit *c*	0.03	work hr/ container	
6	Number of hours required to remove containers of waste from the unit (Multiply line 2 by line 5) (One hour minimum; round up to the half-hour)	18.55	work hrs	
UD			$	
	TOTAL COST OF REMOVAL OF WASTE (Multiply line 4 by line 6) (Enter total on Worksheet CS-1, line 1)	3,805.79	$	

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for height levels of PPE will reduce the productivity of labor and equipment. PPE requirement therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b The estimated cost per hour of all labor and equipment needed to remove containers of waste from the unit.

c The estimated number of hours required to remove one container of waste from the unit. If, for example, it will take 5 minutes to remove each container of waste from the unit, enter a work rate of 0.083 (5 divided by 60) for removing the containers. If an estimate of the total number of hours required to remove the container of waste from the unit has already been formulated, you may bypass this step and enter that number directly on line 6.

CS-4:CONTAINER STORAGE AREAS

Key:

DEMOLITION AND REMOVAL OF CONTAINMENT SYSTEM

1	**DEMOLITION OF CONTAINMENT SYSTEM**			
1.A	Surface area of containment system (Enter from Worksheet CS-2; add lines 2.C, 4.C, and 6.A.1 and 6.A.2)	17,060.54	ft 2	If you are not going to demolish all structures, enter the surface area of the structure(s) you are going to demolish. Ensure all other containment structures are included on other sheets in this program.
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
1.C	Labor and equipment cost per work hour *b*	61.07	$	
1.D	Work rate required to demolish one ft2 of containment system *c*	0.11	work hr/ft 2	
1.E	Number of hours required to demolish the con-containment system (Multiply line 1.A by line 1.D) (One hour minimum; round up to the half-hour)	1,826.48	work hrs	
1.F	Cost to Demolish the Containment System (Multiply line 1.C by line 1.E)		111,485.58	$
2	**REMOVAL AND LOADING OF CONTAINMENT SYSTEM**			
2.A	Volume of the containment system (Enter from worksheet CS-2; add lines 3.C, 5.C, and 7)	0.00	yd3	
2.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
2.C	Labor and equipment cost per work hour *d*	#N/A	$	
2.D	Work rate to remove and load one yd3 *e*	0.27	work hr/yd 3	
2.E	Number of hours required to remove and load the containment system (Multiply line 2.A by line 2.D) (One hour minimum; round up to the half-hour)	0.00	work hrs	
2.F	Subtotal of labor and equipment costs to remove and load the containment system (Multiply line 2.C by line 2.E)	#N/A	$	
2.G	Number of debris box containers needed to hold the containment system (Divide line 2.A by 20 yd3 per container; round up to the nearest whole number)	0.00	containers	
2.H	Cost of one 20-yd3 -capacity debris box container (rent per week)	883.69	$/container	
2.I	Cost of containers (Multiply line 2.G by line 2.H)		0.00	$
2.J	Cost of mobilization and demobilization (flat rate)		548.35	$
2.K	Cost to Remove and Load Containment System (Add lines 2.F, 2.I, and 2.J)		#N/A	$
UD				$
	TOTAL COST OF DEMOLITION AND REMOVAL OF CONTAINMENT SYSTEM (Add lines 1.F and 2.K) (Enter total on worksheet CS-1, line 2)		#N/A	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to demolish the containment system.

c The estimated number of work hours required to demolish one ft of the containment system. If, for example, it is estimated that it will take 5 minutes to demolish one ft of the containment system, enter rate of 0.083 (5 divided by 60) for demolishing the system. If an estimate of the total number of hours required to demolish the containment system has already been formulated, you may bypass this step and enter that number directly on line 1.E

d The estimated cost per work hour of all labor and equipment needed to remove and load the containment system. In addition to costs for labor, this cost should include the average cost per work hour for rental of all equipment and purchase of all supplies needed to conduct this activity.

e The estimated number of work hours required to remove and load one yd of the containment system. If, for example, it is estimated that it will take 20 minutes to remove and load one yd 3 of the containment system, enter a work rate of 0.333 (20 divided by 60) for removing and loading the system. If an estimate of the total number of hours required to remove and load the containment system has already been formulated, you may bypass this step and enter that number directly on line 2.E.

CS-5:CONTAINER STORAGE AREAS
REMOVAL OF SOIL

1	Volume of contaminated soil to be removed (Enter from worksheet CS 2, line 8.E)	0.00	yd3	If you are removing a different volume of soil, please enter the reason here
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*		PPE	
3	Labor and equipment cost per work hour *b*	#N/A	$/hr	
4	Work rate required to remove one yd 3,c	0.03	work hr/yd 3	
5	Number of hours required to remove soil (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	0.00	work hrs	
6	Subtotal of labor and equipment costs to remove soil (Multiply line 3 by line 5)		#N/A	$
7	Number of debris box containers needed to hold soil (Divide line 1 by 20 yd3 per container; round up to the nearest whole number)	0.00	containers	
8	Cost of one 20-yd -capacity debris box 3 container (rent per week)	883.69	$/container	
9	Cost of containers (Multiply line 7 by line 8)		0.00	$
10	Cost of mobilization and demobilization (flat rate)		548.35	$
UD				$
	TOTAL COST OF REMOVAL OF SOIL (Add lines 6, 9, and 10) (Enter total on worksheet CS-1, line 3)		#N/A	$

10 Mobilization cost not required.

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers a who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity

b The estimated cost per work hour of all labor and equipment needed to remove contaminated soil.

c The estimated number of work hours required to remove one yd3 of soil. If, for example, it is estimated that it will take 5 minutes to remove one yd3 of soil, a work rate of 0.083 (5 divided by 60) for removing the soil is calculated.

CS-6:CONTAINER STORAGE AREAS

BACKFILL

1	Volume of fill (Enter from worksheet CS-2; add lines 3.C and 8.E) *a*	0.00	yd3	If you are conducting a different volume of fill, please enter the reason here
2	Recommended compaction factor *b*	0.25		
3	Volume of additional fill required because of compaction factor (Multiply line 1 by line 2)	0.00	yd3	
4	Total volume of fill needed (Add lines 1 and 3) (One yd3 minimum; round up to the nearest whole number)	0.00	yd3	
5	Level of PPE assumed for this activity (protection level D, C, or B) *c*		level of PPE	
5	Labor, material, and equipment cost per yd3,*c*	#N/A	$ /yd 3	
6	Subtotal of labor, material, and equipment costs to backfill (Multiply line 4 by line 5)		#N/A	$
7	Cost of mobilization and demobilization (flat rate)		548.35	$
UD				$
TOTAL COST OF BACKFILL (Add lines 6 and 7) (Enter total on Worksheet CS-1, line 4)			#N/A	$

7 Mobilization cost not required.

Notes:

a If the structures, or portions of the structures, identified in sections 6 and 7 of the inventory worksheet are below the ground surface, the additional volumes of fill that will be required should be added to this

b U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closu Plans (Subparts G and H), January 1987, EPA/530-SW-87-009, Volume III, pg. 7-10. Compaction factor provided is for native soil for slope and fill. Alternative compaction factors may be substituted as appropriat

c The estimated cost per yd3 of all labor, material, and equipment needed to conduct backfilling.

NTAINER STORAGE AREAS
AMINATION SUMMARY WORKSHEET

DECONTAMINATION SUMMARY WORKSHEET			
Activity		**Worksheet Number**	**Cost $**
1	Decontamination of Unit by Steam Cleaning or Pressure Washing	CS-7A	0.00
2	Decontamination of Unit by Sandblasting/Scarification	CS-7B	34,980.93
3	Decontamination of Heavy Equipment	CS-7C	380.90
TOTAL COST OF DECONTAMINATION (Add lines 1, 2, and 3) (Enter total on Worksheet CS-1, line 5)			**35,361.83**

CS-7A:CONTAINER STORAGE AREAS

DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING

1	Area of unit to be decontaminated (Enter from Worksheet CS-2; add lines 2.C, 4.C, and 6.A.1 and 6.B.1)	17,060.54	ft2	If you are not going to pressure wash/steam clean all structures, enter the surface area of the structure(s) you are going to pressure wash/steam clean. Ensure all other containment structures are included on other sheets in this program.
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
3	Labor and equipment cost per work hour *b*	#N/A	$	
4	Work rate to steam clean or pressure wash one ft2 *c*	0.03	work hrs/ft 2	
5	Number of hours required to steam clean or pressure wash the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	460.63	work hrs	
6	Subtotal of labor and equipment costs to decontaminate the unit by steam cleaning or pressure washing (Multiply line 3 by line 5)		#N/A	$
7	Volume of decontamination fluid (Multiply line 1 by 4 gal/ft2) (The decontamination fluids 2*d* generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet CS-10B to cal	68,242.16	gal	
	Check this box if you plan on disposing of the decontamination solution as bulk liquid	☐	If you check this box, please calculate the treatment and disposal costs calculated in Sheet CS-10B	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum; round up to the nearest whole number)	1,241.00	drums	
9	Cost of one drum	263.50	$ /drum	
10	Cost of drums needed to contain decontamination fluid (Multiply line 8 by line 9)		327,003.50	$
11	Sampling and Analysis Costs (If applicable)			$
UD				$
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING (For bulk liquids, enter from line 6. For liquids in drums, add lines 6 and 10). (Enter total on Worksheet CS-7, line 1)			#N/A	$

Remember to calculate costs for transporting, treating, and disposing of all decontamination fluids in drums that are generated from this activity, using worksheets CS-9 and CS-10A, respectively. If decontamination fluids are to be managed as a bulk liquid, use Worksheet CS-10B.

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to decontaminate the unit by steam cleaning or pressure washing.

c The estimated number of work hours required to steam clean or pressure wash one ft 2 of surface area. If, for example, it is estimated that it will take 10 minutes to steam clean or pressure wash one ft2 of surface area, enter a work rate of 0.167 (10 divided by 60) for steam cleaning or pressure washing the unit. If an estimate of the total number of hours required to decontaminate the unit has already been formulated, you may bypass this step and enter that number directly on line 5.

CS-7B:CONTAINER STORAGE AREAS
DECONTAMINATION OF UNIT BY SANDBLASTING/SCARIFICATION

	Area of unit to be decontaminated (Enter from Worksheet CS-2; add lines 2.C, 4.C, and 6.A.1 and 6.B.1)	17,060.54	ft2	If you are to sandbl all structu the surfac the struct are going sandblast Ensure al containm structures included sheets in program.
2	Level of PPE assumed for this activity protection level D, C, or B) a	D	level of PPE	
3	Labor and equipment cost per work hour *b*	102.52	$	
4	Work rate sandblast/scarify ft2 *c*	0.02	work hrs/ft 2	
5	Number of hours required to sandblast/scarify the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	341.21	work hrs	
6	Subtotal of labor and equipment costs to decontaminate the unit by sandblasting/scarification (Multiply line 3 by line 5)		34,980.93	$
7	Volume of cement dust generated (Multiply line 1 by 0.6 cm and convert to gallons	2,515.42	gal	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum; round up to the nearest whole number)	46.00	drums	
9	Cost of transport and disposal of one drum	275.74	$ /drum	
10	Cost of drums needed to contain decontamination fluid (Multiply line 8 by line 9)		12,684.16	$
11	Sampling and Analysis Costs (If applicable)			$
UD	Solids generated from scarification would be managed as bulk, and are addressed in TS-11A, TS-12 and TS-13A		-12,684.16	$
TOTAL COST OF DECONTAMINATION OF UNIT BY SANDBLASTING/SCARIFICATION (For bulk liquids, enter from line 6. For liquids in drums, add lines 6 and 10). (Enter total on Worksheet CS-7, line 1)			**34,980.93**	$

Adjusted scarification rate to average of 1 ft2 per minute, or work rate of 0.02 hr/ft2 (MOOSE machine works at 62.5 ft2 per hour, but won't do area close to walls, which must be done at slower rate – used 60 ft2 per hour as rounded average of larger area at fast rate and smaller area at slower rate)

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to decontaminate the unit by sandblasting/scarificatio

c The estimated number of work hours required to sandblast/scarify one ft 2 of surface area. If, for example, it is estimated that it will take 10 minutes to sandblast/scarify one ft of surface area, a work rate of 0.167 (10 divided 2 by 60) for sandblasting the unit is calculated.

d U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure Plans (Subparts G and H), January 1987, EPA/530-SW-87-009, Volume III, pg. 5-3. The generation rate provided is recommended for this activity. However, alternative rates may be used, as appropriate. U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure.

e Unit weight of medium sand, on average, equals 110 lbs/ft . Using the conversions of 0.1337 ft3 /gal and 55-gal/drum, the calculation is: 110 lbs/ft x 0.1337 ft 3/gal x 55 gal/drum = 808.89 lb/drum.

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CS-7C:CONTAINER STORAGE AREAS

DECONTAMINATION OF HEAVY EQUIPMENT

	Number of hours needed to decontaminate all heavy equipment used during closure of the unit (Use the Decontamination Times for Heavy Equipment chart to estimate this - scroll down to the bottom of the worksheet)	6.00	work hrs	
	Enter types and number of Heavy Equipment being decontaminated			
	Three forklifts plus the skid vac			
2	Cost of rental of steam cleaner per hour	9.58	$ /hr	
3	Subtotal steam cleaner rental costs (Multiply line 1 by line 2)		57.50	$
4	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
5	Labor cost per work hour *b*	53.90	$	
6	Subtotal of labor costs (Multiply line 1 by line 5)		323.40	$
7	Volume of decontamination fluid (Multiply line 1 by 100 gallons per hour) (The decontamination fluids generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet CS-10B	600.00	gal	
	Check this box if you plan on disposing of the decontamination solution as bulk liquid	☑	If you check this box, please calculate the treatment and disposal costs calculated in Sheet CS-10B	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum and round up to the nearest whole number)	11.00	drums	
9	Cost of one drum	263.50	$ /drum	
10	Cost of drums (Multiply line 8 by line 9)		0.00	$
11	Cost of construction of temporary decontamination area for heavy equipment. Only include this cost if no permanent decontamination area exists (otherwise, enter 0). **NOTE: USUALLY THIS COST WILL BE INCURRED ONLY ONCE FOR THE CLOSURE OF ALL UNITS. THIS IS AN ASSUMED COST. IF YOU KNOW AN EXACT COST FOR THIS ITEM, ENTER IT INSTEAD.**		0.00	$
12	Cost of demolition of temporary decontamination area for heavy equipment. Include this cost if no permanent decontamination area exists (otherwise, enter 0). **NOTE: USUALLY THIS COST WILL BE INCURRED ONLY ONCE FOR THE CLOSURE OF ALL UNITS. THIS IS AN ASSUMED COST. IF YOU KNOW AN EXACT COST FOR THIS ITEM, ENTER IT INSTEAD.**		0.00	$
13	Sampling and Analysis Costs (If applicable)			$
JD	Emerald would not construct a separate containment area for decontamination of equipment. Decontamination would be completed in existing containment areas prior to decontamination of the containment.			$
TOTAL COST OF DECONTAMINATION OF HEAVY EQUIPMENT (Add lines 3, 6, 10, 11, and 12) (enter total on worksheets CS-7, line 3)			380.90	$

Remember to calculate costs for transporting, treating, and disposing of all wastes in drums that are generated from this activity, using worksheets CS-9 and CS-10A, respectively. If decontamination fluids are to be managed as a bulk liquid, use Worksheet CS-10B.

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hour required to conduct this activity.

b The estimated cost per work hour of all labor required to decontaminate heavy equipment.

Decontamination Times for Heavy Equipment a Reference for Line 1

Equipment	Decontamination Time (Hours)
Forklift	1
Rotary disc	1
Tractor	2
Tank wagon	2
Front-end loader	3
Dozer	3
Backhoe	3
Front shovel	3

Notes:

a U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure a Plans (Subparts G and H), January 1987, EPA/530-SW-87-009, Volume III, pg. 5-2. Decontamination times provided for specific pieces of equipment are recommended for this activity. However, alternative times also may be used, as appropriate.

CS-8:CONTAINER STORAGE AREAS
SAMPLING AND ANALYSIS SUMMARY SHEET

SAMPLING AND ANALYSIS SUMMARY WORKSHEET				
	Activity	Worksheet Numbers	Cost ($)	
1	Drilling and Subsurface Soil Sampling & Analysis	CS-8B	9,164.94	$
2	Concrete Core Sampling & Analysis	CS-8C	0.00	$
3	Wipe Sampling & Analysis	CS-8D	0.00	$
4	Surface Water/Liquid Sampling & Analysis	CS-8E	0.00	$
5	Soil/Sludge/Sediment Sampling & Analysis	CS-8F	0.00	$
TOTAL SAMPLING AND ANALYSIS COST (Add lines 1 through 5) (Enter total on Worksheet CS-1, line 6)			**9,164.94**	**$**

CS-8A:CONTAINER STORAGE AREAS
SAMPLE INVENTORY

1 NUMBER OF DRILLING AND SUBSURFACE SOIL SAMPLES

In the space below, identify the number of boreholes and the number of subsurface soil samples per borehole to be collected for each individual unit. Record the total number of samples to be collected in the box provided.

1	**Number of Subsurface Soil Samples**			
	Boring Diameter:	14	1	14
		boreholes	samples/borehole	total samples

2 NUMBER OF CONCRETE CORE SAMPLES

In the space below, identify the number of concrete core samples to be collected for each individual unit. Record the total number of samples to be collected in the box provided.

2	**Number of Concrete Core Samples**		total samples

3 NUMBER OF WIPE SAMPLES

In the space below, identify the number of sample locations and the number of wipe samples per location to be collected for each individual unit. Record the total number of samples to be collected in the box provided.

3	**Number of Wipe Samples**			
				0
		locations	samples/location	total samples

4 NUMBER OF SURFACE WATER/LIQUID SAMPLES

In the space below, identify the number of grab samples on lakes, rivers, or ponds and samples taken of liquid wastes such as rinsate and surface water. Record the total number of samples to be collected in the box provided.

4	**Number of Aqueous Samples**			
				0
		locations	samples/location	total samples

5 NUMBER OF SOIL/SLUDGE/SEDIMENT SAMPLES

In the space below, identify the number of grab samples of surface soil, sludge, sediment, or concrete chips and the number of samples per location to be collected for each individual unit. Record the total number of samples to be collected in the box provided.

5	**Number of Nonaqueous Samples**			
				0
		locations	samples/location	total samples

CS-8B:CONTAINER STORAGE AREAS

DRILLING AND SUB SURFACE SOIL SAMPLING AND ANALYSIS AND WELL INSTALLATION

1 COLLECTING SUBSURFACE SOIL SAMPLES - 2-1/2-INCH-DIAMETER BOREHOLE				
1.A	Number of boreholes to be drilled (Enter from worksheet CS-8A, line 1)	14	boreholes	
1.B	Total depth of all boreholes (Add all depths. If the depths are not known, estimate the average depth of the boreholes to be drilled and multiply the estimated depth by line 1.A)	20	ft	
1.C	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
1.D	Labor and equipment cost per work hour *b*	101.266	$ /work hr	
1.E	Work rate to drill 2-1/2-inch-diameter hole *c*	0.43	work hr/ft	
1.F	Number of hours required to drill total depth of 2-1/2-inch-diameter holes (Multiply line 1.B by line 1.E) (One hour minimum; round up to the half-hour)	8.64	work hrs	
1.G	**Cost to Drill 2-1/2-inch Borings (Multiply line 1.D by line 1.F)**		874.93824	$
1.H	**Cost of Wells (if applicable)**			$
1.I	**Total Cost of Borings/Wells**		874.93824	
2 COLLECTING SUBSURFACE SOIL SAMPLES - 4-INCH-DIAMETER BOREHOLE				
2.A	Number of boreholes to be drilled (Enter from worksheet CS-8A, line 1)	14	boreholes	
2.B	Total depth of all boreholes (Add all depths. If the depths are not known, estimate the average depth of the boreholes to be drilled and multiply the estimated depth by line 2.A)		ft	
2.C	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
2.D	Labor and equipment cost per work hour *b*	#N/A	$ /work hr	
2.E	Work rate to drill 4-inch-diameter hole *d*	0.74	work hr/ft	
2.F	Number of work hours required to drill total depth of 4-inch-diameter holes (Multiply line 2.B by line 2.E) (One hour minimum; round up to the half-hour)	0	work hrs	
2.G	**Cost to Drill 4-inch Borings (Multiply line 2.D by line 2.F)**		#N/A	$
2.H	**Cost of Wells (if applicable)**			$
2.I	**Total Cost of Borings/Wells**		0	
3	**ANALYZING SUBSURFACE SOIL SAMPLES**			
3.A	Determine the cost of analysis per sampling event for subsurface soil samples (Use the Estimated Analytical Cost per Sampling Event at the bottom of this worksheet)	8290	$ /event	
3.B	Number of sampling events	1	events	
3.C	**Cost to Analyze Subsurface Soil Samples (Multiply line 3.A by line 3.B)**		8290	$
UD	**Samples are from Loading Dock, Production Pads, Process Areas, and Dangerous Waste**			$
TOTAL COST OF COLLECTION AND ANALYSIS OF SUBSURFACE SOIL SAMPLES (Add lines 1.G, 2.G, and 3.C) (Enter total on Worksheet CS-8, line 1)			9164.93824	$

Notes:

a Because workers who are encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours needed to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to collect boring and subsurface soil samples.

c The estimated number of work hours per foot required to drill a 2½-inch-diameter hole and collect subsurface soil samples. If, for example, it is estimated that it will take 45 minutes per foot to drill a 2½-inchdiameter hole and collect a sample, enter a work rate of 0.750 (45 divided by 60) for conducting those activities. The work rate should account for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all its sampling equipment.

d Enter the estimated number of work hours per foot required to drill a 4-inch-diameter hole and collect subsurface soil samples. If, for example, it is estimated that it will take 45 minutes per foot to drill a 4-inch-diameter hole and collect a sample, enter a work rate of 0.750 (45 divided by 60) for drilling the hole. The work rate should account for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all sampling equipment. If an estimate of the total number of hours required to drill 4-inch holes and collect subsurface soil samples has already been formulated, you may bypass this step and enter that number directly on line 2.F.

Estimated Analytical Cost per Sampling Event Reference for Line 3.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)	160	14	2240
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)	275	14	3850
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)	95	4	380
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis	130	14	1,820
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			8290

a Determine the total number of samples to be analyzed at the time of closure. The number of quality control (QC) samples typically is estimated at 20 percent of the total number of samples to be analyzed.

CS-8C:CONTAINER STORAGE AREAS
CONCRETE CORE SAMPLING & ANALYSIS

1 COLLECTING CONCRETE CORE SAMPLES				
1.A	Number of concrete core samples to be collected (Enter from worksheet CS-8A, line 2)	0	core samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
1.C	Labor and equipment cost per work hour *b*	#N/A	$	
1.D	Work rate to drill a 3-inch-diameter core sample boring to a depth of 6 inches *c*	1.00	work hr/sample	
1.E	Number of hours required to drill 3-inch-diameter borings (Multiply line 1.A by Line 1.D) (One hour minimum; round up to the half-hour)	0	work hrs	
1.F	Cost to Collect Concrete Core Samples (Multiply line 1.C by line 1.E)		#N/A	$
2 ANALYZING CONCRETE CORE SAMPLES				
2.A	Determine the cost of analysis per sampling event for concrete core samples (Use the Estimated Analytical Cost per Sampling Event at the bottom of this worksheet)		$ /event	
2.B	Enter the number of sampling events		events	
2.C	**Cost to Analyze Concrete Core Samples (Multiply line 2.A by line 2.B)**		0.00	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF CONCRETE CORE SAMPLES (Add lines 1.F and 2.C) (Enter total on Worksheet CS-8, line 2)			#N/A	$

Notes:

a Because workers who are encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours needed to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to collect concrete core samples.

c The estimated number of work hours required to drill one 3-inch-diameter core sample boring to a depth of 6 inches. If, for example, it is estimated that it will take 45 minutes to drill one 3-inch-diameter core sample boring, a work rate of 0.750 (45 divided by 60) for conducting that activity is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all its sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			0

a Determine the total number of samples to be analyzed at the time of closure. The number of quality control (QC) samples typically is estimated at 20 percent of the total number of samples to be analyzed.

CS-8D: CONTAINER STORAGE AREAS

WIPE SAMPLING & ANALYSIS

COLLECTING WIPE SAMPLES				
1.A	Number of wipe samples to be collected (Enter from worksheet CS-8A, line 3)	0	samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) a		level of PPE	
1.C	Labor and equipment cost per work hour b	#N/A	$	
1.D	Work rate required to collect one sample c	0.50	work hr/sample	
1.E	Number of hours required to collect all samples (Multiply line 1.A by line 1.D)	0	work hrs	
1.F	**Cost to Collect Wipe Samples (Multiply line 1.C by line 1.E)**		#N/A	$
2 ANALYZING WIPE SAMPLES				
2.A	Cost of analysis per sampling event for wipe samples (Use the Estimated Analytical Cost per Sampling Event at the bottom of this worksheet)		$ /event	
2.B	Number of sampling events		events	
2.C	**Cost to Analyze Wipe Samples (Multiply line 2.A by line 2.B)**		0	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF WIPE SAMPLES (Add lines 1.F and 2.C) (Enter total on Worksheet CS-8, line 3)			#N/A	$

Notes:

a Because workers who are encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours needed to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to collect concrete core samples.

c The estimated number of work hours required to drill one 3-inch-diameter core sample boring to a depth of 6 inches. If, for example, it is estimated that it will take 45 minutes to drill one 3-inch-diameter core sample boring, a work rate of 0.750 (45 divided by 60) for conducting that activity is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all its sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			0

a Determine the total number of samples to be analyzed at the time of closure. The number of quality control (QC) samples typically is estimated at 20 percent of the total number of samples to be analyzed.

CS-8F:CONTAINER STORAGE AREAS
SOIL/SLUDGE/SEDIMENT SAMPLING & ANALYSIS

COLLECTING SOIL/SLUDGE/SEDIMENT SAMPLES				
1.A	Number of soil/sludge/sediment samples to be collected (not from borings) (Enter from worksheet CS-8A, line 5)	0	samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
1.C	Labor and equipment cost per work hour *b*	#N/A	$	
1.D	Work rate required to collect one sample *c*	1.00	work hr/sample	
1.E	Number of hours required to collect all samples (Multiply line 1.A by line 1.D)	0.00	work hrs	
1.F	**Cost to Collect Soil/Sludge/Sediment Samples (Multiply line 1.C by line 1.E)**		#N/A	$
2 ANALYZING SOIL/SLUDGE/SEDIMENT SAMPLES				
2.A	Cost of analysis per sampling event for soil/sludge/sediment samples (Use the Estimated Analytical Cost per Sampling Event at the bottom of this worksheet)		$ /event	
2.B	Number of sampling events		events	
2.C	**Cost to Analyze Soil/Sludge/Sediment Samples (Multiply line 2.A by line 2.B)**		0.00	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF SOIL/SLUDGE/SEDIMENT SAMPLES (Add lines 1.F and 2.C) (Enter total on Worksheet CS-8, line 5)			#N/A	$

Notes:

a Because workers who are encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours needed to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to collect concrete core samples.

c The estimated number of work hours required to drill one 3-inch-diameter core sample boring to a depth of 6 inches. If, for example, it is estimated that it will take 45 minutes to drill one 3-inch-diameter core sample boring, a work rate of 0.750 (45 divided by 60) for conducting that activity is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all its sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			0

a Determine the total number of samples to be analyzed at the time of closure. The number of quality control (QC) samples typically is estimated at 20 percent of the total number of samples to be analyzed.

CS-8E: CONTAINER STORAGE AREAS

SURFACE WATER/GROUNDWATER SAMPLING & ANALYSIS

1 COLLECTING SURFACE WATER/GROUNDWATER SAMPLES				
1.A	Number of surface water/liquid samples to be collected (Enter from worksheet CS-8A, line 4)	0	samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
1.C	Labor and equipment cost per work hour *b*	#N/A	$	
1.D	Work rate required to collect one sample *c*	0.50	work hr/sample	
1.E	Number of hours required to collect all samples (Multiply line 1.A by line 1.D)	0.00	work hrs	
1.F	**Cost to Collect Surface Water/Groundwater Samples (Multiply line 1.C by line 1.E)**		#N/A	$
2 ANALYZING SURFACE WATER/GROUNDWATER SAMPLES				
2.A	Cost of analysis per sampling event for surface water/liquid samples (Use the Estimated Analytical Cost per Sampling Event at the bottom of this worksheet)		$ /event	
2.B	Number of sampling events		events	
2.C	Cost to Analyze Surface Water/Groundwater Samples (Multiply line 2.A by line 2.B)		0.00	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF AQUEOUS SAMPLES (Add lines 1.F and 2.C) (Enter total on Worksheet CS-8, line 4)			#N/A	$

Notes:

a Because workers who are encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours needed to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to collect concrete core samples.

c The estimated number of work hours required to drill one 3-inch-diameter core sample boring to a depth of 6 inches. If, for example, it is estimated that it will take 45 minutes to drill one 3-inch-diameter core sample boring, a work rate of 0.750 (45 divided by 60) for conducting that activity is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all its sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			0

a Determine the total number of samples to be analyzed at the time of closure. The number of quality control (QC) samples typically is estimated at 20 percent of the total number of samples to be analyzed.

CS-9:CONTAINER STORAGE AREAS

TRANSPORTATION OF WASTE

1 TRANSPORTATION OF WASTE IN DRUMS		Flammable solids to Rineco		
1.A	Number of drums of waste	112.00	drums	
1.B	Cost to transport one truckload of 55-gallon drums to the nearest treatment or disposal facility that will accept the waste	4,500.00	$ /truckload	
1.C	Number of truckloads needed to transport waste in drums (Divide line 1.A by 80 drums per truckload; round up to the nearest whole number)	2.00	truckloads	
1.D	Cost to Transport Waste In Drums (Multiply line 1.B by line 1.C)		9,000.00	$
2 TRANSPORTATION OF WASTE IN DRUMS		WA State Reg, Class 9, Poisons, Drum Jail to USE		
2.A	Number of drums of waste	130.00	drums	
2.B	Cost to transport one truckload of 55-gallon drums to the nearest treatment or disposal facility that will accept the waste	2,250.00	$ /truckload	
2.C	Number of truckloads needed to transport waste in drums (Divide line 1.A by 80 drums per truckload; round up to the nearest whole number)	2.00	truckloads	
2.D	Cost to Transport Waste In Drums (Multiply line 1.B by line 1.C)		4,500.00	$
3 TRANSPORTATION OF WASTE IN DRUMS				
3.A	Number of drums of waste		drums	
3.B	Cost to transport one truckload of 55-gallon drums to the nearest treatment or disposal facility that will accept the waste		$ /truckload	
3.C	Number of truckloads needed to transport waste in drums (Divide line 1.A by 80 drums per truckload; round up to the nearest whole number)	0.00	truckloads	
3.D	Cost to Transport Waste In Drums (Multiply line 1.B by line 1.C)		0.00	$
4 TRANSPORTATION OF BULK LIQUIDS		Fuel Blend Liquids by Rail to Cadence		
4.A	Gallons of liquid waste	18,700.00	gal	
4.B	Cost to transport one truckload of bulk liquids to the nearest treatment or disposal facility that will accept the waste	0.00	$ /truckload	
4.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 2.A by 6,900 gallons per truckload; round up to the nearest whole number)	3.00	truckloads	
4.D	Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)		0.00	$
5 TRANSPORTATION OF BULK LIQUIDS		Antifreeze (non-RCRA)		
5.A	Gallons of liquid waste	7,920.00	gal	
5.B	Cost to transport one truckload of bulk liquids to the nearest treatment or disposal facility that will accept the waste	0.00	$ /truckload	
5.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 2.A by 6,900 gallons per truckload; round up to the nearest whole number)	2.00	truckloads	
5.D	Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)		0.00	$
6 TRANSPORTATION OF BULK LIQUIDS		Antifreeze (RCRA) - Fuel Blend		
6.A	Gallons of liquid waste	880.00	gal	
6.B	Cost to transport one truckload of bulk liquids to the nearest treatment or disposal facility that will accept the waste	0.00	$ /truckload	
6.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 2.A by 6,900 gallons per truckload; round up to the nearest whole number)	1.00	truckloads	
6.D	Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)		0.00	$
7	TRANSPORTATION OF BULK WASTE			
7.A	Number of waste debris boxes		debris boxes	
7.B	Cost to transport one truckload of bulk waste to the nearest treatment or disposal facility that will accept the waste		$ /truckload	
7.C	Cost to Transport Bulk Solid Waste (assume one debris box can be hauled on each truck) (Multiply line 3.A by line 3.B)		0.00	$
UD	Rail transportation costs listed on TS-12		0.00	$
TOTAL COST TO TRANSPORT WASTE (Add lines 1.D, 2.D, and 3.C) (Enter total on Worksheet CS-1, line 7)			13,500.00	$

CS-10:CONTAINER STORAGE AREAS
TREATMENT AND DISPOSAL SUMMARY SHEET

Check boxes below to activate sheets	SUMMARY WORKSHEET			
		Activity	Worksheet Number	Cost($)
☑	1	Treatment and Disposal of Waste	CS-10A	19,740.00
☐	2	Transportation and Disposal of Decontamination Fluids	CS-10B	0.00
	TOTAL COST OF TREATMENT AND DISPOSAL (Add lines 1 and 2) (Enter total on Worksheet CS-1, line 8)			**19,740.00**

CS-10A:CONTAINER STORAGE AREAS
TREATMENT AND DISPOSAL OF WASTE

Key:

1	TREATMENT AND DISPOSAL OF WASTE - 1 (SOLID)				
1.A	Volume of dangerous waste in yd3 to be treated or disposed of (If the waste is not recorded in yd3, use the factors in Table 1 of this worksheet to convert to yd3)		yd 3		
1.B	Number of pounds per yd3 of waste (Select from Table 2 of this worksheet the density of material that most closely resembles the density of the waste to be treated or disposed of.)		lb/yd3		
1.C	Amount in lbs of waste to be treated and disposed of (Multiply line 1.A by line 1.B)	0.00	lb		
1.D	Amount in tons of waste to be treated and disposed of (Divide line 1.C by 2,000)	0.00	tons		
1.E	Treatment and disposal cost per ton		$ /ton		
1.F	**Cost to Treat and Dispose of Waste 1 (Multiply line 1.D by line 1.E)**			**0.00**	**$**
2	TREATMENT AND DISPOSAL OF WASTE - 2 (SOLID)				
2.A	Volume of waste in yd to be treated or 3 disposed of (If the waste is not recorded in yd3, use the factors in Table 1 of this worksheet to convert to yd3)		yd3		
2.B	Number of pounds per yd3 of waste (Select from Table 2 of this worksheet the density of material that most closely resembles the density of the waste to be treated or disposed of.)		lb/yd 3		
2.C	Amount in lbs of waste to be treated and disposed of (Multiply line 2.A by line 2.B)	0.00	lb		
2.D	Amount in tons of waste to be treated and disposed of (Divide line 2.C by 2,000)	0.00	tons		
2.E	Treatment and disposal cost per ton		$ /ton		
2.F	**Cost to Treat and Dispose of Waste 2 (Multiply line 2.D by line 2.E)**			**0.00**	**$**
3 TREATME	TREATMENT AND DISPOSAL OF WASTE - 3 (LIQUID)	**Fuel blend liquids to Cadence**			
3.A	Volume of waste to be treated or disposed of. Indicate units.	18,700.00	unit		
3.B	Treatment and disposal cost per unit	0.00	$/unit		
3.C	**Cost to Treat and Dispose of Waste 3 (Multiply line 3.A by line 3.B)**			**0.00**	**$**
4	TREATMENT AND DISPOSAL OF WASTE - 4 (LIQUID)	**Antifreeze for Recycling (non-RCRA)**			
4.A	Volume of waste to be treated or disposed of. Indicate units.	7,920.00	unit		
4.B	Treatment and disposal cost per unit	0.00	$/unit		
4.C	**Cost to Treat and Dispose of Waste 4 (Multiply line 4.A by line 4.B)**			**0.00**	**$**
5	TREATMENT AND DISPOSAL OF WASTE - 5 (LIQUID)	**Antifreeze for Fuel Blending (RCRA antifreeze)**			
5.A	Volume of waste to be treated or disposed of. Indicate units.	880.00	unit		
5.B	Treatment and disposal cost per unit	0.00	$/unit		
5.C	**Cost to Treat and Dispose of Waste 5 (Multiply line 4.A by line 4.B)**			**0.00**	**$**
6	TREATMENT AND DISPOSAL OF WASTE - 6 (LIQUID)	**Non-hazardous Decon Fluid**			
6.A	Volume of waste to be treated or disposed of. Indicate units.	5,100.00	gallons		
6.B	Treatment and disposal cost per unit	0.10	$/unit		
6.C	**Cost to Treat and Dispose of Waste 6 (Multiply line 5.A by line 5.B)**			**510.00**	**$**
7	TREATMENT AND DISPOSAL OF WASTE - 7 (LIQUID)				
7.A	Volume of waste to be treated or disposed of. Indicate units.		unit		
7.B	Treatment and disposal cost per unit		$/unit		
7.C	**Cost to Treat and Dispose of Waste 7 (Multiply line 7.A by line 7.B)**			**0.00**	**$**
8	TREATMENT AND DISPOSAL OF WASTE - 8	**Flammable solids to Rineco (drums)**			

8.A	Volume of waste to be treated or disposed of. Indicate units.	112.00	drums	
8.B	Treatment and disposal cost per unit	65.00	$/unit	
8.C	**Cost to Treat and Dispose of Waste 8 (Multiply line 8.A by line 8.B)**		7,280.00	$
9	TREATMENT AND DISPOSAL OF WASTE - 9	Washington State Regulated to USE		
9.A	Volume of waste to be treated or disposed of. Indicate units.	40.00	drums	
9.B	Treatment and disposal cost per unit	40.00	$/unit	
9.C	**Cost to Treat and Dispose of Waste 9 (Multiply line 9.A by line 9.B)**		1,600.00	$
UD	**Treatment and Disposal cost of Class 9, Poisons, and Drum Jail to USE is estimated at $115 per drum for 90 drums, or $10,350.00.**		10,350.00	$
TOTAL COST OF TREATMENT AND DISPOSAL (Add lines 1.F, 2.F, 3.C through 9.C) (Enter total on Worksheet CS-10, line 1)			19,740.00	$

3.B.	Cost included in transport and disposal costs on TS-12
4.B.	Cost included in transport and disposal costs on TS-12
5.B.	Cost included in transport and disposal costs on TS-12
6.B.	Added treatment & disposal cost for decon fluid listed on CS-10B. Presumes on-site still operational costs only.

Table 1
Volume Conversion Factors

Volume: To Convert	Multiply By	To Obtain
Gallons	4.951×10^{-3}	Cubic yards
Cubic feet	27	Cubic yards
Liters	1.31×10^{-3}	Cubic yards
Cubic meters	1.308	Cubic yards

Table 2
Bulk Densities of Selected Materials [a]

Material	Bulk Density or Range (lb/yd^3)
Water	1,685.8
Sludge	1,620 - 2,430
Soil [b]	2,025 - 3,240
Cement [c]	4,050
Demolition rubble	2,430 - 3,240
Steel [c]	13,230

Notes:

a Densities are derived from the U.S. Environmental Protection Agency's Office of Solid Waste and Emergency Response (OSWER) Policy Directive #9476.00-6, 1987.

b Soils rich in organic matter and soils that have large amounts of fine particles have lower bulk density than soils poor in organic matter and rich in sand particles.

c Densities are derived from Standard Handbook for Civil Engineering, 3rd Edition, 1983.

CS-10B:CONTAINER STORAGE AREAS
TRANSPORTATION AND DISPOSAL OF DECONTAMINATION FLUIDS (BULK)

1	Volume of decontamination fluid generated from closure activities. Add all volumes calculated for closure activity worksheet to determine the total volume of liquid to be transported and disposed of. For each line item, specify the structure or equipment being decontaminated and the amount of decontamination fluids generated.			
	Decontamination fluids from sheet CS-7C (non-listed)	600.00	gal	
	Decontamination fluids from sheet TS-10C (non-listed)	4,500.00	gal	
	Add new tank capacity for antifreeze tanks (non-listed)	5,544.00	gal	
			gal	
	Total Volume of decontamination fluid generated	10,644.00	gal	
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	PPE	
3	Labor and equipment cost per work hour *b*	71.20	$	
4	Work rate to pump decontamination fluid to a holding tank (per gallon) *c*	0.000067	work hrs/gallon	
5	Number of hours required to pump decontamination fluid to a holding tank (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	0.71	work hours	
6	Subtotal of labor and equipment cost to pump decontamination fluid to a holding tank (multiply line 3 by line 5)		50.78	$
7	Number of days of rental of holding tank (Round up line 5 to nearest 8 hours; divide by 8 hours per day)	0.09	days	
8	Holding tank rental fee (10,000 gallon capacity) (flat rate per tank per day)	207.90	$ /day	
9	Number of tanks required (Divide line 1 by 10,000 gallons; round up to the nearest whole number)	2.00	tanks	
10	Subtotal of tank rental costs (Multiply lines 7, 8, and 9)		37.07	$
11	Removal cost per gallon of bulk liquid *d*	0.24	$ /gal	
12	Subtotal of removal cost for bulk liquids (Multiply line 1 by line 11)		2,554.56	$
UD	Decontamination fluid is presumed to be non-hazardous			$
TOTAL COST TO TRANSPORT AND DISPOSE OF DECONTAMINATION FLUIDS AS A BULK LIQUID (Add lines 6,10, and 12) (Enter total on Worksheet CS-10, line 2)			**2,642.40**	**$**

Comments:

11	This sheet used to account for decon fluid that is presumed to be non-hazardous, which includes decon fluid for heavy equipment. Decon fluid for tanks remains on sheet TS-13B. Allowed Emerald's proposed cost of $0.24/gallon for transportation only, not inclusive of treatment. Will allow presumption of on-site still treatment at $0.10/gallon for treatment and disposal.

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b Enter the estimated cost per work hour of all labor and equipment needed to pump decontamination fluid to a holding tank.

c Enter the number of work hours per gallon required to pump decontamination fluid to a holding tank. If, for example, a pump is used that can pump water at a rate of 5,000 gallons per hour, enter a work rate of 0.0002 hours per gallon (60 ÷5,000) ÷60) for conducting the activity. If an estimate of the total number of hours required to pump decontamination fluid to a holding tank has already been formulated, you may bypass this step and enter that number directly on line 5.

d Enter the estimated cost per gallon of transporting and disposing of decontamination fluid as a bulk liquid.

CS-11: CONTAINER STORAGE AREAS
CERTIFICATION OF CLOSURE

1	Number of units requiring certification of closure *a*	1	units	
2	Cost of certification of closure per unit *b*	12,035.24	$	
TOTAL COST OF CERTIFICATION OF CLOSURE (Multiply line 1 by line 2) (Enter total on Worksheet CS-1, line 11)			**12,035.24**	**$**

Notes:

a Facilities closing multiple container storage areas in the same manner at the same time should incur cost of certification of closure only once.

b This cost includes the cost of performance of the following activities by a registered professional engineer: 1) b reviewing the closure plan, 2) conducting a final closure inspection at the unit, and 3) preparing a certification of closure report.

TS-1:TANK SYSTEMS
SUMMARY WORKSHEET

Check boxes below to activate sheets		**Some of the activities listed below are conducted routinely as part of closure of tank systems. The owner or operator, however, might intend or be required to conduct additional activities to effect closure at the unit. Worksheets for estimating the costs of such additional activities are listed in italic type.**	**Worksheet Number**	**Cost**	
☑	1	Removal of Waste	TS-3	3,987.99	$
☐	2	*Tank System Purging (ignitable wastes only)*	TS-4	*0.00*	$
☑	3	*Flushing the Tank and Piping*	TS-5	*149.80*	$
☐	4	*Disassembly and Loading*	TS-6	*0.00*	$
☐	5	*Demolition and Removal of Containment System*	TS-7	*0.00*	$
☐	6	*Removal of Soil*	TS-8	*0.00*	$
☐	7	*Backfill*	TS-9	*0.00*	$
☑	8	Decontamination	TS-10	51,194.86	$
☑	9	Sampling and Analysis	TS-11	14,029.93	$
☑	10	Transportation	TS-12	57,850.00	$
☑	11	Treatment and Disposal	TS-13	50,924.20	$
	12	**Subtotal of Closure Costs (Add lines 1 through 11)**		**178,136.78**	**$**
	13	Engineering Expenses (approximately 10% of closure costs, excluding certification of closure [Multiply line 12 by 0.10])		17,813.68	$
	14	General Conditions (incl. personal protective equipment, labor supervision, insurance, temporary facilities, etc.) Approximately 10% of closure costs, excluding certification of closure. [multiply line 12 by 0.10]		17,813.68	
	15	Certification of Closure	TS-14	12,035.24	$
	16	**Subtotal (add engineering expenses and costs of certification of closure to closure costs) (Add lines 12, 13,14 and 15)**		**225,799.37**	**$**
	17	Contingency Allowance (approximately 20% of closure costs, not including engineering expenses and costs of certification of closure) (Multiply line 12 by 0.20)		35,627.36	**$**
	TANK SYSTEMS: TOTAL COST OF CLOSURE (add lines 15 and 16)			**261,426.73**	**$**

TS-2:TANK SYSTEMS

INVENTORY

If the design characteristics of the tank system to be evaluated do not conform to the format of the worksheet below, alternative calculations may be used to determine accurately the surface areas of all structures to be decontaminated and demolished, and the volumes of all structures, soils, and materials to be removed. Depending on the activities to be conducted to effect closure of the unit, it may not be necessary to complete all sections of this inventory worksheet.

1	**UNIT DESCRIPTION AND MAXIMUM CAPACITY**			
	Describe the unit to determine the cost of the activities to be conducted to close			
1.A	Type of tank system (aboveground or on-ground) *b*	above ground		
1.B	Maximum capacity of all tanks subject to closure	66,716.00	gal	
1.C	Total length of ancillary piping	1,797.00	ft	
1.D	Maximum capacity of ancillary piping (Refer to the table at the bottom of this worksheet for guidance on estimating the capacity of ancillary piping)	659.20	gal	
1.E	Maximum capacity of tank and ancillary piping (Add lines 1.B and 1.D)	67,375.20	gal	
1.F	Type of secondary containment system	Other (explain)		
	If 1.F is Other Explain	Single-walled tanks are located within concrete secondary containment.		
2	**INTERIOR SURFACE AREA OF TANK SYSTEMS**			
	Determine the interior surface area of all tank systems subject to closure to determine costs of decontamination.			
2.A	Interior surface area of tank (Refer to the table at the bottom of this worksheet for guidance on estimating the interior surface area of a tank.)	5,133.00	ft2	
2.B	Ancillary piping (Refer to Page 5 of 5 of this worksheet for guidance on estimating the interior surface area of ancillary piping.)	1,491.25	ft2	
2.C	Surface Area of Tank Systems (Add lines 2.A and 2.B)		6,624.25	ft2
2.D	Surface Area of Tank Systems in yd2 (Divide line 2.C by 9)		736.03	yd 2
3	**SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM PAD**			
	Determine the surface area of the secondary containment system pad to calculate costs for decontaminating or demolishing the pad at the time of closure.			
3.A	Length	108.48	ft	
3.B	Width	108.47	ft	
3.C	Surface Area of Secondary Containment System Pad (Multiply line 3.A by line 3.B)		11,766.83	ft2
3.D	Surface Area of Secondary Containment System Pad in yd2 (Divide line 3.C by 9)		1,307.43	yd2
4	**VOLUME OF SECONDARY CONTAINMENT SYSTEM PAD**			
	Calculate the volume of the secondary containment system pad to determine the cost of removing the pad. Removal of the secondary containment system pad is an activity that might be conducted at the time of closure.			
4.A	Thickness		ft	
4.B	Thickness in yards (Divide line 4.A by 3)	0.00	yd	
4.C	Volume of Secondary Containment System Pad in yd3 (Multiply line 3.D by line 4.B)		0.00	yd 3
5	**SURFACE AREA OF SECONDARY CONTAINMENT SYSTEM BERM**			
	Calculate the interior surface area of the secondary containment system berm, or curbing, to determine the cost of decontaminating and demolishing the berm at the time of closure.			
5.A	Length	1,548.76	ft	
5.B	Height	2.00	ft	
5.C	Surface Area of Secondary Containment System Berm (Multiply line 5.A by line 5.B)		3,097.52	ft2
5.D	Surface Area of Secondary Containment System Berm in yd2 (Divide line 5.C by 9)		344.17	yd2
6	**VOLUME OF SECONDARY CONTAINMENT SYSTEM BERM**			
	Calculate the volume of the secondary containment system berm, or curbing, to determine the cost of removing the berm. Removal of the secondary containment system berm is an activity that might be conducted at the time of closure.			
6.A	Thickness		ft	
6.B	Thickness in yards (Divide line 6.A by 3)	0.00	yd	
6.C	Volume of Secondary Containment System Berm in yd3 (Multiply line 5.D by line 6.B)		0.00	yd3
7.A	**SURFACE AREA OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM (specify by name)**			
	Calculate the surface area of all additional structures that are part of the secondary containment system at the unit that will be decontaminated or demolished at the time of closure (for example, load/unload pads, ramps or sumps).			
1	Surface Area of Other Structures		102.42	ft2
	Specify name of Area	Sumps		
2	Surface Area of Other Structures in yd2 (Divide line 7.A by 9)		11.38	yd 2
8.A	**VOLUME OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM**			

	Calculate the volume of all additional structures that are part of the secondary containment system at the unit to determine costs of removing those structures. Removal of other structures is an activity that might be conducted at the time of closure.		
1	Volume of Other Structures		yd3
7.B	**SURFACE AREA OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM (specify by name)**		
	Calculate the surface area of all additional structures that are part of the secondary containment system at the unit that will be decontaminated or demolished at the time of closure (for example, load/unload pads, ramps or sumps).		
1	Surface Area of Other Structures		ft2
	Specify name of Area		
2	Surface Area of Other Structures in yd2 (Divide line 7.A by 9)	0.00	yd 2
8.B	**VOLUME OF OTHER STRUCTURES IN SECONDARY CONTAINMENT SYSTEM**		
	Calculate the volume of all additional structures that are part of the secondary containment system at the unit to determine costs of removing those structures. Removal of other structures is an activity that might be conducted at the time of closure.		
1	Volume of Other Structures		yd3
9	**VOLUME OF CONTAMINATED SOIL TO BE REMOVED**		
	Calculate the volume of contaminated soil to be removed. Removal of contaminated soil is an activity that might be conducted at the time of closure.		
9.A	Length	ft	
9.B	Width	ft	
9.C	Depth	ft	
9.D	Volume of Contaminated Soil to be Removed (Multiply line 9.A by line 9.B by line 9.C)	0.00	ft3
9.E	Volume of Contaminated Soil to be Removed in yd3 (Divide line 9.D by 27)	0.00	yd3

Notes:

a For example, if a secondary containment system pad is circular in shape rather than rectangular, the user would be unable to calculate the surface area of that pad using the method prescribed in section 2 of this inventory worksheet. Rather, the surface area of such a pad could be calculated using the equation $\pi r2$.

b Owners and operators of in-ground and underground storage tanks are not eligible to use standardized permits.

Interior Surface Areas of Tanks of Various Capacities Reference for Line 2.A.

FOR CONICAL TANKS OR CALCULATIONS NOT LISTED BELOW, USE THE "SURFACE AREA CALCULATOR" ON ECOLOGY'S WEB SITE AT:

http://www.ecy.wa.gov/programs/hwtr/hwfacilities/Surface_Area_Calculations.xls

Click on the box above and select "copy." Then open your browser and paste the address in your address bar.

Capacity (gal)	Approximate Diameter (ft)	Approximate Height or Length (ft)	Surface Area (ft)
DIMENSIONS OF VERTICAL TANKS			
5,000	9	10.50	424.00
10,000	11.5	13.00	677.00
15,000	13	15.00	878.00
20,000	15	15.00	1,060.00
25,000	16	17.00	1,257.00
30,000	17	18.00	1,415.00
DIMENSIONS OF HORIZONTAL TANKS			
5,000	6	23.00	490.00
10,000	8	26.00	754.00
15,000	9.5	29.00	1,007.00
20,000	10	34.00	1,225.00
25,000	10.5	38.00	1,427.00
30,000	11	42.00	1,641.00

Standard Equations for Calculation the Interior Surface Areas of Tanks Reference for Line 2.A

Shape	Equation
Cylinder	2∏rh
Circle	∏r2
Cone	r∏√r2+h2

r = radius
h = height

Properties of Standard Wall Steel Pipe a Reference for Lines 1.C and 2.B

Nominal Size (inches)	Inside Diameter (inches)	Inside Volume (gal/ft) *b*	Inside Surface Area (ft /ft) 2.c
0.75	0.82	0.03	0.22
1	1.05	0.04	0.27
1.25	1.38	0.08	0.36
1.5	1.61	0.11	0.42
2	2.07	0.17	0.54
2.5	2.47	0.25	0.65
3	3.07	0.38	0.80
4	4.03	0.66	1.06
6	6.07	1.50	1.59
8	7.98	2.59	2.09
10	10.02	4.09	2.62
12	12.09	5.95	3.17
14	13.25	7.17	3.46
16	15.25	9.48	3.99
18	17.25	12.09	4.52
20	19.25	15.19	5.04
24	23.25	22.13	6.08

Notes:

a Modified from Carrier Air Conditioning Company, Inc., Carrier System Design Manual, 1973, Chapter 1, page 3-2

b Gallons per linear foot of straight pipe

c Square feet per linear foot of straight pipe

TS-3:TANK SYSTEM

REMOVAL OF WASTE

1	Maximum volume of waste to be removed from the tank and ancillary piping (Enter from worksheet TS-2, line 1.E)	67,375.20	gal	
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
3	Labor and equipment cost per work hour *b*	179.37	$	
4	Work rate required to remove waste from tank and ancillary piping c	0.000330	work hr/gal	
5	Number of hours required to remove waste from tank and ancillary piping (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	22.23	work hrs	
UD			$	
TOTAL COST OF REMOVAL OF WASTE FROM TANK AND ANCILLARY PIPING (Multiply line 3 by line 5) (Enter total on Worksheet TS-1, line 1)			3,987.99	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers a who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to remove waste for the unit.

c The estimated number of hours required to remove one gallon of waste from the tank system. If, for example, it will take 1 minute to remove each gallon of waste for the system, a work rate of 0.017 (1 divided by 60) for removing the waste is calculated.

TS-4:TANK SYSTEMS
PURGING

Complete this worksheet only for tank systems that contain ignitable waste.

1	Maximum capacity of tank system (Enter from Worksheet TS-2, line 1.E)		gal	
2	Amount of dry ice needed to purge tank system (Divide line 1 by 100 gal and multiply value by 1.5 lbs)	0.00	lbs	
3	Cost of one pound of dry ice	2.64	$ /lb	
4	Cost of dry ice needed to purge tank system (Multiply line 2 by line 3)		0	$
5	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
6	Labor cost per work hour *b*	#N/A	$	
7	Work rate required to purge tank system per gal capacity *c*	0.00024	work hr/ gal capacity	
8	Number of hours required to purge tank system (Multiply line 1 by line 7) (One hour minimum; round up to the half-hour)	0.00	work hrs	
9	Labor cost to purge tank system (Multiply line 6 by line 8)		#N/A	$
UD				$
TOTAL COST OF TANK SYSTEM PURGING (Add lines 4 and 9) (Enter total on Worksheet TS-1, line 2)			**#N/A**	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to remove waste for the unit.

c The estimated number of hours required to remove one gallon of waste from the tank system. If, for example, it will take 1 minute to remove each gallon of waste for the system, a work rate of 0.017 (1 divided by 60) for removing the waste is calculated.

TS-5:TANK SYSTEMS
FLUSHING THE TANK AND PIPING

Complete this worksheet only for tank systems that will be flushed.

1	Maximum capacity of the tank and ancillary piping (Multiply Worksheet TS-2, line 2.C by 4)	2,530.80	gal	Only fuel blend tanks and piping will be flushed.
2	Number of times tank and ancillary piping will be flushed (if unknown, assume 1)	1		
3	Total volume of flushing solution (Multiply line 1 by line 2)	2,530.80	gal	
4	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
5	Labor and equipment cost per work hour *b*	179.37	$	
6	Work rate required to flush tank and ancillary piping *c*	0.000330	work hr/gal	
7	Number of hours required to flush tank and ancillary piping (Multiply line 3 by line 6) (One hour minimum; round up to the half-hour)	0.84	work hrs	
8	Subtotal of labor and equipment costs to flush tank and ancillary piping (Multiply line 5 by line 7)		149.80	$
9	Total volume of flushing solution (Enter from line 3). (The flushing solution generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet TS-13B (for water-based flushing solution) or TS-12 and TS-13A (for a solvent solution) to calculate the transportation, treatment, and disposal cost. If the flushing solution is to be placed in drums, complete lines 10 through 12.)	2,530.80	gal	
	Check this box if you plan on disposing of the flushing solution as bulk liquid	☑	If you check this box, calculate the treatment and disposal costs in Sheet TS-13B	
10	Number of drums required to contain flushing solution (Divide line 9 by 55 gallons per drum; round up to the nearest whole number)	47.00	drums	
11	Cost of one drum	263.50	$/drum	
12	Cost of drums needed to contain flushing solution (Multiply line 10 by line 11)		0.00	$
UD	No need to adjust for extra work hours -- work rate of 0.00033 is acceptable		0.00	$
TOTAL COST OF FLUSHING OF TANK AND ANCILLARY PIPING (Add lines 8 and 12) (Enter total on Worksheet TS-1, line 3)			149.80	$

Remember to calculate costs for transporting, treating, and disposing of the wastes in drums that are generated from this activity, using worksheets TS-12 and TS-13A, respectively. If the wastes are to be managed as a bulk liquid, use worksheet TS-13B.

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to remove waste for the unit.

c The estimated number of hours required to remove one gallon of waste from the tank system. If, for example, it will take 1 minute to remove each gallon of waste for the system, a work rate of 0.017 (1 divided by 60) for removing the waste is calculated.

TS-6:TANK SYSTEMS

)ISASSEMBLY AND LOADING

1	**DISASSEMBLY OF ANCILLARY PIPING**			
1.A	Length of ancillary piping to be disassembled (Enter from worksheet TS-2, line 1.C)	1,797.00	ft	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *b*		level of PPE	
1.C	Labor and equipment cost per work hour *c*	#N/A	$	
1.D	Work rate required to disassemble one ft of piped d	0.15	work hr/ft	
1.E	Number of hours required to disassemble ancillary piping (Multiply line 1.A by line 1.D) (One hour minimum; round up to the half-hour)	269.55	work hrs	
1.F	**Cost to Disassemble Ancillary Piping (Multiply line 1.C by line 1.E)**		#N/A	$
2	**LOADING**			
2.A	Capacity of tank (Enter from worksheet TS-2, line 1.B)	66,716.00	gal	
2.B	Level of PPE assumed for this activity (protection level D, C, or B) *b*		level of PPE	
2.C	Labor and equipment cost per work hour e	#N/A	$	
2.D	Work rate required to load tank per gallon capacity f	0.00	work hr/ gal capacity	
2.E	Number of hours required to load tank (Multiply line 2.A by line 2.D) (One hour minimum; round up to the half-hour)	148.11	work hrs	
2.F	**Cost to Load Tank (Multiply line 2.C by line 2.E)**		#N/A	$
UD				$
TOTAL COST OF DISASSEMBLY AND LOADING (Add lines 1.F and 2.F) (Enter total on Worksheet TS-1, line 4)			#N/A	$

Notes:

a Owners and operators of in-ground and underground tank systems are not eligible to use standard permits.

b Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

c The estimated cost per work hour of all labor and equipment needed to disassemble ancillary piping.

d The estimated number of work hours required to disassemble one foot of ancillary piping. If, for example, d it will take 10 minutes to disassemble each foot of ancillary piping, a work rate of 0. 167 (10 divided by 60) for disassembling the piping is calculated.

e The estimated cost per work hour of all labor and equipment needed to load components of the on-ground e or aboveground tank system. In addition to costs for labor, this cost includes the average cost per work hour of rental of all equipment and purchase of all supplies needed to conduct this activity.

f The estimated number of work hours per gallon of capacity required to load the components of the on- f ground or aboveground tank system. If, for example, it will take 1 minute for every gallon of capacity to load components of the tank system, a work rate of 0.017 (1 divided by 60) for loading the system is calculated.

TS-7:TANK SYSTEMS

DEMOLITION AND REMOVAL OF CONTAINMENT SYSTEM

	DEMOLITION OF CONTAINMENT SYSTEM			
1.A	Area of containment system (Enter from worksheet TS-2; add lines 3.C, 5.C, and 7.A.1 and 7.B.1)	14,966.77	ft 2	If you are not going to demolish all structures, enter the surface area of the structure(s) you are going to demolish. Ensure all other containment structures are included on other sheets in this program.
1.B	Level of PPE that you are assuming for this activity (protection level D, C, or B) *a*		level of	
1.C	Labor and equipment cost per work hour *b*	#N/A	$	
1.D	Work rate required to demolish one ft2 of containment system *c*	0.03	work hr/ft 2	
1.E	Number of hours required to demolish the containment system (Multiply line 1.A by line 1.D) (One hour minimum; round up to the half-hour)	449.00	work hrs	
1.F	**Cost of Demolition of the Containment System (Multiply line 1.C by line 1.E)**		#N/A	$
2	**REMOVAL AND LOADING OF CONTAINMENT SYSTEM**			
2.A	Volume of the containment system (Enter from worksheet TS-2; add lines 4.C, 6.C, and 8)	0.00	yd3	
2.B	Level of PPE assumed for this activity (protection level D, C, or B) a		level of	
2.C	Labor and equipment cost per work hour *d*	#N/A	$	
2.D	Work rate to remove and load one yd 3,*e*	0.27	work hr/yd	
2.E	Number of hours required to remove and load the containment system (Multiply line 2.A by line 2.D) (One hour minimum; round up to the half-hour)	0.00	work hrs	
2.F	Subtotal of labor and equipment costs to remove and load the containment system (Multiply line 2.C by line 2.E)		#N/A	$
2.G	Number of debris box containers needed to hold the containment system (Divide line 2.A by 20 yd3 per container; round up to the nearest whole number)	0.00	containers	
2.H	Cost of one 20-yd3 -capacity debris box container (rent per week)	883.69	$/container	
2.I	Cost of containers (Multiply line 2.G by line 2.H)		0.00	$
2.J	Cost of mobilization and demobilization (flat rate)		548.35	$
2.K	**Cost to Remove and Load Containment System (Add lines 2.F, 2.I, and 2.J)**		#N/A	$
UD				$
TOTAL COST OF DEMOLITION AND REMOVAL OF CONTAINMENT SYSTEM (Add lines 1.F and 2.K) (Enter total on worksheet TS-1, line 5)			#N/A	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each

b The estimated cost per work hour of all labor and equipment needed to demolish the containment system.

c The estimated number of work hours required to demolish one ft 2f the containment system. If, for example, it will take 5 minutes to demolish one ft of the containment system, a work rate of 0.083 (5 2 divided by 60) to demolish the system is calculated.

d The estimated cost per work hour of all labor and equipment needed to remove and load the containment system. In addition to costs for labor, this cost includes the average cost per work hour of rental of all equipment and purchase of all supplies needed to conduct this activity.

e The estimated number of work hours required to remove and load one yd 3of the containment system. If, for example, it will take 5 minutes to remove and load one yd of the containment system, a work rate of 3 0.083 (5 divided by 60) to remove and load the system is calculated.

TS-8:TANK SYSTEMS

REMOVAL OF SOIL

	Volume of contaminated soil to be removed (Enter from worksheet TS-2, line 9.E)	0	yd3	If volume of soil to be removed is different, please enter reason here
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
3	Labor and equipment cost per work hour *b*	#N/A	$	
4	Work rate required to remove one yd3, *c*	0.03	work hr/yd 3	
5	Number of hours required to remove soil (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	0	work hrs	
6	Subtotal of labor and equipment costs remove soil (Multiply line 3 by line 5)		#N/A	$
7	Number of debris box containers needed to hold soil (Divide line 1 by 20 yd3 per container; round up to the nearest whole number)	0	containers	
8	Cost of one 20-yd3 -capacity debris box container (rent per week)	883.69	$/container	
9	Cost of containers (Multiply line 7 by line 8)		0	$
10	Cost of mobilization and demobilization (flat rate)		548.35	$
UD				$
TOTAL COST OF REMOVAL OF SOIL (Add lines 6, 9, and 10) (Enter total on Worksheet TS-1, line 6)			#N/A	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and number of hours required to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to remove soil.

c The estimated number of work hours required to remove one yd3 of soil. If, for example, it will take 5 minutes to remove one yd of soil, a work rate of 0.083 (5 divided by 60) to remove the soil is calculated.

TS-9:TANK SYSTEMS
BACKFILL

1	Volume of fill (Enter from Worksheet TS-2; add lines 4.C and 9.E, as appropriate) *a*	0.00	yd 3	If volume of backfill is different, please enter reason here
2	Compaction factor *b*	0.25		
3	Volume of additional fill required because of compaction factor (Multiply line 1 by line 2)	0.00	yd3	
4	Total volume of fill needed (Add lines 1 and 3) (One yd3 minimum; round up to the nearest whole number)	0.00	yd3	
5	Level of PPE assumed for this activity (protection level D, C, or B) *c*		level of PPE	
6	Labor, material, and equipment cost per yd3 *d*	#N/A	$ /yd3	
7	Subtotal of labor, material, and equipment costs to backfill (Multiply line 4 by line 6)		#N/A	$
8	Cost of mobilization and demobilization (flat rate)		548.35	$
UD				$
TOTAL COST OF BACKFILL (Add lines 7 and 8) (Enter total on worksheet TS-1, line 7)			#N/A	$

Notes:

a If the structures, or portions of the structures, identified in sections 7 and 8 of the inventory worksheet are below a the ground surface, the additional volumes of fill that will be required should be added to this estimate.

b The factor in the form of a decimal (for example, 0.25) to account for the compaction of fill material. U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure Plans (Subparts G and H), January 1987, EPA/530-SW-87-009, Volume III, pg. 7-10 suggests a *compaction factor for native soil for slope and fill of 0.25.*

c Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

d The estimated cost per yd3 of all labor, material, and equipment needed to conduct backfilling.

ANK SYSTEM
AMINATION SUMMARY

DECONTAMINATION SUMMARY WORKSHEET				
	Activity	**Worksheet Numbers**	**Cost ($)**	
1	Decontamination of Unit by Steam Cleaning or Pressure Washing	TS-10A	17,650.22	$
2	Decontamination of Unit by Sandblasting/Scarification	TS-10B	30,687.87	$
3	Decontamination of Heavy Equipment	TS-10C	2,856.77	$
TOTAL COST OF DECONTAMINATION (Add lines 1, 2, and 3) (Enter total on Worksheet TS-1, line 8)			51,194.86	$

TS-10A:TANK SYSTEM
DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING

	Area of unit to be decontaminated (Enter from Worksheet TS-2; add lines 2.C, 3.C, 5.C, and 7.A.1 and 7.B.2)	6,624.25	ft2	Only tanks and ancillary piping would be decontaminated by steam cleaning or pressure washing.
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*	C	level of PPE	
3	Labor and equipment cost per work hour *b*	98.68	$	
4	Work rate to steam clean or pressure wash one ft2*c*	0.03	work hrs/ft 2	
5	Number of hours required to steam clean or pressure wash the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	178.85	work hrs	
6	Subtotal of labor and equipment cost to decontaminate the unit by steam cleaning or pressure washing (Multiply line 3 by line 5)		17,650.22	$
7	Volume of decontamination fluid (Multiply line 1 by 4 gal/ft) (The decontamination fluids 2d generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet TS-13B to calculate the costs	26,497.00	gal	
	Check this box if you plan on disposing of the decontamination solution as bulk liquid	☑	If you check this box, the treatment and disposal costs should be calculated in Sheet TS-13B	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum; round up to the nearest whole number)	481.76	drums	
9	Cost of one drum	263.50	$ /drum	
10	Cost of drums needed to contain decontamination fluid (Multiply line 8 by line 9)		0.00	$
UD				$
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE WASHING (For bulk liquids, enter from line 6. For liquids in drums, add lines 6 and 10.) (Enter total on Worksheet TS-10, line 1)			17,650.22	$

Remember to calculate costs for transporting, treating, and disposing of all decontam in drums that are generated from this activity, using worksheets TS-12 and TS-13A, respectively. If decontamination fluids are to be managed as a bulk liquid, use Worksheet TS-13B.

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, a requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to decontaminate the unit by steam cleaning or pressure washing.

c The estimated number of work hours required to steam clean or pressure wash one ft2 of surface area. If, for example, it is estimated that it will take 10 minutes to steam clean or pressure wash one ft2 of surface area, a work rate of 0.167 (10 divided by 60) for steam cleaning or pressure washing the unit is calculated.

d U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure Plans (Subparts G and H), November 1986, EPA/530-SW-87-009, Volume III, pg. 5-3. The generation rate provided is recommended for this activity. However, alternative generation rates also may be used, if appropriate.

TS-10B:TANK SYSTEMS
DECONTAMINATION OF UNIT BY SANDBLASTING/SCARIFICATION

1	Area of unit to be decontaminated (Enter from Worksheet TS-2; add lines 2.C, 3.C, 5.C, and 7.A.1 and 7.B.1)	14,966.77	ft2	If you are not going to sandblast/scarify all structures, enter the surface area of the structure(s) you are going to sandblast/scarify. Ensure all other containment structures are included on other sheets in this program.
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
3	Labor and equipment cost per work hour *b*	102.52	$	
4	Work rate to sandblast one ft2,*c*	0.02	work hrs/ft2	
5	Number of hours required to sandblast/scarify the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	299.34	work hrs	
6	Subtotal of labor and equipment cost to decontaminate unit by sandblasting/scarification (Multiply line 3 by		30,687.87	$
7	Volume of cement dust generated (Multiply line 1 by 0.6 cm and convert to gallons)	2,206.71	gal	
8	Number of drums required to contain decontamination sands for removal (Divide line 7 by 808.89 lbs per drum; round up to the nearest whole number) *e*	3.00	drums	
9	Cost of one drum	263.50	$ /drum	
10	Cost of drums needed to contain decontamination sands (Multiply line 8 by line 9)		790.50	$
UD	Debris would be managed in bulk and is addressed in TS-12 and TS-13A.		-790.5	$
TOTAL COST OF DECONTAMINATION OF UNIT BY SANDBLASTING/SCARIFICATION (Add lines 6 and 10) (Enter total on Worksheet TS-10, line 2)			30,687.87	$

Adjusted scarification rate to average of 1 ft2 per minute, or work rate of 0.02 hr/ft2 (MOOSE machine works at 62.5 ft2 per hour, but won't do area close to walls, which must be done at slower rate – used 60 ft2 per hour as rounded average of larger area at fast rate and smaller area at slower rate)

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to decontaminate the unit by sandblasting/scarification.

c The estimated number of work hours required to sandblast/scarify one ft 2 of surface area. If, for example, it is estimated that it will take 10 minutes to sandblast/scarify one ft of surface area, a work rate of 0.167 (10 divided 2 by 60) for sandblasting/scarifying the unit is calculated.

d U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure Plans (Subparts G and H), January 1987, EPA/530-SW-87-009, Volume III, pg. 5-3. The generation rate provided is recommended for this activity. However, alternative rates may be used, as appropriate. U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure.

e Unit weight of medium sand, on average, equals 110 lbs/ft . Using the conversions of 0.1337 ft3 /gal and 55-gal/drum, the calculation is: 110 lbs/ft x 0.1337 ft 3/gal x 55 gal/drum = 808.89 lb/drum.

TS-10C:TANK SYSTEMS
DECONTAMINATION OF HEAVY EQUIPMENT

	Number of hours needed to decontaminate all heavy equipment used during closure of the unit (Enter from table at bottom of this worksheet)	45	work hrs	
	Enter types and number of Heavy Equipment being decontaminated			
	Glycol recycling unit, thin film evaporator, high boiler distillation unit, fuel blend			
2	Cost of rental of steam cleaner per hour	9.58	$ /hr	
3	Subtotal rental costs for steam cleaner (Multiply line 1 by line 2)		431.26875	$
4	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
5	Labor cost per work hour b	53.90	$	
6	Subtotal of labor costs (Multiply line 1 by line 5)		2425.5	$
7	Volume of decontamination fluid (Multiply line 1 by 100 gallons per hour) (The decontamination fluids generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet TS-13B to calculate the cost of transportation and disposal. If the decontamination fluids are to be placed in drums, complete lines 8 through 10.)	4,500.00	gal	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum and round up to the nearest whole number)	82	drums	
9	Cost of one drum	263.50	$ /drum	
	Check this box if you plan on disposing of the decontamination solution as bulk liquid	☑	If you check this box, the treatment and disposal costs should be calculated in Sheet TS-13B	
10	Cost of drums (Multiply line 8 by line 9)		0.00	$
11	Cost of construction of temporary decontamination area for heavy equipment. Only include this cost if no permanent decontamination area exists (otherwise, enter 0). **NOTE: USUALLY THIS COST WILL BE INCURRED ONLY ONCE FOR THE CLOSURE OF ALL UNITS. THIS IS AN ASSUMED COST. IF YOU KNOW AN EXACT COST FOR THIS ITEM, ENTER IT INSTEAD.**		0.00	$
12	Cost of demolition of temporary decontamination area for heavy equipment. Include this cost if no permanent decontamination area exists (otherwise, enter 0). **NOTE: USUALLY THIS COST WILL BE INCURRED ONLY ONCE FOR THE CLOSURE OF ALL UNITS. THIS IS AN ASSUMED COST. IF YOU KNOW AN EXACT COST FOR THIS ITEM, ENTER IT INSTEAD.**		0.00	$
UD	Emerald would not construct a separate area for decontamination. Decontamination would occur in existing secondary containment areas prior to decontamination of the containment surface.			$
TOTAL COST OF DECONTAMINATION OF HEAVY EQUIPMENT (Add lines 3, 6, 10, 11, and 12) (Enter total on worksheet TS-10, line 3)			2,856.77	$

Decontamination Times for Heavy Equipment a Reference for Line 1

Equipment	Decontamination Time (Hours)
Forklift	1
Rotary disc	1
Tractor	2
Tank wagon	2
Front-end loader	3
Dozer	3
Backhoe	3
Front shovel	3

Notes:

a U.S. Environmental Protection Agency, Final Guidance Manual: Cost Estimates for Closure and Post-Closure a Plans (Subparts G and H), January 1987, EPA/530-SW-87-009, Volume III, pg. 5-2. Decontamination times provided for specific pieces of equipment are recommended for this activity. However, alternative times also may be used, as appropriate.

ANK SYSTEM
IG AND ANALYSIS SUMMARY SHEET

SAMPLING AND ANALYSIS SUMMARY WORKSHEET		
Activity	**Number Worksheet**	**Cost ($)**
1. Drilling and Subsurface Soil Sampling & Analysis	TS-11B	12,614.94
2. Concrete Core Sampling & Analysis	TS-11C	0.00
3. Wipe Sampling & Analysis	TS-11D	0.00
4. Surface Water/Liquid Sampling & Analysis	TS-11E	707.50
5. Soil/Sludge/Sediment Sampling & Analysis	TS-11F	707.50
TOTAL SAMPLING AND ANALYSIS COST (Add lines 1 through 5) (Enter total on Worksheet TS-1, line 9)		14,029.93

TS-11A: TANK SYSTEM
SAMPLE INVENTORY

1 NUMBER OF DRILLING AND SUBSURFACE SOIL SAMPLES In the space below, identify the number of boreholes and the number of subsurface soil samples per borehole to be collected for each individual unit. Record the total number of samples to be collected in the box provided

1	Number of Subsurface Soil Samples			
	Boring Diameter:	20	1	20
		boreholes	samples/borehole	total samples

2 NUMBER OF CONCRETE CORE SAMPLES In the space below, identify the number of concrete core samples to be collected for each individual unit. Record the total number of samples to be collected

2	Number of Concrete Core Samples		total samples

3 NUMBER OF WIPE SAMPLES In the space below, identify the number of sample locations and the number of wipe samples per location to be collected for each individual unit.

3	Number of Wipe Samples:			
				0
		locations	samples/location	total samples

4 NUMBER OF SURFACE WATER/LIQUID SAMPLES In the space below, identify the number of grab samples taken on lakes, rivers, or ponds and samples taken of liquid wastes such as rinsate and surface water. Record the total number of samples to be collected in the box provided.

4	Number of Aqueous Samples:			
		1	1	1
		locations	samples/location	total samples

5 NUMBER OF SOIL/SLUDGE/SEDIMENT SAMPLES In the space below, identify the number of grab samples taken of surface soil, sludge, sediment, or concrete chips and the number of samples per location to be collected for each individual unit. Record the total number of samples to be collected in the box provided.

5	Number of Nonaqueous Samples:			
		1	1	1
		locations	samples/location	total samples

TS-11B: TANK SYSTEMS
DRILLING AND SUBSURFACE SOIL SAMPLING & ANALYSIS

1	**COLLECTING SUBSURFACE SOIL SAMPLES - 2-1/2-INCH-DIAMETER BOREHOLE**			
1.A	Number of boreholes to be drilled (Enter from worksheet TS-11A, line 1)	20	boreholes	
1.B	Total depth of all boreholes (Add all depths. If the depths are not known, estimate the average depth of the boreholes to be drilled and multiply the estimated depth by line 1.A)	20	ft	
1.C	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
1.D	Labor and equipment cost per work hour *b*	101.266	$ /work hr	
1.E	Work rate to drill 2-1/2-inch-diameter hole *c*	0.43	work hr/ft	
1.F	Number of hours required to drill total depth of 2-1/2-inch-diameter holes (Multiply line 1.B by line 1.E) (One hour minimum; round up to the half-hour)	8.64	work hrs	
1.G	**Cost to Drill 2-1/2-inch Borings (Multiply line 1.D by line 1.F)**		874.93824	$
1.H	**Cost of Wells (if applicable)**			$
1.I	**Total Cost of Borings/Wells**		874.93824	
2	**COLLECTING SUBSURFACE SOIL SAMPLES - 4-INCH-DIAMETER BOREHOLE**			
2.A	Number of boreholes to be drilled (Enter from worksheet TS-11A, line 1)	20	boreholes	
2.B	Total depths of all boreholes (Add all depths. If the depths are not known, estimate the average depth of the boreholes to be drilled and multiply the estimated depth by line 2.A)		ft	
2.C	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
2.D	Labor and equipment cost per work hour *b*	#N/A	$ /work hr	
2.E	Work rate to drill 4-inch-diameter hole *d*	0.74	work hr/ft	
2.F	Number of work hours required to drill total depth of 4-inch-diameter holes (Multiply line 2.B by line 2.E) (One hour minimum; round up to the half-hour)	0	work hrs	
2.G	**Cost to Drill 4-inch Borings (Multiply line 2.D by line 2.F)**		#N/A	$
2.H	**Cost of Wells (if applicable)**			$
2.I	**Total Cost of Borings/Wells**		0.00	
3	**ANALYZING SUBSURFACE SOIL SAMPLES**			
3.A	Determine the cost of analysis per sampling event for subsurface soil samples (Use table at the end of this worksheet to estimate).	11,740	$ /event	
3.B	Number of sampling events	1	events	
3.C	**Cost to Analyze Subsurface Soil Samples (Multiply line 3.A by line 3.B)**		11,740.00	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF SUBSURFACE SOIL SAMPLES (Add lines 1.I, 2.I, and 3.C) (Enter total on Worksheet TS-11, line 1)			12,614.94	$

Notes:

a Because workers who are encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours needed to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to collect boring and subsurface soil samples. Costs may vary significantly, depending upon the method of drilling to be used.

c The estimated number of work hours per foot required to drill a 2½-inch-diameter hole and collect subsurface soil samples. If, for example, it is estimated that it will take 45 minutes per foot to drill a 2½-inchdiameter hole and collect a sample, a work rate of 0.750 (45 divided by 60) for conducting those activities is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all its sampling equipment.

d The estimated number of work hours per foot required to drill a 4-inch-diameter hole and collect subsurface soil samples. If, for example, it is estimated that it will take 45 minutes per foot to drill a 4-inch-diameter hole and collect a sample, a work rate of 0.750 (45 divided by 60) for drilling the hole is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all sampling equipment.

Notes:

a *Determine the total number of samples to be analyzed at the time of closure. The number of quality control (QC) samples typically is estimated at 20 percent of the total number of samples to be analyzed.*

Estimated Analytical Cost per Sampling Event Reference for Line 3.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)	160	20	3200
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)	275	20	5500
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)	95	4	380
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis	130	20	2600
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
ASTM D-2982	30	2	60
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			11740

TS-11C:TANK SYSTEMS
CONCRETE CORE SAMPLING & ANALYSIS

	COLLECTING CONCRETE CORE SAMPLES			
1.A	Number of concrete core samples to be collected (Enter from worksheet TS-11A, line 2)	0	core samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
1.C	Labor and equipment cost per work hour *b*	#N/A	$	
1.D	Work rate to drill a 3-inch-diameter core sample boring to a depth of 6-inches *c*	1.00	work hr/sampl	
1.E	Number of hours required to drill 3-inch-diameter borings (Multiply line 1.A by Line 1.D) (One hour minimum; round up to the half-hour)	0.00	work hrs	
1.F	**Cost to Collect Concrete Core Samples (Multiply line 1.C by line 1.E)**		#N/A	$
2	**ANALYZING CONCRETE CORE SAMPLES**			
2.A	Determine the cost of analysis per sampling event for concrete core samples (Use table at the end of this worksheet to estimate).		$ /event	
2.B	Enter the number of sampling events		events	
2.C	**Cost to Analyze Concrete Core Samples (Multiply line 2.A by line 2.B)**		0.00	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF CONCRETE CORE SAMPLES (Add lines 1.F and 2.C) (Enter total on worksheet TS-11, line 2)			#N/A	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to collect concrete core samples.

c The estimated number of work hours required to drill a 3-inch diameter core sample boring to a depth of 6 inches. If, for example, it is estimated that it will take 45 minutes to drill one 3-inch diameter core sample boring, a work rate of 0.750 (45 divided by 60) for conducting that activity is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 3.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			0

TS-11D: TANK SYSTEMS
WIPE SAMPLING & ANALYSIS

1	**COLLECTING WIPE SAMPLES**			
1.A	Number of wipe samples to be collected (Enter from worksheet TS-11A, line 3)	0	samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*		level of PPE	
1.C	Labor and equipment cost per work hour *b*	#N/A	$	
1.D	Work rate required to collect one sample *c*	0.5	work hr/sample	
1.E	Number of hours required to collect all (Multiply line 1.A by line 1.D)	0	work hrs	
1.F	**Cost to Collect Wipe Samples (Multiply line 1.C by line 1.E)**		#N/A	$
2	**ANALYZING WIPE SAMPLES**			
2.A	Cost of analysis per sampling event for wipe samples (Use table at the end of this worksheet to estimate).		$ /event	
2.B	Number of sampling events		events	
2.C	**Cost to Analyze Wipe Samples (Multiply line 2.A by line 2.B)**		0	$
UD				$
TOTAL COST OF COLLECTION AND ANALYSIS OF WIPE SAMPLES (Add lines 1.F and 2.C) (Enter total on Worksheet TS-11, line 3)			#N/A	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to collect wipe samples.

c The estimated number of work hours required to collect one wipe sample. If, for example, it is estimated that it will take 10 minutes per sample to collect wipe samples, a work rate of 0.167 (10 divided by 60) for collecting the samples is calculated. The work rate should account for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs			
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			0

TS-11E:TANK SYSTEMS

SURFACE WATER/LIQUID SAMPLING & ANALYSIS

	COLLECTING SURFACE WATER/LIQUID SAMPLES			
1.A	Number of surface water/liquid samples to be collected (Enter from worksheet TS-11A, line 4)	1	samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
1.C	Labor and equipment cost per work hour *b*	124.995		
1.D	Work rate required to collect one sample *c*	0.50	work hr/sample	
1.E	Number of hours required to collect all (Multiply line 1.A by line 1.D)	0.5	work hrs	
1.F	**Cost to Collect Surface Water/Liquid Samples (Multiply line 1.C by line 1.E)**		62.4975	$
2	**ANALYZING SURFACE WATER/LIQUID SAMPLES**			
2.A	Cost of analysis per sampling event for surface water/liquid samples (Use table at the end of this worksheet to estimate).	645	$ /event	
2.B	Number of sampling events	1	events	
2.C	**Cost to Analyze Surface Water/Liquid Samples (Multiply line 2.A by line 2.B)**		645	$
UD	**Cost for analysis of rinseate prior to off-site shipment for disposal.**			$
TOTAL COST OF COLLECTION AND ANALYSIS OF SURFACE WATER/LIQUID SAMPLES (Add lines 1.F to line 2.C) (Enter total on Worksheet TS-11, line 4)			707.4975	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to collect surface water/liquid samples.

c The estimated number of work hours required to collect one surface water/liquid sample. If, for example, it is estimated that it will take 10 minutes per sample to collect surface water/liquid samples, a work rate of 0.167 (10 divided by 60) for collecting the samples is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all sampling equipment

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs	645	1	645
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			645

TS-11F:TANK SYSTEMS
SOIL/SLUDGE/SEDIMENT SAMPLING & ANALYSIS

	COLLECTING SOIL/SLUDGE/SEDIMENT SAMPLES			
1.A	Number of soil/sludge/sediment samples to be collected (Enter from worksheet TS-11A, line 5)	1	samples	
1.B	Level of PPE assumed for this activity (protection level D, C, or B) *a*	D	level of PPE	
1.C	Labor and equipment cost per work hour *b*	125.00	$	
1.D	Work rate required to collect one sample *c*	0.50	work hr/sample	
1.E	Number of hours required to collect all (Multiply line 1.A by line 1.D)	0.50	work hrs	
1.F	**Cost to Collect Soil/Sludge/Sediment Samples (Multiply line 1.C by line 1.E)**		62.50	$
2.00	**ANALYZING SOIL/SLUDGE/SEDIMENT SAMPLES**			
2.A	Cost of analysis per sampling event for soil/sludge/sediment samples (Use table at the end of this worksheet to estimate).	645.00	$ /event	
2.B	Number of sampling events	1	events	
2.C	**Cost to Analyze Soil/Sludge/Sediment Samples (Multiply line 2.A by line 2.B)**		645.00	$
UD	**Cost of analysis of scarification debris prior to off-site shipment and disposal.**			$
TOTAL COST OF COLLECTION AND ANALYSIS OF SOIL/SLUDGE/SEDIMENT SAMPLES (Add lines 1.F and 2.C) (Enter total on Worksheet TS-11, line 5)			707.50	$

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct this activity.

b The estimated cost per work hour of all labor and equipment needed to collect soil/sludge/sediment samples.

c The estimated number of work hours required to collect one soil/sludge/sediment sample. If, for example, it is estimated that it will take 10 minutes per sample to collect soil/sludge/sediment samples, a work rate of 0.167 (10 divided by 60) for collecting the samples is calculated. The work rate accounts for the time required to mobilize equipment; collect, handle, and pack the samples; and decontaminate the sampling team and all sampling equipment.

Estimated Analytical Cost per Sampling Event Reference for Line 2.A.

Column 1 Analytical Parameter and Method	Column 2 Cost of Analysis ($) per Parameter	Column 3 Number of Analyses, including QC Analyses a	Column 4 Total Cost of Analysis ($) per Parameter per Event (Multiply Column 2 by Column 3)
Method USEPA 8260B Volatile Organics (Soils and Water)			
Method USEPA 8260B SIM Volatile Organics (Soils and Water)			
Method USEPA 8270C Semi volatile Organics (Soils and Water)			
Method USEPA 8270C SIM Semi volatile Organics (Soils and Water)			
Method USEPA 8282 Polychlorinated Biphenyls (Soils and Water)			
Method NWTPH-Gx (Soils and Water)			
Method NWTPH-Dx (Soils and Water)			
Method USEPA 8021B Purgeable Aromatic Hydrocarbons (Soils and Water)			
Method USEPA 6000/7000 Series Metals Analysis			
Method USEPA 8081 or 8085 Chlorinated Pesticides (Soils and Water)			
Method USEPA 1311 TCLP-Metals, VOAs, SemiVOAs	645	1	645
TOTAL COST OF ANALYZING SUBSURFACE SOIL SAMPLES (Sum of all costs in Column 4) $/event			645

TS-12:TANK SYSTEM
TRANSPORTATION OF WASTE

1	**TRANSPORTATION OF WASTE IN DRUMS**			
1.A	Number of drums of waste		drums	
1.B	Cost to transport one truckload of 55-gallon drums to the nearest treatment or disposal facility that will accept the waste		$ /truckload	
1.C	Number of truckloads needed to transport waste in drums (Divide line 1.A by 80 drums per truckload; round up to the nearest whole number)	0.00	truckloads	
1.D	**Cost to Transport Waste In Drums (Multiply line 1.B by line 1.C)**		0.00	$
2	**TRANSPORTATION OF WASTE IN DRUMS**			
2.A	Number of drums of waste		drums	
2.B	Cost to transport one truckload of 55-gallon drums to the nearest treatment or disposal facility that will accept the waste		$ /truckload	
2.C	Number of truckloads needed to transport waste in drums (Divide line 1.A by 80 drums per truckload; round up to the nearest whole number)	0.00	truckloads	
2.D	**Cost to Transport Waste In Drums (Multiply line 1.B by line 1.C)**		0.00	$
3	**TRANSPORTATION OF BULK LIQUIDS (Total Process - decontamination, soil, waste in drums)**	Decontamination solvent (2530.80 gal) and other recyclable solvent		
3.A	Gallons of liquid waste	7,746.80	gal	
3.B	Cost to transport one truckload of bulk liquids to the nearest treatment or disposal facility that will accept the waste	8,000.00	$ /truckload	
3.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 2.A by 6,900 gallons per truckload; round up to the nearest whole number)	2.00	truckloads	
3.D	**Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)**		16,000.00	$
4	**TRANSPORTATION OF BULK LIQUIDS**	Fuel blend liquids by rail to Cadence		
4.A	Gallons of liquid waste	58,500.00	gal	
4.B	Cost to transport one truckload of bulk liquids to the nearest treatment or disposal facility that will accept the waste	8,000.00	$ /railcar	
4.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 2.A by 6,900 gallons per truckload; round up to the nearest whole number)	3.00	truckloads	
4.D	**Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)**		24,000.00	$
5	**TRANSPORTATION OF BULK LIQUIDS**	Antifreeze (non-RCRA)		
5.A	Gallons of liquid waste	30,970.00	gal	
5.B	Cost to transport one truckload of bulk liquids to the nearest treatment or disposal facility that will accept the waste	6,500.00	$ /truckload	
5.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 2.A by 6,900 gallons per truckload; round up to the nearest whole number)	2.00	truckloads	
5.D	**Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)**		13,000.00	$
6	**TRANSPORTATION OF BULK SOLIDS**	Debris from container area scarification – Sheet CS-7B		
6.A	Gallons of scarification waste	2,515.42	gal	
6.B	Cost to transport one truckload of bulk waste to the nearest treatment or disposal facility that will accept the waste	1,750.00	$ /truckload	
6.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 6.A by 6,900 gallons per truckload; round up to the nearest whole number)	1.00	truckloads	
6.D	**Cost to Transport Bulk Liquid Waste (Multiply line 2.B by line 2.C)**		1,750.00	$
7	**TRANSPORTATION OF BULK WASTE**	Debris from tank area scarification (listed waste) – Sheet TS-10B		
7.A	Gallons of scarification waste	2,206.71	gallons	
7.B	Cost to transport one truckload of bulk waste to the nearest treatment or disposal facility that will accept the waste	3,100.00	$ /truckload	
7.C	Number of truckloads needed to transport bulk free liquid waste (Divide line 7.A by 6,900 gallons per truckload; round up to the nearest whole number)	1.00	truckloads	
7.D	**Cost to Transport Bulk Waste (Multiply line 7.B by line 7.C)**		3,100.00	$
TOTAL COST TO TRANSPORT WASTE (Add lines 1.D, 2.D, and 3.C) (Enter total on Worksheet TS-1, line 10)			57,850.00	$

TS-13:TANK SYSTEM
TREATMENT AND DISPOSAL

SUMMARY WORKSHEET			
Activity		Number Worksheet	Cost ($)
1	Treatment and Disposal of Waste	TS-13A	25,541.14
2	Transportation and Disposal of Decontamination Fluids	TS-13B	25,383.06
TOTAL COST OF TREATMENT AND DISPOSAL (Add lines 1 and 2) (Enter total on Worksheet TS-1, line 11)			50,924.20

TS-13A:TANK SYSTEM

TREATMENT AND DISPOSAL OF WASTE

1	**TREATMENT AND DISPOSAL OF WASTE 1 (SOLID)**	**Debris from Tank Area**			
1.A	Volume of waste in yd3 to be treated or disposed of (If the waste is not recorded in yd3, use the factors in Table 1 of this worksheet to convert to yd3)	8.89	yd 3		
1.B	Number of pounds per yd3 of waste (Select from Table 2 of this worksheet the density of material that most closely resembles the density of the waste to be treated or disposed of)	3,240.00	lb/yd3		
1.C	Amount in lbs of waste to be treated and disposed of (Multiply line 1.A by line 1.B)	28,803.60	lb		
1.D	Amount in tons of waste to be treated and disposed of (Divide line 1.C by 2,000)	14.40	tons		
1.E	Treatment and disposal cost per ton	79.00	$ /ton		
1.F	**Cost to Treat and Dispose of Waste 1 (Multiply line 1.D by line 1.E)**			1,137.74	$
2	**TREATMENT AND DISPOSAL OF WASTE 2 (SOLID)**	**Debris from Container Area Only**			
2.A	Volume of waste in yd3 to be treated or disposed of (If the waste is not recorded in yd3, use the factors in Table 1 of this worksheet to convert to yd3)	14.49	yd 3		
2.B	Number of pounds per yd3 of waste (Select from table 2 of this worksheet the density of material that most closely resembles the density of the waste to be treated or disposed of)	3,240.00	lb/yd3		
2.C	Amount in lbs of waste to be treated and disposed of (Multiply line 2.A by line 2.B)	46,947.60	lb		
2.D	Amount in tons of waste to be treated and disposed of (Divide line 2.C by 2,000)	23.47	tons		
2.E	Treatment and disposal cost per ton	45.00	$ /ton		
2.F	**Cost to Treat and Dispose of Waste 2 (Multiply line 2.D by line 2.E)**			1,056.32	$
3	**TREATMENT AND DISPOSAL OF WASTE - 3 (LIQUID)**	**Solvents for Recycling**			
3.A	Volume of waste to be treated or disposed of. Indicate units.	6,866.80	gallons		
3.B	Treatment and disposal cost per unit	0.10	$ /unit		
3.C	**Cost to Treat and Dispose of Waste 3 (Multiply line 3.A by line 3.B)**			686.68	$
4	**TREATMENT AND DISPOSAL OF WASTE - 4 (LIQUID)**	**Fuel Blend liquids to Cadence**			
4.A	Volume of waste to be treated or disposed of. Indicate units.	55,580.00	gallons		
4.B	Treatment and disposal cost per unit	0.13	$ /unit		
4.C	**Cost to Treat and Dispose of Waste 4 (Multiply line 4.A by line 4.B)**			7,225.40	$
5	**TREATMENT AND DISPOSAL OF WASTE - 5 (LIQUID)**	**Antifreeze for Recycling**			
5.A	Volume of waste to be treated or disposed of. Indicate units.	30,870.00	gallons		
5.B	Treatment and disposal cost per unit	0.45	$ /unit		
5.C	**Cost to Treat and Dispose of Waste 5 (Multiply line 5.A by line 5.B)**			13,891.50	$
6	**TREATMENT AND DISPOSAL OF WASTE - 6 (LIQUID)**	**Antifreeze for Fuel Blending**			
6.A	Volume of waste to be treated or disposed of. Indicate units.	3,430.00	gallons		
6.B	Treatment and disposal cost per unit	0.45	$ /unit		
6.C	**Cost to Treat and Dispose of Waste 6 (Multiply line 6.A by line 6.B)**			1,543.50	$
7	**TREATMENT AND DISPOSAL OF WASTE - 7 (LIQUID)**				
7.A	Volume of waste to be treated or disposed of. Indicate units.		unit		
7.B	Treatment and disposal cost per unit		$ /unit		
7.C	**Cost to Treat and Dispose of Waste 7 (Multiply line 7.A by line 7.B)**			0.00	$
8	**TREATMENT AND DISPOSAL OF WASTE - 8 (SLUDGE)**				
8.A	Volume of waste to be treated or disposed of. Indicate units.		unit		
8.B	Treatment and disposal cost per unit		$ /unit		
8.C	**Cost to Treat and Dispose of Waste 8 (Multiply line 8.A by line 8.B)**			0.00	$
UD					$
TOTAL COST OF TREATMENT AND DISPOSAL (Add lines 1.F, 2.F, and 3.C through 8.C) (Enter total on Worksheet TS-13, line 1)				25,541.14	$

Comments:

1.E.	Disallowed use of $45/ton disposal cost for all scarification debris. We cannot assume that scarification debris from the area around the tanks will be non-hazardous due to the presence of listed waste. Scarification debris from the container storage area is presumed to be non-hazardous because no listed waste should be present. This cost is far less than the bid price for solids from Rineco (equivalent to $760/ton).
3.B.	Disallowed use of $0.01/gallon solvents recycling costs as too low an estimate. Instead substituted industry calculated cost of $0.10/gallon for on-site reclamation (labor and supplies to run on-site still). In the alternative, Ecology would accept the written Veolia ES bid of no reclamation cost, but transportation costs to Azuza, CA or Henderson, CO Veolia site would need to be added instead (per bid requirements). As transportation costs are expected to exceed $0.10/gallon, reclamation cost used instead.
4.B.	Disallowed use of $0.08/gallon fuel blend costs as too low an estimate – cannot assume materials will meet criteria for that cost. Instead substituted average of $0.13/gallon, which is average of Emerald's proposed cost ($0.08/gallon) and high-end cost from Cadence ($0.18/gallon). The $0.13/gallon is also in line with other customers' costs for disposal of alternative fuels using energy recovery (e.g., $0.15/gallon from Kitsap County).
6.B.	Disallowed use of $0.00/gallon and $0.08/gallon antifreeze costs as too low an estimate. Instead substituted lower of two costs available (from Kitsap County) of $0.05/lb or $0.45/gallon. This amount is also equivalent to the average between Emerald's proposed cost ($0.08/gallon) and actual cost paid by Ecology under similar contract with PSC ($0.81/gallon). Ecology's cost is equivalent to Thurston County's and King County's cost of $0.09/lb, or $0.81/gallon. Both are far less than the current state contract, which is for $1.60/gallon.

Table 1
Volume Conversion Factors

Volume: To Convert	Multiply By	To Obtain
Gallons	4.951×10^{-3}	Cubic yards
Cubic feet	27	Cubic yards
Liters	1.31×10^{-3}	Cubic yards
Cubic meters	1.308	Cubic yards

Table 2
Bulk Densities of Selected Materials [a]

Material	Bulk Density or Range (lb/yd^3)
Water	1,685.8
Sludge	1,620 - 2,430
Soil [b]	2,025 - 3,240
Cement [c]	4,050
Demolition rubble	2,430 - 3,240
Steel [c]	13,230

Notes:

a Densities are derived from the U.S. Environmental Protection Agency's Office of Solid Waste and Emergency Response (OSWER) Policy Directive #9476.00-6, 1987.

b Soils rich in organic matter and soils that have large amounts of fine particles have lower bulk density than soils poor in organic matter and rich in sand particles.

c Densities are derived from Standard Handbook for Civil Engineering, 3rd Edition, 1983.

TS-13B:TANK SYSTEM
TRANSPORTATION AND DISPOSAL OF DECONTAMINATION FLUIDS

1	Volume of decontamination fluid generated from closure activities. Add all volumes calculated for closure activity worksheet to determine the total volume of liquid to be transported and disposed of. For each line item, specify the structure or equipment being decontaminated and the amount of decontamination fluids generated.			
	Delete entry for CS-7C fluids -- moved to sheet CS-10B		gal	
	Decontamination fluid - TS-10A	20,953.00	gal	
	Delete entry for TS-10C fluids -- moved to sheet CS-10B		gal	
			gal	
			gal	
	total gal	20,953.00	gal	
2	Level of PPE assumed for this activity (protection level D, C, or B) *a*	C	level of PPE	
3	Labor and equipment cost per work hour *b*	116.12	$	
4	Work rate to pump decontamination fluid to a holding tank (per gallon) *c*	0.000067	work hrs/gallon	
5	Number of hours required to pump decontamination fluid to a holding tank (Multiply line 1 by line 4) (one hour minimum; round up to the half-hour)	1.40	work hours	
6	Subtotal of labor and equipment cost to pump decontamination fluid to a holding tank (multiply line 3 by line 5)		163.01	$
7	Number of days of rental of holding tank (Round up line 5 to nearest 8 hours; divide by 8 hours per day)	0.18	days	
8	Holding tank rental fee (10,000 gallon capacity) (flat rate per day)	207.90	$/ day	
9	Number of tanks required (Divide line 1 by 10,000 gallons; round up to the nearest whole number)	2.10	tanks	
10	Subtotal of tank rental costs (Multiply lines 7, 8, and 9)		76.44	$
11	Removal cost per gallon of bulk liquid *d* (this figure is the default from R.S. Means, you can enter your own if you think this figure differs significantly	1.20	$ /gal	
12	Subtotal of removal cost for bulk liquids (Multiply line 1 by line 11)		25,143.60	$
UD	Decontamination fluid is anticipated to be hazardous due to presence of listed waste			$
TOTAL COST TO TRANSPORT AND DISPOSE OF DECONTAMINATION FLUID AS A BULK LIQUID (Add lines 6, 10, and 12) (Enter total on worksheet TS-13, line 2)			**25,383.06**	**$**

Comments:

This sheet used to account for decon fluid that is presumed to be hazardous, which includes decon fluid tanks containing listed waste. Decon fluid for heavy equipment is on sheet CS-10C. Disallowed use of $0.18/gallon disposal costs as too low an estimate. Instead substituted national average of $0.80/gallon transportation AND $0.40/gallon for treatment. This amount appears to be more consistent with vendor price lists provided by Emerald (e.g., American Ecology chagring for listed bulk liquid stabilization @ $1.00/gallon and RCRA direct landfill @ apx. $1.80/gallon)

Notes:

a Because workers encumbered by health and safety equipment cannot perform activities as quickly as workers who are not so encumbered, requirements for higher levels of PPE will reduce the productivity of labor and equipment. PPE requirements therefore should be taken into account in determining the work rate and the total number of hours required to conduct each activity.

b The estimated cost per work hour of all labor and equipment needed to pump decontamination fluid to a holding tank.

c The number of work hours per gallon required to pump decontamination fluid to a holding tank. If, for example, a pump is used that can pump water at a rate of 5,000 gallons per hour, a work rate of 0.0002 hours per gallon (60 ÷5,000) ÷60) for conducting the activity is calculated.

d The estimated cost per gallon of transporting and disposing of decontamination fluid as a bulk liquid.

TS-14:TANK SYSTEM
CERTIFICATION OF CLOSURE

1	Number of units requiring certification of closure *a*	1		
2	Cost of certification of closure per unit *b*	12,035.24	$	
TOTAL COST OF CERTIFICATION OF CLOSURE (Multiply line 1 by line 2) (Enter total on Worksheet TS-1, line 14)			12,035.24	$

Notes:

a Facilities closing multiple tanks in the same manner at the same time should incur cost of certification of closure only once.

b This cost includes the cost of performance of the following activities by a registered professional engineer: 1) reviewing the closure plan, 2) conducting a final closure inspection at the unit, and 3) preparing a certification of closure report.

UD1: USER DEFINED ACTIVITIES

Sr. No.	Activity	Cost ($)
1	As discussed with the facility, no adjustment to the number of hours required for sandblasting/scarification on sheet CS-7B is appropriate. Rate should be calculated at 2 minutes/square foot, not 2 square feet/minute.	$0
2	As discussed with the facility, no adjustment to the number of hours required for sandblasting/scarification on sheet TS-10B is appropriate. Rate should be calculated at 2 minutes/square foot, not 2 square feet/minute.	$0
	Allowance for closure certification cost difference	($817.94)
TOTAL COST		-817.94

Provided below are some commonly used worksheets for your use. Please ensure that the totals are included as line items in the table above

1	**Demolition and Removal of Load/Unload Area for Tanks**			
1.A	Area of Load Unload Area		ft 2	
1.C	Labor and equipment cost per work hour *b*	46.69	$	
1.D	Work rate required to demolish one ft2 of containment system *c*	0.03	work hr/ft 2	
1.E	Number of hours required to demolish the containment system (Multiply line 1.A by line 1.D) (One hour minimum; round up to the half-hour)	0.00	work hrs	
1.F	**Cost of Demolition of the Load/Unload Area (Multiply line 1.C by line 1.E)**		0.00	$
2	**REMOVAL AND LOADING OF CONTAINMENT SYSTEM**			
2.A	Volume of the containment system (Enter from worksheet TS-2; add lines 4.C, 6.C, and 8)		yd3	
2.C	Labor and equipment cost per work hour *d*	63.28	$	
2.D	Work rate to remove and load one yd 3 *e*	0.27	work hr/yd 3	
2.E	Number of hours required to remove and load the demolished unload area (Multiply line 2.A by line 2.D) (One hour minimum; round up to the half-hour)	0.00	work hrs	
2.F	Subtotal of labor and equipment costs to remove and load the demolished load area (Multiply line 2.C by line 2.E)		0.00	$
2.G	Number of debris box containers needed to hold the containment system (Divide line 2.A by 20 yd3 per container; round up to the nearest whole number)	0.00	containers	
2.H	Cost of one 20-yd3 -capacity debris box container (rent per week)	440.00	$/container	
2.I	Cost of containers (Multiply line 2.G by line 2.H)		0.00	$
2.J	Cost of mobilization and demobilization (flat rate)		383.00	$
2.K	**Cost to Remove and Load Containment System (Add lines 2.F, 2.I, and 2.J)**		383.00	$
UD				$
TOTAL COST OF DEMOLITION AND REMOVAL OF CONTAINMENT SYSTEM (Add lines			383.00	$

Cost of Steam Cleaning/Pressure Washing of Other Units:

Specify the structure or equipment being decontaminated				
1	Area of unit to be decontaminated (Enter from Worksheet TS-2; add lines 2.C, 3.C, 5.C, and 7.A)		ft2	
3	Labor and equipment cost per work hour *b*	46.47	$	
4	Work rate to steam clean or pressure wash one ft2 *c*	0.03	work hrs/ft 2	
5	Number of hours required to steam clean or pressure wash the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	0.00	work hrs	
6	Subtotal of labor and equipment cost to decontaminate the unit by steam cleaning or		0.00	$
7	Volume of decontamination fluid (Multiply line 1 by 4 gal/ft) (The decontamination fluids 2d generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet TS-13B to calculate the costs	0.00	gal	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum; round up to the nearest whole number)	0.00	drums	
	Cost of one drum	86.90	$ /drum	

10	Cost of drums needed to contain decontamination fluid (Multiply line 8 by line 9)	0.00	$
UD			$
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE		0.00	$

Cost of Steam Cleaning/Pressure Washing of Other Units:

Specify the structure or equipment being decontaminated				
	Area of unit to be decontaminated (Enter from Worksheet TS-2; add lines 2.C, 3.C, 5.C, and 7.A.1 and 7.B.2)		ft2	If you are not going to pressure wash/steam clean all structures, enter the surface area of the structure(s) you are going to pressure wash/steam clean. Ensure all other containment structures are included on other sheets in this program.
3	Labor and equipment cost per work hour *b*	46.47	$	
4	Work rate to steam clean or pressure wash one ft2*c*	0.03	work hrs/ft 2	
5	Number of hours required to steam clean or pressure wash the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	0.00	work hrs	
6	Subtotal of labor and equipment cost to decontaminate the unit by steam cleaning or		0.00	$
7	Volume of decontamination fluid (Multiply line 1 by 4 gal/ft) (The decontamination fluids 2d generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet TS-13B to calculate the costs	0.00	gal	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum; round up to the nearest whole number)	0.00	drums	
9	Cost of one drum	0.00	$ /drum	
10	Cost of drums needed to contain decontamination fluid (Multiply line 8 by line 9)		0.00	$
UD				$
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE			0.00	$

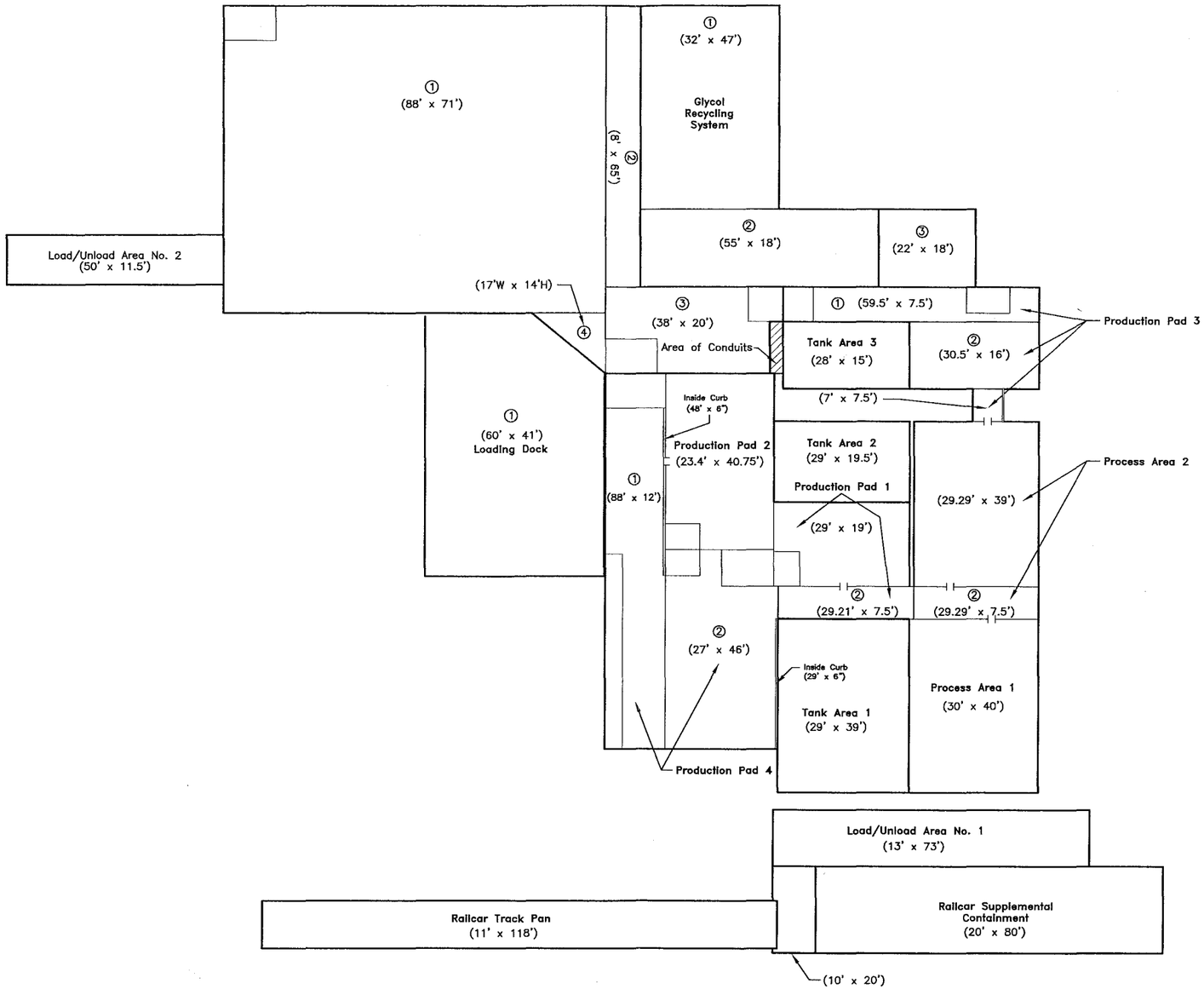
Cost of Steam Cleaning/Pressure Washing of Other Units:

Specify the structure or equipment being decontaminated				
1	Area of unit to be decontaminated (Enter from Worksheet TS-2; add lines 2.C, 3.C, 5.C, and 7.A.1 and 7.B.2)		ft2	If you are not going to pressure wash/steam clean all structures, enter the surface area of the structure(s) you are going to pressure wash/steam clean. Ensure all other containment structures are included on other sheets in this program.
3	Labor and equipment cost per work hour *b*	46.47	$	
4	Work rate to steam clean or pressure wash one ft2*c*	0.03	work hrs/ft 2	
5	Number of hours required to steam clean or pressure wash the unit (Multiply line 1 by line 4) (One hour minimum; round up to the half-hour)	0.00	work hrs	
	Subtotal of labor and equipment cost to decontaminate the unit by steam cleaning or		0.00	$
/	Volume of decontamination fluid (Multiply line 1 by 4 gal/ft) (The decontamination fluids 2d generated may be disposed of in drums or as bulk liquid. If the volume is too large to be handled effectively by placement in drums, use worksheet TS-13B to calculate the costs	0.00	gal	
8	Number of drums required to contain decontamination fluid for removal (Divide line 7 by 55 gallons per drum; round up to the nearest whole number)	0.00	drums	
9	Cost of one drum	0.00	$ /drum	
10	Cost of drums needed to contain decontamination fluid (Multiply line 8 by line 9)		0.00	$
UD				$
TOTAL COST OF DECONTAMINATION OF UNIT BY STEAM CLEANING OR PRESSURE			0.00	$

Part B

Section I

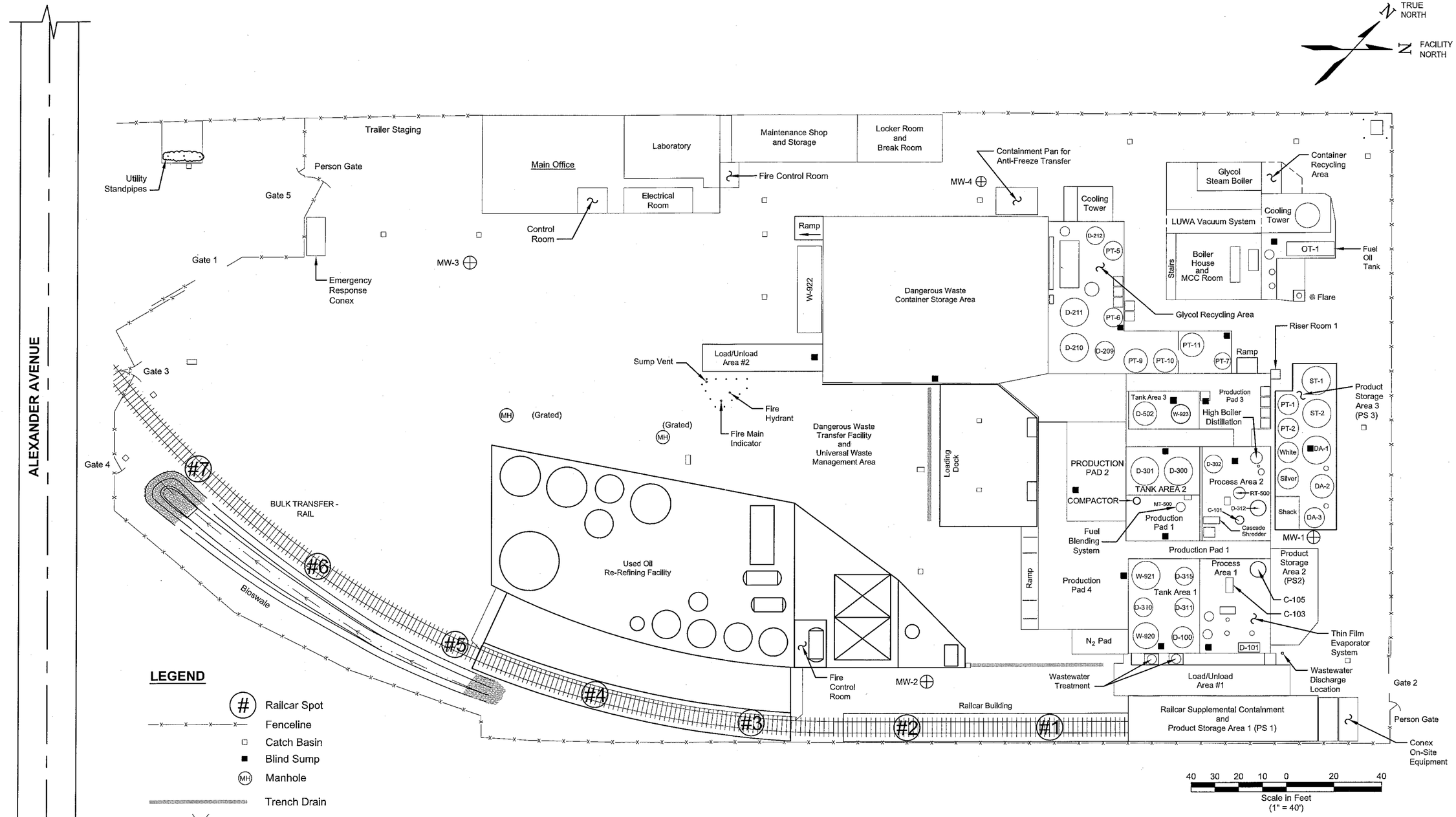
Closure Plan
Figures I-1 thru I-3



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE I–1
DANGEROUS WASTE
CONTAINMENT LAYOUT

FILE NO: CLD	DATE: July 2, 2007	SCALE: 1"=30'

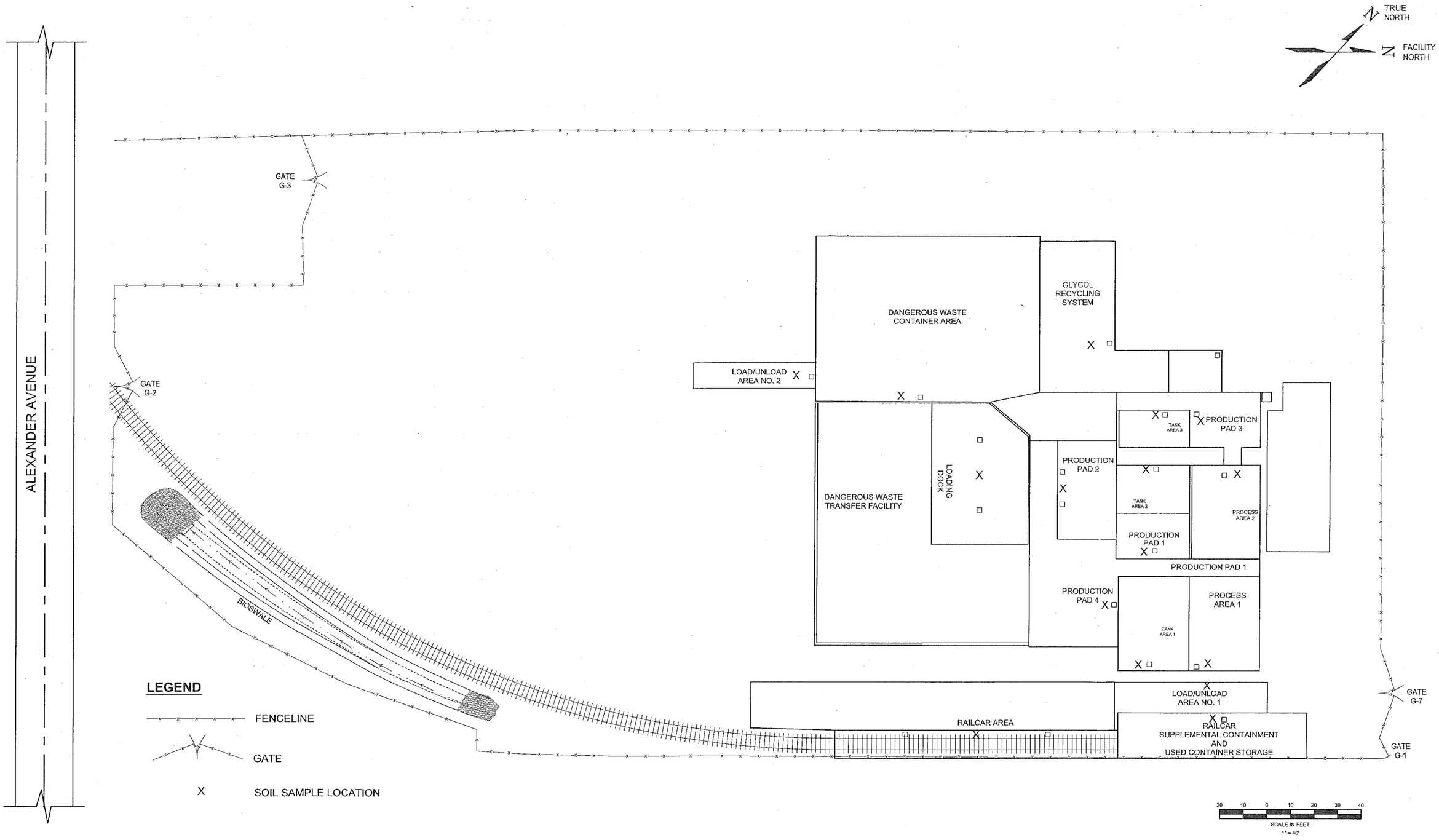


Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE I-2

FACILITY LAYOUT DIAGRAM

FILE NO:	FLDI-2	DATE:	Feb. 9, 2015	SCALE:	1"=40'



Emerald Services, Inc.
1825 Alexander Avenue
Tacoma, Washington 98421

FIGURE 1-3
SUBSURFACE SOIL BIAS SAMPLE LOCATIONS

FILE NO: SM-LOCNS	DATE: Dec. 9, 2009	SCALE: 1"=40'

Part B

Section I

Closure Plan
Appendix I
Certificate of Liability Insurance

ACORD CERTIFICATE OF LIABILITY INSURANCE

OP ID JM EMESE-1

DATE (MM/DD/YYYY) 01/07/09

PRODUCER

Hall-Conway-Jackson, Inc.
Box 8010
Creek WA 98082-8010
Phone: 425-368-1200 Fax:425-368-1290

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

Emerald Services, Inc. and per attached Named Insured List
7343 E. Marginal Way S.
Seattle, WA 98108

INSURERS AFFORDING COVERAGE		NAIC #
INSURER A:	Greenwich Ins Co (A+)	
INSURER B:	XL Specialty Insurance Co	
INSURER C:	National Union Fire Ins.	
INSURER D:	Indian Harbor Ins. Co.	
INSURER E:		

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A		GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS MADE X OCCUR X $5,000 Deductible GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC	GEC0000653-09	01/15/09	01/15/10	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
B		AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS X $5,000 Deductible	AEC0000654-09	01/15/09	01/15/10	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
		GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EA ACC AGG	$ $ $
A		EXCESS/UMBRELLA LIABILITY X OCCUR CLAIMS MADE DEDUCTIBLE X RETENTION $10,000	UEC0017860-04	01/15/09	01/15/10	EACH OCCURRENCE AGGREGATE	$ 10,000,000 $ 10,000,000 $ $ $
C		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	WC 538-5823 WORKERS COMP POLICY INCLUDES USL&H	01/15/09	01/15/10	X WC STATUTORY LIMITS OTHER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
D		OTHER Professional Lia & Contractors Pollut	PEC0017842-04 PEC0017842-04	01/15/09	01/15/10		$1,000,000 $5,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

For Bid Purposes only. Blanket Additional Insured forms CG2026, Primary GENL157a, Auto133 & Contractors Pollution IHIC-CEL2CP & Blanket Waiver forms CG2404, Auto114 & WC000313 attached apply to Certificate Holder if required in written contract.

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 45 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE
Thomas E. Jackson

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Part B

Section I

Closure Plan
Appendix II
Possible Constituents of Concern

Closure Plan
Appendix II
Possible Constituents of Concern

Waste Category	Waste Code	Constituent of Concern
Characteristic Waste	D020	Chlordane
	D021	Chlorobenzene
	D022	Chloroform
	D023	o-Cresol
	D027	1,4-Dichlorobenzene
	D029	1,1-Dichloroethylene
	D030	2,4-Dinitrotoluene
	D031	Heptachlor (and its peroxide)
	D032	Hexachlorobenzene
	D033	Hexachlorobutadiene
	D034	Hexachloroethane
	D036	Nitrobenzene
	D037	Pentachlorophenol
	D041	2,4,5-Trichlorophenol
	D042	2,4,6-Trichlorophenol
	D043	Vinyl chloride
Washington State Only Dangerous Waste	WP03	Polycyclic Aromatic Hydrocarbons
	WPCB	Polychlorinated Biphenyls
Listed Waste	F027	tri-, tetra-, or pentachlorophenol or compounds derived from these chlorophenols.
	K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.
	K087	Decanter tank tar sludge from coking operations.
	K169	Crude oil storage tank sediment from petroleum refining operations. (T)
	K170	Clarified slurry oil tank sediment and/or in-line filter/separation solids from petroleum refining operations. (T)
Commercial Chemicals	P001	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%; Warafin & salts present at concentrations greater than 0.3%

Waste Category	Waste Code	Constituent of Concern
	P002	Acetamide, -(aminothioxomethyl)-; 1-Acetyl-2-thiourea
	P003	Acrolein; 2-Propenal
	P006	Aluminum phosphide
	P007	5-(Aminomethyl)-3-isoxazolol; 3(2H)-Isoxazolone, 5-(aminomethyl)
	P008	4-Aminopyridine; 4-Pyridinamine
	P010	Arsenic acid H3 AsO4
	P011	Arsenic oxide As2 O5; Arsenic pentoxide
	P012	Arsenic oxide As2 O3; arsenic trioxide
	P014	Benzenethiol; Thiphenol
	P015	Beryllium powder
	P016	Dichloromethyl ether; Methane, oxybis[chloro-
	P017	Bromoacetone; 2-Propanone, 1-bromo-
	P018	Brucine; Strychnidin-10-one,2,3-dimethoxy-
	P022	Carbon disulfide
	P023	Acetaldehyde, chloro-; Chloroacetaldehyde
	P024	Benzenamine, 4-chloro-; p-Chloroaniline
	P027	3-Chloropropionitrile; Propanenitrile, 3-chloro-
	P028	Benzene, (chloromethyl)-; Benzyl chloride
	P036	Arsonous dichloride, phenyl-; Dichlorophenylarsine
	P038	Arsine, diethyl-; Diethylarsine
	P041	Diethyl-p-nitrophenyl phosphate; Phosphoric acid, diethyl 4-nitrophenyl ester
	P046	Benzeneethanamine,alpha,alpha-dimethyl-; alpha, alpha-Dimethylphenethylamine
	P048	2,4-Dinitrophenol; Phenol, 2,4-dinitro
	P056	Fluorine
	P057	Acetamide, 2-fluoro-; Fluoroacetamide
	P058	Acetic acid, fluoro-, sodium salt; Fluoroacetic acid, sodium salt
	P062	Hexaethyl tetraphosphate; Tetraphosphoric acid, hexaethyl ester
	P065	Fulminic acid, mercury(2+) salt; mercury fulminate
	P067	Aziridine, 2-methyl-; 1,2-Propylenimine
	P069	2-Methyllactonitrile; Propanenitrile, 2-hydroxy-2-methyl-
	P072	alpha-Naphthylthiourea; Thiourea, 1-naphthalenyl-

Waste Category	Waste Code	Constituent of Concern
	P075	Nicotine, & salts; Pyridine, 3-(1methyl-2-pyrrolidinyl)-,(S)-, & salts
	P076	Nitric oxide; Nitrogen oxide NO
	P077	Benzenamine, 4-nitro-; p-Nitroaniline
	P078	Nitrogen dioxide; Nitrogen oxide NO2
	P081	Nitroglycerine ; 1,2,3-Propanetriol, trinitrate
	P082	Methanamine, -methyl-N-nitroso-; N-Nitrosodimethylamine
	P084	N-Nitrosomethylvinylamine; Vinylamine, -methyl-N-nitroso-
	P085	Diphosphoramide, octamethyl-; Octamethylpyrophosphoramide
	P087	Osmium oxide OsO4, (T-4)-; Osmium tetroxide
	P088	Endothall; 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
	P092	Mercury, (acetato-O)phenyl-; Phenylmercury acetate
	P093	Phenylthiourea Thiourea, phenyl-
	P095	Carbonic dichloride; phosgene
	P102	Propargyl alcohol; 2-propyn-1-ol
	P103	Selenourea
	P105	Sodium azide
	P108	Strychnidin-10-one, & salts; Strychnine & salts
	P110	Plumbane, tetraethyl-; Tetraethyl lead
	P111	Diphosphoric acid, tetraethylester; tetraethyl pyrophosphate
	P112	Methane, tetranitro-; Tetranitromethane
	P113	Thallic oxide; Thallium oxide
	P114	Selenious acid,dithallium(1+) salt ; tetraethyldithiopyrophoshate
	P116	Tetraethyl lead; Thiosemicarbazide
	P118	Methanethiol, trichloro-; Trichloromethanethiol
	P119	Ammonium vanadate; Vanadic acid, ammonium salt
	P120	Vanadium oxide V2O5; Vanadium pentoxide
	P123	Toxaphene
	P127	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-,methylcarbamate; Carbofuran
	P190	Carbamic acid, methyl-, 3-methylphenyl ester; Metolcarb

Waste Category	Waste Code	Constituent of Concern
	P196	Manganese,bis(dimethylcarbamodithioato-S,S')-,; Manganesedimethyldithiocarbamate
	P205	Zinc, bis(dimethylcarbamodithioato-S,S'); Ziram
	U001	Acetaldehyde; Ethanal
	U005	Acetamide, -9H-fluoren-2-yl-; 2-Acetylaminofluorene
	U006	Acetyl chloride (C,R,T)
	U007	Acrylamide; 2-Propenamide
	U008	Acrylic acid; 2-Propenonic acid
	U009	Acrylonitrile; 2-Propenenitrile
	U011	Amitrole; 1H-1,2,4-Triazol-3-amine
	U012	Aniline; Benzeneamine
	U014	Auramine; Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
	U016	Benz[c]acridine
	U017	Benzal chloride; Benzene, (dichloromethyl)-
	U018	Benz[a]anthracene
	U019	Benzenesulfonic acid chloride(C,R)
	U020	Benzenesulfonyl chloride(C,R)
	U022	Benzo[a]pyrene
	U023	Benzene, (trichloromethyl)-; Benzotrichloride
	U024	Dichloromethoxy ethane; Ehtane, 1,1-,[methylenebis(oxy)]bis[2-chloro-
	U025	Dichloroethyl ether; Ethane,1,1'-oxybis[2-chloro-
	U026	Chlornaphazin; Naphthalenamine,N,N'-bis(2-chloroethyl)-
	U027	Dichloroisopropyl ether; Propane,2,2'-oxybis[2-chloro-
	U030	Benzene, 1-bromo-4-phenoxy-; 4-Bromophenyl phenyl ether
	U031	1-Butanol; n-Butyl alcohol
	U032	Calcium chromate; Chromic acid H2 CrO4, calcium salt
	U033	Carbonic difluoride; Carbon oxyfluoride
	U034	Acetaldehyde, trichloro-; Chloral
	U037	Benzene, chloro-; Chlorobenzene
	U039	p-Chloro-m-cresol; Phenol, 4-chloro-3-methyl-
	U041	Epichlorohydrin; Oxirane, (chloromethyl)-
	U042	2-Chloroethyl vinyl ether; Ethene, (2-chloroethoxy)-
	U043	Ethene, chloro-; Vinyl chloride
	U044	Chloroform; Methane, trichloro-

Waste Category	Waste Code	Constituent of Concern
	U045	Methane, chloro-; Methyl Chloride
	U046	Chloromethyl methyl ether; Methane, chloromethyoxy-
	U047	beta-Chloronaphthalene; Naphthalene,2-chloro-
	U048	o-Chlorophenol; Phenol, 2-chloro-
	U049	Benzenamine, 4-chloro-2-methyl-, hydrochloride; 4-Chloro-o-toluidine,hydrochloride
	U050	Chrysene
	U051	Creosote
	U052	Cresol (Cresylic acid); Phenol, methyl-
	U053	2-Butenal; Crotonaldehyde
	U055	Cumene; Benzene, (1-methylethyl)-
	U056	Cyclohexane; Benzene, hexahydro-
	U057	Cyclohexanone (I)
	U063	Dibenz[a,h]anthracene
	U064	Dibenzo[a,i]pyrene; Benzo[rst]pentaphene
	U066	Propane,1,2-dibromo-3-chloro; 1,2-Dibromo-3-chloropropane
	U068	Methylene bromide; Methane, dibromo-
	U070	o-Dichlorobenzene; Benzene, 1,2-dichloro-
	U071	m-Dichlorobenzene; Benzene, 1,3-dichloro-
	U072	p-Dichlorobenzene; Benzene, 1,4-dichloro-
	U074	1,4-Dichloro-2-butene; 2-Butene, 1,4-dichloro-
	U075	Dichlorodifluoromethane; Methane, dichlorodifluoro-
	U076	Ethylidene dichloride; Ethane, 1,1-dichloro-
	U077	Ethylene dichloride; Ethane, 1,2-dichloro-
	U078	1,1-Dichloroethylene; Ethene, 1,1-dichloro-
	U079	1,2-Dichloroethylene; Ethene, 1,2-dichloro-
	U081	2,4-Dichlorophenol; Phenol, 2,4-dichloro-
	U082	2,6-Dichlorophenol; Phenol, 2,6-dichloro
	U083	Propylene dichloride; Propane, 1,2-dichloro-
	U084	1,3-Dichloropropene; 1-Propene, 1,3-dichloro-
	U085	2,2'-Bioxirane; 1,2:3,4-Diepoxybutane
	U086	N,N'-Diethylhydrazine; Hydrazine, 1,2-diethyl-
	U092	Dimethylamine; Methanamine, -methyl
	U093	p-Dimethylaminoazobenzene; Benzenamine, N,N-dimethyl-4-(phenylazo)-
	U094	Benz[a]anthracene, 7,12-dimethyl-; 7,12-Dimethylbenz[a]anthracene

Waste Category	Waste Code	Constituent of Concern
	U097	Dimethylcarbamoyl chloride; Carbamic chloride, dimethyl-
	U098	1,1-Dimethylhydrazine; Hydrazine, 1,1-dimethyl-
	U099	1,2-Dimethylhydrazine; Hydrazine, 1,2-dimethyl-
	U101	2,4-Dimethylphenol; Phenol, 2,4-dimethyl-
	U105	2,4-Dinitrotoluene; Benzene, 1-methyl-2,4-dinitro-
	U106	2,6-Dinitrotoluene; Benzene, 2-methyl-1,3-dinitro-
	U108	1,4-Dioxane; 1,4-Diethyleneoxide
	U109	Hydrazine, 1,2-diphenyl-; 1,2-Diphenylhydrazine
	U110	Dipropylamine; 1-Propanamine, N-propyl-
	U111	Di-n-propylnitrosamine; 1-Propanamine, N-nitroso-N-propyl-
	U112	Ethyl acetate; Acetic acid ethyl ester
	U113	Ethyl acrylate; 2-Propenoic acid, ethyl ester
	U114	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters; Ethylenebisdithiocarbamic acid
	U115	Ethylene oxide; Oxirane
	U116	Ethylenethiourea; 2-Imidazolidinethione
	U117	Ethyl ether; Ethane, 1,1'-oxybis-
	U118	Ethyl methacrylate; 2-Propenoic acid, 2-methyl-,ethyl ester
	U119	Ethyl methanesulfonate; Methanesulfonic acid, ethyl ester
	U120	Fluoranthene
	U121	Trichloromonofluoromethane; Methane, trichlorofluoro-
	U122	Formaldehyde
	U123	Formic acid
	U124	Furan; Furfuran
	U125	Furfural; 2-Furancarboxaldehyde
	U126	Glycidylaldehyde; Oxiranecarboxyaldehyde
	U127	Hexachlorobenzene; Benzene, hexachloro-
	U131	Hexachloroethane; Ethane, hexachloro-
	U133	Hydrazine
	U134	Hydrofluoric acid; Hydrogen fluoride
	U136	Cacodylic acid; Arsinic acid, dimethyl-
	U137	Indeno[1,2,3-cd]pyrene
	U140	Isobutyl alcohol; 1-Propanol, 2-methyl-
	U144	Lead acetate; Acetic acid, lead(2+) salt
	U145	Lead phosphate; Phosphoric acid, lead(2+)salt (2:3)

Waste Category	Waste Code	Constituent of Concern
	U146	Lead Subacetate; Lead, bis(acetato-O)tetrahydroxytri-
	U147	2,5-Furandione; Maleic anhydride
	U148	Maleic hydrazide; 3,6-Pyridazinedione, 1,2-dihydro-
	U149	Malononitrile; Propanedinitrile
	U151	Mercury
	U152	Methacrylonitrile; 2-Propenenitrile, 2-methyl-
	U153	Methanethiol; Thiomethanol
	U156	Carbonochloridic acid, methylester; methyl chlorocarbonante
	U158	Benzenamine, 4,4'-methylenebis[2-chloro-; 4,4'-Methylenebis(2-chloroaniline)
	U161	Methyl isobutyl ketone; 4-methyl-2-pentanone
	U162	Methyl methacrylate; 2-Propenoic acid, 2-methyl-,methyl ester
	U164	Methylthiouracil; 4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
	U165	Naphthalene
	U166	1,4-Naphthalenedione; 1,4-Naphthoquinone
	U167	1-Naphthalenamine; alpha-Naphthylamine
	U168	2-Naphthalenamine; beta-Naphthylamine
	U169	Nitrobenzene; Benzene, nitro-
	U170	Phenol, 4-nitro; p-Nitrophenol
	U171	2-Nitropropane; Propane, 2-nitro-
	U172	N-Nitrosodi-n-butylamine; 1-Butanamine, N-butyl-N-nitroso-
	U174	N-Nitrosodiethylamine; Ethanamine, -ethyl-N-nitroso-
	U176	N-Nitroso-N-ethylurea; Urea, N-ethyl-N-nitroso-
	U177	N-Nitroso-N-methylurea; Urea, N-methyl-N-methy-N-nitroso-
	U178	Carbamic acid, methylnitroso-, ethyl ester; N-Nitroso-N-methylurethane
	U179	N-Nitrosopiperidine; Piperidine, 1-nitroso-
	U180	N-Nitrosopyrrolidine; Pyrrolidine, 1-nitroso-
	U181	Benzenamine, 2-methyl-5-nitro-; 5-Nitro-o-toluidine
	U182	Paraldehyde; 1,3,5-Trioxane, 2,4,6-trimethyl-
	U183	Pentachlorobenzene; Benzene, pentachloro-
	U184	Pentachloroethane; Ethane, pentachloro-
	U185	Pentachloronitrobenzene; Benzene, pentachloronitro-
	U186	1-Methylbutadiene; 1,3-Pentadiene

Waste Category	Waste Code	Constituent of Concern
	U187	Phenacetin; Acetamide, -(4-ethoxyphenyl)-
	U188	Phenol
	U191	Pyridine, 2-methyl-; 2-Picoline
	U194	1-Propanamine; n-Propylamine
	U196	Pyridine
	U197	p-Benzoquinone; 2,5-Cyclohezadiene-1,4-dione
	U200	Reserpine; Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methylester,(3beta,16beta,17alpha, 18beta,20alpha)-
	U201	Resorcinol; 1,3-Benzenediol
	U204	Selenious acid; Selenium dioxide
	U205	Selenium sulfide
	U207	1,2,4,5-Tetrachlorobenzene; Benzene, 1,2,4,5-tetrachloro-
	U208	1,1,1,2-Tetrachloroethane; Ethane, 1,1,1,2-tetrachloro-
	U209	1,1,2,2-Tetrachloroethane; Ethane, 1,1,2,2-tetrachloro-
	U211	Carbon tetrachloride; Methane, tetrachloro-
	U213	Tetrahydrofuran; Furan, tetrahydro-
	U214	Thallium acetate; Acetic acid, thallium(1+)salt
	U215	Thallium carbonate; Carbonic acid, dithallium(1+) salt
	U216	Thallium(I) chloride
	U217	Thallium nitrate; Nitric acid, thallium(1+) salt
	U218	Thioacetamide; Ethanethioamide
	U219	Thiourea
	U221	Toluenediamine; Benzenediamine, ar-methyl-
	U222	o-Toluidine hydrochloride; Benzenamine, 2-methyl-,hydrochloride
	U223	Toluene diisocyanate; Benzene, 1,3-diisocyanatomethyl-
	U225	Bromoform; Methane, tribromo-
	U226	1,1,1-Trichloroethane; Methyl chloroform; Ethane, 1,1,1-trichloro-
	U227	1,1,2-Trichloroethane; Ethane, 1,1,2-trichloro-
	U228	Trichloroethylene; Ethene, trichloro-
	U234	1,3,5-Trinitrobenzene; Benzene, 1,3,5-trinitro-
	U235	Tris(2,3-dibromopropyl) phosphate; 1-Propanol, 2,3-dibromo-,phosphate (3:1)

Waste Category	Waste Code	Constituent of Concern
	U238	Ethyl carbamate (urethane); Carbamic acid, ethyl ester
	U240	2,4-D, salts & esters; Acetic acid, (2,4-dichlorophenoxy)-, salts & esters
	U243	Hexachloropropene; 1-Propene, 1,1,2,3,3,3-hexachloro-
	U279	Carbaryl; 1-Naphthalenol, methylcarbamate
	U328	o-Toluidine; Benzenamine, 2-methyl-
	U353	p-Toluidine; Benzenamine, 4-methyl-
	U359	Ethanol, 2-ethoxy-; Ethylene glycol monoethylether
	U367	Carbofuran phenol; 7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-
	U373	Propham; Carbamic acid, phenyl-, 1-methylethyl ester
	U404	Triethylamine; Ethanamine, N,N-diethyl-

Part B

Section J

Permit List and SEPA Checklist

Emerald Services, Inc. – Tacoma Facility
Permit List

Washington State Department of Ecology Part B Permit for Storage of Dangerous Waste - Effective/expiration dates respectively – May 23, 1999 / May 23, 2009 (Updated June 2003) – new Part B Permit is anticipated for finalization in January 2010. EPA ID and Permit Number WAD 981 769 110

City of Tacoma Industrial Wastewater Discharge Permit #001-795-805

Puget Sound Clean Air Agency Registration #10126

Washington State Department of Ecology General Industrial Stormwater Permit #WAR001234 (permit number effective January 1, 2010.

Solid Waste Permit #2009-001 (permit number is anticipated to be #2010-001 as of January 2010)

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

Emerald Services, Inc. Tacoma Facility Part B Permit for the Storage of Dangerous Waste - Renewal

2. Name of applicant:

Emerald Services, Inc.

3. Address and phone number of applicant and contact person:

Emerald Services, Inc. – Tacoma facility
1825 Alexander Ave.
Tacoma WA 98421
Sheila Smith, Environmental Coordinator, 206-832-3204

4. Date checklist prepared:

October 27, 2009

5. Agency requesting checklist:

Washington State Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable):

Part B Permit is expected to be renewed in February 2010.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Increase in volume of permitted dangerous waste storage and addition of some tanks for product storage. Some existing product tanks are proposed for use as dangerous waste storage tanks. Increase in storage capabilities.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Part B Permit Application

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

Yes. Part B Permit Application is being reviewed by the Washington State Department of Ecology and will go to public comment by the end of 2009.

10. List any government approvals or permits that will be needed for your proposal, if known.

Washington State Department of Ecology Part B Permit for Storage of Dangerous Waste renewal.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Proposed increase of dangerous waste container storage capacity from 24,200 gallons to 40,810 gallons.
Proposed increase of dangerous waste bulk storage capacity from 51,216 gallons to 121,216 gallons.
Proposed addition of specific categories of waste for storage only: low Btu Class 9 hazardous waste; low Btu dangerous and non-hazardous wastes not otherwise regulated by RCRA, DOT packing group II and III poisons.
Reauthorization of other activities addressed in current permit.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

All proposed activities will occur at 1825 Alexander Ave., Tacoma WA 98421. at existing dangerous waste management areas.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. **Earth**

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other . . . . . .

b. What is the steepest slope on the site (approximate percent slope)? Site is flat – maximum slope is 1-5% for stormwater drainage.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Over 90% of the site is covered by either asphalt or concrete. There is a bioswale located in the site's southeast corner. Underlying soil is 1 foot of dense silty, sandy, gravel fill followed by six to nine feet of loose silty sand fill, then four to five feet o clay. Bioswale is lined with a permeable liner, and contains compost and various grasses.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

No filling or grading is proposed.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

No

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

There will be no change in the percentage of impervious surfaces. Greater than 90% of the site is currently covered.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

n/a

a. **Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

No additional emissions would result from the proposal due to construction of completion. The permit application addresses emission controls for operation according to dangerous waste regulatory requirements.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No

b. Proposed measures to reduce or control emissions or other impacts to air, if any:

Emissions from solvent distillation are controlled by a flare; emissions from glycol distillation are controlled by carbon adsorption; emissions from storage tanks are controlled by conservation vents.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

3. **Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The Blair Waterway is less than ¼ mile to the south of the site. The Hylebos Waterway is approximately ½ mile to the north.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No, site is not within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

All runoff in stormwater management areas is collected in the facility's stormwater management system prior to discharge to the Blair Waterway. Runoff in dangerous waste management areas is managed as industrial wastewater prior to discharge to the City of Tacoma POTW.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Waste materials could enter ground or surface waters if a large volume spill occurred at the site.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Emerald has an extensive Contingency Plan for spill response, along with numerous control measures that are designed to protect surface, ground, and runoff water.

4. **Plants**

a. Check or circle types of vegetation found on the site:

——— deciduous tree: alder, maple, aspen, other

——— evergreen tree: fir, cedar, pine, other

√ shrubs – pampas grass

√ grass – various grasses for bioswale

——— pasture

——— crop or grain

——— wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

——— water plants: water lily, eelgrass, milfoil, other

——— other types of vegetation

c. What kind and amount of vegetation will be removed or altered?

None

c. List threatened or endangered species known to be on or near the site.

None

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

None

5. **Animals**

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other: seagulls, crows
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other:

b. List any threatened or endangered species known to be on or near the site.

None

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Is the site part of a migration route? If so, explain.

No

d. Proposed measures to preserve or enhance wildlife, if any:

None

6. **Energy and natural resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

No additional energy will be required to meet the project's energy needs.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No

d. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

None

7. **Environmental health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

The proposal is for an increase in storage volume and type of waste that is allowed for storage. Therefore, there is additional risk of exposure due to the additional storage volume. There will otherwise be no significant change in on-site management practices.

1) Describe special emergency services that might be required.

Fire, medical, public health, and safety.

2) Proposed measures to reduce or control environmental health hazards, if any:

Proposed measures to reduce and control environmental health hazards are outlined in the Part B Permit Application. They include state of the art equipment and extensive training of employees. Measures meet all dangerous waste regulatory requirements.

b. **Noise**

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

No additional noise is anticipated due to the project.

3) Proposed measures to reduce or control noise impacts, if any:

n/a

8. **Land and shoreline use**

a. What is the current use of the site and adjacent properties?

Area is zoned for industrial use. The site is currently a Part B Permitted TSDF. The Port of Tacoma owns the property to the north and east. Georgia Pacific is to the south, Phillip Services and Handon Transport operate to the west.

b. Has the site been used for agriculture? If so, describe.

No

c. Describe any structures on the site.

The site has several vertical tanks for storage, covered production areas, a boiler house, maintenance shed, laboratory, rail house, locker room, office, and a temporary cover for use when transferring used oil. Dangerous waste management areas are surrounded by a concrete berm. Containerized wastes and products are off-loaded and loaded at the loading dock.

d. Will any structures be demolished? If so, what?

No

e. What is the current zoning classification of the site?

Heavy Industrial

f. What is the current comprehensive plan designation of the site?

Commercial

g. If applicable, what is the current shoreline master program designation of the site?

n/a

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No

i. Approximately how many people would reside or work in the completed project?

Existing facility personnel would work on the completed project. There are currently between 11 and 13 people employed at the site.

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

None

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

None

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None

c. Proposed measures to reduce or control housing impacts, if any:

None

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The proposed change will not change the tallest height of structures on-site.

b. What views in the immediate vicinity would be altered or obstructed?

None

c. Proposed measures to reduce or control aesthetic impacts, if any:

None

11. **Light and glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

There will be no change to the light or glare that would be used or produced by the facility.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No

c. What existing off-site sources of light or glare may affect your proposal?

None

d. Proposed measures to reduce or control light and glare impacts, if any:

None

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

Puget Sound

b. Would the proposed project displace any existing recreational uses? If so, describe.

No

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None

13. **Historic and cultural preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

n/a

c. Proposed measures to reduce or control impacts, if any:

None

14. **Transportation**

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The site address is Alexander Ave. There is no proposed change to the current means of access to the site, which is via Alexander Ave., and via the property to the north of the facility.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

No

c. How many parking spaces would the completed project have? How many would the project eliminate?

No new parking spaces would be added, and no parking spaces would be removed. The site currently has approximately 18 parking spaces.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The facility currently utilizes rail for some operations. There would be no change to the current operations due to the project.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

Emerald estimates that an additional 19 trips per day (one-way) would be generated from the complete project.

g. Proposed measures to reduce or control transportation impacts, if any:

None

15. **Public services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No

b. Proposed measures to reduce or control direct impacts on public services, if any.

n/a

16. **Utilities**

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No additional utilities are proposed.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: .....11/16/09.....

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The proposal is not likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise as the proposal is consistent to similar activities already occurring at the site.

Proposed measures to avoid or reduce such increases are:

n/a

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

This proposal is not likely to affect plants, animals, fish, or marine life as the proposal is consistent to similar activities already occurring at the site.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

n/a

3. How would the proposal be likely to deplete energy or natural resources?

The proposal is not likely to deplete energy or natural resources as the proposal is consistent to similar activities already occurring at the site.

Proposed measures to protect or conserve energy and natural resources are:

n/a

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

The proposal is not likely to use or affect environmentally sensitive areas or areas designated for governmental protection and there are no such areas in the vicinity of the project.

Proposed measures to protect such resources or to avoid or reduce impacts are:

n/a

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

The proposal is not likely to affect land and shoreline use as the proposal is consistent to similar activities already occurring at the site.

Proposed measures to avoid or reduce shoreline and land use impacts are:
n/a

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

The proposal will create a slight increase in depend on transportation as increased trips are estimated.

Proposed measures to reduce or respond to such demand(s) are:

No measures will be taken to reduce this demand as the increase in trips due to this proposal should decrease the number of trips, or travel distance necessary, if this activity is conducted elsewhere.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The Part B Permit Application has undergone extensive review to ensure compliance with all applicable regulations. The proposal is therefore considered consistent with local, state, and federal laws or requirements for the protection of the environment.

Part B

Section K

Part B Certification

K. Part B Certification

WAC 173-303-806(4)(a), 810(12), and (13)

The following certification has been prepared in accordance with the regulatory citations listed above. The certification originally accompanied the Part B Permit Application submitted by Emerald Services, Inc. to the Washington State Department of Ecology on October 1, 2009. It has since been updated to account for the organizational changes that occurred due to the purchase of Emerald by Safety-Kleen Systems, Inc., a wholly owned subsidiary of Clean Harbors.

Responsible Corporate Officer Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Officer

Date 2/6/18

Matthew Sauvageau, Vice President, Environmental Compliance
Clean Harbors Environmental Services, Inc.