SITE HAZARD ASSESSMENT

SUMMARY REPORT

FOR

BURLINGTON NORTHERN RAILROAD
INTERBAY YARD

SEATTLE, WASHINGTON

JUNE, 1991

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1.0 INTRODUCTION

This report summarizes the results of a Site Hazard Assessment performed at Burlington Northern Railroad's (BNR) Interbay Railyard (Interbay) located in Seattle, Washington. The work was conducted by the SAIC/Parametrix team on behalf of the Washington Department of Ecology (Ecology). The specific objective of this assessment was to gather sufficient, available environmental data to enable in an effort to assess the site using the Washington Ranking Method (WARM) guidelines. A Site Hazard Assessment (SHA), as defined by WAC 173-340-320, will be generated based on information gathered from this project.

The objectives of the SHA are described in Section 2.0, the site background is discussed in Section 3.0 and references are listed in Section 4.0. The Data Collection Summary Sheets are provided in Appendix A and MTCA cleanup standards are given in Appendix B.

As directed by Ecology and described in the Work Plan, no sampling was conducted at this site specifically for the purpose of this investigation.

2.0 OBJECTIVES

The primary objective of this project was to perform a SHA at the Interbay Yard and to gather sufficient information to allow the site to be scored by WARM. This information has been compiled along with available data from previous assessments to complete the Site Hazard Data Collection Summary Sheets (SHADCSS). In order to accomplish these objectives, the Scope of Work required collection of data regarding concentrations of hazardous substances present in surface soil and marine sediment; site characteristics that control movement into adjacent environments; and potential for threats to human and environmental health.

3.0 BACKGROUND

Site conditions at the Interbay Yard have been previously evaluated during a sequence of investigations by Remediation Technologies (ReTec). The information presented in this report is obtained from "Burlington Northern Interbay Railyard, 1989-1990 Site Investigation Report" (Remediation Technologies, July 1990).

3.1 Location

The Interbay Yard is located at 1809 West Emerson in Seattle, Washington. It is flanked by West Emerson Place, 20th Avenue West and Gilman Avenue West.

3.2 Past Operational Practices

The Interbay Yard has been in operation since the 1870's and is used for repair and maintenance. From 1916 to the late 1920's a roundhouse was located (Figure 1) where the Store House is presently located. Apparently due to flooding problems, the building was removed and the roundhouse pits located under the roundhouse stalls were filled. A replacement roundhouse was built north of the original location. In a 1930 aerial photo, it appears that a large amount of fill had been deposited prior to building the new roundhouse.

A Bunker C fuel oil UST was previously located between the current Store House and the Machine Shop. Bunker C fuel was used at the facility from the 1920's until the late 1940's when it was replaced by diesel. The tracks near the UST were used as a fueling location until the 1970's. This set of tracks was also used for train car washing. The cars were washed with soap (a strong lye cleaner) and water. Until approximately 1977, engine fueling was performed near the present roundhouse. From 1977 until late 1990, engine fueling was accomplished in and around the Diesel Service Building. Engine fueling now occurs in the southwest portion of the site.

Tank car fueling is currently performed in the northern portion of the facility on the tracks west of the 2.4 million gallon above-ground diesel oil storage tank. Tank car fueling operations have been performed at this location since the late 1940's and engine fueling may have also been performed in this area. Track pans were constructed in this area during the 1970's to contain fuel spilled during the refueling process.

At the Machine Shop, near the south entrance, a large above ground storage tank (AST) was used to clean axles and frames. Up to six axles and frames could be contained in the cleaning tank, which was filled with steam heated Oakite, an alkaline (potassium chloride) cleaner. The equipment was soaked in the Oakite for several hours, then removed and rinsed with water. This process was used in the early 1950's to the 1960's. According to Don Reiling, Assistant Manager of Environmental Engineering Field Operations for BNR,

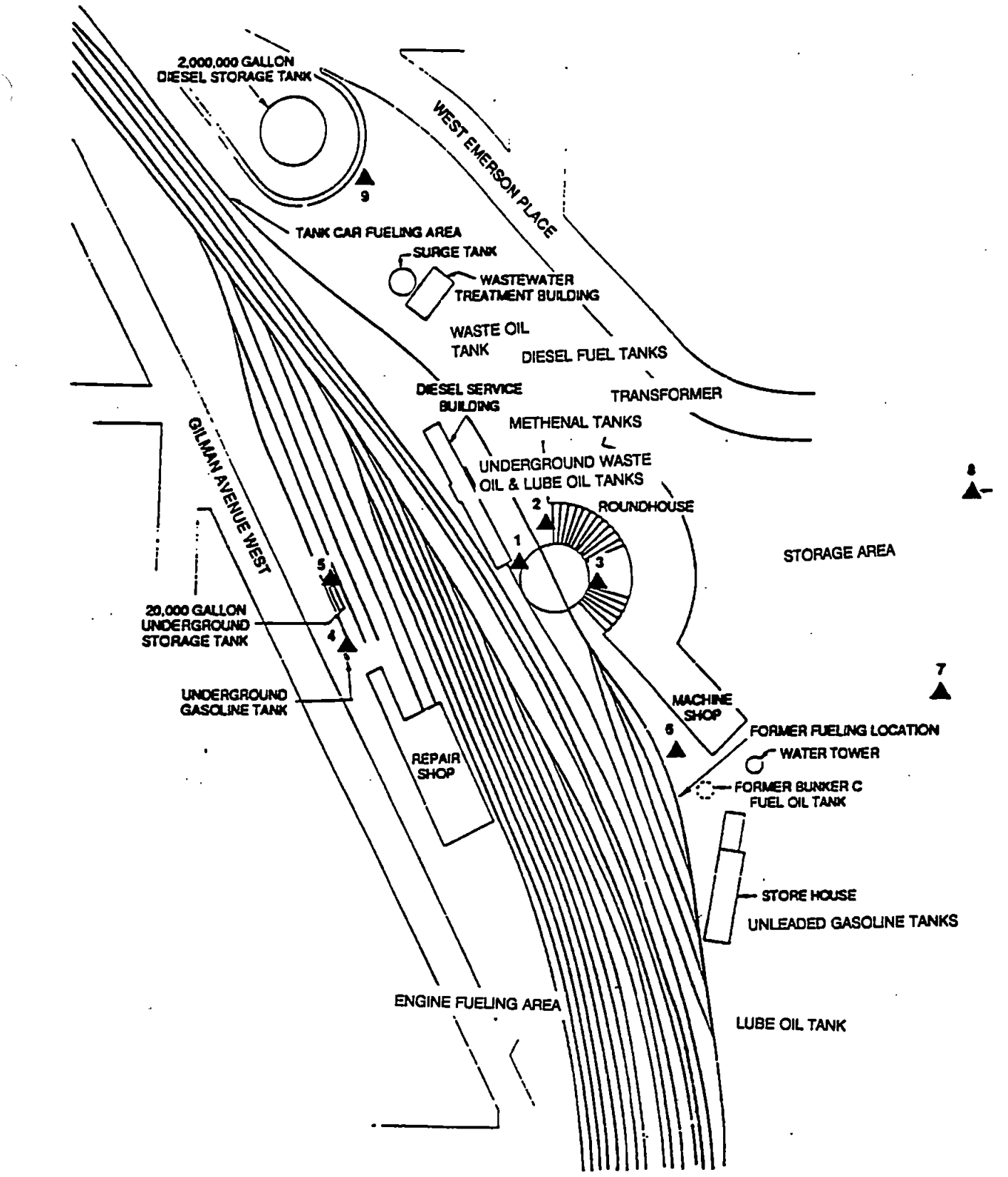

Figure 1.
Site Facility Map
Burlington Northern Railroad
Interbay Railyard

this tank has been removed and a small tank used to clean paint brushes is in use. Waste from paint brush cleaning is collected and disposed of separately by a private contractor.

In 1987 a fuel spill (less than 4,000 gallons) occurred in the turntable area when a locomotive derailed. In response to the spill, three groundwater monitoring wells were installed to determine the impact of the spill on the groundwater and to determine whether free product would accumulate in the wells. These wells were labeled as Wells 1, 2 and 3. No measurable product was detected, but Well 1 near the fueling area was reported to have a slight odor.

According to an Owner/Operator Site Information Sheet obtained from Ecology's files, the contaminants suspected to be at the site include halogenated organic compounds, metals priority pollutants and polynuclear aromatic hydrocarbons. Confirmed pollutants are petroleum products and non-chlorinated solvents. The potential contamination pathways are sediment and surface water while the confirmed pathways are groundwater and soil.

3.3 Site Walk Through

On June 5, 1990 from 12:00 to 2:30 Jeff Neuner and Mike Mondress visited the Interbay site. Mr. Reiling and Shelly Birch of ReTec accompanied us on a tour of the site.

A 2.4 million gallon above-ground diesel storage tank is located in the northern portion of the site. The tank is fed via an above-ground pipeline leading from Salmon Bay. The tank containment area, bermed and clay lined, was heavily stained with oil. Water that accumulates in the tank is drained through drains located on the bottom of the tank. The water used to be drained directly into the containment area but is now piped directly into the drainage catch basin which feeds to the on-site Wastewater Treatment Plant. Ms. Birch said that tests conducted in the containment area indicate minimal contamination of the subsurface soils.

Two 37,000 gallon above-ground diesel storage tanks, located north of the roundhouse, are gravity fed from the 2.4 million gallon tank via underground lines. These tanks also are bermed and thought to be clay lined.

Located directly south of the two diesel tanks is a pump station that is used to direct fuel to the fueling/sand loading area located in the southwest of the site. Track pans are used to catch spilled fuel which is then pumped to the Wastewater Treatment Plant.

On the tracks, directly adjacent to the 2.4 million gallon diesel storage tank, is where tank car fueling operations occur. Any fuel spillage is collected in track pans and is pumped to the Wastewater Treatment Plant.

The Wastewater Treatment Plant is located between the 2.4 million gallon and the 37,000 gallon diesel fuel tanks. Waste from various areas around the site is pumped here to be

treated. Chemicals used in the treating process include sulfuric acid, lime and aluminum sulfate. Up to 136,000 gallons of treated water (20% more on rainy days) per day is discharged into Salmon Bay and oil is directed from the oil/water separator towards a 20,000 gallon waste oil UST located in the front of the Wastewater Treatment Plant. The oil is pumped into a truck and sent to a recycler. Some staining of the soil was noted in the immediate vicinity of the waste oil UST. The oil-water separator is located on the southwest side of the Wastewater Treatment Building.

Two 500 gallon methanal tanks are located directly south of the 37,000 gallon diesel tanks. The methanal is used as an anti-freeze for the fuel piping systems in the winter.

The barrel storage area, located in a fenced area behind the Wastewater Treatment Plant, contains approximately 60 to 70 drums. Of these, approximately 30 contain oily sand, 15 to 20 contain Part A and B tie plug, several contain oil mixed with water and several contain cleaner solution. All waste products stored in this area are drummed and the storage area has a concrete berm around it. Usable transformers are also stored in this area. All have been checked by the electrical company and have been found to not contain PCBs.

East of the Roundhouse is the material storage area. Approximately 112 drums of various usable product are commonly stored here.

Two 15,000 gallon USTs are located between the Roundhouse and the Diesel Storage Area. One is a waste oil tank and the other is a lube oil tank. Above ground pipes carry new lube oil from the UST to the Diesel Service Building and used lube oil from the Diesel Service Building to the used lube oil UST. The waste oil UST is pumped to tank cars and disposed of off site by a private contractor.

Up until 8 months ago, the Diesel Service Building and the area next to it was the engine fueling location. Spilled fluids were collected in track pads and pumped to the Wastewater Treatment Plant. Some repairs are now conducted in this area. Four product barrels that are located on the east side of Diesel Service Building feed a product supply area inside.

In March of 1987, a fuel spill occurred in the turntable. Apparently, a runaway train fell into the turntable area and punctured its fuel tank. A maximum 4,000 gallons were spilled. Spilled fuel was pumped out and Monitoring Wells 1, 2 and 3 were installed. The area is oil stained.

Located on the south side of the Roundhouse is an oil filter crusher. Oil is squeezed out of oil filters and is piped to the waste oil UST located between the Roundhouse and the Diesel Storage Area. The filters are disposed of as solid waste in a landfill.

A 15,000 gallon lube oil tank is located east of the Store House. The concrete lined collection area is able to hold 110% of the volume on the tank.

Northwest of the Store House is the former fueling area. This is also the former location of a Bunker C Fuel Oil UST.

North of the repair shop, near Monitoring Well 4, is the former location of a 500 gallon gasoline UST. Contaminated soil excavated during the April, 1991 removal of this UST is being treated in a bermed, plastic lined area east of the Store House. The soil is being aerated and will be tested for petroleum contamination before removal.

Located north of Monitoring Well 4 and south of Monitoring Well 5 is a 20,000 gallon UST. The UST used to contain diesel and has been filled. No information on the decommissioning of the tank was available.

Engines are repaired and maintained in the Roundhouse. All engine repair bays have concrete bottom and are connected by underground piping to the treatment facility. All cleaning solvents are used in Safety-Clean or similar parts wash stations. Solvents are collected separately and disposed of by an independent contractor. A product supply area that dispenses small amounts of substances is located in this building.

East of the Store House is a 6,000 gallon unleaded gasoline UST that is slated for removal. A gasoline pump is also located here.

The engine car cleaning area is located in the southwest corner of the yard. Locomotives are washed here using a "drive through washer". Used wash water is retained in a catch basin and recycled until it is no longer usable. Wastewater is piped to the Wastewater Treatment Plant. The cleaner storage tank, stored next to the wash pump, is marked as either a caustic alkali liquid or an alkaline corrosive liquid.

Two transformer stations are located in the vicinity of the Wastewater Treatment Plant. Usable transformers are stored in the storage area behind the wastewater treatment plant. All have been checked by the electrical company for PCBs.

Most of the area inside the tracks was heavily oiled.

3.4 Hydrogeology/Geology

The Interbay Yard is situated between Elliott Bay and Salmon Bay. This area is part of the Puget Sound Lowland. According to the ReTec report, it is likely that some of the deposits underlying the site are Vashon Till and marine sediments. Historically areas of the site have been filled. The sediments identified during drilling on site consist of clays, silts, sands and gravels.

The site hydrogeology is not clear. It is likely the southern portion of the site (Balmar Yard) is influenced by tidal action and it is also possible a saltwater interface is located in the area. The northern portion is not as likely influenced by the tide due to the Ballard

Locks creating an artificial lake, but the fill used in this area may have an influence on the groundwater flow direction.

The depth to groundwater, according to the ReTec report, can be seen in Table 1. Since information on groundwater flow in relation to tidal cycles is not given in the report it is not apparent whether the water levels were taken at high or low tide. The depth to groundwater in the eastern portion of the site (Wells 7 and 8) appears to range from 1.70 to 2.50 feet while the depth to groundwater on the western portion (Wells 4 and 5) of the site appears to range from 7.06 to 11.59 feet. The depth to groundwater around the roundhouse (Wells 1,2,3) ranged from 7.97 to 10.45 feet. The depth to groundwater around near the Machine Shop (Well 6) was measured to be 6.96 feet.

TABLE 1

DEPTH TO GROUNDWATER IN FEET

Well Number	Water Level 11-14-89	Water Level 1-23-89
1	NM	10.45
2	NM	9.78
3	NM	7.97
4	11.76	11.59
5	2.4	7.06
6	6.96	NM
7	2.65	1.70
8	2.78	2.50
9	NM	NM

3.5 Previous Site Investigation and Results

In July of 1990, Remediation Technologies of Kent, Washington submitted a report on the Interbay Yard to BNR. At the time the ReTec report was written, 9 wells had been installed. Wells 1,2 and 3 were installed March 31 and April 1, 1987. Wells 4 through 9 were installed on October 30 and 31, 1989. During the installation of Wells 4 through 9 soil samples were obtained from the borings. These samples were analyzed for Total Petroleum Hydrocarbons (TPH), Purgeable Halocarbons and Purgeable Aromatics. Groundwater at the site was sampled for TPH, methylene chloride, acetone and chloroform in November

1989, January 22 and 23 1990 and February 1990. Results of the available lab work can be seen in Tables 2 and 3.

ReTec has installed additional groundwater monitoring wells and is in the process of preparing another report. It was not available at this writing.

On October 30 and 31, 1989, six groundwater monitoring wells (Wells 4 through 9) were installed at the Interbay facility. The wells are located where potential for contamination exists. Well 4 was located near a gasoline UST and Well 5 was located near a 20,000 gallon UST thought to have contained diesel fuel. These wells are located north of the repair shop.

While drilling the boring for Well 6, a thick dark oily substance thought to be Bunker C fuel oil was observed in the soil matrix. This is the only boring where fuel contamination was visually evident and the contamination appeared to increase with depth toward the water table. Well 6 is located west of the Machine Shop near the area where past fueling activities occurred.

Wells 7 and 8 were located in the storage area east of the roundhouse. These wells were located in this area because surface runoff and possibly ground-water flow is in this direction. Well 9 is located between the Wastewater Treatment Plant and the 2.4 million gallon diesel AST.

Although acetone has been identified as present in groundwater, ReTec/BNR believes that acetone to be a lab contaminant and is not suspected on the site. However, the acetone lab contaminant levels are unusually high for a lab contaminant and thus acetone is suspected to be present at the site.

TABLE 2

BNRR INTERBAY RAILROAD
ANALYTICAL RESULTS OF SOIL BORINGS

Boring Number	Depth (feet)	TPH (mg/kg)	Toluene (mg/kg)	Meta and Para Xylene (mg/kg)	Ortho Xylene (mg/kg)
4	2.5-4.0	5.5	<0.05	<0.05	<0.05
	7.5-9.0	<5.0	<0.05	<0.05	<0.05
	12.5-14.0	<5.0	<0.05	<0.05	<0.05
5	2.5-4.0	10.7	0.19	<0.05	<0.05
	7.5-9.0	7.0	<0.05	<0.05	<0.05
6	0-2.5	27651	<0.05	0.85	0.81
	2.5-4.0	51826	<0.05	<0.05	<0.05
	7.5-9.0	53339	<0.05	<0.05	<0.05
7	2.5-4.0	6596	<0.05	<0.05	<0.05
	7.5-9.0	<5.0	<0.05	<0.05	<0.05
8	2.5-4.0	371	<0.05	<0.05	<0.05
	7.5-9.0	<5.0	<0.05	<0.05	<0.05
9	2.5-4.0	5.2	<0.05	<0.05	<0.05
	7.5-9.0	5.4	<0.05	<0.05	<0.05
	12.5-14.0	<5.0	<0.05	<0.05	<0.05

Source: ReTec, 1990

TABLE 3

BNRR INTERBAY RAILROAD
ANALYTICAL RESULTS OF GROUNDWATER ANALYSIS

Well Number	TPH (ug/L)	Methylene Chloride (ug/L)	Acetone (ug/L)	Chloroform (ug/L)
1	1100	NA	NA	NA
2	617	NA	NA	NA
3	845	NA	NA	NA
4	52	2	13	1
5	59	11	200	2
6	1100	<5	1700	5
7	NA	3	130	<1
8	197	2	100	<1
Field Blank	87	<1	6	8
Trip Blank	---	<1	<5	<1

Source: ReTec, 1990

4.0 REFERENCES

Birch, Shelley, Remediation Technologies, June 1990, site visit.

Department of Ecology, undated, Owner/Operator Site Information.

Metro, August 9, 1977, Letter to C.F. Intlekofer from Larry Peterson.

Remediation Technologies, July 1990, Burlington Northern Interbay Railyard, 1989-1990 Site Investigation Report.

Reiling, Don, Burlington Northern Railroad, June, 1990, site visit and personal communication.

APPENDIX A
Site Hazard Assessment Data Collection Sheets

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
TOXICS CLEANUP PROGRAM

SITE HAZARD ASSESSMENT DATA COLLECTION SUMMARY SHEETS
FOR
WASHINGTON RANKING METHOD

Site Name: BNRR INTERBAY

Location: E ½ NW¼ SECTION 14 T25N R3E

Site owner/operator: Burlington Northern R.R.

Address: 1809- West Emerson, Seattle, WA

Any other known PLP(s): no

Address: _____

Site Number: _____

Date(s) of field site hazard assessment: June 5, 1991

Samples or field measurements: _____ soil
_____ surface water
_____ air _____ ground water

(Attach copies of pertinent sampling and analytical data, as well as all other supporting documentation.)

Photographs: attached

Weather: sunny

Lead inspector: Mike Mondress

Other inspectors: Jeff Warner

Signature: Mike Mondress

PART I: Hazardous Substances

NOTE: Page numbers (e.g. SW-2) shown in parentheses thoughout this checklist refer to the WARM Scoring Manual. WK- numbers refer to pages of the new scoring sheets (not those in the scoring manual).

A. LIST

List hazardous substances, known or suspected (check k or s), currently at the property, or that have been previously(check c or p) at the property (WK-2,3):

Hazardous Substance	K	S	C	P	Quantity	Units
1. TPH					53339	(mg/kg)
2. Toluene					0.19	(mg/kg)
3. Multi fibra Xylene (meta)					-85	"
4. Orthoxylene					-81	"
5. Methylene Chloride					11	ug/L
6. Acetone					1700	ug/L
7. chloroform					5	ug/L
8.						
9.						

Additional?_____(list on attachment)

By which routes are these available?

Number(from above)	Surface Water	Air	Groundwater
1. 1		✓	✓
2. 2		✓	✓
3. 3		✓	✓
4. 4		✓	✓
5. 5		✓	✓
6.			
7.			
8.			
9.			

Please see Attachment 1

B. SOURCES

Check those known or observed (WK-3):

- ✓ drums or other containers
- ✓ electrical transformers
- ✓ above ground tanks
- ✓ below ground tanks
- ____ ponds, pits, or other impoundments
- ✓ pipelines (other than water, sewer, or gas)
- ✓ floor drains
- ____ exterior drains for rainwater, surface waters, spills, etc.
- ____ other? Identify:_____

C. INDICATORS

Check those know or observed:

- ✓ discolored soils
- ✓ disturbed soils
- ____ discolored standing water
- ____ unusual or noxious odors
- ____ sick or dead vegetation
- ✓ groundwater monitoring wells
- ____ other? Identify:_____

If any are checked in B or C, explain details including exact locations (identify location in a map or drawing). (See Attachment 2 §3

Additional information:_____

PART II: Releases

A. KNOWN OR SUSPECTED RELEASES

List those hazardous substances identified (by number) in I.A. which are known, or suspected, to have been released (WK-2,3):

Substance (#)	Quant.Released	Units	Medium released to
(Attachment 4)			

Additional information/reference? _____

B. SOURCES AND IMPACTS (Pages SW-5,6; A-9,10; GW-6,7)

List those hazardous substances identified (by number) in II.A. and identify the source and impact:

Substance No.	Source	Impacts/affects To	Area
(Attachment 4)			

Additional information/reference? _____

III. Migration Potential

A. CONTAINMENT--LANDFILLS (SW-7; A-12; GW-8,9)

Present? None observed How many?_____

Check those that apply:

1. _____An engineered, maintained run-on/run-off control system
2. _____An engineered/maintained cover without ponding
3. _____Unmaintained run-on/runoff control system or cover
4. _____No run-on/runoff control or no cover
5. _____Uncontaminated soil cover greater than 6" thick
6. _____Uncontaminated soil cover less than 6" thick
7. _____Contaminated soil used as cover
8. _____A functioning vapor collection system
9. _____Mixing or agitation used
10. _____No liner
11. _____Single clay or compacted soil liner (permeability_____cm/sec)
12. _____Single synthetic liner (permeability_____cm/sec)
13. _____Double liner system (permeability_____cm/sec)
14. _____Leachate collection system, maintained and functioning
15. _____Leachate collection system, unknown condition or not functioning
16. _____Liquid wastes may have been disposed of
17. _____Liquid wastes were disposed of in landfill
18. _____Reliable evidence no liquid wastes were disposed

Additional comments:_____

B. CONTAINMENT--SURFACE IMPOUNDMENTS (SW-7,8; A-13; GW-10,11)

Present Pow channel. How many?_____

Check those that apply:

1. _____The dike is apparently sound

2. _____The dike is regularly inspected and maintained

3. _____There is evidence of failure, erosion, slumping, or release of contents

4. _____Two feet of freeboard maintained automatically

5. _____The freeboard is manually controlled so that there is at least 2 feet of freeboard

6. _____Evidence of insufficient freeboard (<2 ft.)

7. _____A maintained cover

8. _____Unmaintained cover, no cover

9. _____No liner

10. _____Single synthetic liner

11. _____Single clay or compacted soil liner

12. _____Double liner

13. _____Working leak detection system

14. _____Evidence of loss of fluid (other than by evaporation)

Additional comments:_____

C. CONTAINMENT--DRUMS AND SMALL CONTAINERS (SW-9; A-11; GW-11)

Present observed How many? ~ 180

Check those that apply:

1. _____No functional containment
2. _____There is secondary containment capacity for the total volume of containers
3. _____There is secondary containment with capacity for at least 110% of volume of the largest container
4. ✓ The secondary containment is less that 110% of the volume of the largest container
5. _____The containers are stored in single, or double layers on pallets, or in racks
6. _____The containers are stored in an unstable manner
7. _____Some containers are open or have visible liquid
8. _____Some containers are leaking
9. _____Containers are protected from weather
10. _____Containers showing deterioration
11. ✓ Containment surface is impervious
12. _____Containment surface has cracks or semi-permeable
13. _____No base material/permeable base such as gravel/base materials unknown
14. ✓ Containment is regularly inspected and maintained
15. _____Evidence of containment failure

Additional comments: _____

D. CONTAINMENT--STORAGE TANKS (SW-9; A-11; GW-11)

Present observed How many? 12

Check those that apply:

1. ✓ Secondary containment with a capacity of 110% of the volume of the tanks
2. _____ Secondary containment at least 50% of the volume of all tanks
3. _____ Containment system with capacity for at least 10% of volume of containers or tanks
4. _____ No containment, or less than 10% capacity
5. _____ Tank volumes maintained
6. _____ Automatic controls used for volume maintenance
7. ✓ Tanks are covered
8. _____ Uncovered tanks have aeration, mixing, or heating of tank contents
9. ✓ Containers sealed, protected
10. _____ Containers sealed, not protected
11. _____ Containers deteriorated
12. _____ Containers leaking
13. Record the #s of above which apply only to above ground tank _____
14. Record the #s of above which apply only to below ground tanks _____
15. Record the #s of above which apply to both above and below ground tanks: _____

Additional comments: _____

E. CONTAINMENT--WASTE PILES (SW-10; A-13; GW-12,13)

Present Yes How many? 1

Check those that apply:

1. ✓ Waste pile is outside, no protecting structure
2. _____ Waste pile is outside, in open structure with roof
3. _____ Waste pile is outside, with partial or unmaintained cover
4. _____ Waste pile is outdoors, with maintained cover
5. ✓ No cover is present
6. _____ Waste pile is fully enclosed, intact building
7. _____ There is an engineered run-on/run-off control
8. _____ The run-on/run-off is maintained
9. _____ Run-on/runoff control present, unknown condition
10. ✓ No run-on/runoff control system present, or unknown if present
11. ✓ Liner or base present; _____ Not present
12. _____ Single clay or compacted soil liner
13. _____ Single synthetic liner
14. ✓ Double liner (2- 60mm pvcc q VIS-glow)
15. _____ Maintained, functioning leachate collection system
16. _____ Leachate collection system; _____ Unknown condition; or _____ Not functioning

Additional comments: _____

F. CONTAINMENT--SPILLS, DISCHARGES, AND CONTAMINATED SOIL (SW-10,11; A-13,14; GW-13)

Check those that apply:

1. _____Spill, discharge, or contaminated soil only in the subsurface at the site--including dry wells, drain fields, leaking underground storage tanks

2. _____Soil contamination that has been covered partially excavated and filled with at least 6 inches of clean soil

3. _____Soil contamination that has been covered or partially excavated and filled with less than 6 inches of clean soil

4. _____Uncontaminated soil cover >2 feet thick

5. _____No cover; or _____Cover <2 feet, but > 6" thick

6. _____Spill, discharge, or contaminated soil present at the surface in an area with maintained run-on/run-off controls

7. ✓ Spill, discharge, or contaminated soil present at the surface in an area with unmaintained run-on/run-off controls

8. _____Spill, discharge, or contaminated soil present at the surface with no run-on/run-off controls or unknown controls

9. ✓ Contaminated soil has been disturbed or excavated and stored above grade

10. _____A functioning vapor recovery system

11. _____No vapor recovery system

Additional comments:_____

G. CONTAINMENT--SITE CHARACTERISTICS (SW-11,12; A-6; GW-14; WK-5,6,8)

1. How would you evaluate the site soils? Circle predominant textural class.

SCS Soil Data unavailable

_____ Sand, gravel, sandy gravel, well-graded sand, well-graded gravel, gravelly sand, gravelly sand loam, silty sandy loam?

(Fill) Poorly-graded sands with fines, silt-sand mixtures, loam, silt loam, sandy silt loam, clayey sand, clay sand loam?

_____ Clayey sands, sand-clay mixtures, clayey gravels, clay-sand-gravel mixtures, inorganic silts, clayey silt loam, silty clay loam, porous rock outcrop, sandy silty clay, sandy clay loam?

_____ Clay (organic and inorganic), clay loam, rock outcrop, peat, peaty clay?

Is the above based on personal observation, lab analysis, or professional judgment by a soil expert? (circle)

2. Total annual precipitation= 34.8 in./yr (SW-12; WK-5)

3. Max. 2-yr/24-hr precip.= 2.0 inches (SW-14; WK-5)

4. Net precipitation (see 2.2, GW-13)= 20.2 in. (WK-9)

5. Is the site not in a flood plain? X (SW-14; WK-5)
Is the site in a 500 year flood plain? _____ Best Professional Judgement
Is the site in a 100 year flood plain? _____
Flood Insurance Rate Map Comm. Panel No. _____

6. What is the terrain slope to the nearest surface water?
<2 % (SW-14,15; WK-6)

7. What is the subsurface hydraulic conductivity?
$>10^{-5}$-10^{-3} cm/sec (GW-14; WK-9) Unknown - suspected fill material with moderate permeability - assume SIC value

8. What is the vertical depth from the deepest point of known contamination to ground water? ? feet (GW-15; WK-9)

Additional comments: _____

IV. Targets

A. DISTANCE TO SURFACE WATER (SW-16; WK-6)

1. What surface water(s) (lake, stream, river, pond, bay, etc.) is/are within 10,000 feet (downgradient) of the site?

Name	Dist. - ft.	Obs.	Meas.
Smith Cove Waterway	3960 Ft		X
SALMON BAY FISHERMANS TERMINAL	3700 Ft		X

None?_____ Comments_____

2. What drinking water intakes are within 2 miles of the site? (all lake intakes, river intakes downstream only) (SW-12; WK-6)

None? X DRINKING WATER SUPPLIED FROM PROTECTED SOURCE IN THE CASCADES.

Source	Location	Pop. Served

3. How much acreage (anywhere) is irrigated by surface water intakes (downstream only) or wells (anywhere) within 2 miles of the site? (SW-16; GW-18; W/S 5; WK-6,9)

None? X

SURFACE WATER: Acres _____ (1600 acres max.)

Source(s) _____;

GROUNDWATER: Acres _____ (4500 acres max.)

Source(s) _____

Topo map does not indicate direction of surface flow (North or South)

4. What is the distance to the nearest fishery resource (total of overland distance plus downgradient distance)? (SW-17; WK-6)
3760 Ft to Southshore Waterway (Elliot Bay of Puget Sound) and
Over 10,000 feet?_____ Distance if less than 10,000 feet?_____ ft.
Salmon Bay 3700 Ft to North

5. What are the names of, and the distances to the nearest sensitive environments (total of overland distances plus downgradient distances)? (SW-18; A-15; WK-6)

Over 10,000 feet?_____ Names and distance if less than 10,000 feet:
Municipal Park 530 Feet North of site

6. Is the aquifer a federally-designated sole source aquifer? No (GW-16; WK-9)

7. Is the ground water used for: (GW-16; WK-9)

_____ private supply
_____ public supply
_____ irrigation of human food crops or livestock
_____ non-food (human) vegetation
_____ not used due to natural contaminants
__X__ ground water not used, but usable

DRINKING WATER OBTAINED FROM PROTECTED SOURCE IN CASCADES

8. Distance to nearest drinking water well?_____feet (GW-17; WK-9)

9. Is there an alternate source available to groundwater for private or public water supply? (WK-9) YES - SEE NOTE FOR #1

10. Population served by drinking water wells within 2 miles 0 ? (GW-17; WK-9)

11. Distance to the nearest population? adjacent feet (A-15, 16; WK-8)

12. Population within one-half mile radius? 4,700 (A-16; WK-8)

Additional comments:_____

4.0 REFERENCES

Birch, Shelley, Remediation Technologies, June 1990, site visit.

Department of Ecology, undated, Owner/Operator Site Information.

Metro, August 9, 1977, Letter to C.F. Intlekofer from Larry Peterson.

Remediation Technologies, July 1990, Burlington Northern Interbay Railyard, 1989-1990 Site Investigation Report.

Reiling, Don, Burlington Northern Railroad, June, 1990, site visit and personal communication.

Attachment 1

BNRR INTERBAY RAILROAD
ANALYTICAL RESULTS OF SOIL BORINGS

Boring Number	Depth (feet)	TPH (mg/kg)	Toluene (mg/kg)	Meta and Para Xylene (mg/kg)	Ortho Xylene (mg/kg)
4	2.5-4.0	5.5	<0.05	<0.05	<0.05
	7.5-9.0	<5.0	<0.05	<0.05	<0.05
	12.5-14.0	<5.0	<0.05	<0.05	<0.05
5	2.5-4.0	10.7	0.19	<0.05	<0.05
	7.5-9.0	7.0	<0.05	<0.05	<0.05
6	0-2.5	27651	<0.05	0.85	0.81
	2.5-4.0	51826	<0.05	<0.05	<0.05
	7.5-9.0	53339	<0.05	<0.05	<0.05
7	2.5-4.0	6596	<0.05	<0.05	<0.05
	7.5-9.0	<5.0	<0.05	<0.05	<0.05
8	2.5-4.0	371	<0.05	<0.05	<0.05
	7.5-9.0	<5.0	<0.05	<0.05	<0.05
9	2.5-4.0	5.2	<0.05	<0.05	<0.05
	7.5-9.0	5.4	<0.05	<0.05	<0.05
	12.5-14.0	<5.0	<0.05	<0.05	<0.05

BNRR INTERBAY RAILROAD
ANALYTICAL RESULTS OF GROUNDWATER ANALYSIS

Well Number	TPH (ug/L)	Methylene Chloride (ug/L)	Acetone (ug/L)	Chloroform (ug/L)
1	1100	NA	NA	NA
2	617	NA	NA	NA
3	845	NA	NA	NA
4	52	2	13	1
5	59	11	200	2
6	1100	<5	1700	5
7	NA	3	130	<1
8	197	2	100	<1
Field Blank	87	<1	6	8
Trip Blank	---	<1	<5	<1

note: Acetone is belived to be a lab contaminant

Suspected pathways of contamination are groundwater and surface soil.

Chemicals used in the Wastewater treatment plant include sulfuric acid, lime and aluminum sulfate.

According to an Owner/Operator Site Information Sheet obtained from Ecology's files, the suspected contaminants are halogenated organic compounds, metals priority pollutants and polynuclear aromatic hydrocarbons. Confirmed pollutants are petroleum products and non-chlorinated solvents. The potential contamination pathways are sediment and surface water while the confirmed pathways are groundwater and soil.

Attachment 2

I-B. Sources

Drums or Other Containers:

The barrel storage area, located in a fenced area behind the Wastewater Treatment Plant, contains approximately 60 to 70 drums. Of these, approximately 30 contain oily sand, 15 to 20 contain Part A and B tie plug, several contain oil mixed with water and several contain cleaner solution. All waste products stored in this area are drummed and the storage area has a concrete berm around it.

East of the Roundhouse is the material storage area. Approximately 112 drums of various usable product are commonly stored there.

Four product barrels that are located on the east side of Diesel Service Building feed a product supply area inside.

The cleaner storage tank, stored next to the wash pump, is marked as either a caustic alkali liquid or an alkaline corrosive liquid.

Electrical Transformers:

Two transformer stations are located in the vicinity of the Wastewater Treatment Plant. Usable transformers are stored in the storage area behind the wastewater treatment plant. All have been checked by the electrical company for PCBs.

Above Ground Tanks:

A 2.4 million gallon diesel storage tank is located in the northern portion of the site. The tank is fed via an above-ground pipeline leading from Salmon Bay.

Two 37,000 gallon diesel tanks are located north of the roundhouse These tanks also are bermed and thought to be clay lined.

Two 500 gallon methenal tanks are located directly south of the 37,000 gallon diesel tanks.

A 15,000 gallon lube oil tank is located east of the Store House. The concrete lined collection area is able to hold 110% of the volume on the tank.

Below Ground Tanks:

Two 15,000 gallon USTs are located between the Roundhouse and the Diesel Storage Area. One is a waste oil tank and the other is a lube oil tank.

Northwest of the Store House is the former location of a Bunker C Fuel Oil UST.

North of the repair shop, near Monitoring Well 4, is the former location of a 500 gallon gasoline UST.

Located north of Monitoring Well 4 and south of Monitoring Well 5 is a 20,000 gallon UST. The UST used to contain diesel and has been filled.

East of the Store House is a 6,000 gallon unleaded gasoline UST that is slated for removal. A gasoline pump is also located here.

Oil is directed from the oil/water separator towards a 20,000 gallon waste oil UST located in the front of the Wastewater Treatment Plant.

Pipelines:

Above ground pipes carry new lube oil from the UST to the Diesel Service Building and used lube oil from the Diesel Service Building to the used lube oil UST.

The methenal is used as an anti-freeze for the fuel piping systems in the winter.

The two 37,000 gallon tanks are gravity fed from the 2.4 million gallon tank via underground lines. Underground piping carrries fuel from these tanks to the southern fueling area.

Oil is squeezed out of oil filters and is piped to the waste oil UST located between the Roundhouse and the Diesel Storage Area.

Above ground pipes carry new lube oil from the UST to the Diesel Service Building and used lube oil from the Diesel Service Building to the used lube oil UST.

Underground lines carrry waste oil from the drain near the 37,000 gallon tank, all fueling areas and all maintenace areas to the Wastewater Treatment Plant.

Floor Drains:

All floor drains are routed thruogh the Wastewater Treatment Plant.

Attachment 3

I-C. Indicators

Discolored Soils:

Most of the area inside the tracks was heavily oiled.

The area inside the turntable, the area around the waste oil UST, the area in the 2.4 million gallon tank containment area and the area in the 37,000 gallon tank containment area are oil stained.

Disturbed Soils:

Contaminated soil excavated during the April, 1991 removal of this UST is being treated in a bermed, plastic lined area east of the Store House. The soil is aerating and will be tested for petroleum contamination before removal.

Groundwater Monitoring Wells:

Sixteen monitoring wells have been installed at the site.

Attachment 4

II A & B Releases

An August 9, 1977 letter to BNR presents results of sampling taken in the manhole after the oil separator. Analysis revealed up to 320 mg of oil per liter of water.

The tank containment area, bermed and clay lined, was heavily stained with oil. Water that accumulates in the tank is drained through drains located on the bottom of the tank. The water used to be drained directly into the containment area but is now piped directly into the drainage catch basin which feeds to the Wastewater Treatment Plant. Ms. Birch said that tests conducted in the area indicate minimal contamination of the subsurface soils.

In March of 1987, a fuel spill occurred in the turntable. Apparently, a runaway train fell into the turntable area and punctured its fuel tank. A maximum 4,000 gallons were spilled. Spilled fuel was pumped out and Monitoring Wells 1, 2 and 3 were installed.

APPENDIX B
MTCA Clean Up Standards

MTCA clean up levels for groundwater

Analyte	Method A (ug/L)	Method B (mg/L)
TPH: Gasoline Diesel Oil & Grease	1000 --- --- ---	NS
Methylene Chloride	5	NS
Acetone	NS	NS
Chloroform	NS	59.2
Toluene	40	1
Ethylbenzene	30	0.7
Benzene	5	.00151

NS-No standard listed

MTCA clean up levels for soil

	Method A (mg/kg) Industrial Soil	Method A (mg/kg)	Method B (mg/kg)
TPH Diesel Oil & Grease Gasoline	 200 200 100	 200 200 100	 NS NS NS
Toluene	40	40	NS
m-Xylene	20	20	0.2
p-Xylene	20	20	0.2
o-Xylene	20	20	0.2
Benzene	0.5	0.5	0.0151
Ethylbenzene	20	20	8

NS-No standard listed