PROJECT FILE No. 025093 R-2

RZ3-SAI-R10003-01-TR-00148
R.Category:2-A; R.Color:7-yellow-A

RCRA FACILITY ASSESSMENT REPORT FOR BOEING DEVELOPMENTAL CENTER TUKWILA, WASHINGTON EPA I.D. NO. WAD 09363 9946 AND BOEING MILITARY FLIGHT CENTER SEATTLE, WASHINGTON EPA I.D. NO. WAD 98847 5943

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EPA Contract No. 68-W4-0005
Work Assignment No. R10003
SAIC Project No. 05-5025-03-8141-070

SEPTEMBER 1994

PART 1
BOEING DEVELOPMENTAL CENTER

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1.0 INTRODUCTION

This section of the Boeing Developmental Center Preliminary Review/Visual Site Inspection (PR/VSI) report outlines the purpose and scope of the RCRA Facility Assessment (RFA). Other report sections are also described below.

1.1 PURPOSE AND SCOPE OF THE RFA PROGRAM

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) provide authority to the Environmental Protection Agency (EPA) to require comprehensive corrective action on all solid waste management units (SWMUs) and other areas of concern (AOCs) at interim status hazardous waste management facilities where a release(s) of hazardous constituents has occurred. These include RCRA interim status facilities, those applying for Part B permits, and those undergoing closure. The intent of this authority is to address previously unregulated constituents released to air, surface water, ground water, and soil, as well as the generation of subsurface gases.

A major activity of the EPA's corrective action program consists of the RFA. According to the EPA's RCRA Facility Assessment Guidance Document (1), the purposes of the RFA are to:

1. Identify and gather information on releases at RCRA-regulated facilities;

2. Evaluate solid waste management units (SWMUs) and other areas of concern (AOCs) for releases to all media and regulated units for releases to media other than ground water;

3. Make preliminary determinations regarding releases of concern and the need for further actions and interim measures at the facility; and

4. Screen from further investigation those SWMUs which do not pose a threat to human health or the environment.

The three basic steps of the RFA consist of a preliminary review (PR) of existing files and other generally available information, a visual site inspection (VSI) to confirm and/or obtain additional information on past or present releases, and when warranted, a sampling visit to fill data gaps by obtaining field and analytical data.

1.2 REPORT CONTENTS

This report provides a summary of the PR of files and Visual Site Inspection for the Boeing Developmental Center (BDC) in Tukwila, Washington. Primary sources of information utilized in this review include files and correspondence from EPA Region 10 and the Washington State Department of Ecology (Ecology).

Section 2.0 of this report describes the BDC facility and its operations. Information pertaining to the environmental setting is presented in Section 3.0. Finally, Section 4.0 provides a description of SWMUs identified in the course of the assessment. The discussion of each SWMU includes unit description, period of operation, wastes managed, release controls, and release history.

Appendix A contains photographs taken as part of the VSI. The field notes from the VSI are in Appendix B. Finally, Appendix C contains a list of current and former accumulation areas.

2.0 FACILITY DESCRIPTION

2.1 LOCATION AND HISTORY

The Boeing Developmental Center (BDC) is located at 9725 East Marginal Way South in Tukwila, Washington (Figure 1). The facility consists of approximately 60 buildings on 164.4 acres of property. Boeing owns 94.5 acres and leases the remaining 59.9 acres.(2,3)

The BDC is primarily an aircraft and aerospace research and development complex with most of their work supporting U.S. Department of Defense (DOD) projects. Past projects at the BDC include research on supersonic transportation and developing military aircraft. Currently, parts for AWAC airplanes which are sold to Japan are manufactured on site. Boeing is preparing to manufacture F22 airplanes. Due to the sensitive nature of the work at the BDC, areas within the facility where work is being performed on classified projects are designated as "black areas" and require security clearance to enter.(4,11)

Boeing has operated on this site since 1956. The Military Airplane Company Division of Boeing operated this facility prior to October 1980. The Boeing Developmental Center began operations in October 1980, with the operation transferring to the Boeing Advanced Systems Company Division in November 1987. In 1990, as part of a reorganization, Boeing separated the Military Flight Center from the Developmental Center.(3,4)

Historically, a variety of activities have occurred on various portions of the site. Until the U.S. Army Corp of Engineers "straightened" the Duwamish River in 1911 the site was farmland. The earliest known commercial operations at the site began in 1927, when Washington Compressed Gas Company (a welding supply company), Associated Packing Company's stockyard and meat-packing plant, and Prankratz Lumber Company (a sawmill) occupied the northeast corner. The stockyard occupied a location southwest of the welding company. The sawmill was to the southwest of the stockyard and adjacent to the Duwamish River. The date the welding supply company ceased operating is unknown. However, by 1947 a warehouse of modular home components and an office building occupied that location. The stockyard operated until 1956. The saw mill closed sometime between 1958 and 1963. The only known waste associated with these businesses was a scrap wood pile that was in the southwestern corner of the sawmill property.(5)

In the mid-1930s, the southeastern portion of the property contained a grocery store and gasoline station. The rest of the grocery store building was leased with a tavern and warehouse occupying the building. A fire destroyed the building in the 1940's. The gas station only operated for a short time period.(5)

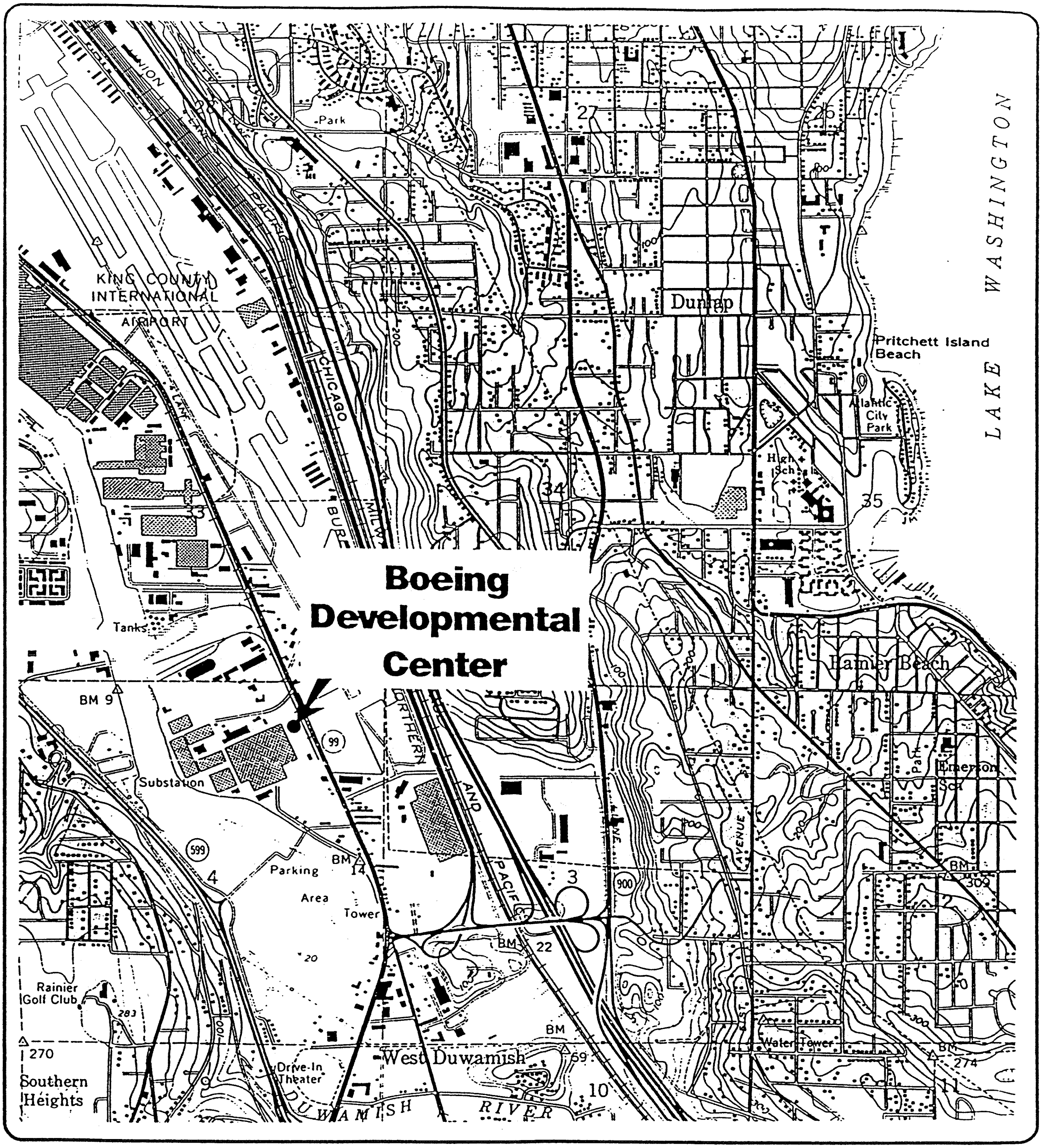

Figure 1

SITE LOCATION MAP
BOEING DEVELOPMENTAL CENTER

In 1938, a winery owned by American Winegrower's Association occupied the property south of Washington Compressed Gas and adjacent to East Marginal Way. The winery expanded in 1946 and again in 1968 until it occupied 60,000 square feet; it closed in the mid-1970's. There were two 1,000 gallon underground concrete settling tanks associated with the winery that are no longer on site.(5)

An auto wrecking yard occupied the area of the BDC south parking lots until 1956. Pamco construction company owned and operated a construction yard and commercial parking lot north and west of the auto wrecking yard. The construction yard closed in 1955. Boeing has a long term lease on the parking lot. Between 1958 and 1963, Pro Gas, a propane distributor, was located between East Marginal Way and the Step 3 area. A commercial trucking operation (Dallas-Mavis) occupied the location of the 9-04 building and the adjacent parking lot areas (part of the former winery) until 1989. A 77,000 square foot granary was located north and west of the winery. It ceased storing grain in 1973 and functioned as a warehouse until 1985.(5)

Monsanto Fund purchased the northern 38 acres of the BDC site at an unknown time. The area included warehouse and office buildings, winery buildings, the granary, Dallas-Mavis, and Slip #6. During the time that Monsanto owned the 38 acres they leased out the property. The Port of Seattle purchased the property and took over the leases in 1976. They leased the northeastern 5 acres in two 2.5 acre parcels to Kenworth Truck company and Transport Pool International for parking and storage. Isaacson Steel leased the granary for storage. Terminal 128 Corporation leased Slip #6 and intended to develop the slip as a marina. However, plans never materialized and the Port sold Boeing the property in 1985. The only known problems were with the Terminal 128 lease. In February 1984, the Port notified Terminal 128, that three transformer vaults had illegal hook-ups and that the associated sumps contained debris that was making them inoperable. There were also oil and chemical leaks and spills. Terminal 128 hired a contractor to remediate the conditions to the Port's satisfaction.(5)

2.2 IDENTIFICATION OF SOLID WASTE MANAGEMENT UNITS

During the course of this assessment, 157 solid waste management units (SWMUs) and 5 Areas of Concern (AOCs) were identified. These are listed below in Tables 1 and 2. Locations of the SWMUs and AOCs are shown on Figure 2.

2.3 FACILITY OPERATIONS

The BDC generates a number of wastes associated with manufacturing airplanes and missiles, including wastes from manufacturing parts (oil, paint wastes, solvents, and scrap metal), laboratory chemicals, photographic processing wastes, copier/printer wastes,

Table 1

SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN AT BOEING DEVELOPMENTAL CENTER

SWMU NO.	DESCRIPTION
SWMU 1	Bldg 9-04, Final Accumulation Area
SWMU 2	Bldg 9-04, Consolidation Room
SWMU 3	Bldg 9-04, Loading Dock
SWMU 4	Bldg 9-04, Bulk Waste Oil Recycling Tank
SWMU 5	Bldg 9-08, Former Temporary Incinerator
SWMU 6	Bldg 9-50, Former Container Storage Area
SWMU 7	Bldg 9-50, Former Steam Cleaning Area
SWMU 8	Bldg 9-50, Solid Waste Collection Area
SWMU 9	Bldg 9-51, Steam Cleaning Tank
SWMU 10	Bldg 9-51, Steam Cleaning Sump
SWMU 11	Bldg 9-51, Former Steam Cleaning Tank
SWMU 12	Bldg 9-52, Former Water Wash Paint Booth
SWMU 13	Bldg 9-60, Former Container Storage Area
SWMU 14	Bldg 9-67, Incinerator
SWMU 15	Bldg 9-67, Paper Shredder
SWMU 16	Bldg 9-69/70, Former Regulated Materials Storage Area
SWMU 17	Bldg 9-75, Former UST Waste Storage Tank
SWMU 18	Bldg 9-101, Former Wash Water Paint Booth
SWMU 19	Bldg 9-101, Waste Hydraulic Oil Tank
SWMU 20	Bldg 9-101, Former Degreaser Pit
SWMU 21	Bldg 9-101, Former First Sump
SWMU 22	Bldg 9-101, Former Second Sump
SWMU 23	Bldg 9-101, Former Tank A Waste Alkaline
SWMU 24	Bldg 9-101, Former Tank B Waste Acid
SWMU 25	Bldg 9-101, Former Tank C Waste Water
SWMU 26	Bldg 9-101, Former Pilot Plating Sump
SWMU 27	Bldg 9-101, Former Maskant Dump Tank and Control Pit
SWMU 28	Bldg 9-101, Former Waste Water Treatment Plant
SWMU 29	Bldg 9-99, Oil/Water Separator
SWMU 30	Bldg 9-007, Oil/Water Separator 3
SWMU 31	Bldg 9-08, Oil/Water Separator 2
SWMU 32	Bldg 9-12, Oil/Water Separator 1
SWMU 33	Bldg 9-51, Oil/Water Separator 951
SWMU 34	Bldg 9-52, Oil/Water Separator DM
SWMU 35	Bldg 9-60, Oil/Water Separator BMA003
SWMU 36	Bldg 9-96, Oil/Water Separator C
SWMU 37	Bldg 9-99, Oil/Water Separator A
SWMU 38	Bldg 9-99, Oil/Water Separator B
SWMU 39	Bldg 9-101, Oil/Water Separator SDC
SWMU 40	Bldg 9-120, Oil/Water Separator G
SWMU 41	Bldg 9-64, Former Oil/Water Separator
SWMU 42	Bldg 9-101, Former Oil/Water Separator
SWMU 43	Storm Water Sewer System

Table 1 (continued)

SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN AT BOEING DEVELOPMENTAL CENTER

SWMU NO.	DESCRIPTION
SWMU 44	Bldg 9-49, Accumulation Area D003
SWMU 45	Bldg 9-51, Accumulation Area D004
SWMU 46	Bldg 9-52, Accumulation Area D005
SWMU 47	Bldg 9-99, Accumulation Area D007
SWMU 48	Bldg 9-99, Accumulation Area D008
SWMU 49	Bldg 9-101, Accumulation Area D009
SWMU 50	Bldg 9-101, Accumulation Area D010
SWMU 51	Bldg 9-101, Accumulation Area D011
SWMU 52	Bldg 9-101, Accumulation Area D012
SWMU 53	Bldg 9-101, Accumulation Area D013
SWMU 54	Bldg 9-101, Accumulation Area D014
SWMU 55	Bldg 9-101, Accumulation Area D016
SWMU 56	Bldg 9-101, Accumulation Area D017
SWMU 57	Bldg 9-101, Accumulation Area D019
SWMU 58	Bldg 9-101, Accumulation Area D020
SWMU 59	Bldg 9-101, Accumulation Area D021
SWMU 60	Bldg 9-101.2, Accumulation Area D024
SWMU 61	Bldg 9-101.2, Accumulation Area D025
SWMU 62	Bldg 9-102, Accumulation Area D027
SWMU 63	Bldg 9-120, Accumulation Area D028
SWMU 64	Bldg 9-120.1, Accumulation Area D029
SWMU 65	Bldg 9-120, Accumulation Area D031
SWMU 66	Bldg 9-120, Accumulation Area D032
SWMU 67	Bldg 9-51, Accumulation Area D033
SWMU 68	Bldg 9-120, Accumulation Area D034
SWMU 69	Bldg 9-120.3, Accumulation Area D036
SWMU 70	Bldg 9-140, Accumulation Area D037
SWMU 71	Bldg 9-102, Accumulation Area D039
SWMU 72	Bldg 9-08.4, Accumulation Area D042
SWMU 73	Bldg 9-101, Accumulation Area D043
SWMU 74	Bldg 9-51, Accumulation Area D047
SWMU 75	Bldg 9-51, Accumulation Area D048
SWMU 76	Bldg 9-101, Accumulation Area D051
SWMU 77	Bldg 9-101.1, Accumulation Area D053
SWMU 78	Bldg 9-101, Accumulation Area D054
SWMU 79	Bldg 9-53, Accumulation Area D058
SWMU 80	Bldg 9-101.1, Accumulation Area D061
SWMU 81	Bldg 9-96.2, Accumulation Area D062
SWMU 82	Bldg 9-101.1, Accumulation Area D063
SWMU 83	Bldg 9-101.2, Accumulation Area D064
SWMU 84	Bldg 9-98.2, Accumulation Area D065
SWMU 85	Bldg 9-101.1, Accumulation Area D066
SWMU 86	Bldg 9-101, Accumulation Area D071
SWMU 87	Bldg 9-61, Accumulation Area D072
SWMU 88	Bldg 9-101, Accumulation Area D074
SWMU 89	Bldg 9-08, Accumulation Area D075
SWMU 90	Bldg 9-60, Accumulation Area D076

Table 1 (continued)

SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN AT BOEING DEVELOPMENTAL CENTER

SWMU NO.	DESCRIPTION
SWMU 91	Bldg 9-08.3, Former Accumulation Area D001
SWMU 92	Bldg 9-48, Former Accumulation Area D002
SWMU 93	Bldg 9-99, Former Accumulation Area D006
SWMU 94	Bldg 9-101, Former Accumulation Area D015
SWMU 95	Bldg 9-101, Former Accumulation Area D018
SWMU 96	Bldg 9-101.1, Former Accumulation Area D022
SWMU 97	Bldg 9-101, Former Accumulation Area D023
SWMU 98	Bldg 9-101.2, Former Accumulation Area D026
SWMU 99	Bldg 9-101.1, Former Accumulation Area D030
SWMU 100	Bldg 9-120, Former Accumulation Area D035
SWMU 101	Bldg 9-101, Former Accumulation Area D038
SWMU 102	Bldg 9-70, Former Accumulation Area D040
SWMU 103	Bldg 9-50, Former Accumulation Area D041
SWMU 104	Bldg 9-101, Former Accumulation Area D044
SWMU 105	Bldg 9-90.2, Former Accumulation Area D045
SWMU 106	Bldg 9-101, Former Accumulation Area D046
SWMU 107	Bldg 9-101.1, Former Accumulation Area D049
SWMU 108	Bldg 9-101, Former Accumulation Area D050
SWMU 109	Bldg 9-52, Former Accumulation Area D052
SWMU 110	Bldg 9-101, Former Accumulation Area D055
SWMU 111	Bldg 9-101.2, Former Accumulation Area D056
SWMU 112	Bldg 9-101.2, Former Accumulation Area D057
SWMU 113	Bldg 9-77.3, Former Accumulation Area D059
SWMU 114	Bldg 9-101.1, Former Accumulation Area D060
SWMU 115	Bldg 9-101.1, Former Accumulation Area D067
SWMU 116	Bldg 9-140, Former Accumulation Area D068
SWMU 117	Bldg 9-140, Former Accumulation Area D069
SWMU 118	Bldg 9-120, Former Accumulation Area D070
SWMU 119	Bldg 9-101.2, Former Accumulation Area D073
SWMU 120	Bldg 9-102, Former Accumulation Area D077
SWMU 121	Bldg 9-43, Former Accumulation Area D078
SWMU 122	Former Accumulation Area DT01
SWMU 123	Bldg 9-90, Former Accumulation Area Photographic Waste
SWMU 124	Bldg 9-51, Newyork Blower Baghouse
SWMU 125	Bldg 9-51, Spencer Baghouse
SWMU 126	Bldg 9-53, Delta Filter/Pack Box
SWMU 127	Bldg 9-53, Kei Filter Bag
SWMU 128	Bldg 9-77, Sternvent Filter/Pack Box
SWMU 129	Bldg 9-77, Sternvent Filter/Pack Box
SWMU 130	Bldg 9-77, Sternvent Filter/Pack Box
SWMU 131	Bldg 9-99, Aget Filter/Pack Box
SWMU 132	Bldg 9-101, Donaldson Torit Bag/Filter
SWMU 133	Bldg 9-101, Donaldson Torit Bag/Filter
SWMU 134	Bldg 9-101, Donaldson Torit Bag/Filter
SWMU 135	Bldg 9-101, Clemco Industries Sand Blaster with a Drum/Filter
SWMU 136	Bldg 9-101, Empire Abrasive Sand Blaster with a Drum/Filter
SWMU 137	Bldg 9-101, Agent Manufacturing Filter/Pack Box
SWMU 138	Bldg 9-101, Delta Filter/Pack Box
SWMU 139	Bldg 9-101, Aget Dustkop Filter/Pack Box
SWMU 140	Bldg 9-101, Rockwell Filter/Pack Box

Table 1 (continued)

SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN AT BOEING DEVELOPMENTAL CENTER

SWMU NO.	DESCRIPTION
SWMU 141	Bldg 9-101, Micropulse Baghouse
SWMU 142	Bldg 9-101, Spencer Baghouse
SWMU 143	Bldg 9-101, Spencer Baghouse
SWMU 144	Bldg 9-101, Donaldson Torit Bag/Filter
SWMU 145	Bldg 9-101, Donaldson Industries Baghouse
SWMU 146	Bldg 9-101, Donaldson Torit Bag/Filter
SWMU 147	Bldg 9-101, Donaldson Torit Bag/Filter
SWMU 148	Bldg 9-101, Hoffman
SWMU 149	Bldg 9-101, Torit Corp. Filter/Pack Box
SWMU 150	Bldg 9-101, Rockwell Filter/Pack Box
SWMU 151	Bldg 9-120, Torit Filter/Pack Box
SWMU 152	Bldg 9-120, Torit Filter/Pack Box
SWMU 153	Bldg 9-120, Torit Corp. Filter Bags
SWMU 154	Bldg 9-120, Spencer Baghouse
SWMU 155	Bldg 9-120, Spencer Baghouse
SWMU 156	Bldg 9-120, Donaldson Torit Baghouse
SWMU 157	Bldg 9-120, Torit Baghouse
AOC 1	Underground Storage Tank DC 14
AOC 2	Underground Storage Tank DC 13
AOC 3	Underground Storage Tank DC 20
AOC 4	Underground Storage Tank DC 21
AOC 5	Underground Storage Tank DC 01

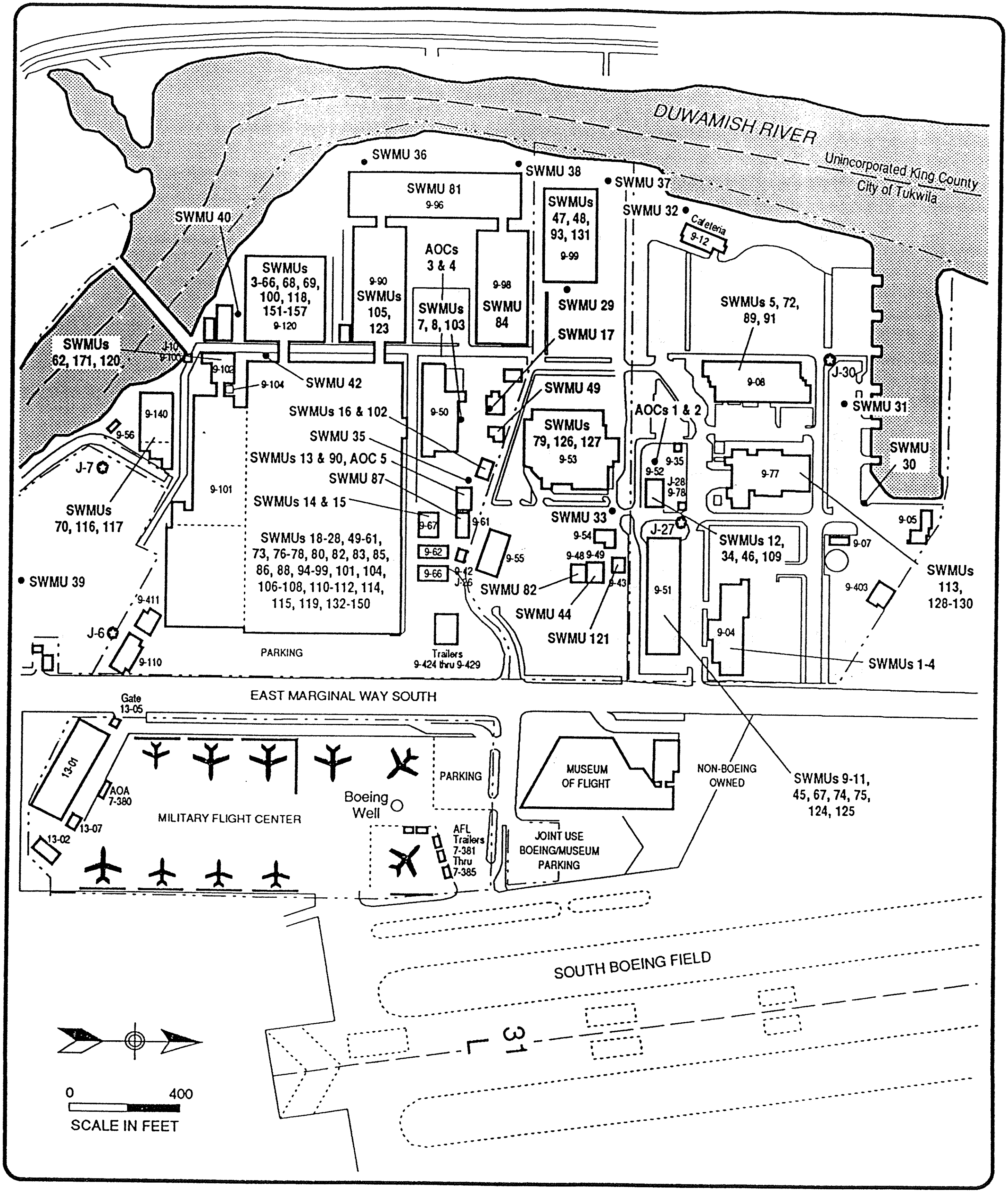

Figure 2

LOCATION OF SWMUs AND AOCs AT BOEING DEVELOPMENTAL CENTER

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and maintenance shop wastes. These waste are accumulated near their points of origin, in accumulation areas in individual drums near the work stations located throughout BDC. When a drum is full it is moved to Building 9-04 (SWMUs 1, 2, and 3), where wastes are consolidated, if applicable, and prepared for shipment to a TSD facility. Historically, there have been a number of waste storage areas for containerized materials at the BDC. Containerized waste storage areas that are no longer in use and are currently undergoing closure, including those in Building 9-50 (SWMU 6), Building 9-60 (SWMU 13), and Building 9-69/70 (SWMU 16).(2,6)

Due to the nature of the aerospace industry, the BDC facility is a large complex facility with activities changing over time. The following paragraphs briefly describe activities that have occurred at the BDC facility.

Manufacturing airplanes and missiles involves machining metal aircraft hardware, assembly, electroplating, chemical milling, conversion coating, painting, and parts cleaning. The machining, assembly, painting, and cleaning processes have existed since 1957. However, they have declined since the 1970's when graphite composite fabrication began. Electroplating, chemical milling, and conversion coating processes were used during the 1960's and 1970's.(5)

Research and development activities have been a part of the BDC operations, with a substantial emphasis between 1957 and the early 1970's. Research laboratories and experimental manufacturing shops were used to investigate production aspects of materials and processes for manufacturing. There were also laboratories to investigate metals technology and electronics sciences.(5)

2.3.1 Hazardous Waste Management

BDC currently generates the following general categories of waste streams:

- Paints,
- Solvents,
- Inks,
- Acids,
- Dye penetrant,
- Asbestos,
- Contaminated debris,
- Contaminated waste oil,
- Contaminated waste water,
- Lab wastes,
- Developers, fixers, and toners,
- Batteries,
- Aerosol cans, and
- Solvent rags.

Table 2 presents more information on the management of these waste streams at BDC, including their hazardous waste codes, and annual quantities managed. The bulleted information above and Table 2 are primarily based on a waste analysis plan that was included in a 1988 Washington State Department of Ecology CEI report and the 1993 Generator Annual Dangerous Waste Report.(4,5,10)

Most of the hazardous wastes are currently collected in 5-, 30-, or 55-gallon drums in accumulation areas near where they are generated. When the drums are full, or once a month, which ever is more frequent, their contents are transported to Building 9-04 for consolidation and shipping. Drums of solid wastes (i.e., rags) have plastic bags lining them. The bags are pulled from the drums, labeled, and taken to the consolidation room where the contents are combined with similar wastes for off site disposal. The contents of each bag are logged into a waste tracking system. The combined wastes are then prepared for shipment. Liquid wastes are accumulated in drums at designated accumulation areas. In preparation for transport, the drums are placed on pallets and sent to Building 9-04, where they are prepared for shipment off-site. Resource Recovery transports the wastes. Ramic receives solvents for recycling and Burlington Environmental receives all of the other hazardous wastes.(2,11)

2.3.2 Non-Hazardous Solid Waste Generation

The following types of non-hazardous wastes have been identified during the VSI and PR:

- Cardboard,
- Trash,
- Wood waste,
- Paper,
- Magnetic media,
- Aluminum cans,
- Plastic sheeting,
- Oil water mixture from oil/water separators and general maintenance,
- Oil, hydraulic fluid, and jet fuel from the maintenance shops and the flight line,
- Metal scrap,
- Oily and greasy rags, and
- Graphite from tooling.(5,11,12)

Cardboard, trash, and wood waste are all collected in 40 cubic yard containers at the solid waste collection area (SWMU 8). Aluminum cans, scrap metal, and plastic sheeting are also consolidated in this area in a variety of containers. In addition to the containers of solid wastes, there are trash compactors and street sweepers to clean the area. Trash is also collected east of Building 9-08. Newspapers are collected northeast of Building 9-94. Trash is disposed of at Cedar Hills Landfill. Cardboard, aluminum cans, metal scrap, and plastic sheeting are all recycled

Table 2

HAZARDOUS WASTE MANAGEMENT AT BOEING DEVELOPMENTAL CENTER

Waste Category	Hazardous Waste Codes	Dates Managed	Annual Quantity Managed (lb/yr)
Developer, Fixer, Toner	D001, D002, D006, D007, D011, WT02	(1987,1983, 1985, 1988) 1993	(49,100) 14,436.3
Sodium Dichromate Solution and Paint Booth Rinsate	D007	1983, 1987	4,000
Trichloroethylene, 1,1,1-Trichloroethane	F002	1987, 1988	1,300
Mixed Flammable Solvents	F003, F005	1983, 1987	5,700
Sodium Dichromate Solution	D002, D007	1983, 1987	7,100
Batteries	D002, D004, D006, D008, D009, WT01, WC02	(1987) 1993	(1,500) 2,623.1
Perchloroethylene - Tetrachloroethylene Developer	F001	1987	1,000
Metal Contaminated Dirt/Gravel/Sand/Solids (Cd, Cr, Pb, Hg)	D006, D007, D008, D009	1987	10,100
Oil-Solvent Mixtures	D001, D018, D040, F001, F003, F005, WT01, WT02, WP01, WP02, WC01, WC02	(1987) 1993	(6,600) 3,982.9
Heat Treat Salts - Sodium Nitrate, Sodium Chloride	D001, D002	1983, 1987	300
Asbestos	WC01	(1987) 1993	81,700 (7,420)
Oil and Grease contaminated materials	WT02	(1987) 1993	(132,000) 44,526.6
Detergent: ethylene glycol, n-butyl ether, sodium metasilicate	D002, WT02	1993	463.8
Ammonium hydroxide (12-44%)	D002, WT02	1993	52.6
Solid chromic acid product	D001, D002, D007, WC01, WT01	1993	1,442.1
Lab Pack/Overpack	D001, D002, D003, D007, D010, U165, U190, WC01. WL01, WL02, WP01, WT02	(1987, 1988) 1993	(3,970) 1,780.7
Mineral oil contaminated with trichlorofluoromethane	WP01, WT02, WC01	1993	425.9
Solvent: methylene chloride, resins, MEK	F002, D035, WT02, WP02	1993	91.8
Spent parts cleaner: oleic acid, monoethanolamine, methylene chloride, PCE, dichlorobenzene, cadmium	D006, D027, D039, F002, W001, WT02	1993	158.7

Table 2 (continued)

HAZARDOUS WASTE MANAGEMENT AT BOEING DEVELOPMENTAL CENTER

Waste Category	Hazardous Waste Codes	Dates Managed	Annual Quantity Managed (lb/yr)
Dry sodium hydroxide	D002, WT02	1993	1,077.8
Paints and inks: Ba, Cr, Pb, Hg; solvents: acetone, MEK, methylene chloride, toluene, xylene	F002, F003, F005, D001, D005, D007, D008, D009, D035, WT01, WP02, WC01	(1983, 1987, 1988) 1993	(62,100) 13,569.1
Mercury switch, glass, debris, absorbent	D009, WT01, WC02	1993	124.4
Waste hydrofluoric, citric, organophosphonic, and hydrochloric acid	D002, WT02	1993	1,265.4
Dye penetrant: petroleum distillates, naphthalene, developer: sodium dichromate, water	D007, WT02	1993	3,857.4
Rags contaminated with alodine: Cr	D007, WT02, WC01	1993	440.3
Paper filters contaminated with composite sludge and coolant	WT02	1993	2,457.6
Nitric and sulfuric acids contaminated with resins: MEK	D002, D035, WT02	1993	229.5
Aerosol cans containing paints: Ba, benzene, isobutane, liquified petroleum gas, MEK, methylene chloride, propane, 1,1,1-TCA	D001, D005, D018, D035, WT02, WP01, WC02	1993	1,562.4
Solvents: sodium metasilicate, ethylene glycol n-butyl ether	D002, WT02	1993	1,728.9
Rubber product: toluene diisocyanate	WT02	1993	250.5
Aerosol cans and sprayer units: dichlorodifluoromethane, chlorodifluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, methylene chloride	U075, WT02, WP01	1993	1,089
Cleaner disinfectant	WT02	1993	4,953.5
Molding Compounds: phenols, formaldehyde	WT02	1993	2,003.8

Table 2 (continued)

HAZARDOUS WASTE MANAGEMENT AT BOEING DEVELOPMENTAL CENTER

Waste Category	Hazardous Waste Codes	Dates Managed	Annual Quantity Managed (lb/yr)
Freon, Polyurethane Resin	WP01, F002	1987	2,300
Alcohol, Ink	WT02, D001	1987	6,000
Chromium Contaminated Solids	WT02, D007	1987	2,000
Water with low level metal contamination, (Cr, Pb)	WT02, D007, D008	1987	900
Containers - Paint, Resin, Adhesives, Sealant	D001, D002, D005, D006, D007, D008, D010, D018, D035, D039, WT01, WT02, WP01, WP02, WC01, WC02	1987, 1993	10,150 - 47,421.4
Uncured preimpregnated composite material	WT02	1993	66,832.6
Wood with pentachlorophenol	D037, WT01, WC02, WP02	1993	71,523.7
Rags contaminated with solvents: acetone, hexane, MEK, methyl isobutyl ketone, methylene chloride, toluene, Cr, Pb, Ag, PCE	F002, F003, F005, D007, D008, D011, D035, D039, WT02, WP01, WC02	1993	11,295.6
Mixed Oils: petroleum distillates, hydraulic fluid, ethylene glycol	WT02	1993	29,174.6
Polychlorinated biphenyls - light ballasts, transformers, debris, absorbent	WC02, WP02, W001	1993	5,470.9
Water with oil, ethylene glycol, latex paint, coolant, descaling solution, and composite sludge	WT02	1993	640,514.6
Paint booth filters with dried paint: Ba, benzene, Cr, Pb	D005, D007, D008, D018, WT01, WC02	1993	6,398.4

Source: Reference (4,5,10,14,15,16)
Note: Hazardous Waste Codes that start with "W" are Washington State codes.

by unspecified sources, or by Boeing. Wood waste and newspapers are recycled by Recovery 1, Inc. and Fibers International, respectively.(5)

Confidential papers are shredded at SWMU 15 and magnetic media are incinerated at SWMU 14 or in an incinerator located in Spokane, Washington. The shredded paper is used for compost by Iddings (a composting company): the incinerator ash is sent to a non-hazardous landfill.(5)

BDC has eleven oil/water separators (SWMUs 30 through 40) located throughout the facility; these oil/water separators collect storm water prior to discharge to the Duwamish River. There is also one oil/water separator associated with Building 9-99 that manufacturing process water passes through prior to being discharged to the sanitary sewer.(2,3,4,5,11)

Waste oil and oily rags are accumulated in drums at accumulation areas located throughout the facility. The oil is consolidated in a bulk waste oil recycling tank (SWMU 4) at Building 9-04 then shipped off-site to be recycled by Basin Oil. Oil and water mixtures are transported to Boeing's Auburn treatment plant for processing.(5)

2.4 REGULATORY HISTORY

2.4.1 RCRA Notification and Permit History

The Boeing Developmental Center (BDC) submitted a Notification of Hazardous Waste Activity form to EPA, in August 1980, identifying the facility as a generator. Approximately 660,000 pounds of waste per year was reported on this form, along with a storage capacity of 11,000 gallons in containers and 5,000 gallons in tanks.(17)

In November 1980, BDC submitted a Part A permit application as a storage facility and was granted Interim Status by EPA. The facility's Part A permit was revised in April 1985 increasing the annual waste quantity generated at BDC to 1,017,000 pounds. In April 1988, BDC's Part A permit was again revised, this time reducing the waste quantity to 488,000 pounds and indicating that the tanks were no longer used. The tanks were removed in 1985 (See SWMUs 23-25).(18,19,20)

The facility never submitted a Part B permit application. In April 1989, BDC formally requested withdrawal of their Part A permit and requested that BDC be allowed to revert to generator status. BDC is currently closing its regulated units including, storage areas in/near Buildings 9-50, 9-60, and 9-69/70, and tanks near Building 9-101.(17,21)

2.4.2 RCRA Interim Status Compliance History

According to the State and EPA Region 10 files, six RCRA CEIs have been conducted at the BDC facility: December 1981 (Ecology), February 1984 (Ecology), June 1988 (EPA), August 1989 (Ecology), August 1991 (Ecology), and July 1993 (Ecology). Results of these inspections are summarized below:

- December 1981 - No information was found in the files indicating there were violations as a result of this CEI.(22)

- February 1984 - No information was found in the files indicating there were violations as a result of this CEI.(9)

- June 1988 - A Notice of Violation was sent to Boeing citing the following: inadequate warning signs, inadequate training procedures/records, lack of notification to local agencies regarding facility layout and location of hazardous wastes, not having an evacuation plan, having an incomplete closure plan, and storing a hazardous waste container without an accumulation date.(23)

- August 1989 - A letter was sent to Boeing citing the BDC for failure to attach Notification of Certification for Land Ban Dangerous Wastes to manifests and failure to maintain continuous inspection records.(24)

- August 1991 - A letter was sent to Boeing noting BDC's non-compliance by having an incomplete training plan for the Military Flight Center, formerly part of the BDC.(25)

- July 1993 - A letter was sent to Boeing for BDC's non-compliance regarding lack of a written schedule for equipment inspection.(26)

2.4.3 Other Permits

2.4.3.1 NPDES Permit

Prior to 1972, discharge permits were handled by the U.S. Army Corp of Engineers. Boeing was unable to find copies of any of these permits as part of the information requested in the VSI needs letter. The first NPDES permit that was provided was issued by the State of Washington for rain water and non-contact cooling water and was valid from August 16, 1972 to August 16, 1977. No date of issue was provided for the next NPDES permit that was identified by Boeing. According to Boeing, it expired on December 2, 1987. The permit was reissued by Ecology in March 1988. In an August 1988 letter, Boeing stated that they were no longer discharging non-storm water and asked Ecology to discontinue the NPDES permit.(5,12)

On September 2, 1986, approximately 30 gallons of oil was released to the Duwamish River when a steam heat exchanger in the boiler room of Building 9-50 (Figure 2) ruptured, releasing oil along with steam condensate to the storm drain. The heat exchanger was removed and the line was capped. Booms were placed at the outfall to the Duwamish to recover the oil. Another release from the same area occurred on September 19, 1986 following a rain storm. A notice of violation was issued by the Washington State Department of Ecology for the release and Boeing paid a fine.(5)

On December 24, 1984, approximately 80 gallons of PS 300 fuel was spilled while the oil was being transferred from a tank truck to an underground storage tank near Building 9-72 (Figure 2). Since the oil was not contained, it entered a storm water catch basin and drained to the Duwamish River. Boeing acquired the services of an independent contractor to clean up the spill. This spill resulted in the Washington State Department of Ecology issuing a notice of violation requiring Boeing to install an oil/water separator and maintain personnel and equipment capable of responding to a spill. Boeing complied with the notice and also paid a penalty.(5)

Boeing requested and received a modification for the water quality criteria they were required to meet by Washington State Department of Ecology. Between March 25, 1987 and June 30, 1987, Boeing constructed a laboratory building near Slip 6 which impacted the storm water runoff that discharged to the Duwamish River.(5)

EPA Region 10 conducted an NPDES Compliance Inspection on November 16, 1987. Boeing was advised that their NPDES permit expired on September 14, 1987 and that no application had been filed with Washington State Department of Ecology (Ecology). Poor record keeping practices were identified and monitoring had ceased without notifying Ecology. EPA also observed drums stored without containment. Boeing was working on containment for the drums and was to construct dikes and drum storage sheds by December 1987.(5)

Boeing is currently operating under a NPDES and State Waste Discharge Baseline General Permit for Storm Water Discharges Associated with Industrial Activities. The permit period is from December 18, 1992 to November 18, 1995. In March 1994, Boeing submitted an application to Washington State Department of Ecology to discharge ground water from their on site pump and treat remediation project at Building 9-101. The permit has not been issued to date.(5)

2.4.3.2 WPCC Permit

The State of Washington Pollution Control Commission (WPCC) issued permit No. 725 to Boeing in 1957. The permit, which expired in 1962, regulated pH and metals concentrations for water discharged to the sanitary sewer. The permit history between 1962 and 1967 is unknown. In 1967, Boeing applied for and received another permit from the Pollution Control Commission.(5)

2.4.3.3 Metro Permit

There is no other information regarding sanitary sewer permits until 1979 when the Municipality of Metropolitan Seattle (Metro) issued permit 7137 regulating pH and metals concentrations. This permit covered industrial discharges. The permit was modified in June 1984 and expired July 24, 1984. There is no information between this date and November 1991 when authorization 135 was renewed. The permit was for discharges to the sanitary sewer from the silver reclamation process and treated ground water. This permit was modified in October 1993 to include additional ground water from the pump and treat remediation at Building 9-101. The permit expires in November 1995. This is BDC's only current water discharge permit. During the inspection they stated that they were applying for an NPDES permit to discharge additional treated ground water from their ground water extraction system.(5)

2.4.3.4 PASAPCA Permit

The following sources of potential air releases at the BDC were permitted by Puget Sound Air Pollution Control Agency:

- Mikro-Pulsaire baghouse (SWMU 141), March 23, 1987
- Two gas/oil fired water heaters and one dust collector (SWMU 129), July 25, 1988
- Paper Shredder (SWMU 15), August 15, 1988
- Autoclave, September 12, 1988
- Paint Spray booth, November 14, 1988
- Graphite Dust Collector (SWMU 145), December 18, 1989
- Torit Baghouse (SWMU 156), Paint Baking Oven, and four fume hoods, April 27, 1990
- Two underground storage tanks (AOCs 3 and 4), October 2, 1992
- Two underground storage tanks (AOC 2), September 21, 1992
- Two dust collectors (SWMUs 154 and 155), November 24, 1992
- Dust collector (SWMU 124), November 24, 1992
- Ground Water Pump and Treat System, November 22, 1993
- Incinerator (SWMU 14), March 7, 1994

There are over 230 sources listed by Boeing on an air emission source list. Many of these were grandfathered into the registration process since they were active prior to 1987. The types of sources include pumps, tanks, generators, heaters, fume hoods, boilers, dust collectors, solvent cleaning tanks, blueprint copy machines, spray booths, printers, and other miscellaneous sources. A summary of the dust collectors included on the list are summarized in section 4.30.(5)

3.0 ENVIRONMENTAL SETTING

3.1 LOCATION AND SURROUNDING LAND USE

The Boeing Developmental Center (BDC) is located in an industrial area along E. Marginal Way South in Tukwila, Washington (Figure 1). The facility consists of approximately 164 acres of property located in the north half of Section 4, T23N, R4E W.M. (latitude 47° 30' 54", longitude 122° 17' 55").(2,4)

The Military Flight Center and Museum of Flight are east of BDC, immediately across East Marginal Way South, with Boeing field further east (Figure 2). The Duwamish River forms the southern and western boundaries of the site, and also borders part of the northern boundary where a slip (Slip #6) separates the site from the Rhone Poulenc Company facility to the north (Figure 2).(13)

3.2 METEOROLOGY

The Puget Sound/Seattle area has cool, dry summers and mild, rainy winters. The dry season occurs from about April through September, with the wet season from October to March. Average annual precipitation is approximately 34-inches at the site. Temperatures range from a daily average of 35°F in January, to 70°F in July and August.(27)

3.3 SURFACE HYDROLOGY

The BDC is situated on the east bank of the Duwamish River, approximately 4.5 miles south of its mouth on Elliot Bay of Puget Sound. The Duwamish River discharges at an annual average rate of 1,660 ft^3/sec into the Bay. The Duwamish is influenced by tidal action over its lower 10 miles, where it becomes a salt wedge estuary. The wedge toe fluctuates along the lower 10 miles of the Duwamish as a function of river flow rates and tides. Statistically, river flow is below the annual average through the months of July to October, with lowest flow typically occurring during the month of August. The highest flows are usually experienced in the months of January and December.(28)

Surface drainage from the BDC is routed to the Duwamish River through a storm water drainage system that contains 16 separate lines with 11 oil/water separators capable of treating petroleum product spills (Figure 2).(5,13)

3.4 GEOLOGY AND GROUND WATER HYDROLOGY

3.4.1 Geology

The Duwamish Valley lowland is an alluvium-filled remnant of a Pleistocene marine embayment. The Valley, which in the area of the BDC is generally at or below 25 feet above mean sea level in elevation, is bordered by glacial drift plain uplands both to the east and west, wherein occasional outcrops of Tertiary bedrock occur. The facility sits on the Duwamish River flood plain on the inside of an old meander loop that was eventually filled in with dredge spoils in 1918 when the present day Duwamish Waterway was dredged. (27,35)

The stratigraphy beneath the site is, from oldest to youngest: 1) consolidated Tertiary sedimentary and volcanic rocks, 2) semiconsolidated to unconsolidated strata of Pleistocene to Recent ages, and 3) Quaternary alluvium. The stratigraphy recorded in an abandoned 686-foot deep Boeing Airplane Company well drilled in 1947 (Figure 2) indicated an interbedded succession of sand, clay, gravel and "mud" down to 200 feet below surface, whereupon 220 feet of blue and sandy clay was penetrated. Below this clay was a series of sands and clays within which the well was perforated adjacent to a 100-foot thick sand layer to produce artesian water. (27,29)

3.4.2 Ground Water Hydrology

Ground water at the BDC facility occurs within unconfined aquifers in the Quaternary alluvium in the Duwamish Valley, and in confined aquifers within the deeper consolidated sediments, as evidenced by the drilling records of the Boeing Airplane Company well. Washington State records indicate shallow ground water had been developed for irrigation use prior to 1955 near the BDC, where six well points were driven between 17 and 22 feet below ground surface to yield water. A sample of water collected from this system in March 1955 had 83 mg/l chloride (below the Secondary Drinking Water Level (SDWL) of 250 mg/l).(27)

A sample of water from the Boeing well was tested by the U.S. Geological Survey in April 1954, and was found to have a chloride concentration of 348 mg/l, which is above the 250 mg/l SDWL for chloride. The calculated total dissolved solids (876 mg/l) from the same sampling event for this well also exceeded the SDWL of 500 mg/l.(27)

Approximately two miles southwest of the site is the Highline well field. The City of Seattle extracts water from this well field for their municipal drinking water system from confined aquifers within the glacial till sequence which forms the border for the Duwamish Valley.(30)

Site characterization in support of remedial activities on site at Building 9-101 (Figure 2) have served to characterize the details of the uppermost aquifer at that location. At this location there is a 50-foot thick aquifer which is primarily unconfined except where a local, 1 to 3 foot thick, silty aquitard produces a semi-confined condition. Flow within the aquifer is primarily horizontal, with little vertical mixing based on observed differences in geochemistry. All water bearing zones within this upper aquifer are tidally influenced.(36)

The base of the uppermost aquifer rests on a 20-foot thick marine silt unit that acts as an aquitard separating a confined aquifer within sandy silts and silty sands beneath it. The piezometric head in this confined aquifer is typically 3 feet above the uppermost aquifer head. This confined aquifer is also tidally influenced.(36)

A constant rate pumping test performed on the uppermost aquifer provided the following range of aquifer parameters: 1) Transmissivity - 1.91 to 2.28 ft^2/min, 2) Storativity - 1.02E-2 to 3.31E-3, and 3) Hydraulic Conductivity - 7.5E-2 to 9.0E-2 ft/min. (36)

3.5 SITE CONTAMINATION

Throughout the operational history of the BDC there have been numerous spills. There have also been a number of areas where contamination has been identified by Boeing. These are summarized in the following sections.

3.5.1 Spills

Over 150 spills have been recorded at the BDC since 1980. Most of these spills have been small and have not resulted in releases to the environment. The substances most frequently spilled were hydraulic fluid, ethylene glycol, oil, gasoline, and diesel fuel. Other materials released include; mercury, paper slurry, picric acid, caustic soda, paint, hardeners, and thinners, liquid nitrogen, coolants, acetone, hot asphalt, sodium dichromate, battery acid, BMA 7-11 solvent, transmission fluid, sulfuric acid and phosphoric/nitric/hydrofluoric acids. Spills with releases to the environment will be discussed below.(5,11)

In 1986, there were two spills of PS 300 fuel oil that reached the Duwamish River. The first occurred in September 1986, when a steam to oil heat exchanger burst causing oil to spill and enter the storm water sewer that drained into the Duwamish River. Up to 20 to 30 gallons of oil reached the river. Following cleanup, the heat exchanger was repaired and its discharge routed away from the storm sewer. A second spill of approximately 80 gallons of PS 300 fuel oil, occurred on December 24, 1986, when it was being transferred from a tank truck to an underground storage tank at Building 9-72 (Figure 2). The spilled oil entered a storm drain catch basin, which discharged to the river. Contractors cleaned up both spills. To contain future spills, Boeing installed curbing around the fill pipes to the tanks and installed oil/water separators on the main storm water sewer lines.(5,13)

Other spills to the storm water sewer system are summarized below. There was a 10 gallon spill of heat transfer oil from an unspecified location, in 1987, from which approximately 10 percent reaching the storm water sewer system. The next spill, in 1989, at Building 9-120 was 15,000 gallons of 15 percent alkyl trimethylene diamine (a biocide). Most of this spill was recovered. It is unclear if any reached the river. In 1992, there was a release of approximately 1 quart of diesel (Diesel tank at Building 9-102) and two releases of water (90 gallons, in January and an unknown volume, in April) with Dearborn 547 and steamate from autoclave #4 (Building 9-101). There was a spill containing 30 gallons of ethylene glycol (Building 9-05) and a spill of 4,500 gallons of cooling water (Building 9-101), in 1993. One spill occurred in 1994, when a portion of 75 gallons of spilled diesel fuel (Building 9-08) with some of it entered a catch basin.(5)

Approximately 200 gallons of paper slurry from the paper shredder in Building 9-67 was released to a storm drain. The material was captured in the oil/water separator.(5)

On May 29, 1980, approximately 800 gallons of a mixture of aluminum oxidizing phosphoric/nitric/hydrofluoric/sulfuric acids was being loaded into a tanker truck. After the material was loaded an orange cloud of nitric oxide emitted from the pressure vent. Building 9-101 and adjacent buildings were evacuated and traffic on East Marginal Way was diverted. The reaction continued for approximately one hour while the truck was cooled with fire hoses to control the reaction. The area under the truck was treated with soda ash to neutralize the acid. The storm drains to the Duwamish were opened to control the water used to cool down the truck and the acid reaction products were cleaned up. (5)

3.5.2 Building 9-50, Underground Storage Tanks

One of two 20,000 underground storage tanks (AOC 3, tank DC-20 and AOC 4, tank DC-21) located between Buildings 9-50 and 9-72 was discovered to be leaking in 1992 and the two tanks were removed and replaced. During the removal approximately 250 yd^3 of TPH contaminated soil was removed along with 200-500 gallons of free hydrocarbon product and 80,000 gallons of water generated during the project. An area of soil with contamination above the 200 mg/kg TPH cleanup level that was beyond the reach of the excavating equipment and beneath the water table was left. A monitoring well was installed nearby and sampled for TPH. No TPH was detected in the well.(5)

3.5.3 Building 9-52, Underground Storage Tanks

Two underground storage tanks (AOC 1, tank DC-14 and AOC 2, tank DC-13) were located near Building 9-52 (Figure 2) until they were removed in 1990. The original tanks at this location were installed in approximately 1985 and were used to store unleaded gasoline (a 500 gallon tank) and diesel fuel (a 300-gallon tank). In 1990, when tank tightness testing was conducted for BDC the unleaded gasoline tank was discovered to be leaking. Both tanks were removed and soil was removed to a depth of two feet below the water table. The last samples collected from the excavation indicated there was some soil contamination present at concentrations below the Washington State MTCA cleanup goals. However, concentrations of BTEX were present in ground water at concentrations above the cleanup goals. During the removal, no free product was observed on the ground water. However, there was foam present. The contaminated ground water was left in place since no one was using the ground water in the immediate area and it was away from the Duwamish River. It was recommended that monitoring wells be installed.(5)

3.5.4 Building 9-75, Underground Storage Tank

One former underground storage tank (SWMU 17, tank DC-05) was located near Building 9-75 (Figure 2). Following the discovery that there was soil contamination the tank was removed in 1986. During the tank removal limited soil and ground water contamination was discovered. Boeing's subcontractor determined that the contamination associated with this tank was originating from an associated sump.(5)

3.5.5 Gate J-28 Total Petroleum Hydrocarbons

In 1987 when Boeing was installing a communication utility vault near Gate J-28 (Figure 2) petroleum contaminated soil was discovered in the excavation pit. Following this discovery 11 borings ranging from 10 to 14 feet below ground surface (bgs) were installed and sampled. Diesel product was present in 10 of the 11 borings below 6 to 8 feet bgs down to at least 14 feet bgs in at least one boring. Four of the samples were sent to a laboratory for oil/grease analysis using #2 diesel as a standard and for PCB analysis. The diesel concentrations ranged from 2,500 ppm to undetected at <50 ppm. No PCBs were detected. No free product was observed during the investigation. Based on the location and depth of the contamination Boeing determined that the contamination was migrating from off site, potentially from the former Enco gasoline station that had been located due west across East Marginal Way. There is no additional information regarding this contamination.(5)

3.5.6 Buildings 9-60 and 9-61, Underground Storage Tank

Between August 23 and 25, 1985, approximately 830 gallons of unleaded gasoline leaked out of a 1,000 gallon underground storage tank (AOC 5, tank DC-01) located between Buildings 9-60 and 9-61. This underground storage tank was removed in September 1985 along with 500 to 600 gallons of free product and the associated contaminated soil and ground water. One monitoring well was installed. The well, along with another nearby well, was sampled and analyzed for benzene, toluene, and xylenes. Benzene (20 $\mu g/l$), with and MCL of 5 $\mu g/l$ was the only compound detected in the ground water.(5)

3.5.7 Dallas-Mavis Site

The Dallas-Mavis Forwarding Company once occupied the site located at the intersection of East Marginal Way and Boeing Gate J-28 entrance. In 1989, the Boeing Company hired Landau Associates to remove and dispose of contaminated materials that remained on site. Oil/water separators and storm water catch basins were cleaned and removed. An underground storage tank and the associated piping from fueling operations along with contaminated soil from pipe leaks were removed. Approximately 95 cubic yards of contaminated soil was disposed of at Arlington, Oregon.(5)

3.5.8 Building 9-101, Solvent Release

Soil and ground water contaminated with chlorinated solvents was discovered in 1989 near the northwest corner of Building 9-101 (Figure 2). The solvent release was interpreted to be from a vapor degreaser in a plating shop that was used in this area of Building 9-101 from 1956 to 1984. The degreaser was located within a containment sump about 10 feet below the elevation of the building.(5)

The soil is contaminated primarily with chlorinated volatile organics which occurred in two depth intervals. The shallowest interval includes soil from the vadose zone to 10 feet below the surface of the unconfined aquifer. The deeper zone is at 32 to 40 feet beneath the surface. The highest concentrations of volatiles in the soil are found in the shallowest zone.(5)

Sampling from 36 down gradient monitoring wells installed at the site has confirmed the existence of the volatile organics in ground water near Building 9-101. Of these organic compounds, perchloroethylene (PCE), trichloroethylene (TCE), dichloroethylene (DCE), and vinyl chloride have the greatest distribution. Testing for dense non-aqueous phase liquid (DNAPL) in the wells proved negative for their presence. No upgradient wells are installed due to cultural features at the site limiting their emplacement. Concentrations of the organics generally decrease with depth within the uppermost aquifer.(5)

Following a detailed characterization by Boeing's contractors of the uppermost aquifer hydraulic parameters, a ground water extraction and treatment system was recently installed at the site. It was in operation at the time of the VSI.

3.5.9 Slip 6 Sediment Evaluation

Slip 6 has had a number of studies performed on the sediments. The most recent was performed for Boeing to determine if sediments dredged from the slip could be disposed of at the Four-Mile Rock open-water disposal site. It was determined that in at least one sample arsenic (41 ppm), cadmium (1 ppm), copper (100 ppm), zinc (400 ppm), and low molecular weight polynuclear aromatic hydrocarbons (LPAHs) (8670 ppm) all exceeded disposal criteria. It was suggested that the metals concentrations may have resulted from former on site sandblasting operations in the slip. The elevated LPAH concentrations were believed to have originated from an up stream source, possibly the Renton Sewage Treatment Plant.(5)

4.0 DESCRIPTION OF INDIVIDUAL UNITS

157 solid waste management units (SWMUs) and 5 areas of concern (AOCs) were identified and evaluated during the preliminary review of files and July 26, 1994 Visual Site Inspection (VSI) for the Boeing Developmental Center. The following sections provide descriptive and historical information on each SWMU.

4.1 SWMU 1 - BLDG 9-04, FINAL ACCUMULATION AREA

4.1.1 Information Summary

Unit Description: SWMU 1, a final accumulation area (photos 7-14), is located in the chemical management building (Building 9-04) (Figure 2). This area is the final accumulation point for hazardous wastes from BDC prior to being shipped off site. The entire area has sealed concrete floors that slope towards containment trenches that are either blind or drain to vaults. The vaults have capacities of either 5,400 gallons or 8,100 gallons. The vaults drain to a sloped loading dock (SWMU 3). The area is divided into three rooms with nine bays. Room 1 contains three bays (15, 14, and 13), where wastes are divided by compatible hazard classes. At the time of the inspection, Bay 15 contained ten drums of solid wastes that were ready for shipment. Bay 14 also contained solid wastes and some product. There were no wastes in Bay 13. All three bays had blind trenches across the front with gratings. Room 2 contained two bays (16 and 21), both with containment trenches that drained to a containment vault (5,400 gallons) in the middle of the room. Bay 21 contained one 55-gallon drum and seven 5-gallon drums of flammable liquids. Both bays have containment trenches that drain to the containment vault. Room 3 has four bays (17 - 20). Bay 20 contained one 5-gallon drum of sodium hydroxide, while Bay 17 contained one 5-gallon drum of nitric and sulfuric acid. Bay 18 contained a barrel of concrete slurry (not a hazardous waste). Neither Bay 18 nor 19 contained hazardous waste but could be used for storage of hazardous wastes if additional space was required. Both bays had blind trenches across the fronts. Drums are stored on pallets in SWMU 1. Every other week, Resource Recovery removes drums of hazardous wastes for off site disposal, usually at Burlington Environmental.(2,5,11)

Dates of Operation: March 1992 to present.(5)

Wastes Managed: This unit is used to manage drums of all types of hazardous waste generated throughout the facility. Up to 100 drums can be stored in this unit prior to shipment.(2,5,11)

Release Controls: The unit has tertiary containment including sealed concrete floors that slope to either blind trenches or trenches that drain to containment vaults. The containment vaults drain to a covered sloped loading dock (SWMU 3), where any spills would accumulate.(2,5,11)

History of Releases: There is no indication that releases from this unit have occurred.(5)

4.1.2 Conclusions

There is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. Spills occurring within this unit would be adequately contained to prevent any releases to the environment.

4.2 SWMU 2 - BLDG 9-04, CONSOLIDATION ROOM

4.2.1 Information Summary

Unit Description: SWMU 2, a consolidation room (photos 1-6), is located in the chemical management building (Building 9-04) (Figure 2). Plastic bag lined-drums are used to accumulate solid wastes throughout BDC. The types of wastes that are consolidated include rags, spent aerosol cans, and used batteries. The wastes accumulated in these plastic bags are consolidated in this room. Once the wastes are consolidated they are stored in the final accumulation area SWMU 1. The room has slotted drains across the door way and a containment vault (1,350 gallon capacity) in the middle of the room that would receive overflow from the drains. If the vault was ever full it would overflow into the sloped loading dock (SWMU 3).(2,5,11)

Dates of Operation: March 1992 to present.(5)

Wastes Managed: This unit is used to consolidate solid waste generated through out the facility. The contents of plastic bags used in accumulation drums are consolidated in this unit. Solids are consolidated and primarily consist of rags, aerosol cans, batteries, etc. During the VSI the following wastes were observed in 17 containers: rags contaminated with chromium, xylene, methyl ethyl ketone (MEK) and oil, garbage, disinfectant (a WDOT waste), spent aerosol cans, PCB ballast absorbent, toluene, acetone, kerosene, waste oil, mercury materials, latex paint, potassium hydroxide, and chromium trioxide.(5,11)

Release Controls: The unit has tertiary containment, including slotted drains across the doorways which drain to a concrete containment vault (1,350 gallon capacity) in the middle of the room. The vault is controlled by separate valves which drain to a covered sloped loading dock (SWMU 3), where any spills would accumulate. (2,5,11)

History of Releases: There is no indication that releases from this unit have occurred.(5)

4.2.2 Conclusions

There is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. Spills occurring within this unit would be adequately contained to prevent any releases to the environment.

4.3 SWMU 3 - BLDG 9-04, LOADING DOCK

4.3.1 Information Summary

Unit Description: SWMU 3, a loading dock (photos 15-19), is located on the side of the chemical management building, Building 9-04 (Figure 2). The loading dock is covered by a roof and is sloped. Drummed wastes stored in the final accumulation area (SWMU 1) are shipped off site from this loading dock. Containment vaults in Building 9-04 would drain to this area which would accumulate any spills.(2,5,11)

Dates of Operation: March 1992 to present.(5)

Wastes Managed: This unit is used to ship containerized waste generated through out the facility off-site.(2,5,11)

Release Controls: The unit is a covered, sloped loading dock.(2,5,11)

History of Releases: There is no indication that releases from this unit have occurred.(5)

4.3.2 Conclusions

There is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. Spills occurring within this unit would be adequately contained to prevent any releases to the environment.

4.4 SWMU 4 - BLDG 9-04, BULK WASTE OIL RECYCLING TANK

4.4.1 Information Summary

Unit Description: SWMU 4 is a 500 gallon steel above ground storage tank (photos 20 & 21) for waste oil located on the loading dock SWMU 3. Drums of waste oil from various BDC operations (automotive shops, compressor rooms, chiller rooms, fatigue test shops, etc.) throughout the facility are pumped into the tank. When the tank is full, the waste oil is sent off-site to Basin Oil for recycling.(5,11)

Dates of Operation: The unit was installed in February 1994 and was active at the time of the VSI.(5,11)

Wastes Managed: This unit is used to store waste oil including waste hydraulic oil, engine oil, and lubricating oils.(5)

Release Controls: The tank has blind trenches with sumps located beneath it. If the tank ever overflowed the material would flow into two more sumps on the loading dock that are closed to prevent materials from accidentally discharging to the Duwamish River.(5)

History of Releases: There is no indication that releases from this unit have occurred.(5)

4.4.2 Conclusions

There is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas based on the containment.

4.5 SWMU 5 - BLDG 9-08, FORMER TEMPORARY INCINERATOR

4.5.1 Information Summary

Unit Description: SWMU 5 was an Consumat C-75P incinerator, a two chambered manual feed incinerator used to destroy classified microfilm and mylar prints until SWMU 14, an incinerator in Building 9-67, was installed. The incinerator was rated to burn 400 pounds per hour. Waste ash was disposed as non-hazardous in an off site landfill.(5)

Dates of Operation: The incinerator operated between 1986 and early 1988.(5)

Wastes Managed: This unit was used to burn classified microfilm and mylar prints. The ash was disposed as non-hazardous in an off site landfill.(5)

Release Controls: The second chamber is a secondary burner.(5)

History of Releases: There are no reported releases.(5)

4.5.2 Conclusions

There is currently a low potential for releases of hazardous constituents to surface water, ground water, air, or soil or to generate subsurface gas since the incinerator is no longer in operation. Historically there was a low potential for releases of hazardous constituents to surface water, ground water, or soil or the potential to generate subsurface gas. The potential for past releases to air was also low if the incinerator was operating properly.

4.6 SWMU 6 - BLDG 9-50, FORMER CONTAINER STORAGE AREA

4.6.1 Information Summary

Unit Description: SWMU 6, a former container storage area (photos 78 & 79), is located on the north side of Building 9-50 (Support Building) (Figure 2). This area was formerly an accumulation point for hazardous wastes from BDC prior to being shipped off site. The area is approximately 27 feet long by 19 feet wide with 8-inch high curbs on two sides, a containment trench across the front, and Building 9-50 to the back of the unit. The area, currently undergoing closure, is surrounded by a chainlink fence and is covered by a roof.(2,5,11)

In April 1994, samples were collected from the floor and sumps of the former storage area. Based on the concentrations of Aroclor 1260 (0.2 ppm), bis(2-ethylhexyl)phthalate (640 ppb), arsenic (4.167 ppm), beryllium (0.217 ppm), cadmium (1.318 ppm), and chromium (14.921 ppm) (all maximum concentrations) when compared to the State of Washington Model Toxics Control Act (MTCA) Method B standards, the Washington State Department of Ecology (Ecology) stated that no further action was required.(5)

Dates of Operation: The unit was in operation from 1988 through 1992 and is currently undergoing closure.(2,5,6)

Wastes Managed: This unit was used to store containerized waste generated throughout the BDC facility. An August 14, 1991 Compliance Evaluation Inspection by Ecology, indicated that 40 to 50 drums of liquid and solid (rags) waste were in the area ready for shipment off site by Chempro. Carts containing creosote-treated timbers were also noted during the inspection. Soil and concrete samples collected from the floor and sumps contained Aroclor 1260, bis(2-ethylhexyl)phthalate, arsenic, beryllium, cadmium, and chromium.(2,3,5)

Release Controls: The unit is surrounded by two 8-inch curbs on the sides, a containment trench across the front, and the wall of Building 9-50 on the back. The area is covered by a roof.(2)

History of Releases: The is no information indicating that significant past releases from this unit have occurred. The soil and concrete samples collected as part of the closure contained Aroclor 1260, bis(2-ethylhexyl)phthalate, arsenic, beryllium, cadmium, and chromium. Ecology stated that based on the MTCA Method B cleanup levels, no further action was required to clean up the unit.(5)

4.6.2 Conclusions

Currently, there is a low potential for any releases since hazardous materials are no longer stored in this unit. Based on available information the potential for past releases of hazardous constituents to air, surface water, ground water, or soil or the potential to generate subsurface gas is low.

4.7 SWMU 7 - BLDG 9-50, FORMER STEAM CLEANING SLUDGE AREA TRAP

4.7.1 Information Summary

Unit Description: SWMU 7, a former steam cleaning sludge trap, was located inside Building 9-50 (Figure 2). The steam area cleaning area floor sloped to a floor drain with a five to seven gallon sludge trap (i.e., a steel basket). The steam cleaning waste water passed through the trap which removed grease from the waste water. The water was then pumped into an oil/water separator or possibly a tank for storage prior to disposal.(5)

Dates of Operation: The area was used prior to 1985.(5)

Wastes Managed: This unit was used to capture grease in steam cleaning waste water generated during the steam cleaning of equipment. The water was primarily contaminated with oil (WT02). (5)

Release Controls: The unit had no known additional containment.(5)

History of Releases: None reported.(5)

4.7.2 Conclusions

There is currently a low potential for releases of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. Historically, there was a low potential for release of hazardous constituents to air, ground water, or soil or to generate subsurface gas. The historic potential to release to surface water is unknown.

4.8 SWMU 8 - BLDG 9-50, SOLID WASTE COLLECTION AREA

4.8.1 Information Summary

Unit Description: SWMU 8 is the yard north of Building 9-50 (Figure 2) where non-hazardous solid wastes are accumulated and consolidated for off-site disposal and recycling (photo 74). The wastes and containers are as follows:

- Cardboard is collected in a 40 yard container and sent off site for recycling.
- Trash is collected in a 40 yard container and sent off site to Cedar Hills Landfill for disposal.
- Wood waste is collected in a 40 yard container and sent to Recovery 1, Inc. for recycling
- Aluminum cans are stored in dolleys and sent to another Boeing facility (Kent Benaroya Building 7-48) to be consolidated. They are then recycled.
- Metal scrap is collected in tub skids and sent to Boeing Plant II for recycling.
- Plastic Sheeting is collected in boxes and sent to Boeing Portland for recycling.

The area is underlain by asphalt and has collection containers and compactors. Street sweepers are used to clean the area.(5,11)

Dates of Operation: Wastes have been accumulated in the area since 1957 and it is currently active.(5)

Wastes Managed: This unit is used to accumulate non-hazardous solid wastes from throughout the facility. The wastes include cardboard, trash, wood, aluminum cans, metal, and plastic sheeting.(5)

Release Controls: The only containment is the containers the wastes are accumulated in and the asphalt.(5,11)

History of Releases: None.(5)

4.8.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

4.9 SWMU 9 - BLDG 9-51, STEAM CLEANING TANK

4.9.1 Information Summary

Unit Description: SWMU 9, a steam cleaning tank (photos 99 & 100), is an above ground storage tank located outside Building 9-51 under a canopy (Figure 2). The 3,000 gallon steel tank is approximately 15 feet long and 6 feet in diameter, with diked steel secondary containment and a level indicator on the tank. Steam cleaning waste water is pumped from a collection sump (SWMU 10) in the steam cleaning room, where equipment is cleaned, into the tank for storage prior to disposal.(2,3,4,5,11)

Dates of Operation: The tank was installed in 1987 and is currently active.(5,11)

Wastes Managed: This unit is used to store steam cleaning waste water generated during the steam cleaning of equipment. The water is primarily contaminated with oil (WT02). According to the file information a waste water sample from the tank contained 0.19 ppm of lead, 0.16 ppm of chromium, and 1.2 ppm of zinc. The sample was only analyzed for metals.(2,4,5,11)

Release Controls: The unit has secondary containment consisting of steel diking.(2,5)

History of Releases: In the past, the tank has leaked into the secondary containment.(5)

4.9.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

4.10 SWMU 10 - BLDG 9-51, STEAM CLEANING SUMP

4.10.1 Information Summary

Unit Description: SWMU 10, a sump (photos 101, 102, & 103) used to collect steam cleaning waste water, is located in the steam cleaning area in Building 9-51 (Figure 2). Steam cleaning waste water, collected in the sump (SWMU 10), is pumped through a pipe located in a containment sump into the steam cleaning tank (SWMU 9) for storage. At the time of the VSI, the containment sump was disassembled because the leak detection alarm had indicated there was a leak. According to the Boeing representatives, the leak had been very small and only within the secondary containment.(2,11)

Dates of Operation: The sump was originally installed in 1985. It was redesigned and replaced in 1988 and is still active.(5)

Wastes Managed: This unit is used to collect steam cleaning waste water generated during the steam cleaning of equipment. The water is primarily contaminated with oil (WT02). A waste water sample from the steam cleaning tank (SWMU 9), that receives water from the sump, contained 0.19 ppm of lead, 0.16 ppm of chromium, and 1.2 ppm of zinc. The sample was only analyzed for metals.(2)

Release Controls: The concrete lined sump has secondary containment with a leak detection system and it is located inside Building 9-51.(5,7,11)

History of Releases: There is no indication that releases other than to the secondary containment of this unit have occurred.

4.10.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

4.11 SWMU 11 - BLDG 9-51, FORMER STEAM CLEANING TANK

4.11.1 Information Summary

Unit Description: SWMU 11, a former steam cleaning tank (photo 99), was an underground storage tank located outside Building 9-51 adjacent to SWMU 9, the current tank (Figure 2). The 300 gallon steel underground storage tank did not have any additional containment. Steam cleaning waste water was pumped from a collection sump (SWMU 10) in the steam cleaning room, where equipment was cleaned, into the tank for storage prior to off-site disposal.(5,11)

Dates of Operation: The tank was used from 1985 through 1987.(5)

Wastes Managed: This unit was used to store steam cleaning waste water generated during the steam cleaning of equipment. The water was primarily contaminated with oil (WT02). According to the file a waste water sample from the current tank (SWMU 9) contained 0.19 ppm of lead, 0.16 ppm of chromium, and 1.2 ppm of zinc. The sample was only analyzed for metals.(2,4,5)

Release Controls: The unit has no additional containment.(5)

History of Releases: None reported.(5)

4.11.2 Conclusions

Currently, there is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas since the unit is no longer in use. Based on the available information, historically there was a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

4.12 SWMU 12 - BLDG 9-52, FORMER WATER WASH PAINT BOOTH

4.12.1 Information Summary

Unit Description: SWMU 12, a former water wash paint booth, located in Building 9-52 (Figure 2), used approximately 1,500 gallons of circulating water to remove paint overspray from the air. The waste paint was separated from the water and accumulated as a sludge in the paint booth. The paint booth has subsequently been converted to filters.(3,5,11)

Dates of Operation: The unit became operational in 1985. It was reported to be active at the time of the August 14, 1991 Ecology Compliance Evaluation Inspection. According to Boeing information the paint booth was converted to filters in 1990. Therefore the exact time the paint booth was converted is unknown.(3,5)

Wastes Managed: Paint sludges were generated as the water trapped overspray during painting operations.(3)

Release Controls: The unit was used to remove paint overspray from the air.(3)

History of Releases: There is no file information indicating that releases from this unit have occurred. According to Boeing, only minor paint spills have occurred on the concrete in the paint booth.(5)

4.12.2 Conclusions

There is a discrepancy in dates of operation for the wash water paint booth. It was reported to be active in the 1991 CEI. However, Boeing claims to have converted to filters in 1990.

Since the wash water paint booth is no longer active the current potential for releases is low. Based on the available information, historically there was a low potential for release of hazardous constituents to surface water, ground water, or soil or to generate subsurface gas. The potential to release to air was dependent on the efficiency of the unit.

4.13 SWMU 13 - BLDG 9-60, FORMER CONTAINER STORAGE AREA

4.13.1 Information Summary

Unit Description: SWMU 13, a former container storage area (photos 80-83), consisted of two areas, one on the north side (Bays 2, 3, and 4) and one on the west side (Bay 1). The area was located outside of Building 9-60 (Flammable Storage Building) (Figure 2). This entire area is covered with a roof and has a concrete floor. Cracks in the floor were noted during the VSI. This area, which was an accumulation point for hazardous wastes from BDC prior to their being shipped off site, is currently undergoing closure. Currently, wastes are stored in SWMU 1.(2,4,6)

The area on the north side of Building 9-60 is approximately 50 feet on two sides by 18 feet on one side and 29 feet on the other side. The area consists of three bays (Bays 2, 3, and 4), with one of these bays having a catch basin which drains to a containment trench across the front of all the three bays. The floor in the three bays slopes towards the catch basin and containment trench. Based on soil and concrete samples collected as part of the unit closure in April 1994, Bay 2 required decontamination of the concrete because of elevated Aroclor 1260 (1.2 ppm), chromium (190.619 ppm), and arsenic (91.94 ppm). No soil decontamination was required by Ecology. During the VSI, Boeing stated that only Bay 2 had been used for waste storage. The floor was observed to contain cracks and stains.(2,4,5,11)

There was an area between the north bays and Building 9-60 that was used for product storage area. There are two catch basins in this area that drain to the south towards an oil/water separator (SWMU 35). Drums that were stored in this area did not have any containment trenches to prevent spills from leaving the area.(2,4)

The area on the west side of Building 9-60 is irregular in shape and occupies approximately 550 ft^2. The area slopes towards a containment trench located across most of the front of the west area. There is one-to-two inch high curbing blocking approximately seven feet of the front on the edges. Building 9-60 is located along the back side of this unit. During the VSI, cracks were observed in the floor of Bay 1.(2,4,11)

Dates of Operation: The unit was used from 1961 through 1992. The area is currently undergoing closure.(2,4,5,6)

Wastes Managed: This unit was used to manage drums and tubs of waste, including solvents (F002 waste), generated through out the BDC facility.(2,4)

Release Controls: The unit has a concrete floor with catch basins and containment trenches and had a roof. The concrete floor was observed to be cracked and stained.(2,4,5,11)

History of Releases: During operation small spills occurred. However, there were no reported large spills that caused releases to the environment. Sampling in April 1994 during closure indicated the concrete in Bay 2 was contaminated. However, no soils remediation was required.(5)

4.13.2 Conclusions

Currently, there is a low potential for any releases since no hazardous materials are currently stored in this unit. Based on available information there is a low potential for past releases of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

4.14 SWMU 14 - BLDG 9-67, INCINERATOR

4.14.1 Information Summary

Unit Description: SWMU 14 is an Ecolaire 780-E incinerator (photo 94), a two-chambered incinerator used to destroy classified microfilm, mylar, and computer disks. The incinerator is rated to burn 500 pounds per hour or 4,000 pounds per day or 10 tons per week. The incinerator is typically operated five days a week for less than 8 hours per day and burns up to 400 pounds per hour. Waste ash has been tested by Boeing, found to be non-hazardous, and is disposed in an off site landfill.(5,11)

Dates of Operation: The incinerator has been in operation since 1988 and was active at the time of the VSI.(5,11)

Wastes Managed: This unit is used to burn classified microfilm, mylar, and computer disks. Boeing tested the ash, and determined it is non-hazardous, and disposes of it in an off site landfill.(5,11)

Release Controls: The second chamber is a secondary burner.(5)

History of Releases: There are no reported releases.(5)

4.14.2 Conclusions

There is a low potential for releases of hazardous constituents to surface water, ground water, or soil or to generate subsurface gas. The potential for releases to air are also low if the incinerator is operating properly.

4.15 SWMU 15 - BLDG 9-67, PAPER SHREDDER

4.15.1 Information Summary

Unit Description: SWMU 15 consists of two adjacent paper shredders (photo 95) used to destroy classified and "Boeing Limited" documents. Papers are ground into fine particles in one of two shredders that each have an associated baghouse. The particles are then sent to another baghouse (cyclone) where water is added as they leave the baghouse. The paper slurry passes through a screw press where excess water is removed. The wetted paper is then loaded into a box and sent off site to be blended with compost.(5,11)

Dates of Operation: The shredder has been in operation since 1984 and was active at the time of the VSI. The baghouses were added in 1988.(5,11)

Wastes Managed: This unit was used to shred classified and "Boeing Limited" documents. The wetted paper is placed in a thirteen yard box. Approximately one box of paper is generated each day. The paper is shipped off site to be combined with compost.(5,11)

Release Controls: Water is added to the paper to eliminate dust.(5)

History of Releases: There has been at least one release of paper slurry waste water from this operation. Approximately 200 gallons of paper slurry waste water were released to a storm drain on June 30, 1994.(5)

4.15.2 Conclusions

There is a low potential for releases of hazardous constituents to air, ground water, or soil or the potential to generate subsurface gas. The potential for releases to surface water are high based on the paper slurry release.

4.16 SWMU 16 - BLDG 9-69/70, FORMER REGULATED MATERIALS STORAGE AREA

4.16.1 Information Summary

Unit Description: SWMU 16, a former regulated materials storage area (photos 84-93), is located in Building 9-69/70 and behind the building (Figure 2). This area was an accumulation point for hazardous wastes generated throughout the BDC. Building 9-69/70 had six container storage bays, each 18 feet wide by 16 feet deep with 6-inch high curbs on two sides, walls on top of the curbs, a strip drain across the front of each bay, and the inside wall of Building 9-69/70 forming the back side of the bays. The bays are arranged such that three bays face each other with a 15-foot corridor down the middle. The corridor slopes towards a catch basin in the middle. The strip drains empty into a 1,000 gallon oil/water separator (SWMU 35) with a shut off valve. An asphalt paved container storage area behind the building is surrounded by a chainlink fence on three sides and the building on one side. The bays were used to segregate corrosives, flammables, and other wastes. Wastes are now stored in SWMU 1.(2,3,4,5,6,11)

The area is currently undergoing closure. In April 1994, Boeing collected soil and concrete samples from the floor and sumps of the building as part of the closure. Elevated levels of nickel (723.8 ppm) and copper (2,338.9 ppm) were detected in the concrete samples. Ecology required that the concrete near the elevated concentrations be decontaminated. Additional soil samples are to be collected and analyzed for PCBs and semi-volatile compounds.(5)

Dates of Operation: The unit operated from 1979 through 1992. Siding was added in 1987 and additional walls and yard fencing were added in 1989.(5)

Wastes Managed: This unit was used to manage regulated waste generated throughout the facility, including contaminated rags. During Ecology's August 14, 1991 Inspection, drums stored in this area were dated as having been stored there less than 60 days.(2,3,4)

Release Controls: The former container storage bays are surrounded by 6-inch high curbs on the sides, a strip drain across the front, and the inside walls of Building 9-69/70 on the back. The roof of Building 9-69/70 covers the containment bays. The strip drains empty into a 1,000 gallon oil/water separator (SWMU 35) with a shut off valve. The asphalt paved area is not covered or bermed.(2,3,5,11)

History of Releases: Small spills have occurred during the operation of the unit. However, there is no indication that releases to the environment have occurred from this unit.(5)

4.16.2 Conclusions

Currently, there is a low potential for any releases to the environment, since no hazardous materials are stored in this unit. Based on soil sampling and other information there is a low potential for past releases of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

4.17 SWMU 17 - BLDG 9-75, FORMER UNDERGROUND WASTE STORAGE TANK DC-05

4.17.1 Information Summary

Unit Description: SWMU 17, a former underground storage tank and associated sump (photo 73) were used to store waste hydraulic and engine oil. The 4,000 gallon steel tank was 17 feet long and 6 feet 3.5 inches in diameter. The associated 67 gallon sump was approximately 3 feet square and 1.5 feet deep. Oil was poured into the sump and then flowed into the tank. The waste oil was generated by hydraulic testing shops, automotive maintenance, and other locations throughout BDC. There was a shed located adjacent to the tank that may have been used to store waste oil (there are no records to document this). Some of the waste oil was possibly contaminated with solvents. The waste oil was shipped off site for treatment and disposal.(5)

Dates of Operation: The waste oil tank was used from 1958 to 1986.(5)

Wastes Managed: Waste hydraulic and engine oil were accumulated in the storage tank. Some of the oil was possibly contaminated with solvents.(5)

Release Controls: None.(5)

History of Releases: During tank removal some soil contamination was discovered. After the removal ground water monitoring wells were installed. Some ground water contamination was identified and determined to be limited in area and coming from the sump associated with the former UST.(5)

4.17.2 Conclusions

There was a low potential for releases of hazardous constituents to air and surface water or the potential to generate subsurface gas. The potential for releases to soil and ground water are high since releases have been documented. However, based on the tank removal and the sampling, the area that is impacted appears to be limited.

4.18 SWMU 18 - BLDG 9-101, FORMER WATER WASH PAINT BOOTH

4.18.1 Information Summary

Unit Description: SWMU 18, a paint booth located in Building 9-101 (Figure 2) was a former water wash paint booth that contained approximately 3,000 gallons of water and collected paint overspray resulting in sludges. The paint booth was changed to an air filter paint booth.(3,5,11)

Dates of Operation: This unit was installed in 1984. It was active at the time of the August 14, 1991 Ecology Compliance Evaluation Inspection. However, it is reported by Boeing to have been changed to air filters in 1990. Therefore the exact date the paint booth changed to filters is unknown.(3,5)

Wastes Managed: Paint sludges were generated from water that trapped overspray during painting.(3)

Release Controls: The paint booth was used to collect paint overspray from the air. There are no additional release controls.(3)

History of Releases: The only reported spills were minor paint spills on the concrete floor of the paint booth.(5)

4.18.2 Conclusions

There is a discrepancy in dates of operation for the wash water paint booth. It was reported to be active in the 1991 CEI. However, Boeing claims to have converted to filters in 1990.

There is currently a low potential for release of hazardous constituents to surface water, ground water, air or soil or to generate subsurface gas. The potential for past releases to air was dependent on the efficiency of the unit. The potential for past releases to all other environmental media is low.

4.19 SWMU 19 - BLDG 9-101, WASTE HYDRAULIC OIL TANK

4.19.1 Information Summary

Unit Description: SWMU 19, a waste hydraulic oil tank (photo 53), is a 250 gallon above ground steel storage tank located in the basement of Building 9-101 (Figure 2). Waste hydraulic oil from leaking pipes is collected and stored in this tank. The tank collects waste oil until the level alarm is activated at which time it is pumped out and the waste oil goes to the bulk oil recycling tank (SWMU 4). (3,5,11)

Dates of Operation: The tank was installed in 1980 and was active at the time of the VSI.(3,5,11)

Wastes Managed: This unit is used to store waste hydraulic oil.(3,5,11)

Release Controls: The only containment the unit has is the building.(3)

History of Releases: There is no indication that releases from this unit have occurred.

4.19.2 Conclusions

There is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. Spills occurring in this unit would be contained within Building 9-101.

4.20 SWMUs 20 - 22 - BLDG 9-101, NORTHWEST CORNER DEGREASER PIT AND TANK LINE SUMPS

4.20.1 Information Summary

Unit Description: SWMUs 20 through 22 , the former sumps in the tank line and degreaser pit (photo 50) were containment for the anodizing tank line and vapor degreaser located in the northwest corner of Building 9-101. Originally, there was an 8.5 foot deep degreaser pit that was nine feet wide by 22.3 feet long with an adjacent plating line sump that was 6.6 feet deep, 6.3 feet long, and 7.3 feet wide. In 1967, a new sump pit was added that was 6.3 feet deep, 8 feet long, and 6 feet wide. These pits and sumps were all constructed of concrete. The degreaser pit was used to contain and accumulate solvents used in the degreaser. The two sumps were used to contain and accumulate waste water contaminated with liquid acid, alkaline, and metals from the anodizing plating line. Depending on whether or not the plating wastes meet sanitary sewer discharge limits, they were either pumped to the waste tanks (SWMUs 23 - 25) or discharged to the sanitary sewer. Elementary Neutralization was performed on the wastes prior to discharge to the sanitary sewer. Based on the soils and ground water contamination in the area (see Section 3.5.8) Boeing has determined that the degreaser pit leaked. A pump and treat system has been installed to remediate the contamination.(5,11)

Dates of Operation: SWMUs 20 and 21 were in use from 1958 through 1984. The sumps were modified and a new sump (SWMU 22) was added in 1967. All sumps were taken out of service in 1984.(5)

Wastes Managed: The pit and these sumps accumulated waste solvent, waste acid, alkaline, and water that contained metals contamination.(5)

Release Controls: Soils and ground water contamination indicate that the degreaser pit leaked solvents. These sumps functioned as containment for the plating lines and degreaser.(5)

History of Releases: The degreaser pit leaked solvents to the soil and ground water. Boeing is currently remediating the ground water with a pump and treat system.(5,11)

4.20.2 Conclusions

Currently, there is a low potential for any releases since no hazardous materials are currently stored in these units. Historically, there was a high potential for past releases of hazardous constituents to ground water and soil based on current contaminants. The historic potentials for releases to air and surface water were most likely low since the lines were located in Building 9-101.

4.21 SWMUs 23 - 25 - BLDG 9-101, FORMER STORAGE TANKS

4.21.1 Information Summary

Unit Description: SWMUs 23 through 25, three former above ground storage tanks (A, B, and C), were located outside Building 9-101 (photos 45, 46, & 49), the Manufacturing Building (Figure 2). Waste alkaline, acid, and water were stored in Tanks A, B, and C, respectively. Tank A held waste sodium hydroxide and other alkaline solutions used for chemically milling, stripping, and cleaning. Tank B held waste nitric acid, hydrochloric acid, chromic acid, and other acid solutions used for chemically milling, etching, and plating operations. Tank C held metals-contaminated waste water that exceeded Metro permit discharge limits. Waste water included process rinse water, general cleaning wash water, and rain water. The rain water initially accumulated in a sump in the tank line containment area, for Tanks A, B, and C. When the sump was full the water would be analyzed and either discharged to Metro or Tank C depending on whether the results were below or above Metro permit limits, respectively. These SWMUs are currently undergoing closure. All that remains to close the area are final regulatory requirements. Tanks A and B were moved to a second nearby location in 1982 to make room for a new scrubber and then removed from the second location in 1985. A description of the tanks is summarized in Table 3.(2,6,9,31,32)

Dates of Operation: The tanks were in use from 1957 through 1984. In 1982, Tanks A and B were moved to make room for a new scrubber. These three tanks were removed from BDC in 1985. Closure is completed except for final regulatory requirements.(2,5,6,31,33)

Wastes Managed: These tanks were used to store waste acid, alkaline, and water that were generated in the manufacturing process. See Table 3 for additional information on the tanks.(3)

Release Controls: During the August 14, 1991 Ecology Compliance Evaluation Inspection, it was noted the concrete surrounding the tanks "had some brown staining and appeared old with some cracks except for some strips that had been replaced with newer concrete." In addition to curbing surrounding the tanks, there were secondary containment drains routed to the tank line sump system.(3,5)

History of Releases: The are no reported releases from these units. However in 1980, when waste acid was being loaded into a tanker truck it was discovered that the metal and acid were incompatible. The acid reacted with the metal resulting in an air release.(5)

4.21.2 Conclusions

Currently, there is a low potential for any releases to the environment, since no hazardous materials are currently stored in these units. Except for the air release while filling the tanker truck, there appears to be a low potential for past releases of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas.

Table 3

BUILDING 9-101 TANKS

SWMU	Tank	Size (gallons)	Waste Managed*	Dates of Operation
23	A	3,000	Alkaline Wastes (Titanium, alkaline, chem mill) 1980 - 27,150 gal. 1981 - 43,375 gal. 1982 - 31,250 gal, 1983 - 24,819 gal. 1984 - 56,100 gal.	1957 to 1984
24	B	2,000	Acid Wastes (Chromium, Nickel, Titanium, Acetone, Nitric, Hydrochloric, Alodine) 1980 - 91,790 gal. 1981 - 76,756 gal. 1982 - 90,325 gal. 1983 - 82,050 gal. 1984 - 69,860 gal.	1957 to 1984
25	C	10,000	Waste Water (Chromium, Nickel, Titanium, Copper, Zinc) 1980 - 42,550 gal. 1981 - 40,500 gal. 1982 - 57,975 gal. 1983 - 73,494 gal. 1984 - none	1957 to 1984

* - Waste quantities are totals from manifests by year. The numbers are questionable, however, since the manifested volumes frequently exceeded the tank volumes.

References: 2,10,34

4.22 SWMUs 26 & 27 - BLDG 9-101, FORMER TITANIUM CHEM MILL MASKANT TANK AND SUMPS

4.22.1 Information Summary

Unit Description: SWMUs 26 and 27, the former maskant tank and sumps in the titanium chem mill and planting line (photo 59), were used for containment and waste storage for the tank line and associated pilot plating line located in Building 9-101 (Figure 2). The 3,000 gallon underground steel maskant tank was 18 feet long and 5.3 feet in diameter. There was a control pit associated with the tank. There was a sump in the pilot line that was 4 feet long by 1.5 feet wide by four feet deep. The sump was constructed of concrete. In addition, there were three sumps and a drain pit shown on drawings of the chem mill operation provided by Boeing. The exact sizes and materials of construction were not included in the drawings. The wastes associated with the area were liquid acid, alkaline, maskants, and waste water. The wastes were pumped to the former waste treatment plant (SWMU 28) and discharged to the sanitary sewer, or sent off site for disposal.(5,11)

Dates of Operation: SWMUs 26 and 27 were in use from 1966 through the early 1970s.(5)

Wastes Managed: Waste acid, alkaline, maskants, and waste water were collected in the tank and sumps.(5)

Release Controls: The tank and sumps functioned as containment units for the chem milling and metal plating lines.(5)

History of Releases: None reported.(5)

4.22.2 Conclusions

Currently, there is a low potential for any releases to the environment, since no hazardous materials are currently stored in these units. The historic potentials for releases to ground water, soil, air, and surface water and the potential to generate subsurface gas were most likely low since the lines were located in Building 9-101.

4.23 SWMU 28- FORMER WASTE WATER TREATMENT PLANT

4.23.1 Information Summary

Unit Description: SWMU 28, the former waste water treatment plant (photo 62), was located west of Building 9-08 (Figure 2) and treated waste water from the former titanium chem mill and plating lines in Building 9-101. The waste water treatment plant contained a floc tank for chem mill wastes and a clay mix tank, both with agitators, a surge tank, a sludge tank, a clarifier, an air saturation tank, and a flash mix tank (Table 4).(5,11)

Table 4
Former Waste Water Treatment Plant Tanks

Tank	Height (feet)	Diameter (feet)
Floc Tank	7.3	3.1
Clay Mix Tank	7.3	3.1
Surge Tank	10	12
Sludge Tank	4	6
Clarifier	10.5	10.5
Air Saturation Tank	4.9	2
Flash Mix Tank	7	6

Dates of Operation: The waste water treatment plant operated at the same time as the chem mill and plating lines, from 1966 through the early 1970s.(5)

Wastes Managed: Waste water from the chem mill and plating line was treated in the waste water treatment plant.(5)

Release Controls: The tanks were on a concrete slab; there is no other known containment.(5)

History of Releases: None reported.(5)

4.23.2 Conclusions

Currently, there is a low potential for any releases to the environment, since no hazardous materials are stored in these units. The historic potentials for releases to ground water, soil, air, and surface water and the potential to generate subsurface gas are unknown.

4.24 SWMU 29 - BLDG 9-99, OIL/WATER SEPARATOR

4.24.1 Information Summary

Unit Description: SWMU 29, the Building 9-99 oil/water separator (photo 72), is located outside and east of Building 9-99 (Figure 2). The oil/water separator is constructed of concrete and located in a two chambered 1,000 gallon subsurface vault located approximately four feet below ground surface. The first chamber is approximately 10 feet long by 4.25 feet deep. The adjacent second chamber is approximately 2.5 feet long by 4.25 feet deep. Both chambers are 4.3 feet across. The oil/water separator is used to intercept potential spills from Building 9-99 that enter any open drain. Most of the drains in the building are currently plugged. The water drains from the oil/water separator to the sanitary sewer. Once a year the oil/water separator is cleaned and the wastes are sent off-site for treatment and disposal.(5,11)

Dates of Operation: 1968 to present.(5)

Wastes Managed: This unit is used to collect water from Building 9-99's processes and intercept spills and remove oil that is carried by the water prior to discharge to the sanitary sewer system.(5,11)

Release Controls: The unit is used as containment for process water. There is no additional containment associated with this unit.(5)

History of Releases: There is no information indicating that releases from this unit has occurred.(5)

4.24.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. If the oil/water separator is not maintained, there is a potential that some oil may flow into the sanitary sewer system.

4.25 SWMUs 30 - 40 - OIL/WATER SEPARATORS

4.25.1 Information Summary

Unit Description: SWMUs 30 - 40, oil/water separators (photos 63, 68, & 69), are located through out the BDC facility (Figure 2). All of the oil/water separators are constructed of concrete and located in subsurface vaults approximately seven to fifteen feet below ground surface. They are used to collect storm water from parking lots and open areas and remove oil from the water before it is discharged to the Duwamish River. Once a year the oil/water separators are cleaned out and the wastes are sent off site for treatment and disposal. Table 5 summarizes the locations, purposes, and dates of installation for the oil water separators.(5,11)

During an 1993 Ecology Inspection, an oil/water separator (SWMU 35) was identified near Building 9-69/70 as receiving wastes from strip drains across waste storage areas. During the 1988 EPA CEI, two oil/water separators were observed by inspectors. The first oil/water separator was near Building 9-50 (possibly SWMU 35) and second was in Building 9-52, near the paint booth area (probably SWMU 34). It was drained approximately every two months by vacuum truck.(2,4,5)

Dates of Operation: The date these units were installed is included in Table 5. They were active at the time of the VSI.(5,11)

Wastes Managed: This units are used to collect storm water runoff and remove oil that is carried by the water prior to discharge to the storm water sewer system and on to the Duwamish River.

Release Controls: The units are used as containment for storm water runoff. There is no additional containment associated with these units.

History of Releases: There is no information indicating that releases from these units have occurred.

4.25.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, ground water, or soil or to generate subsurface gas. If the oil/water separators are not maintained, there is a potential that some oil may flow into the storm water sewer system and eventually into the Duwamish River.

Table 5
OIL/WATER SEPARATORS

SWMU	Building/ Separator	Location	Purpose	Installed
30	9-007/SEP 3	West of Building	Oil trap for parking lot	1987
31	9-08/SEP 2	NW corner of yard	Oil trap for parking lot	1987
32	9-12/SEP 1	West side of building	Oil trap for parking lot	1987
33	9-51/ SEP 951	SW of bldg, in road	Oil trap for parking lot	1985
34	9-52/SEP DM	West yard	Collection point for fuel station spills	1985
35	9-60/BMA003	North yard	Oil trap for Storage yard	1961
36	9-96/SEP C	West yard	Oil trap for parking lot	1987
37	9-99/SEP A	NW corner of yard	Oil trap for parking lot	1987
38	9-99/SEP B	SW corner of yard	Oil trap for parking lot	1987
39	9-101/SEP SDC	South BDC parking lot	Oil trap for parking lot	1987
40	9-101/SEP G	South yard	Oil trap for parking lot/ autoclave	1990

Reference: 2,5

4.26 SWMU 41 - BLDG 9-64, FORMER OIL/WATER SEPARATOR

4.26.1 Information Summary

Unit Description: SWMU 41, a former oil/water separator (photo 75) was located east of Building 9-64 (Figure 2). The 500 gallon oil/water separator was constructed of concrete and located in a vault below ground surface. The vault was six feet long, four feet wide, and 8.25 feet deep. The oil/water separator received steam cleaning water from Building 9-50 via a six inch concrete pipe. After the water passed through the oil/water separator, it was discharged to the sanitary sewer. The oil was periodically cleaned out and shipped off site for treatment or disposal. The steam cleaning operation in Building 9-50 was transferred to its current location in Building 9-51.(5)

Dates of Operation: 1979 through 1987.(5)

Wastes Managed: This unit was used to remove waste oil from steam cleaning water prior to its discharge to the sanitary sewer system.

Release Controls: The unit was used as containment for steam cleaning water. There was no additional containment associated with this unit.

History of Releases: There is no information indicating that releases from this unit has occurred.

4.26.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas. If the oil/water separator was not maintained, there is a potential that some oil may have flow into the sanitary sewer system.

4.27 SWMU 42 - BLDG 9-101, FORMER OIL/WATER SEPARATOR

4.27.1 Information Summary

Unit Description: SWMU 42, a former oil/water separator (photo 55), was located west of Building 9-101 (Figure 2). The 500 gallon oil/water separator was constructed of concrete and located in a vault below ground surface. It was used to collect process water from Building 9-101 and remove oil from the water before it is discharged. It is unknown where the oil/water separator discharged. The oil/water separator was cleaned periodically and the wastes are sent off site for treatment and disposal.(5)

Dates of Operation: The installation date is unknown. The oil/water separator was removed in 1987.(5)

Wastes Managèd: This unit was used to collect process water from Building 9-101 and remove oil that was carried by the water prior to discharge.

Release Controls: The unit was used as containment for process water. There was no additional containment associated with this unit.

History of Releases: There is no information indicating that releases from this unit have occurred.

4.27.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to air, ground water, or soil or to generate subsurface gas. If the oil/water separator discharged to the storm water sewer system and it was not maintained, there is a potential that some oil may have flowed into the storm water sewer system and eventually into the Duwamish River.

4.28 SWMU 43 - STORM WATER SEWER SYSTEM

4.28.1 Information Summary

Unit Description: SWMU 43, the storm water sewer system (photo 16), is used to control surface water runoff throughout the BDC facility. There are also drains from some of the buildings that enter the storm water sewer system. While many of these drains have been sealed, some are still some in use. Storm water from areas expected to contain oil passes through oil/water separators (SWMUs 30 through 40) prior to discharge to the storm water sewer system. There are 16 lines in the storm water sewer system that discharge to the Duwamish River. There are eleven oil/water separators (SWMUs 30 through 40) associated with the storm water sewer system lines.(5)
Dates of Operation: 1956 to present. There have been additions and changes in the sewer system over the life of the facility.(5)

Wastes Managed: Surface water runoff and any materials that are spill, primarily oil, fuel, and water.(5)

Release Controls: The only release controls are some valves that can be closed (i.e. by the loading dock) and the oil/water separators.(5)

History of Releases: For details on the spills see Section 3.5. Historically, there have been periodic spills to the storm water sewer system. In 1986, there were two spills of 30 and 80 gallons of PS 300 oil. There was a 10 gallon spill of heat transfer oil, in 1987, with approximately 10 percent reaching the storm water sewer system. The next spill, in 1989, was 15,000 gallons of 15 percent alkyl trimethylene diamine (a biocide). Most of this spill was recovered. It is unclear if any reached the river. In 1992, there was a release of approximately 1 quart of diesel and two releases of water (90 gallons and unknown) with Dearborn 547 and steamate from autoclave #4. There was a spill containing 30 gallons of ethylene glycol and a spill of 4,500 gallons of cooling water, in 1993. Only one spill of 75 gallons of diesel fuel with some of it entering a catch basin had occurred in 1994.(5)

4.28.2 Conclusions

There is a low potential for releases of hazardous constituents to air, ground water, or soil and for this unit to generate subsurface gas based on the water being contained with in the storm water sewer system. There is a high potential for releases of hazardous constituents to surface water based on the past releases.

4.29 SWMUs 44-123 WASTE ACCUMULATION AREAS

4.29.1 Information Summary

Units Description: Most of the hazardous or dangerous waste generated at the Boeing Developmental Center is collected at accumulation stations (photos 22, 25-28, 30-36, 43, 44, 52, 54, 56, 57, 61, 64-67, 70, 71, 97, & 104-106) throughout the facility. The current accumulation areas are summarized in Table 6. The known former accumulation areas are included in Table 7. There is no waste information provided for the former units since there was none available. Boeing Environmental Services personnel provide the set-up services and daily maintenance of these stations. The Hazardous Waste Monitor for the area in which a station is located is responsible for ensuring that the waste is deposited properly at the stations. The stations are inspected on a weekly basis by Environmental Engineering personnel. After consolidation and preparation for shipment at Building 9-04, all containerized waste is sent off-site, typically within 60 days of its accumulation start date, for treatment, storage, recycle/recovery, or disposal.(5,11)

Boeing currently manages 21 different waste streams at the Developmental Center using the accumulations stations system. Accumulation stations are set-up and removed on an 'as needed' basis. The stations are set-up in a variety of configurations which reflect the types of waste managed. For example solid debris-type waste is collected in plastic bag lined steel drums (DOT type 17H open-head drum with removable top, or equivalent -- 55- and 30-gallon sizes) or 5-gallon metal cans. Liquid wastes are collected in 5-, 30-, or 55-gallon metal, closed-head containers and drums (e.g. DOT type 17E closed-head or equivalent), except for corrosives, which are collected in 5-, 30-, or 55-gallon closed-head poly drums and containers. Accumulation stations for liquid wastes have secondary containment which consists of either grate-topped steel pans, grated concrete berms, oversize drums, or 10-gallon plastic totes (for 5-gallon containers only).(5)

Dates of Operation: Little information is available regarding the historical status of various accumulation stations. In August 1989 and August 1991, Ecology Dangerous Waste Compliance Inspections were performed at the facility, and SWMUs were identified. Table 6 lists currently active SWMUs, along with designated SWMU numbers. During the 1989 inspection, several accumulation areas described are probably the same as active SWMUs 47, 69, and 120. In 1989, SWMU 47 was reported to contain oil and rags. There were no other wastes described for the SWMUs. After cross referencing the current list with the 1991 report (using specific location as an indicator), it appears that SWMUs 45, 46, 53, 60, 64, 70, and 73 were active at the time of the 1991 inspection, and are still active in 1994. The wastes were similar or not mentioned for these SWMUs with the exceptions that SWMU 53 had hardeners, resins,

Table 6

WASTE ACCUMULATION AREAS

SWMU	Accumulation Area	Building	Col/Row	Wastes
44	D003	9-49	None	Oily rags, solvent rags, aerosol cans, and batteries
45	D004	9-51	DR S-1	Oily rags, aerosol cans, and oil for recycling
46	D005	9-52	C-2	Solvent rags, aerosol cans, and paints and inks
47	D007	9-99	D-2	Oil rags, solvent rags, aerosol cans, paints and inks, and oil for recycling
48	D008	9-99	D-4	Oily rags
49	D009	9-101	C-2	Solvent rags, aerosol cans, and paints and inks
50	D010	9-101	D-19	Oily rags, solvent rags, aerosol cans, and oil for recycling
51	D011	9-101	W-12	Oil for recycling
52	D012	9-101	H-17	Oily rags and solvent rags
53	D013	9-101	K-17	Oily rags
54	D014	9-101	K-18	Oily rags, solvent rags, aerosol cans, and alodine rags
55	D016	9-101	P-12.5	Oily rags, solvent rags, and aerosol cans
56	D017	9-101	N-15	Solvent rags
57	D019	9-101	R-17	Solvent rags
58	D020	9-101	T-5	Oily rags, solvent rags, and aerosol cans
59	D021	9-101	W.7-21.6	Solvent rags, aerosol cans, and paints and inks
60	D024	9-101.2	G-15	Oily rags, solvent rags, batteries, paints and inks, and alodine rags
61	D025	9-101.2	P-11	Oily rags, solvent rags, aerosol cans, and oil for recycling
62	D027	9-102	D-3	Oil for recycling
63	D028	9-120	B-8	Oily rags

Table 6 (continued)

WASTE ACCUMULATION AREAS

SWMU	Accumulation Area	Building	Col/Row	Wastes
64	D029	9-120.1	B-8	Oil for recycling
65	D031	9-120	A-3	Oily rags, solvent rags, aerosol cans, and batteries
66	D032	9-120	Room 116	Solvent rags, and paints and inks
67	D033	9-51	M-4	Oily rags, solvent rags, aerosol cans, and batteries
68	D034	9-120	Model lab	Oily rags, solvent rags, aerosol cans, paints and inks, and containers with paints and inks
69	D036	9-120.3	A-2	Oily rags, solvent rags, aerosol cans, and batteries
70	D037	9-140	OAD Doc	Photographic developer and photographic fluids
71	D039	9-102	B-5	Oily rags, solvent rags, aerosol cans, and oil for recycling
72	D042	9-08.4	Repro	Aerosol cans and toner
73	D043	9-101	Y-7	Oily rags and solvent rags
74	D047	9-51	St Cl Sm	None
75	D048	9-51	St Cl Tnk	None
76	D051	9-101	S-9	Batteries
77	D053	9-101.1	E-2	Oily rags and solvent rags
78	D054	9-101	T-19	Solvent rags
79	D058	9-53	SH-SA	Oily rags, solvent rags, and batteries
80	D061	9-101.1	N-13	Oily rags, solvent rags, aerosol cans, and oil for recycling
81	D062	9-96.2	F-20	Oil for recycling
82	D063	9-101.1	U-9	Oily rags
83	D064	9-101.2	R-11	Waste HF

Table 6 (continued)

WASTE ACCUMULATION AREAS

SWMU	Accumulation Area	Building	Col/Row	Wastes
84	D065	9-98.2	A-7	Aerosol cans and batteries
85	D066	9-101.1	N-12	Paints and inks and solvents
86	D071	9-101	X-18.5	Paper filters with composite sludge/coolant
87	D072	9-61	ROLL-U	Oily rags
88	D074	9-101	P-10	Mixed acid plating solutions and NaOH/chromium wastes
89	D075	9-08	C-17	Oily rags, aerosol cans, batteries and spent toner wastes
90	D076	9-60	OILHOUSE	Oily rags, paint and ink contaminated debris, and alodine contaminated rags

Table 7
FORMER WASTE ACCUMULATION AREAS

SWMU	Accumulation Area	Building	Col/Row
91	D001	9-08.3	A-2
92	D002	9-48	DR W-1
93	D006	9-99	A-3
94	D015	9-101	M-12
95	D018	9-101	P-9
96	D022	9-101.1	T-5.5
97	D023	9-101	Y-9
98	D026	9-101.2	R-11
99	D030	9-101.1	D-14
100	D035	9-120	C-5
101	D038	9-101	NE 9-101
102	D040	9-70	IL HOUS
103	D041	9-50	DR N-9
104	D044	9-101	D-14
105	D045	9-90.2	K-3
106	D046	9-101	K-15
107	D049	9-101.1	M-13
108	D050	9-101	X-9
109	D052	9-52	C-3
110	D055	9-101	E-22
111	D056	9-101.2	D-11
112	D057	9-101.2	L-5
113	D059	9-77.3	H-17
114	D060	9-101.1	P-3
115	D067	9-101.1	B-5
116	D068	9-140	
117	D069	9-140	
118	D070	9-120	C-5.5
119	D073	9-101.2	J-9
120	D077	9-102	
121	D078	9-43	DR W-1
122	DT01	ASBESROL-OF	
123	Photographic Waste	9-90	

solvents, and paints; SWMU 60 to store alcohol; and SWMU 73 was used to store waste vinyl chloride. SWMU 105 (see Table 7) was active at the time of the 1991 inspection, but was closed as of the 1994 inspection.(3,5)

Wastes Managed: Any waste generated throughout the facility including oil, solvents, aerosol cans, batteries, paints, inks, photo chemicals, acids, and contaminated water are managed. Since types of wastes generated in each area change with the operations, the waste types accumulated in each of the former accumulation areas can not be identified.(5)

Release Controls: Drums containing liquid wastes are stored in drip pans that will contain small spills and accumulation areas are inside buildings that should prevent any spills from releasing to the environment.(11)

History of Releases: There were no reported releases beyond the buildings or secondary containment for these SWMUs.(5,11)

4.29.2 Conclusions

There is a low potential for releases of hazardous constituents to surface water, air, ground water, or soil and for this unit to generate subsurface gas based on the wastes being contained within the Buildings.

4.30 SWMUs 124 THROUGH 157 - DUST COLLECTORS

4.30.1 Information Summary

Unit Description: SWMUs 124 through 157 are dust collectors (photo 24) that are located throughout the BDC facility. They are used to collect wood dust, metal dust, plastic, composite dust, sand, and phenolic from manufacturing processes. They are summarized in Table 10 and shown in Figure 2. Most of these units were grandfathered into the current air emissions registration process. Only units installed after 1987 were individually listed.(5)

Dates of Operation: See Table 10 for installation dates. These units were active as of the VSI.(5)

Wastes Managed: These units are used to collect particulate and dust generated throughout the BDC facility during manufacturing process.

Release Controls: The units are used as containment for air releases of dust. There was no additional containment associated with these units.

History of Releases: There is no information indicating that releases from these units have occurred.

4.30.2 Conclusions

Based on the available information, there is a low potential for release of hazardous constituents to surface water, ground water, or soil or to generate subsurface gas. If the units are not maintained, there is a potential that some material may be released to the air.

Table 8

DUST COLLECTORS

SWMU	Description	Building	Col/Row	Wastes	Install Date
124	Newyork Blower Baghouse	9-51	L-5	Wood Dust	unknown
125	Spencer Baghouse	9-51	L-5	Wood Dust	8/27/92
126	Delta Filter/Pack Box	9-53	B-2	Metal Dust	unknown
127	Kei Filter Bag	9-53	B-3	Metal Dust	unknown
128	Sternvent Filter/Pack Box	9-77	P-15	Wood and Metal Dust	unknown
129	Sternvent Filter/Pack Box	9-77	H-16	Wood and Metal Dust	7/25/88
130	Sternvent Filter/Pack Box	9-77	R-14	Wood and Metal Dust	unknown
131	Aget Filter/Pack Box	9-99	D-1	Metal Dust	unknown
132	Donaldson Torit Bag/Filter	9-101	D-4	Composite Dust	unknown
133	Donaldson Torit Bag/Filter	9-101	D-4	Composite Dust	unknown
134	Donaldson Torit Bag/Filter	9-101	D-4	Composite Dust	unknown
135	Clemco Industries Sand Blaster with a Drum/Filter	9-101	D-9	Sand, Metals, Phenolic	unknown
136	Empire Abrasive Sand Blaster with a Drum/Filter	9-101	E-1	Composite Dust	unknown
137	Agent Manufacturing Filter/Pack Box	9-101	E-11	Metal Dust	unknown
138	Delta Filter/Pack Box	9-101	M-11	Wood and Metal dust	unknown
139	Aget Dustkop Filter/Pack Box	9-101	M-11	Composite Dust	unknown
140	Rockwell Filter/Pack Box	9-101	M-121	Composite Dust	unknown
141	Micropulse Baghouse	9-101	N-1	Composite Dust	3/23/87
142	Spencer Baghouse	9-101	N-1	Composite Dust	1984
143	Spencer Baghouse	9-101	N-16	Composite Dust	1/1/87

Table 8 (continued)

DUST COLLECTORS

SWMU	Description	Building	Col/Row	Wastes	Install Date
144	Donaldson Torit Bag/Filter	9-101	P-3	Composite dust	unknown
145	Donaldson Industries Baghouse	9-101	P-15	Composite Dust	12/18/89
146	Donaldson Torit Bag/Filter	9-101	R-6	Composite Dust	unknown
147	Donaldson Torit Bag/Filter	9-101	R-16	Composite Dust	unknown
148	Hoffman	9-101	R-18	Composite Dust	11/83
149	Torit Corp. Filter/Pack Box	9-101	G-15	Metal Dust	unknown
150	Rockwell Filter/Pack Box	9-101	R-11	Wood and metal dust	unknown
151	Torit Filter/Pack Box	9-120	B-3	Wood dust	unknown
152	Torit Filter/Pack Box	9-120	B-3	Wood dust	unknown
153	Torit Corp. Filter Bags	9-120	E-4	Plastics	unknown
154	Spencer Baghouse	9-120	J-1	Wood dust	9/10/92
155	Spencer Baghouse	9-120	J-1	Wood dust	11/15/92
156	Donaldson Torit Baghouse	9-120	K-5	Plastic, metal, wood	4/27/90
157	Torit Baghouse	9-120	K-6	Plastic	unknown

4.31 AOCs 1 and 2 - UNDERGROUND STORAGE TANKS

4.31.1 Information Summary

AOCs 1 and 2 (Figure 2) are two double walled steel underground storage tanks (DC-14 and DC-13) located near Building 9-52 (photo 96). The original tanks at this location were installed in approximately 1985 and were used to store unleaded gasoline (500 gallon tank) and diesel fuel (300-gallon tank). In 1990, when tank tightness testing was conducted the unleaded gasoline tank was discovered to be leaking. After the tanks were removed it was discovered that the leak had occurred in the unleaded gasoline tank's associated piping. In 1990, both tanks were removed and replaced with two new 550 gallon and 1,100 gallon tanks for diesel and unleaded gasoline, respectively. Soil was removed to a depth of two feet below the water table. The last samples collected from the excavation indicated there was some soil contamination present at concentrations below the Washington State MTCA cleanup goals. However, concentrations of BTEX were present in ground water at concentrations above the cleanup goals. During the removal no free product was observed on the ground water. However, there was foam present. The contaminated ground water was left in place since no one was using the ground water in the immediate area and it was away from the Duwamish River. It was recommended that monitoring wells be installed.(5)

4.31.2 Conclusions

Based on the past releases and the remaining contamination there is a high potential for releases to the soil and ground water. The potential for releases to surface water and air and to generate subsurface gas is low.

4.32 AOCs 3 and 4 - UNDERGROUND STORAGE TANKS

4.32.1 Information Summary

AOCs 3 and 4 (photo 51) are two 20,000 gallon double wall composite underground storage tanks (DC-20 and DC-21) located near Buildings 9-50 and 9-72 (Figure 2). The original tanks at this location were installed in 1957 and were used to store No. 5 fuel oil used by a steam plant in Building 9-50. When soil conditions were evaluated in 1985 there did not appear to be any problem. However, in 1991 when tank tightness testing was conducted the western most tank was discovered to have a problem. Both tanks were removed and replaced with two new 20,000 gallon tanks in 1992. During the removal approximately 250 yd^3 of TPH contaminated soil was removed along with 200-500 gallons of free hydrocarbon product and 80,000 gallons of water generated during the project. An area of soil with contamination above the 200 mg/kg TPH cleanup level that was beyond the reach of the excavating equipment and beneath the water table was left. A monitoring well was installed nearby and sampled for TPH. No TPH was detected in the well.(5)

4.32.2 Conclusions

Based on the past releases and the remaining contamination there is a high potential for releases to the soil and ground water. However, since the fuel oil is not migrating rapidly the area that is likely to be impacted is limited. The potential for releases to surface water and air and to generate subsurface gas is low.

4.33 AOC 5 - UNDERGROUND STORAGE TANK

4.33.1 Information Summary

SWMU 5 was a 1,000 gallon steel underground storage tank (DC-01) located near Buildings 9-60 and 9-61. The tank was used to store unleaded gasoline and was removed in 1985. Prior to removal approximately 830 gallons of unleaded gasoline had leaked out of the tank. During the removal 500-600 gallons of floating product was removed during cleanup and the remainder was reported to have been removed with contaminated soils. A monitoring well was installed nearby and two wells were sampled. The sample results that were provided could not be correlated to sample locations. However, two samples were analyzed for benzene, toluene, and xylenes. Only benzene was detected in one sample at 20 μg/l.(5)

4.33.2 Conclusions

Based on the past releases and the remaining contamination there is a high potential for releases to the soil and ground water. However, since the fuel oil is not migrating rapidly the area that is likely to be impacted is limited. The potential for releases to surface water and air and to generate subsurface gas is low.

REFERENCES

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APPENDIX A

Photo Documentation

PHOTO LOG: RCRA Facility Assessment (VSI)
Developmental Center
July 26, 1994

Roll # 1

Photo	Frame	SWMU/AOC	Location	Description
1	1	SWMU #2	9-04 Consolidation Room	East - Trench
2	2	SWMU #2	9-04 Consolidation Room	East - Compactor
3	3	SWMU #2	9-04 Consolidation Room	North- Drums Room Area
4	4	SWMU #2	9-04 Consolidation Room	SW- Doorway & Trench
5	5	SWMU #2	9-04 Consolidation Room	South - Trench/Room
6	6	SWMU #2	9-04 Consolidation Room	Down Into Secondary Containment Vault/Sump
7	7	SWMU #1	Bay 15 (9-04)	NW - Barrels & Trench
8	8	SWMU #1	Bay 14 (9-04)	NW Materials (Recycling) From Office Areas
9	9	SWMU #1	Bay 21 (9-04)	SW - Flammable Liquid Room
10	10	SWMU #1	Bay 21 (9-04)	SE - Flammable Liquid Room
11	11	SWMU #1	Bay 17 (9-04)	E - Corrosive Liquid Area
12	12	SWMU #1	Bay 20 (9-04)	W - Corrosive/Caustic Area
13	13	SWMU #1	Bay 18 (9-04)	E- Empty Drums
14	14	SWMU #1	Bay 19 (9-04)	W - Empty Drums
15	15	SWMU #3	Loading Dock (9-04)	NW - Loading Dock
16	16	SWMUs #3 & #43	Loading Dock (9-04)	E - Overflow Drain / Loading Dock
17	17	SWMU #3	Loading Dock (9-04)	W - Valve To Control Drain To Duwamish
18	18	SWMU #3	Loading Dock (9-04)	E - Hazardous Waste Receiving & Dead Sump / Loading Dock Area
19	19	SWMU #3	Loading Dock (9-04)	Drum At Dock - Containment Sump
20	20	SWMU #4	9-04 Tank	Oil Recycling Tank
21	21	SWMU #4	9-04 Tank	S - Close Up Of Oil Recycling Tank
22	22	SWMU #58	9-101 (D020)	S - Machining Area Hazardous Waste Collection Station
23	23	NA	9-101 (Near D020)	W - Waste Graphite Tub Skid
24	24	Unknown	9-101 (Near D020)	W - Cyclone Dust Collector
25	25	NA	9-101 (Near D020)	W - Vacuum Equipment In Machining Area

PHOTO LOG: RCRA Facility Assessment (VSI)
Developmental Center
July 26, 1994

Roll # 2

Photo	Frame	SWMU/AOC	Location	Description
26	1	SWMU #82	D063 (9-101)	E - Liquid Waste Collection / Maint. Oil Area
27	2	SWMU #76	D051 (9-101)	N - Alkaline Battery Collection Station
28	3	SWMU #55	D016 (9-101)	E - Pump System / Dye-Penetrant
29	4	NA	Adjacent To D016 (9-101)	Dye - Penetrant Tank
30	5	SWMU #55	D016 (9-101)	W - Station
31	6	SWMU #88	D074 Lab 9-4888 (9-101)	NaOH Container (Labeled/empty) In Plastic Tote
32	7	SWMU #88	D074 Lab 9-4888 (9-101)	NaCN Container (Labeled/empty) In Plastic Tote
33	8	SWMU #85	D066 Lab 9-4888 (9-101) (Hood/Chem)	Methylene Chloride/ Analytical Use Chemical
34	9	SWMU #80	D061 X-ray Lab (9-101)	NE - Silver Reclamation
35	10	SWMU #80	D061 X-ray Lab (9-101)	NW - Sink w/ Na Thiosulfate
36	11	SWMU #61	D025 (9-101.2)	E - Collection Station Adjacent To Degreaser
37	12	NA	9-101.2	W - Degreaser Area
38	13	NA	9-101.2	W - Degreaser Area
39	14	NA	9-101.2	East Side Of Tank Looking Down At Cooling Lines
40	15	NA	9-101.2	E - Still Adjacent To Degreaser Tank (Never used)
41	16	NA	9-101.2	S - Whole System
42	17	SWMU #18	9-101 Paint Booth	W - Paint Booth
43	18	unknown	9-101 Paint Booth	E - Accum. Area View Of Floor
44	19	unknown	9-101 Paint Booth	W - Accum. Area View Of Floor
45	20	SWMUs #23 & #24	NW Corner 9-101 (Door N-2)	S - Removed Old Tanks & Sample Locations
46	21	SWMUs #23 & #24	NW Corner 9-101	SE - 2nd Position Of Tanks & Building for Pump & Treat Equipment
47	22	N/A	NW Corner 9-101	E - Equipment For Pump & Treat SWMU 20-25
48	23	N/A	NW Corner 9-101	E - Equipment For Pump & Treat SWMU 20-25
49	24	SWMUs #23-25	NW Corner 9-101	N - Sampling Well Location of Former SWMUs 23-25
50	25	SWMUs #20-22	9-101 Inside NW Corner	NW - Sampling Wells Associated With SWMUs 20-22 and Location of Former SWMUs 20-22

PHOTO LOG: RCRA Facility Assessment (VSI)
Developmental Center
July 26, 1994

Roll # 3

Photo	Frame	SWMU/AOC	Location	Description
51	1	AOCs # 3 & 4	West of 9-50	N - Petroleum UST
52	2	unknown	9-90.2 Graphics Lab	NW - Photo Lab Developer Bucket
53	3	SWMU #19	9-101 Tunnel (BMA 049)	N - Oil Storage Tank
54	4	SWMU #50	D010 (9-101)	S - View Of Station
55	5	SWMU #42	9-101 (Door W-5)	E - Former Location Of Oil/Water Separator
56	6	SWMU #50	9-102 (South Side)	W - Containment Pad (Accumulation Station)
57	7	SWMU #50	9-102 (South East Side)	E - Vacuum Pump Oil Recycle Drum
58	8	NA	9-101 (SW Outside)	W - Location Of Former UST
59	9	SWMUs #26 & 27	9-101 (Column F-22)	S - Former Titanium Chem Mill & Plating Line Area
60	10	NA	9-101 (South Outside)	N - Cover Of Active UST
61	11	SWMU #70	9-140 (South Side Loading Dock)	NE - Portable Secondary Containment & Barrels (Accumulation Station D037)
62	12	SWMU #28	West Of 9-80	SE - Former Water Treatment Area
63	13	SWMU #40	9-120 South Outside	W - Oil/Water Separator (others the same)
64	14	SWMU #68	D034 (9-120)	Model Shop / N- Waste Station
65	15	SWMU #66	D032 (9-120)	Fiberglass Shop /W - Waste Station
66	16	SWMU #66	D032 (9-120)	Fiberglass Shop / W - Waste Station
67	17	SWMU #65	D031 (9-120)	S - General Waste
68	18	SWMU #36	9-96 South Outside	N - Looking At Baffles Of Oil/Water Separator
69	19	SWMU #36	9-96 South Outside	N - Looking At Baffles Of Oil/Water Separator
70	20	SWMU #48	D008 (9-99)	SE - Waste Accum. Station
71	21	SWMU #47	D007 (9-99)	W - Station (Oil, Rags, Cans)
72	22	SWMU #29	9-99 East Outside	W - Manhole Cover To Sewer May Drain Roof
73	23	SWMU #17	9-75 East Outside	NW - Removed UST / Waste Oil
74	24	SWMU #8	Area North Of 9-50	SE - Solid Waste (Garbage) Transfer/Shipping Area
75	25	SWMU #41	9-64 East Outside	N - Steam Clean Tank/Separator

PHOTO LOG: RCRA Facility Assessment (VSI)
Developmental Center
July 26, 1994

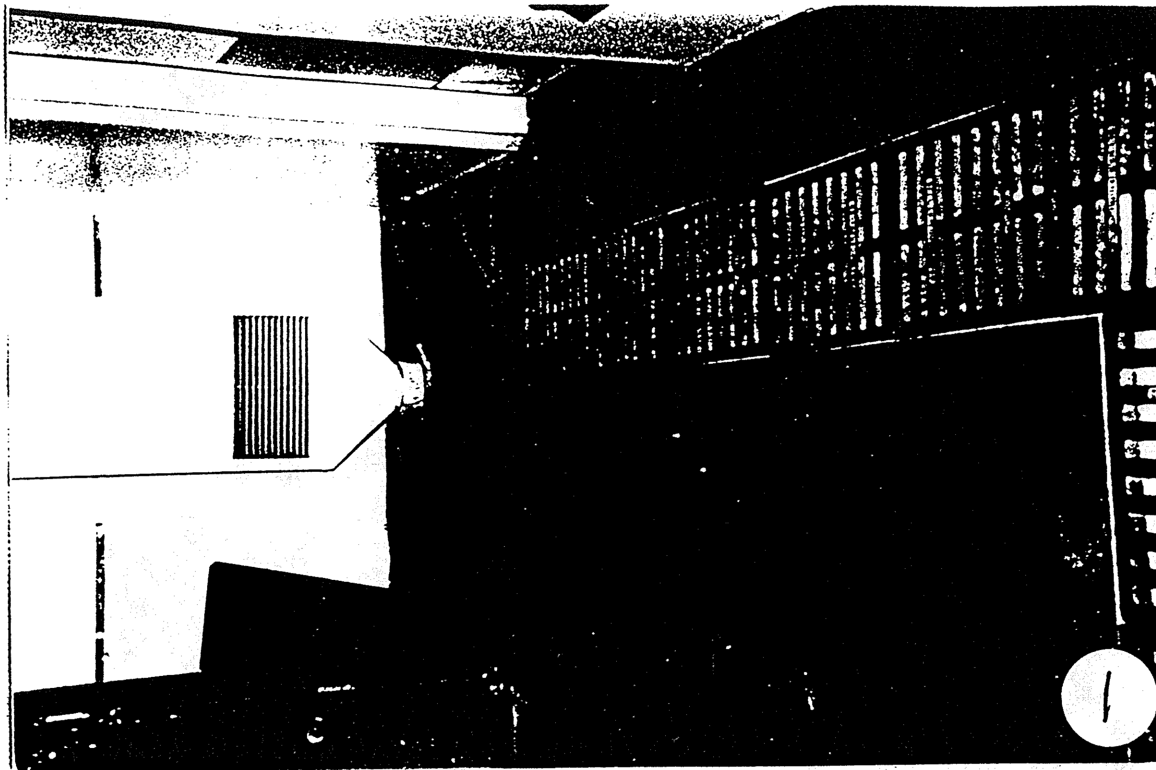
Roll # 4

Photo	Frame	SWMU/AOC	Location	Description
76	1	N/A	9-50 (North Side)	NW - Rain Water Tanks
77	2	N/A	9-50 (North Side)	NE - Containment
78	3	SWMU #6	9-50 (NE Corner)	S - Former Container Area
79	4	SWMU #6	9-50 (NE Corner)	NE - Showing Borings / Area
80	5	SWMU #13	9-60 (NW Corner)	SE - Raw Materials Chem.
81	6	SWMU #13	9-60 (West Side)	E - Empty Sampling Drums
82	7	SWMU #13	9-60 (West Side)	SW - Containment Area
83	8	SWMU #13	9-60 (West Side)	SW - Containment Area
84	9	SWMU #16	9-69/70	S - Bay 1
85	10	SWMU #16	9-69/70	S - Bay 2
86	11	SWMU #16	9-69/70	S - Bay 3? (Not Labeled)
87	12	SWMU #16	9-69/70	S - Bay 4? (Not Labeled)
88	13	SWMU #16	9-69/70	N - Bay 5? (Not Labeled)
89	14	SWMU #16	9-69/70	N - Bay 6? (Not Labeled)
90	15	SWMU #16	9-69/70	N - Bay 7? (Not Labeled)
91	16	SWMU #16	9-69/70	N - Bay 8? (Not Labeled)
92	17	SWMU #16	9-69/70	E - View Of Where Empty New Drums Were Stored
93	18	SWMU #16	9-69/70	W - View Of Where Empty New Drums Were Stored
94	19	SWMU #14	9-67	E - Building & Incinerator Stack
95	20	SWMU #15	9-67	S - Air/Water/Paper Cyclone (Paper Shredder)
96	21	AOCs #1 & #2	9-52 (North Outside)	N - Active UST
97	22	SWMU #46	9-52 (North Side)	SW - Into Room (Accum Area & Raw Material)
98	23	N/A	9-52 (South Side)	N - Fume Hood
99	24	SWMUs #9 & #11	9-52 (SW Outside)	N - Former Location Of Steam Clean
100	25	SWMU #9	9-52 (SW Outside)	N - New Above Ground Steam Clean Tank

PHOTO LOG: RCRA Facility Assessment (VSI)
Developmental Center
July 26, 1994

Roll # 5

Photo	Frame	SWMU/AOC	Location	Description
101	1	SWMU #10	9-51 Auto Shop	W - Steam Clean Sump & Secondary Trench
102	2	SWMU #10	9-51 Auto Shop	N - Steam Clean Sump & Secondary Trench
103	3	SWMU #10	9-51 Auto Shop	W - New/Used Battery Storage
104	4	SWMU #45	9-51 Auto Shop	NE - Waste Accum. Area (D004)
105	5	SWMU #45	9-51 Auto Shop	NE - Waste Accum Area D004 (Close-up)
106	6	SWMU #67	9-51 Tool Room	S - Accum Area Near Tool Room (D033)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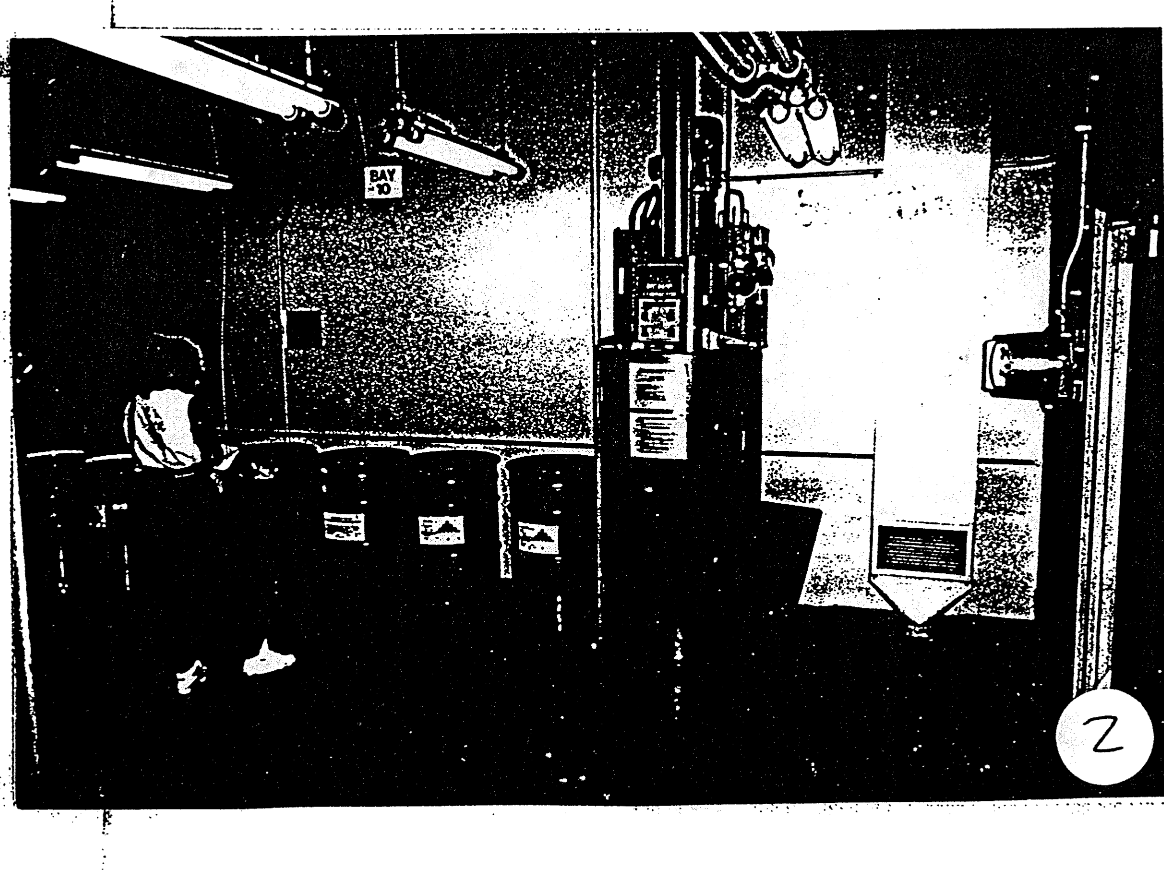
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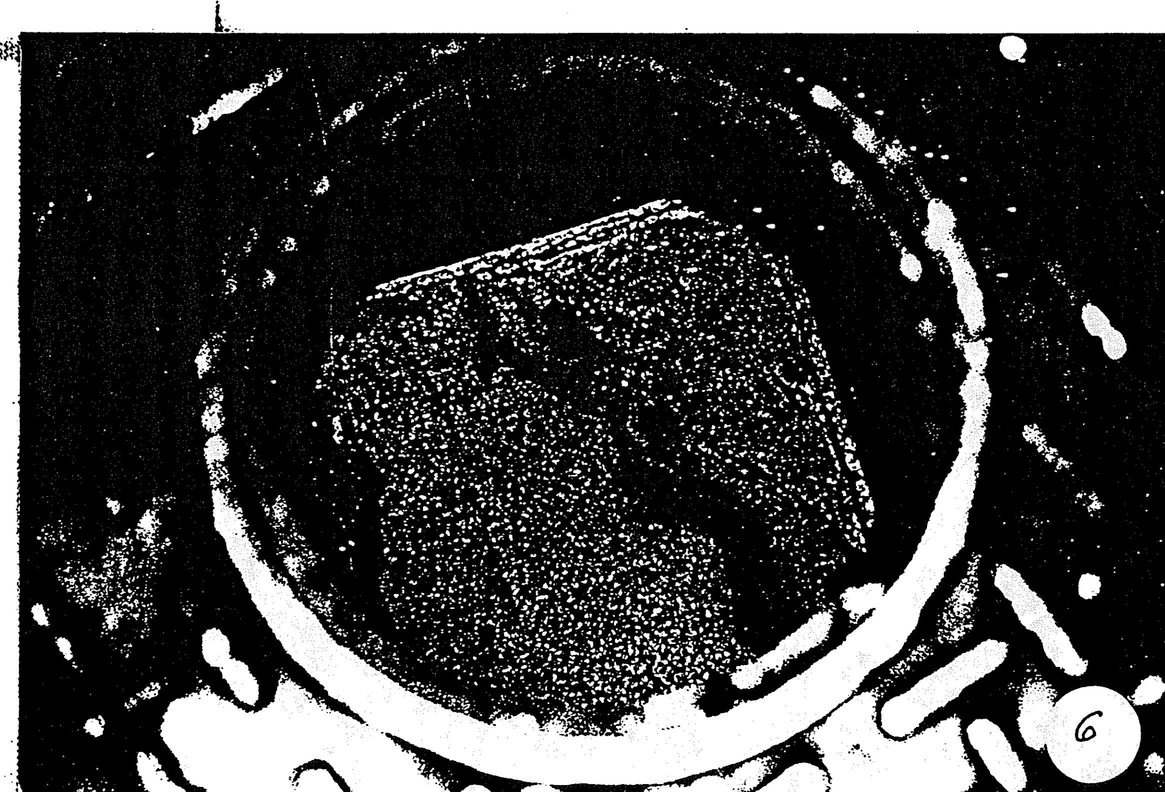
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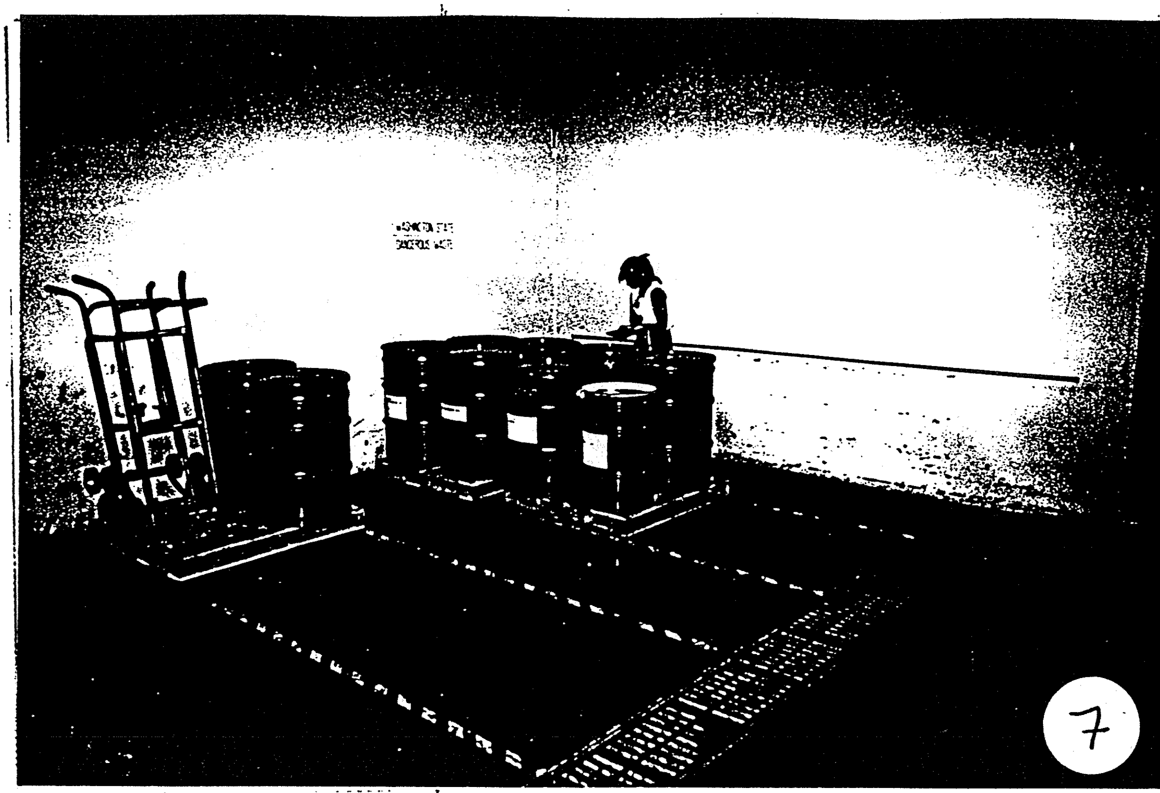
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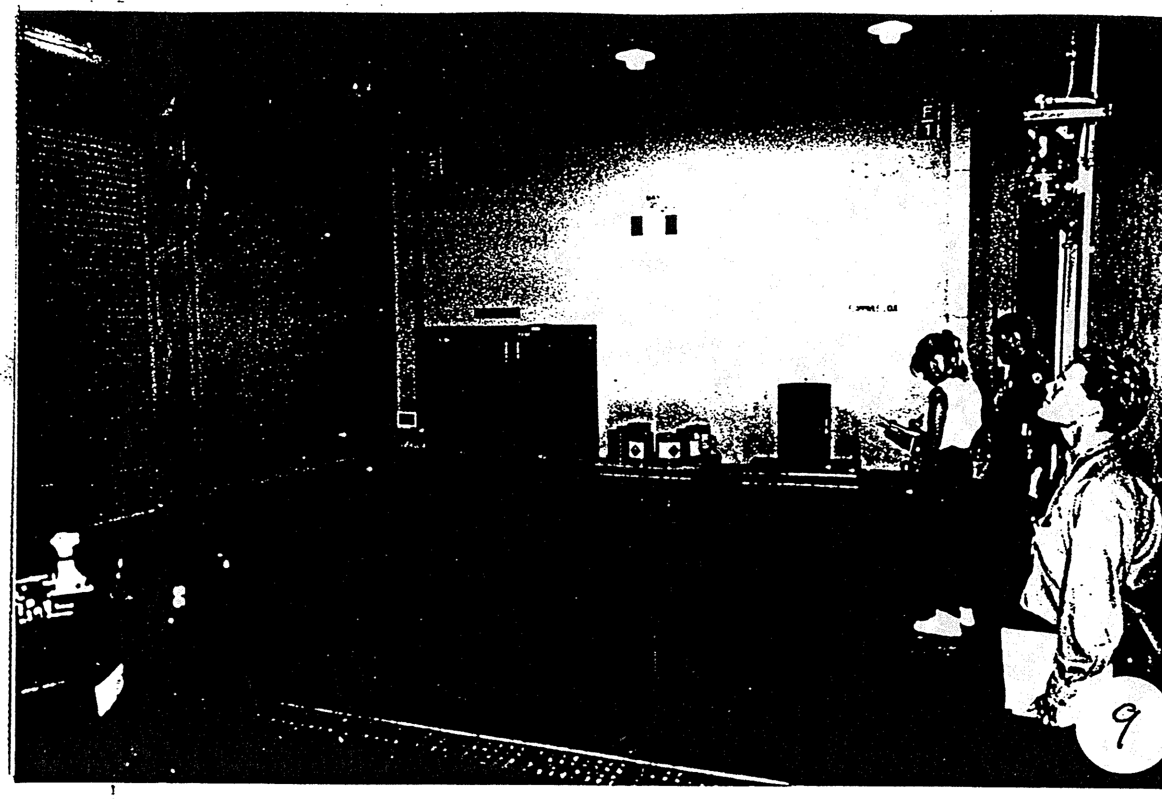
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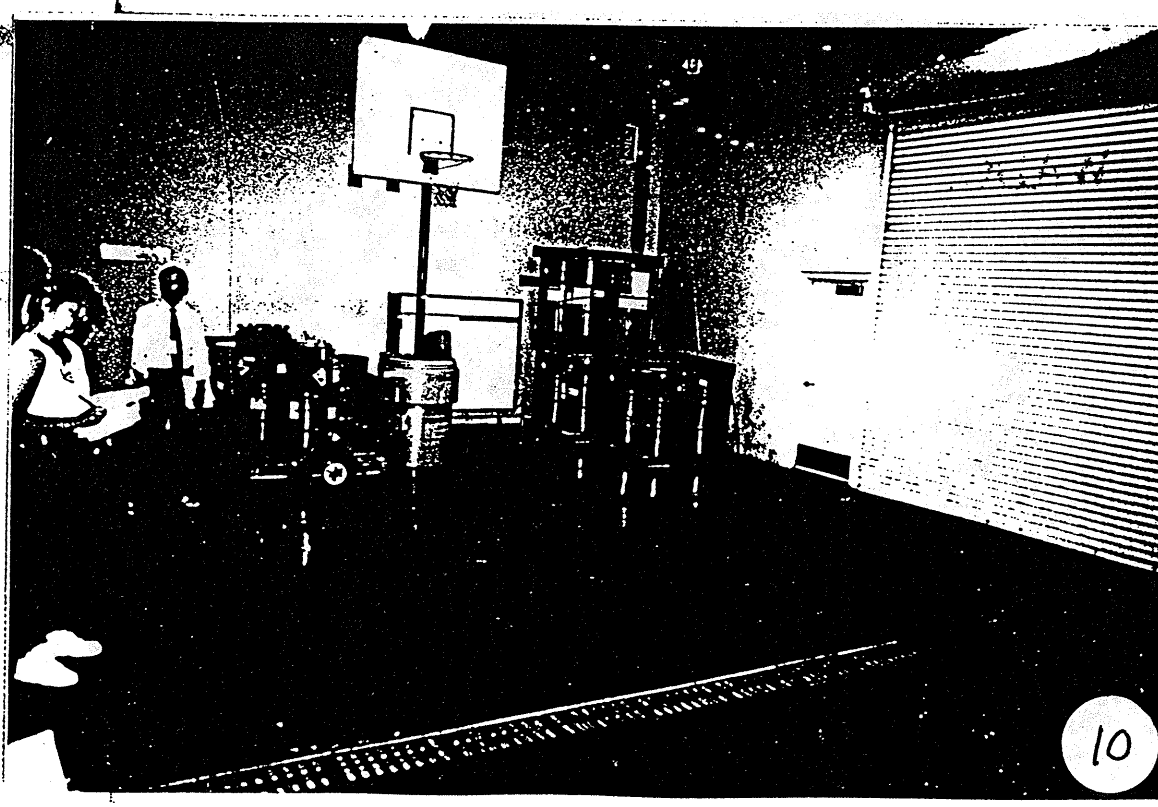
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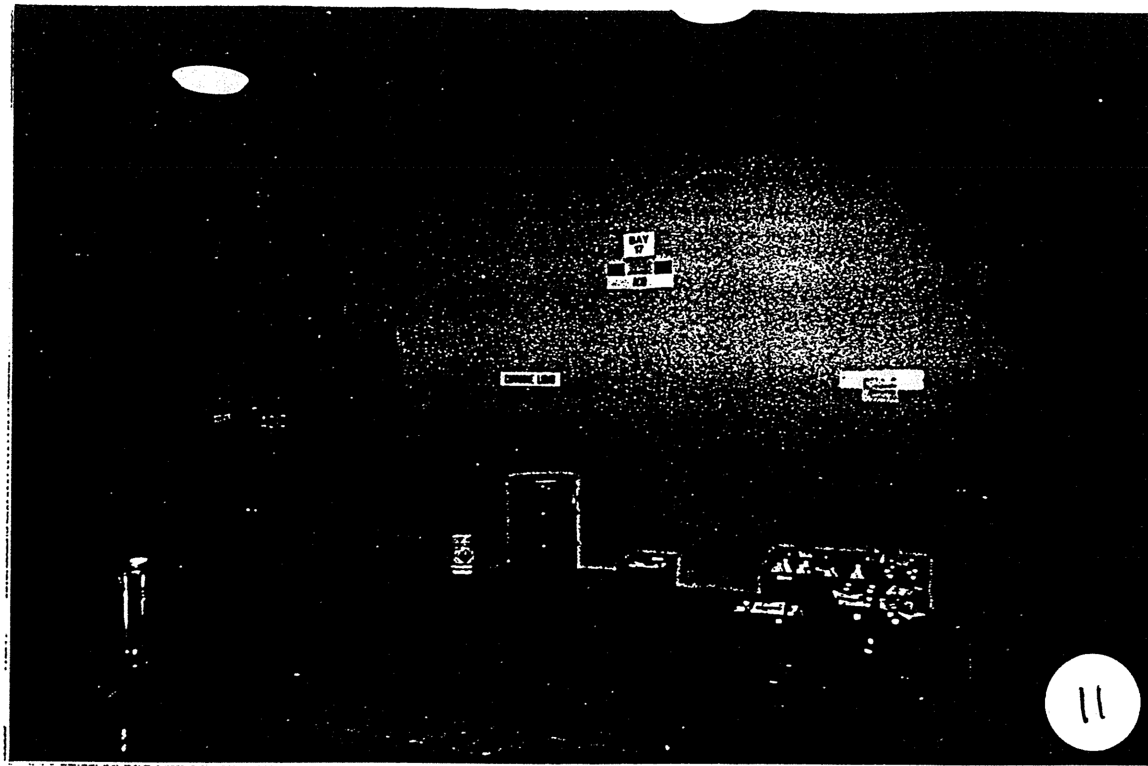

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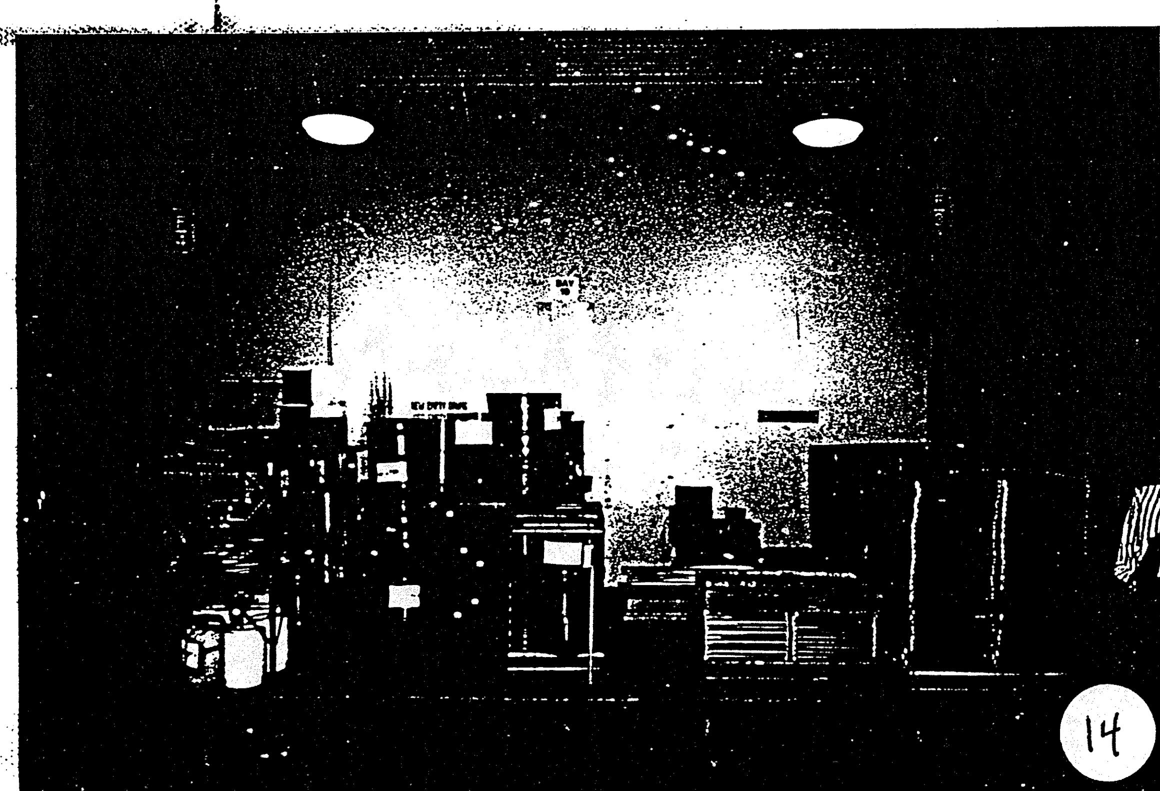
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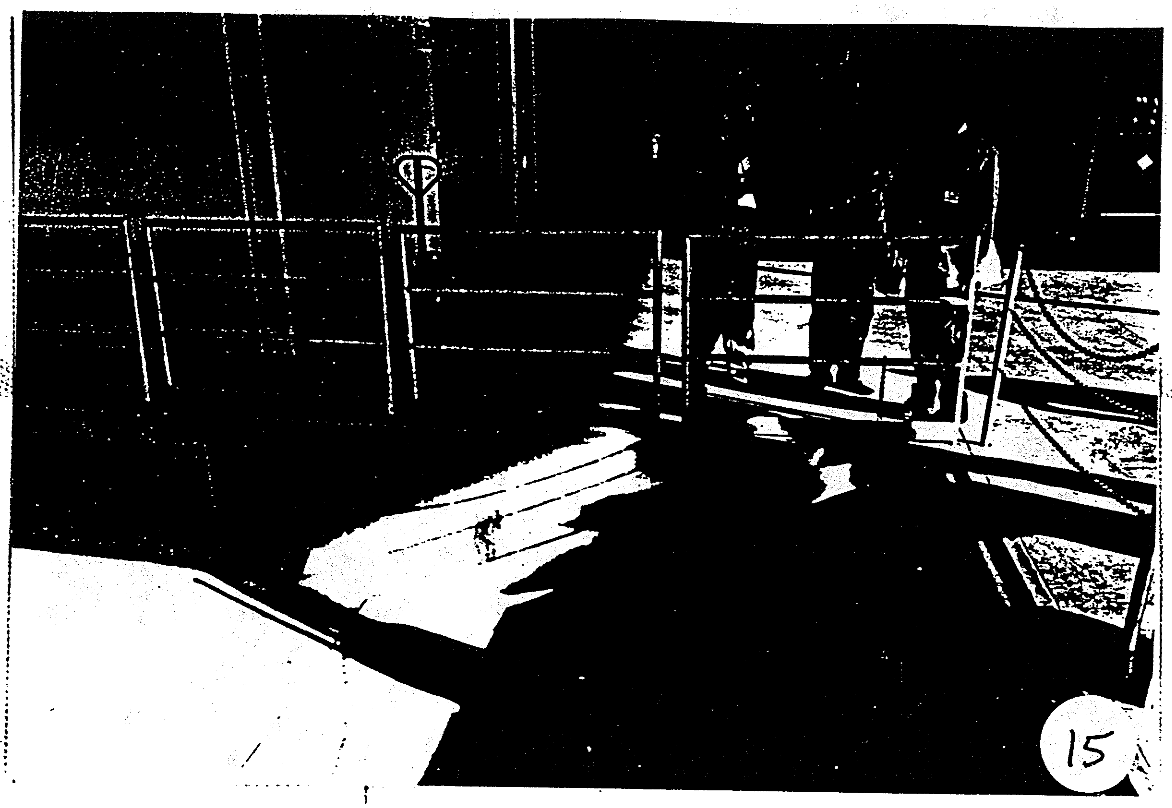

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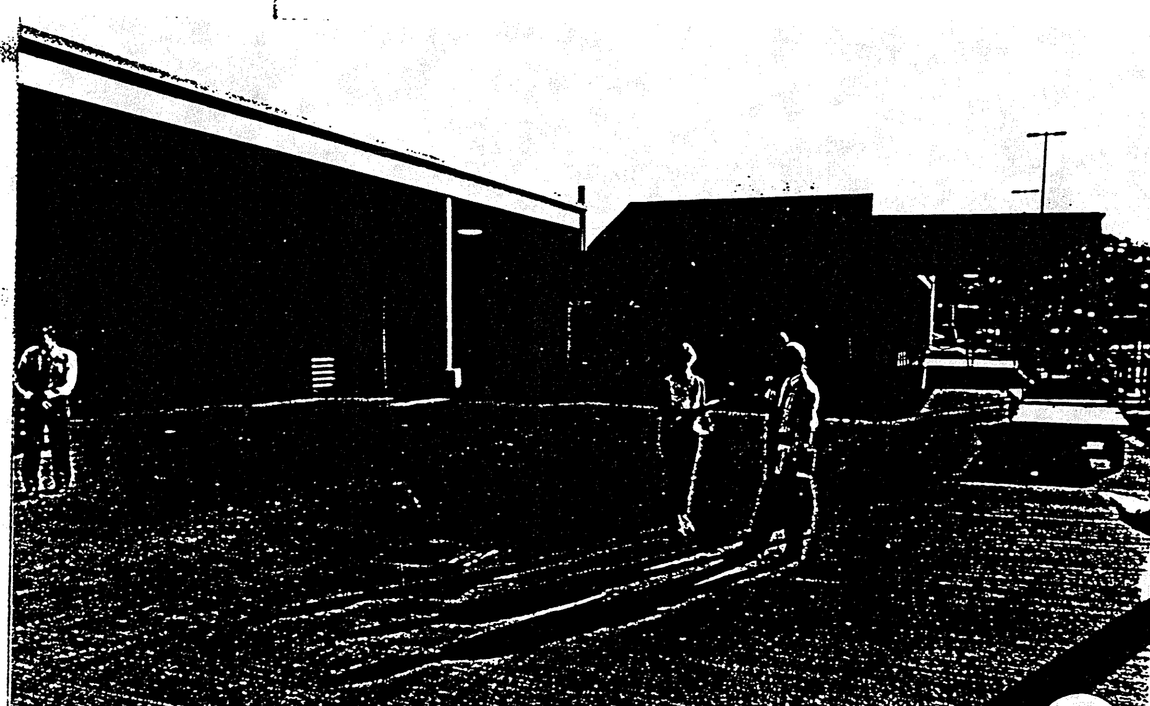

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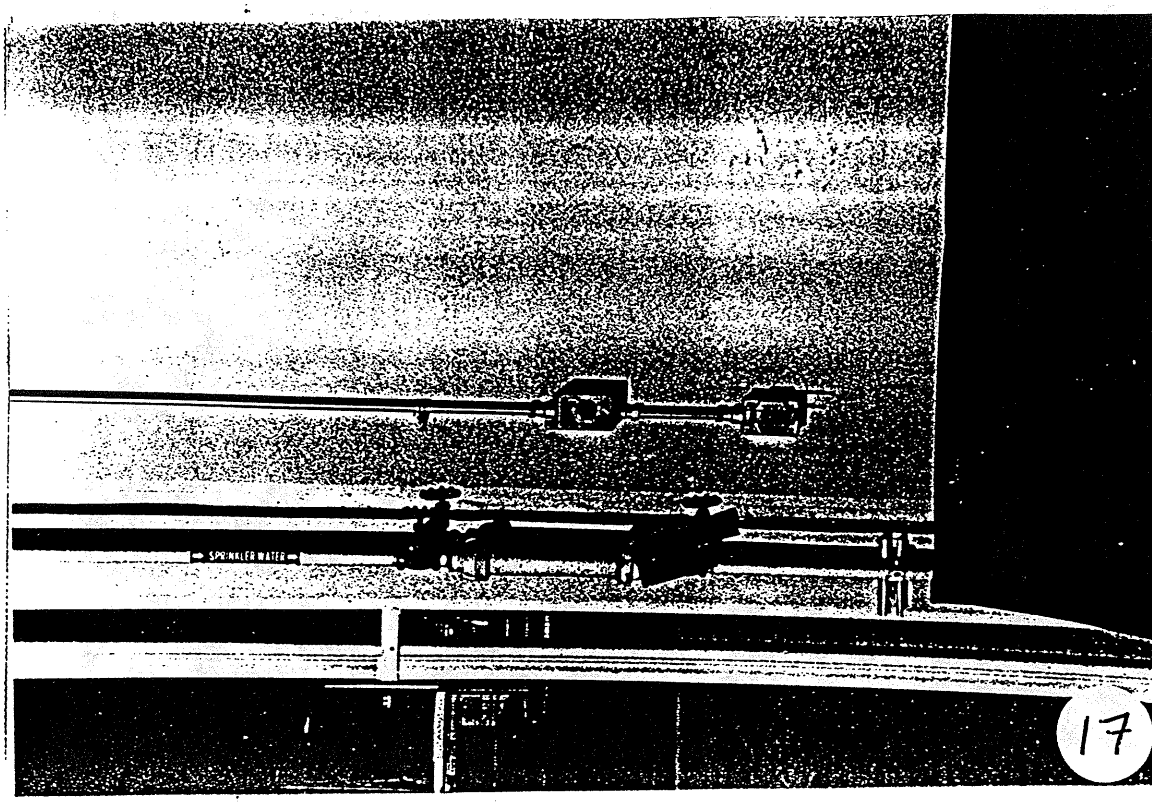

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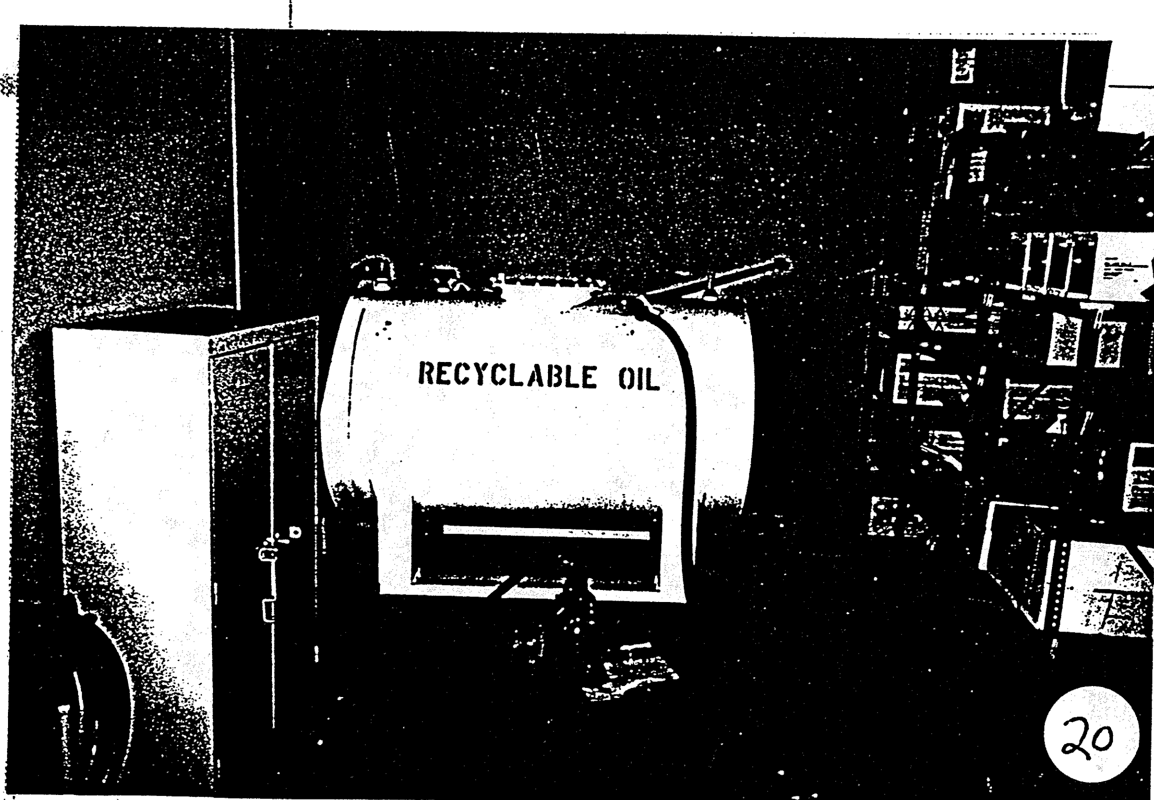
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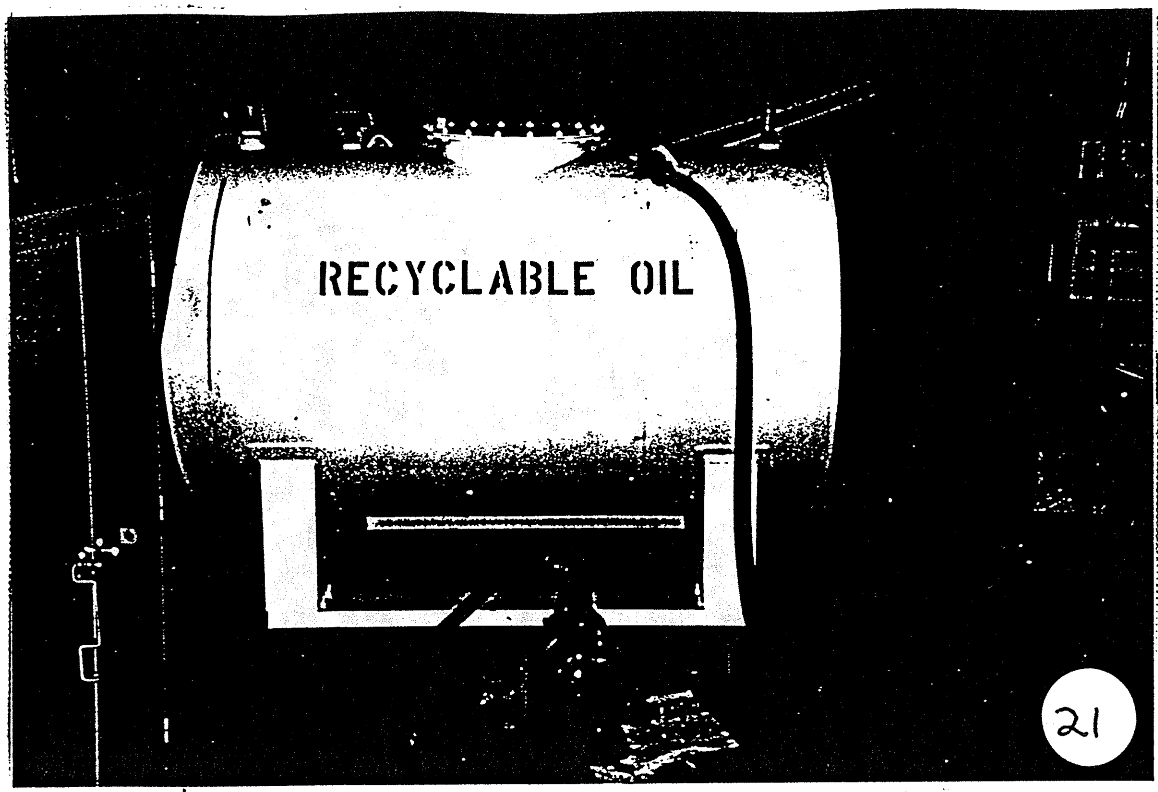
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NO UNAUTHORIZED
PERSON ON
MACHINE BED
NO EXCEPTIONS
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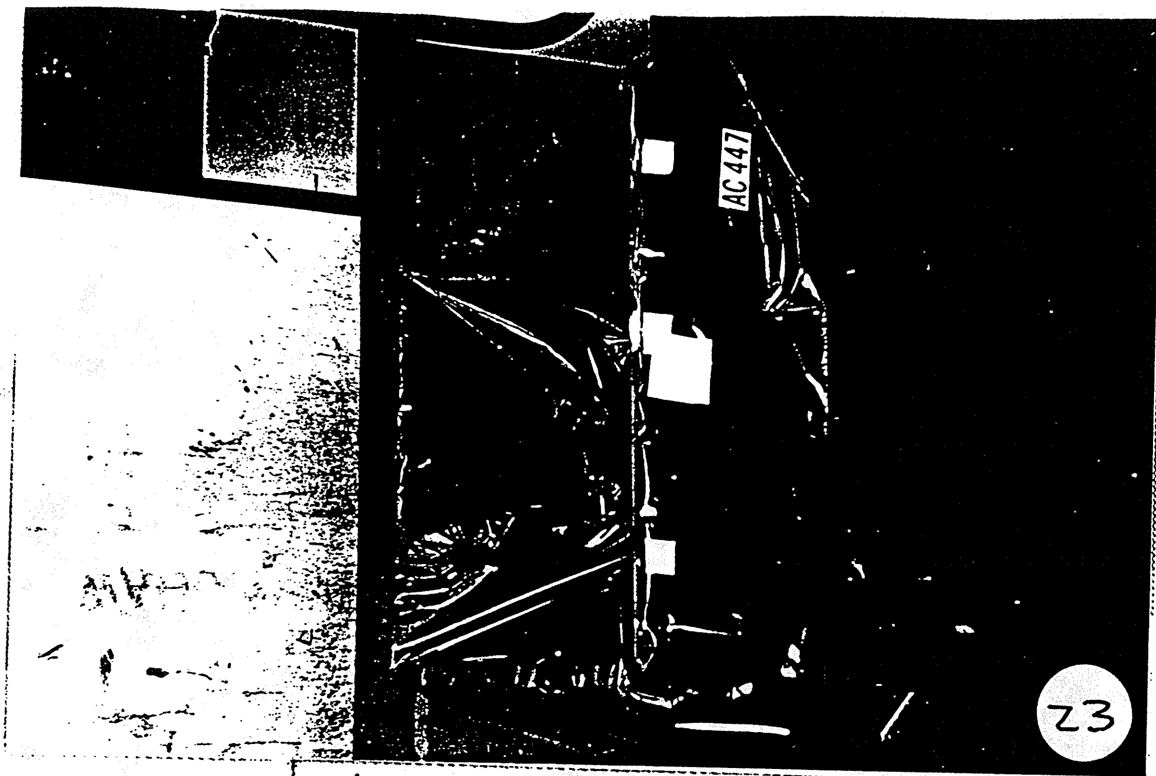
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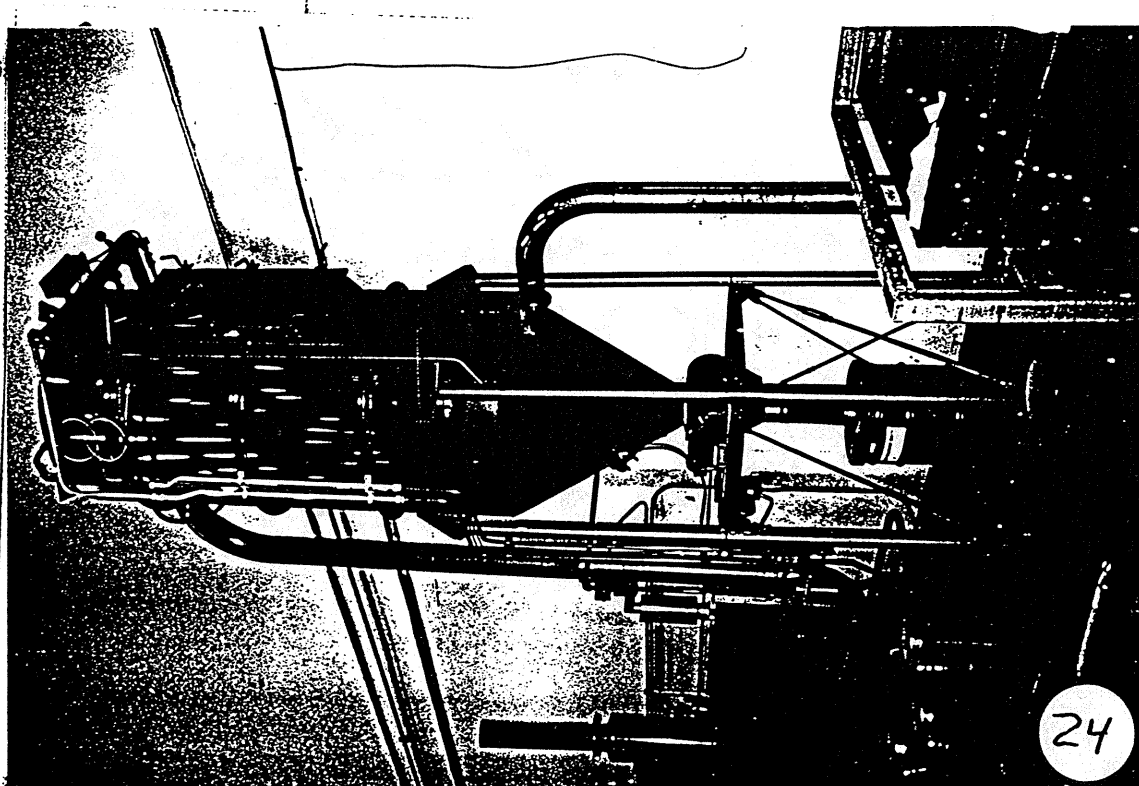
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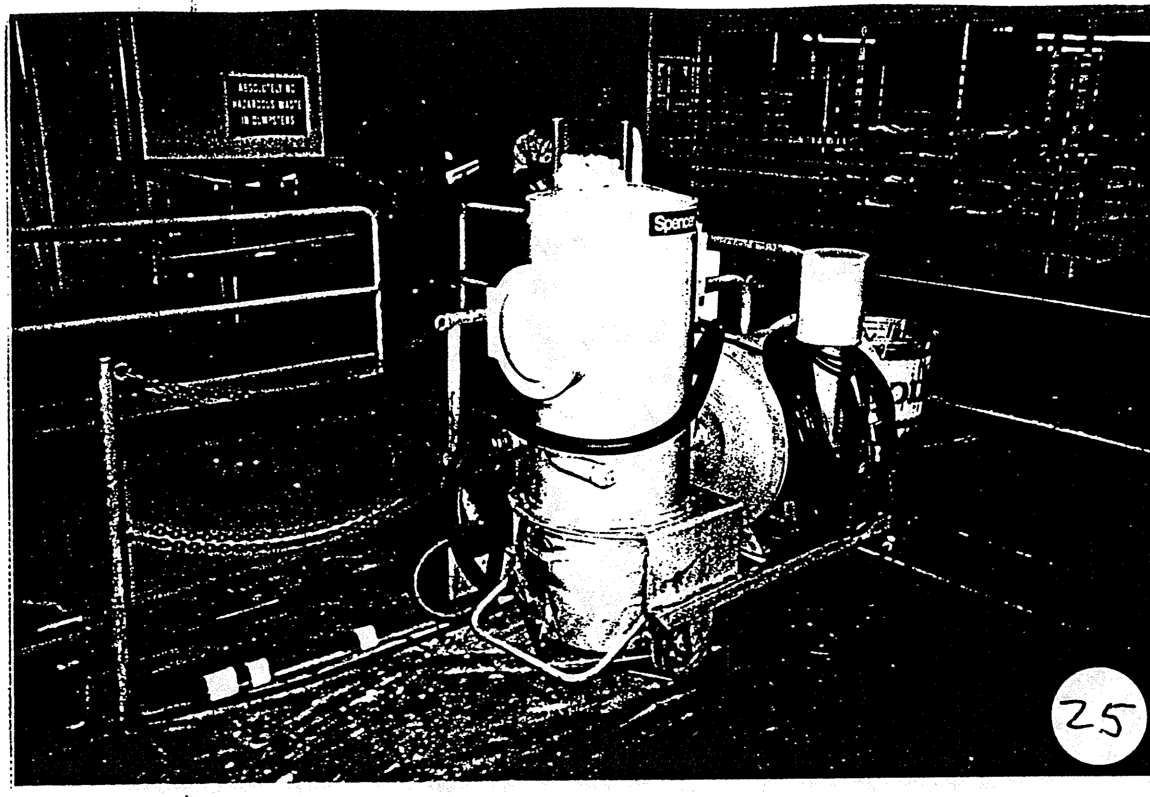

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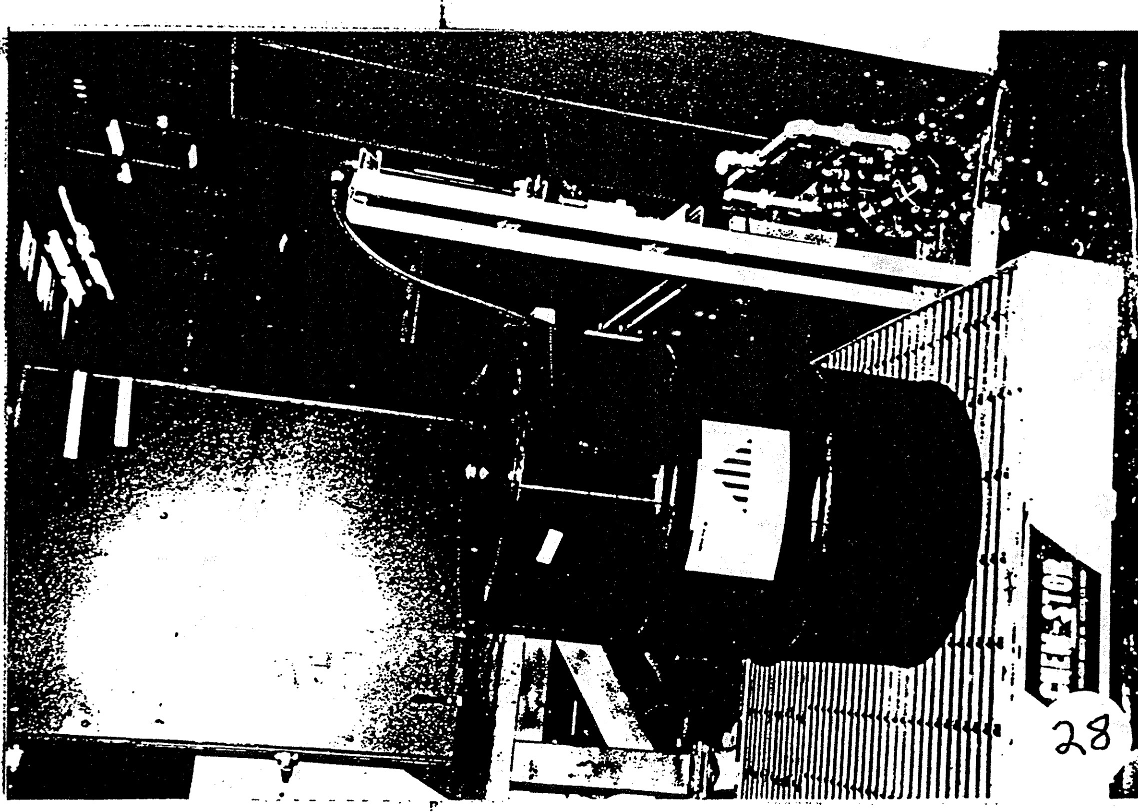
26


NOTICE
OR CHEMICAL SPILL AND
LEAN UP CONTACT YOUR
UPERVISOR IMMEDIATELY
THEN CALL
655-2222
HAZARDOUS WASTE
COLLECTION STATION
HAZARDOUS WASTE
COLLECTION STATION
BATTERIES
NOTICE
AT BUILDING

27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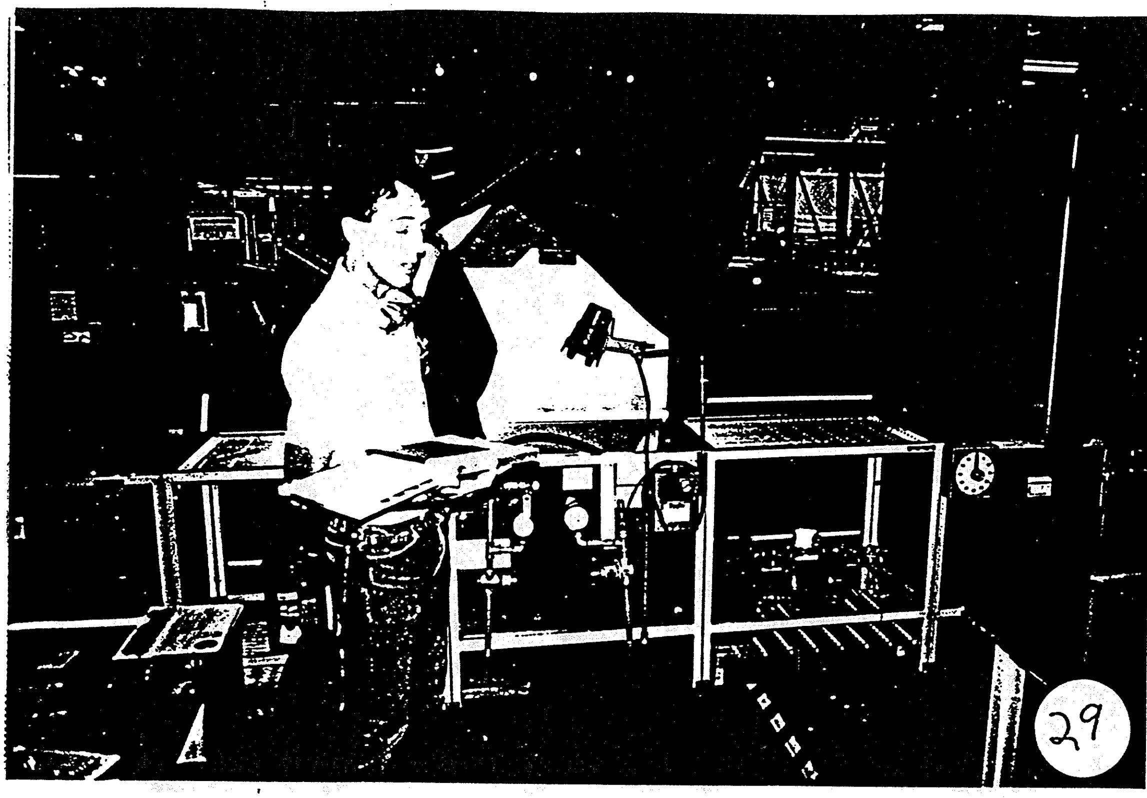
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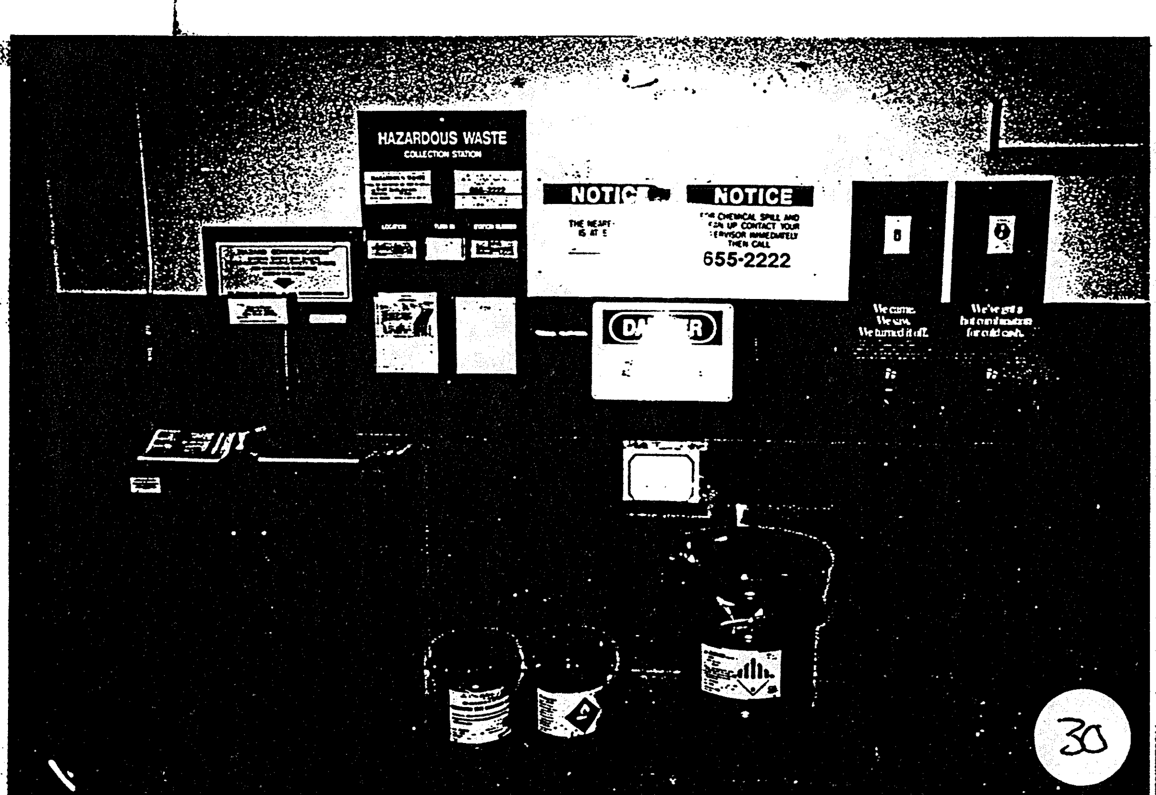
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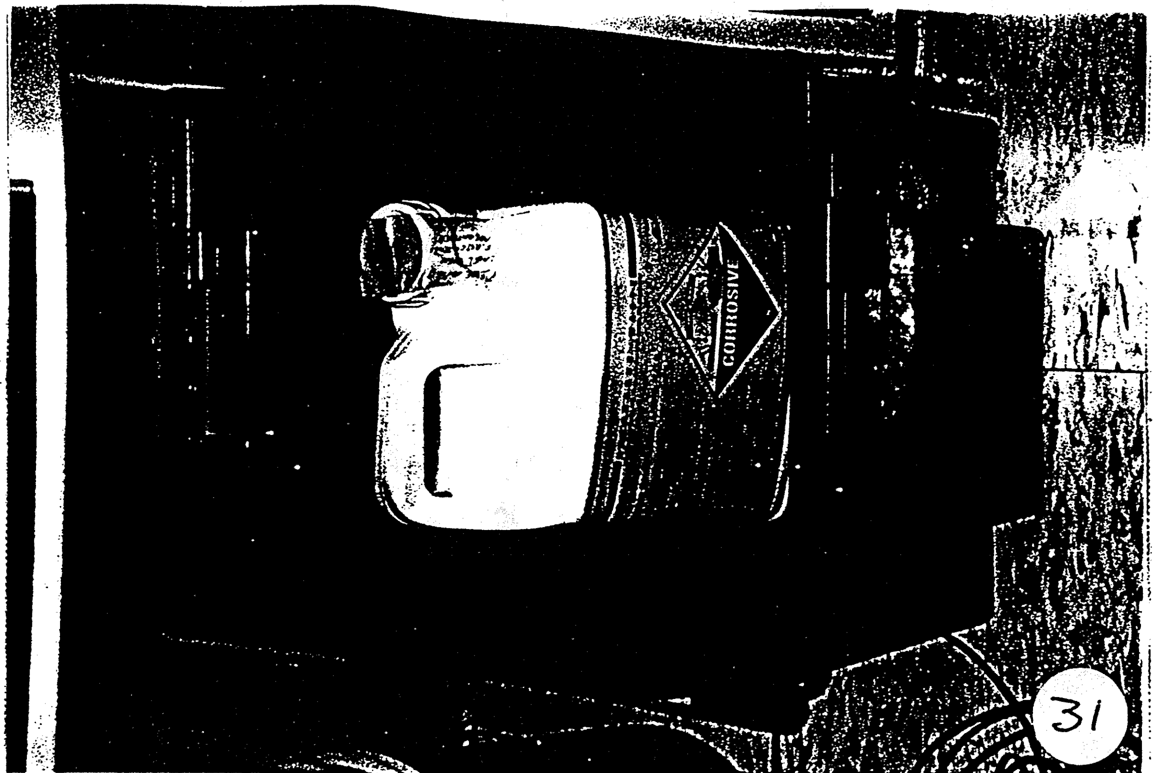
COLLECTION STATION
NOTICE
NOTICE
THEN CALL
655-2222
We came.
We saw.
We turned it off.
30



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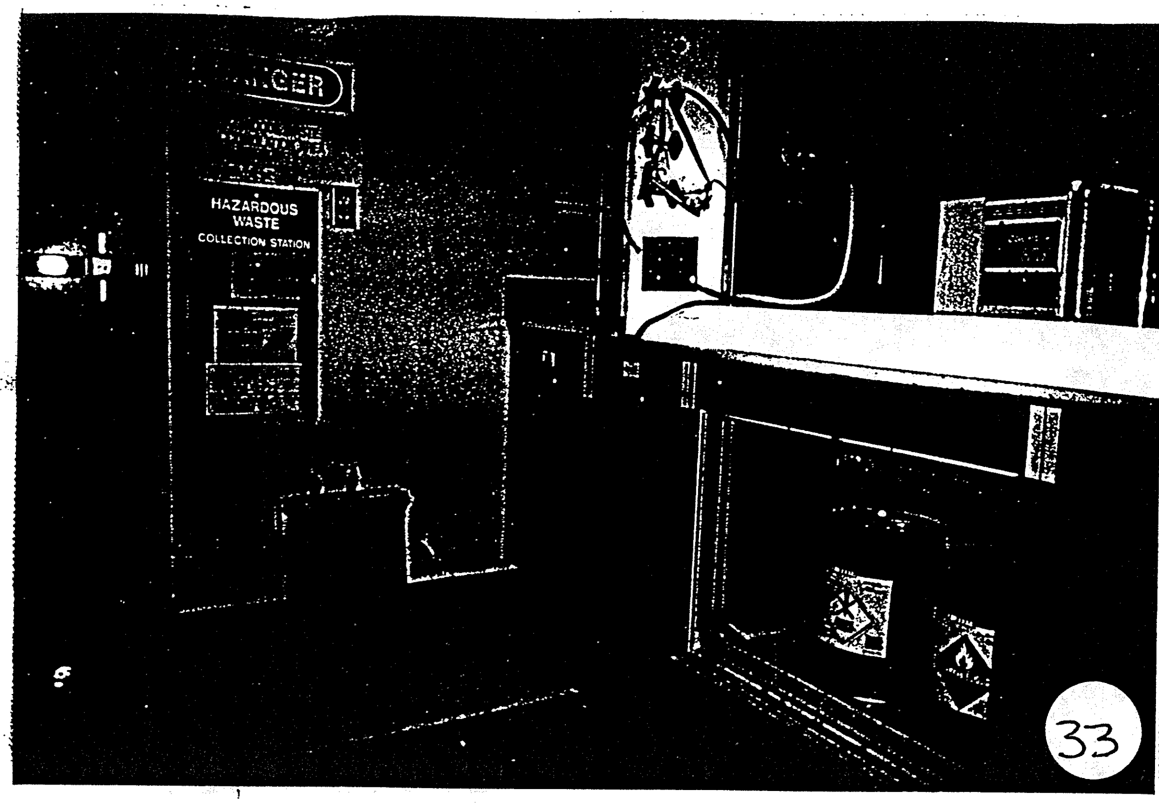

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COLLECTION STATION
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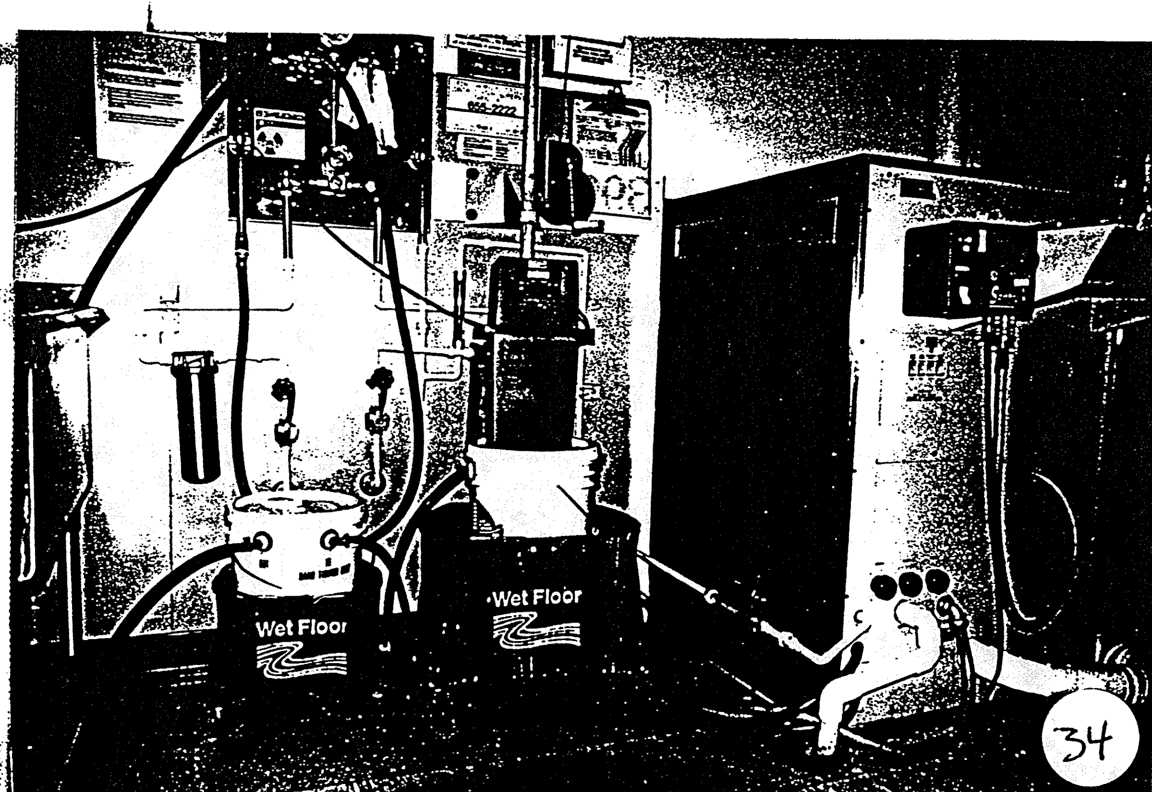

Wet Floor
Wet Floor
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Wet Floor
35


GER
HAZARDOUS WASTE
COLLECTION STATION
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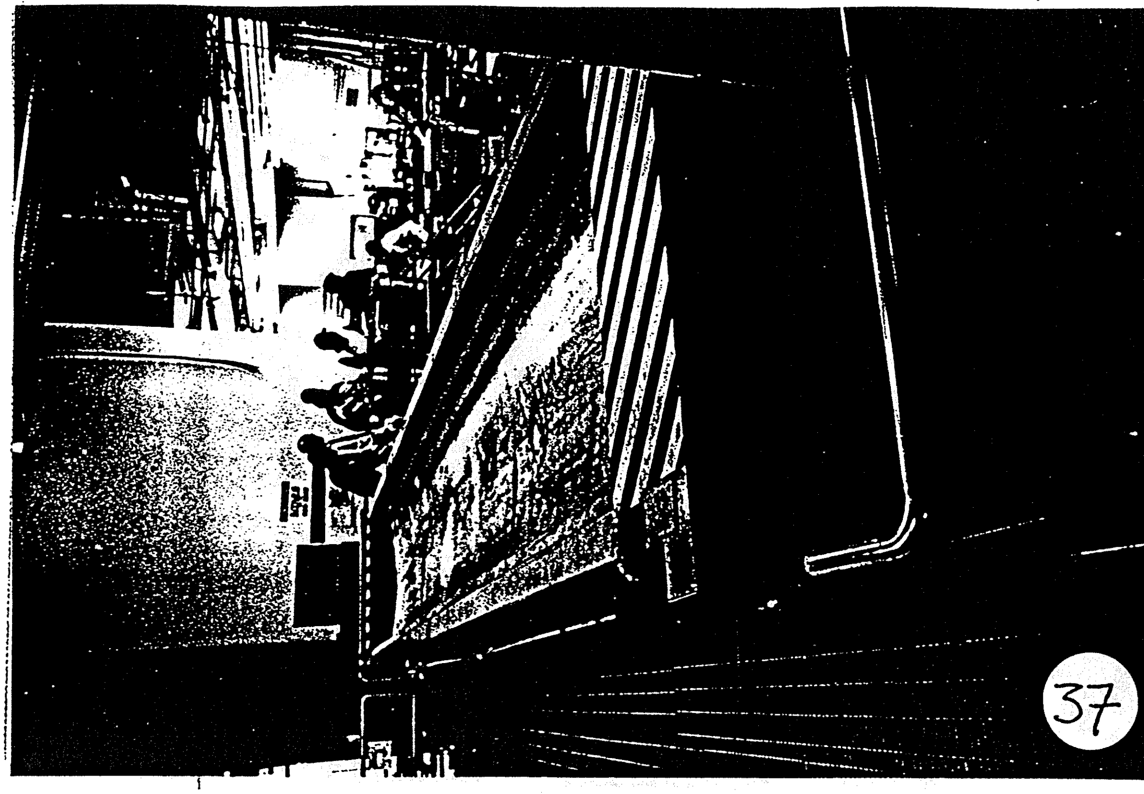

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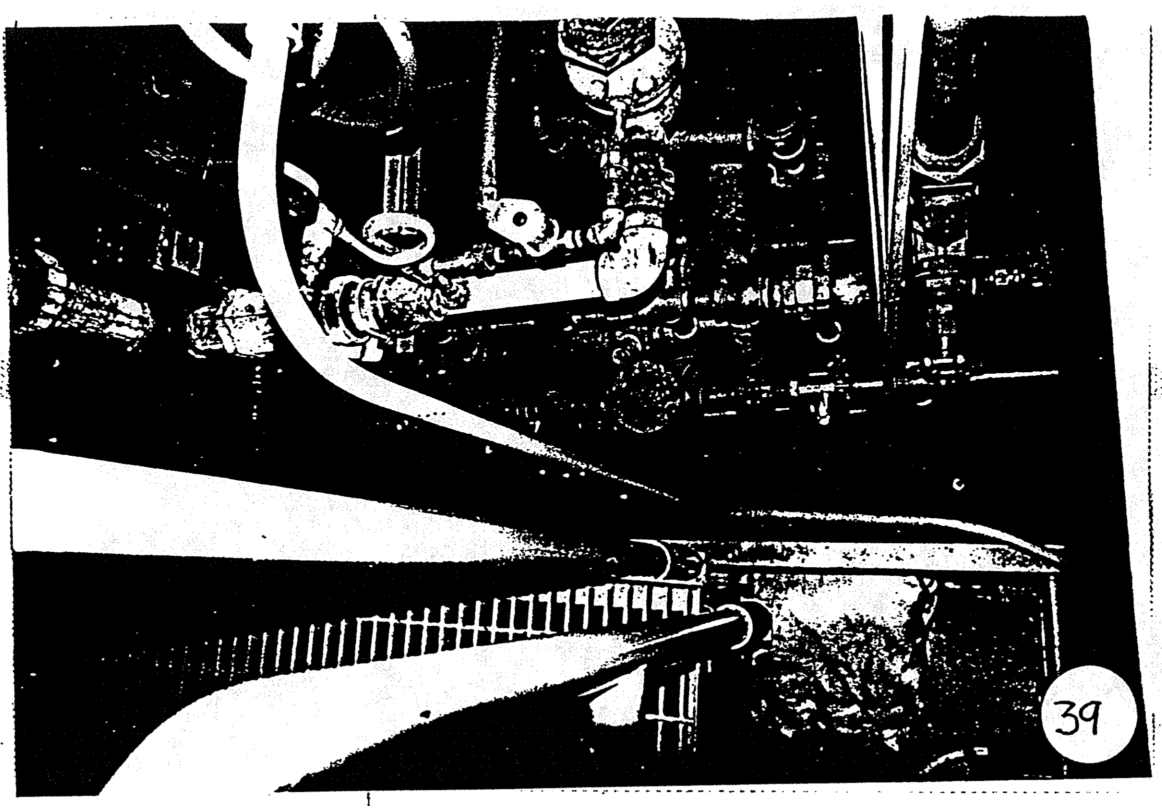

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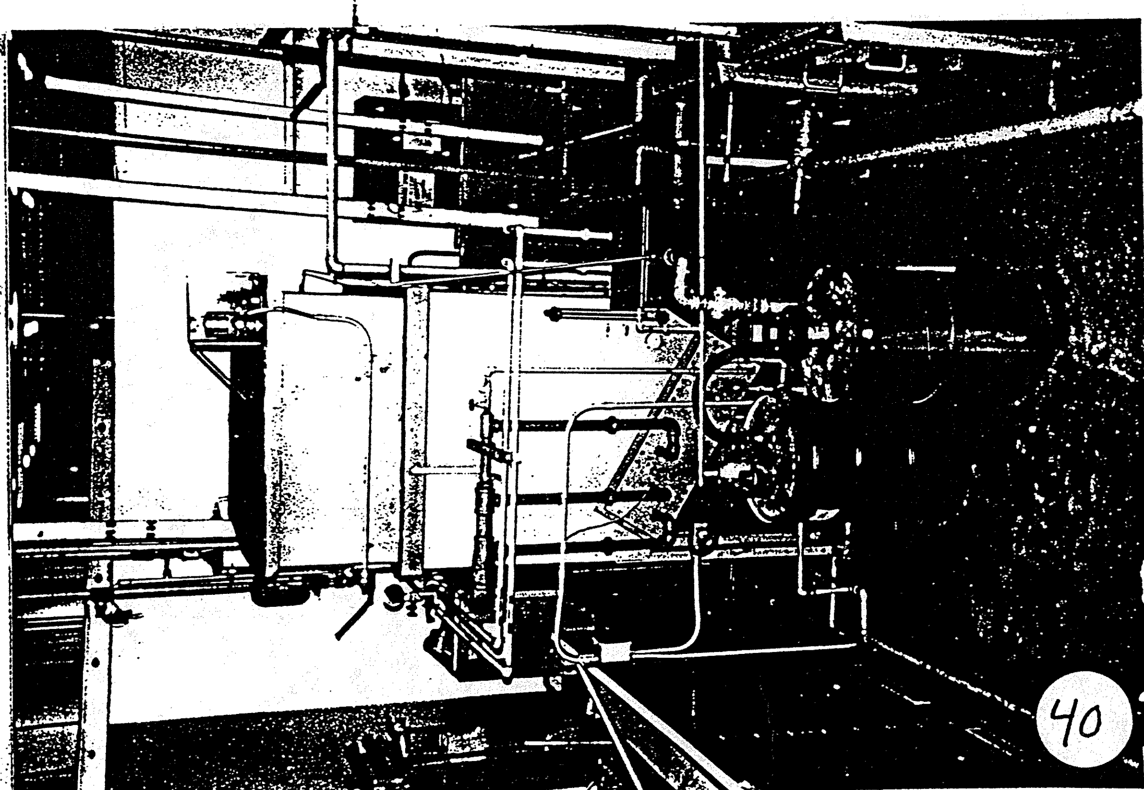

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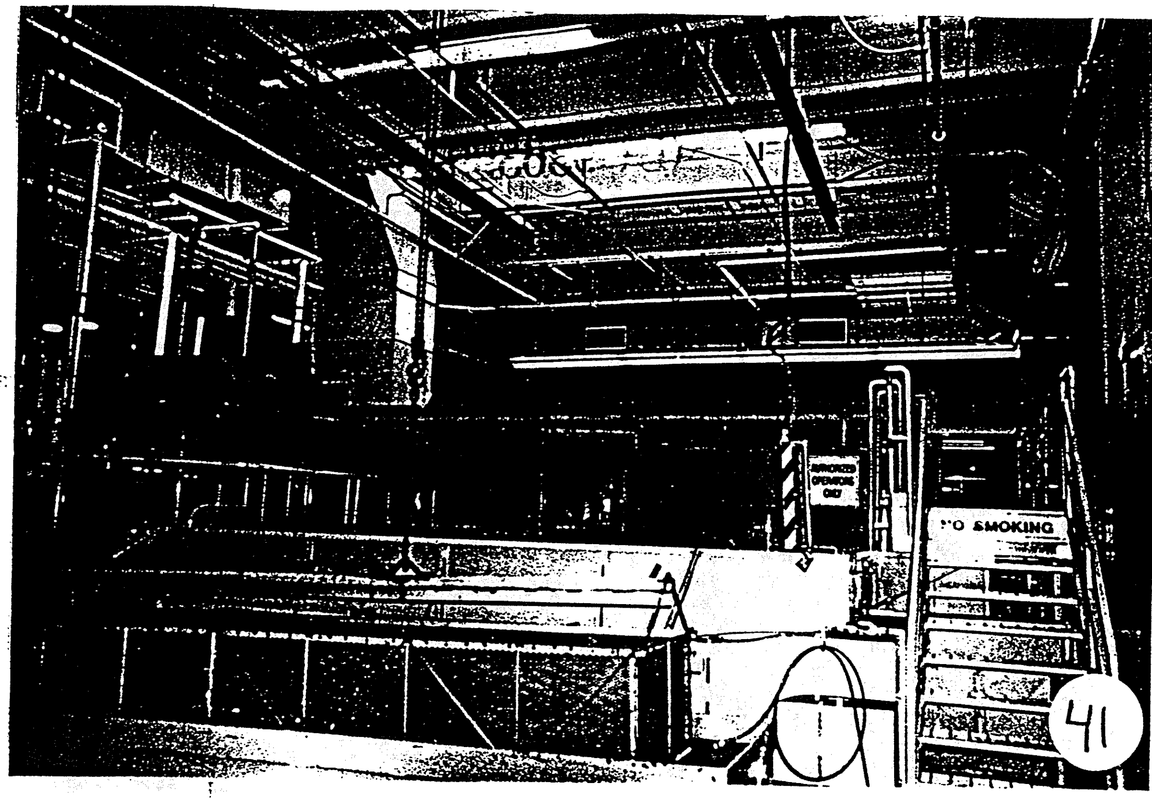
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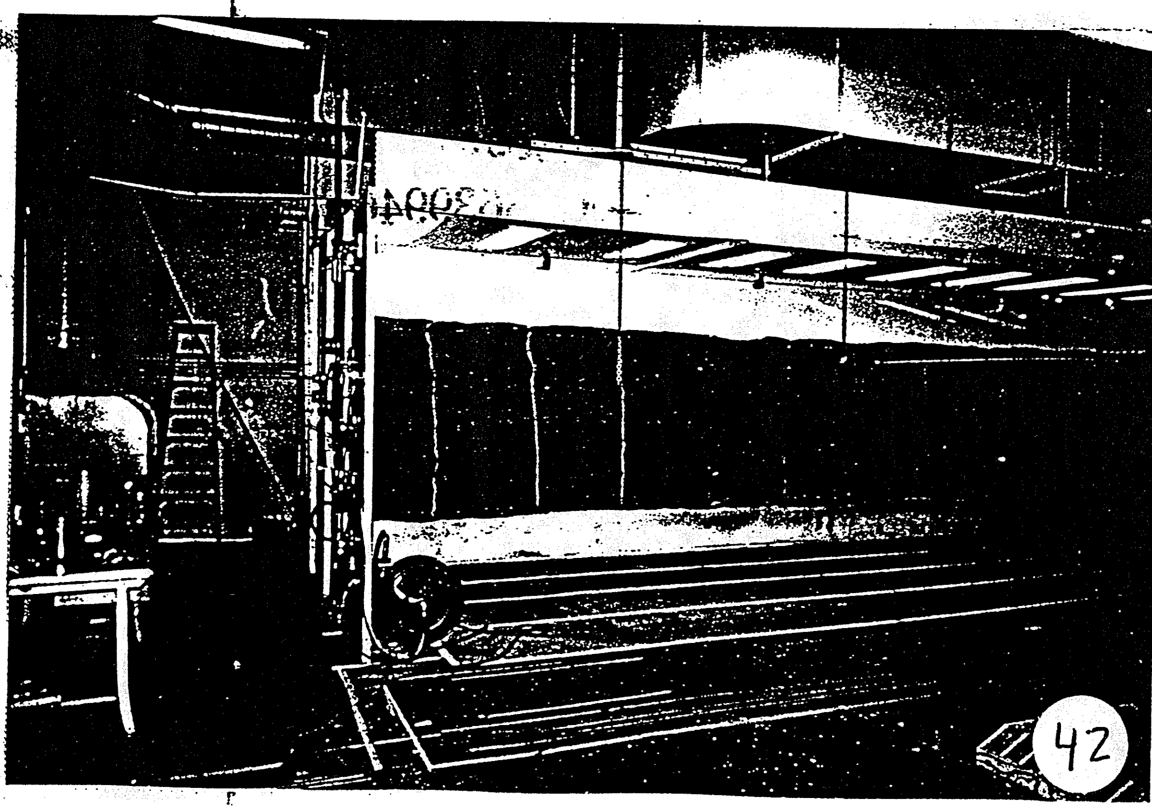
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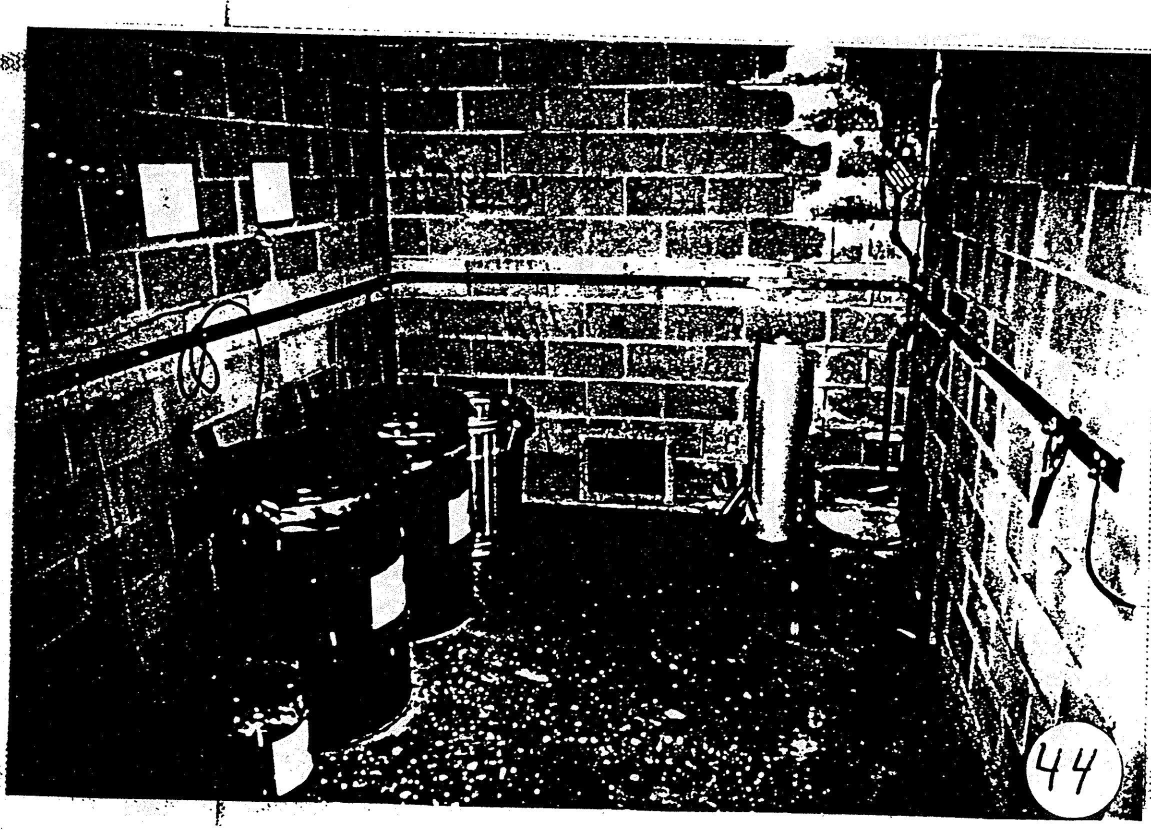
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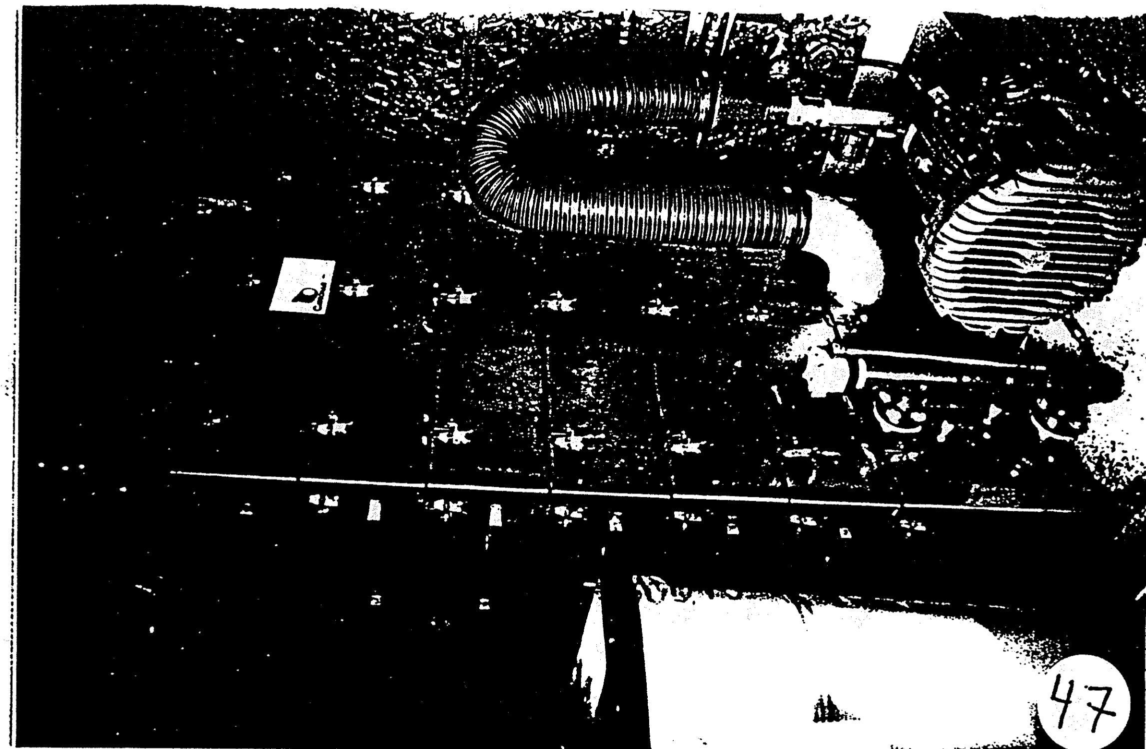
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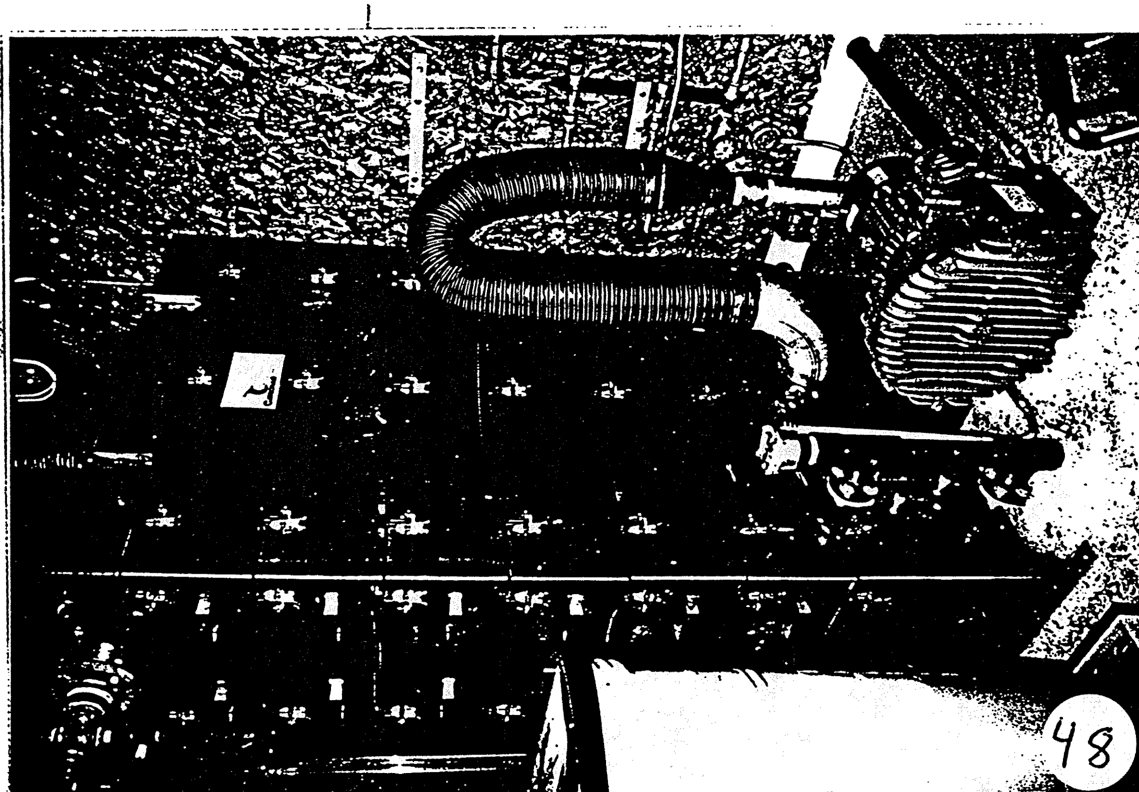
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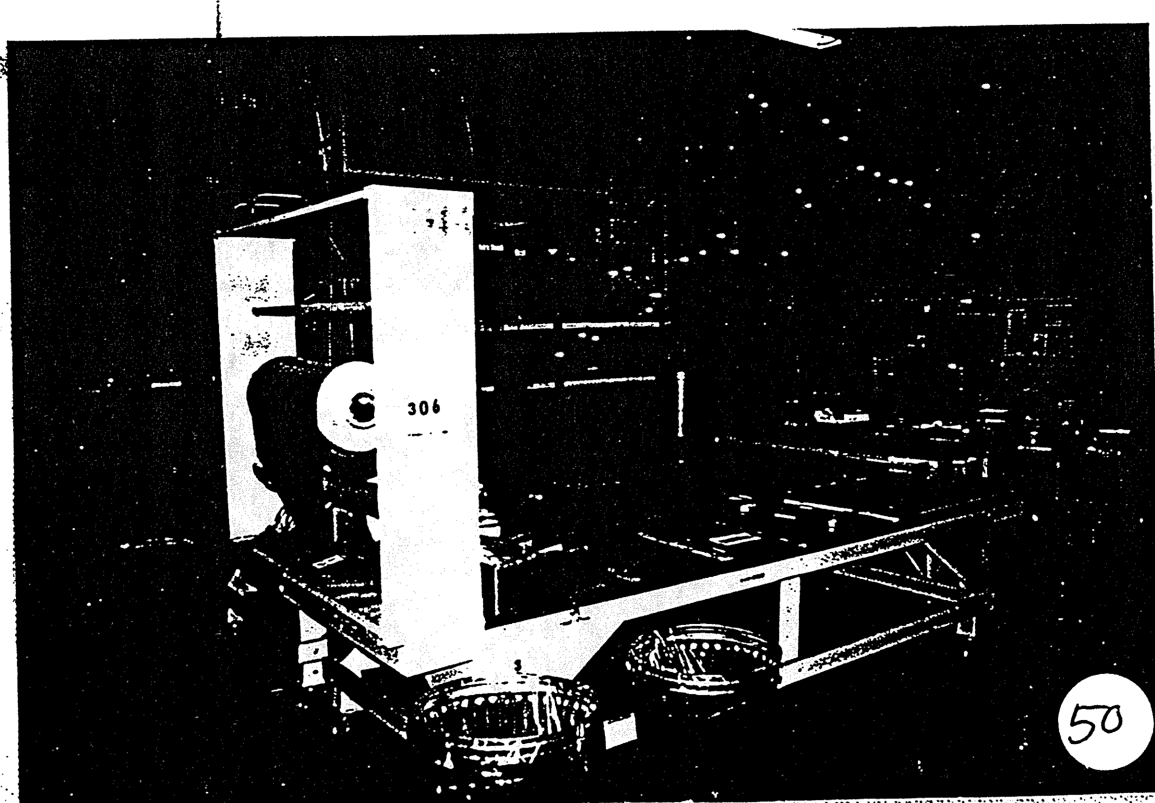

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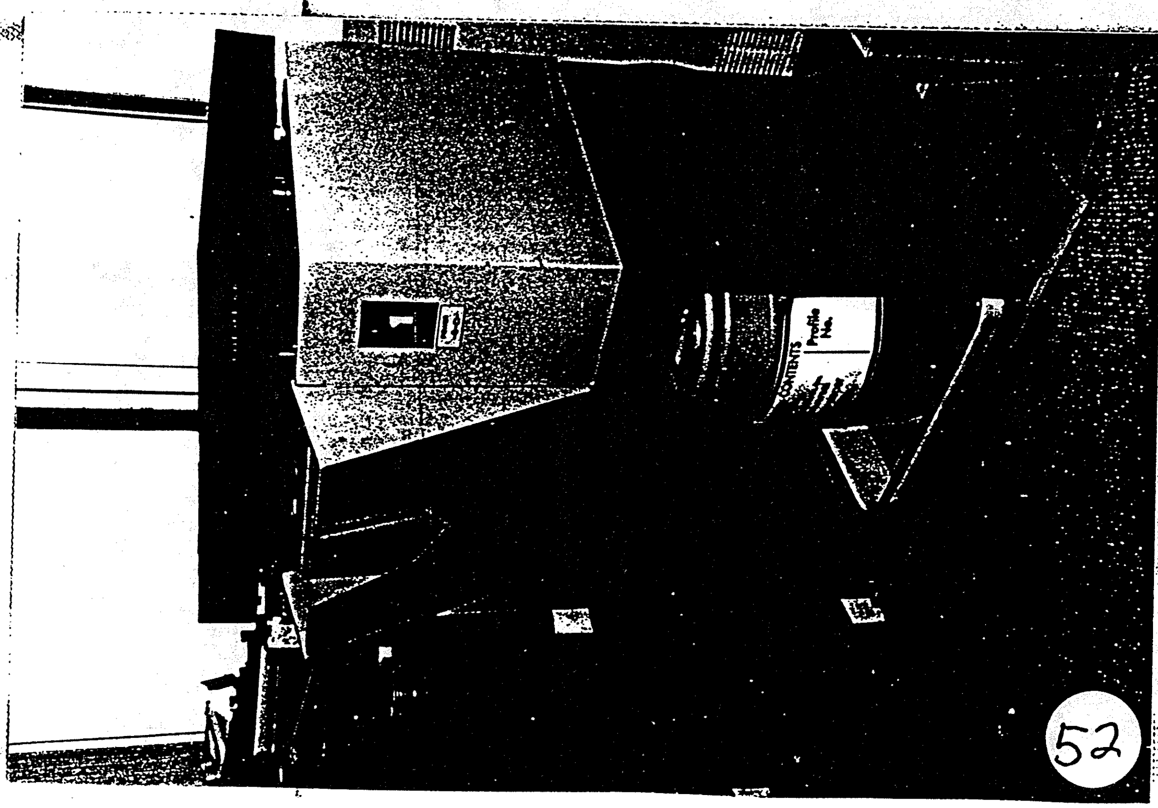

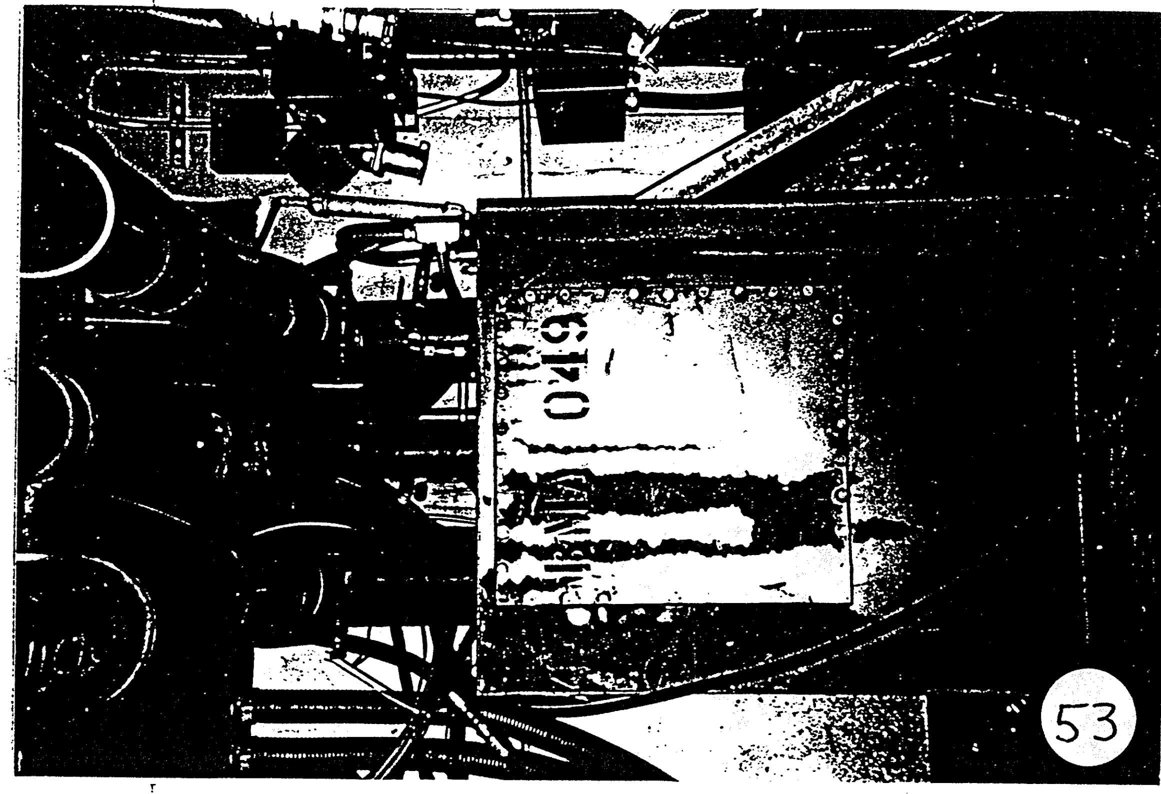

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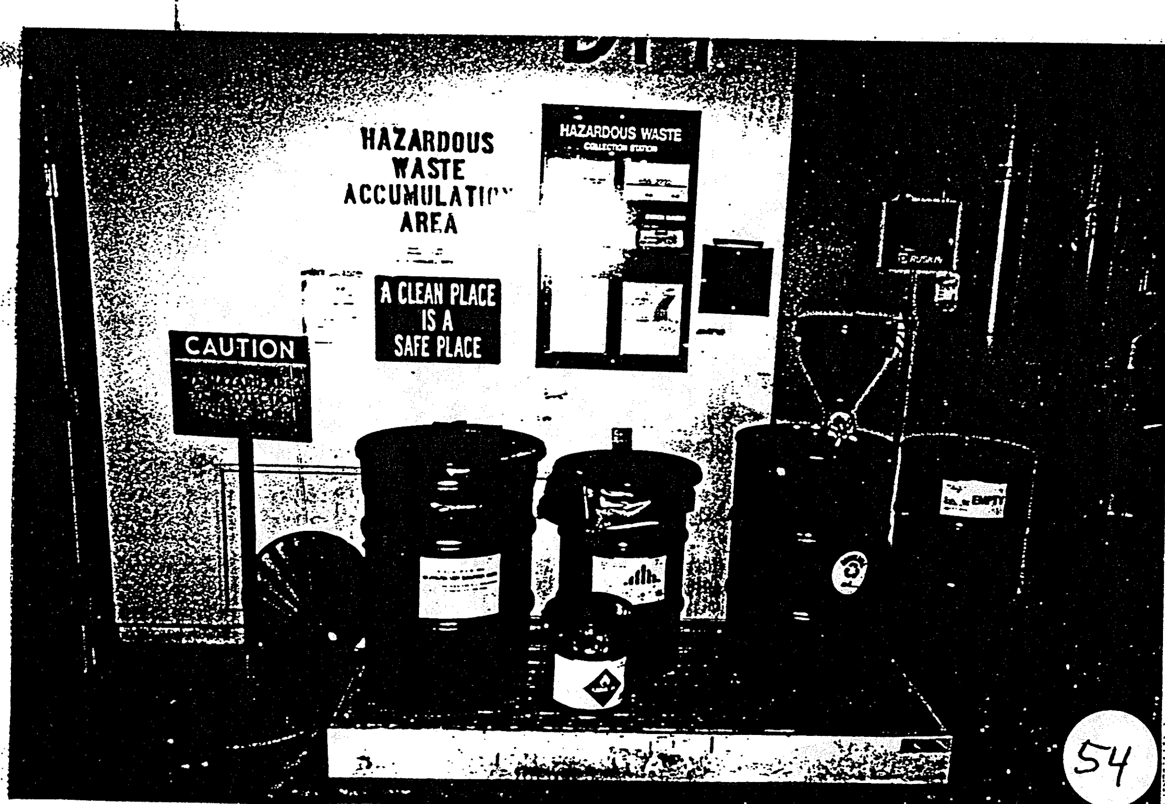
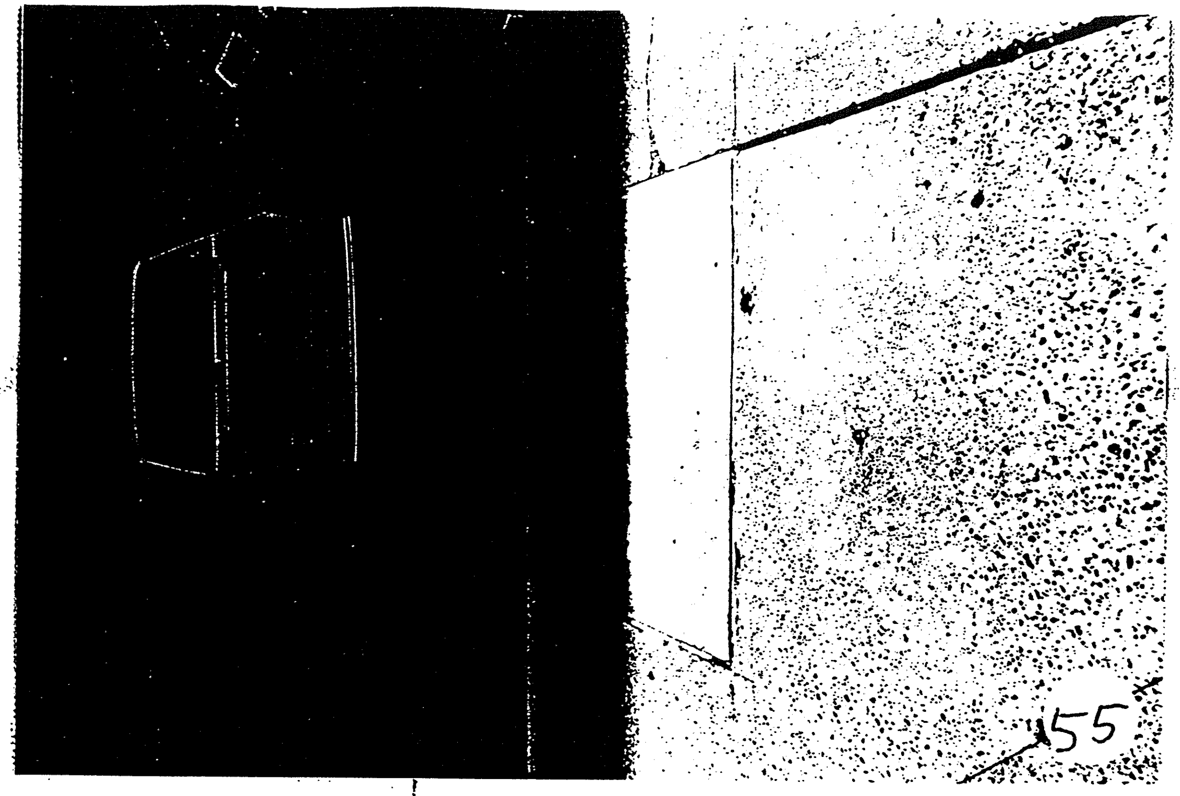

HAZARDOUS
WASTE
AREA
A CLEAN PLACE
IS A
SAFE PLACE
CAUTION
HAZARDOUS WASTE

54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HAZARDOUS WAST
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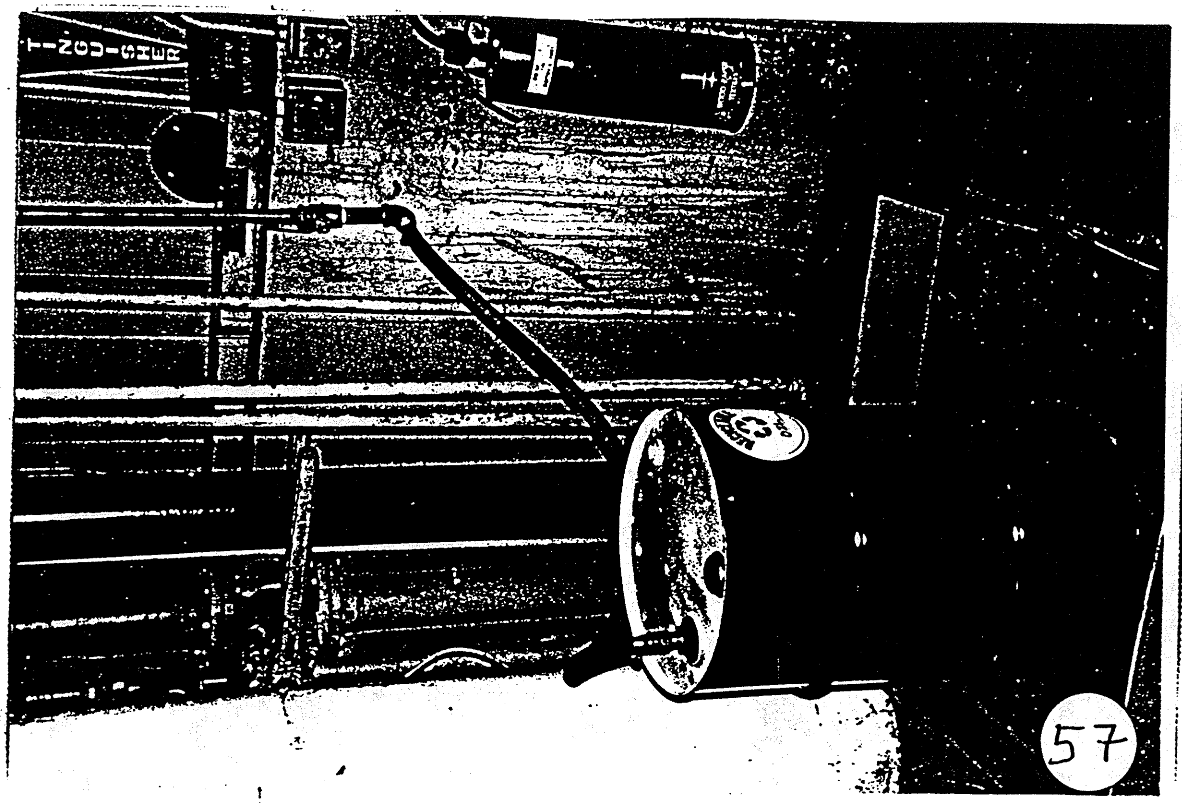

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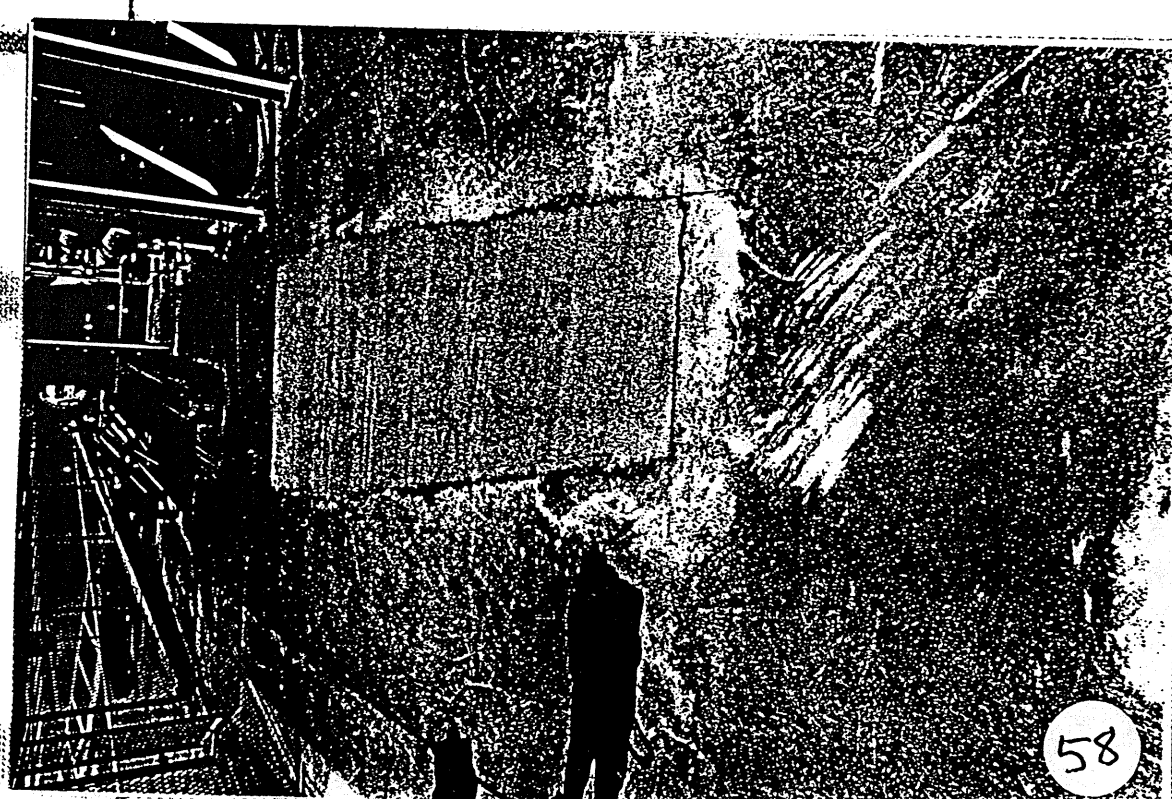

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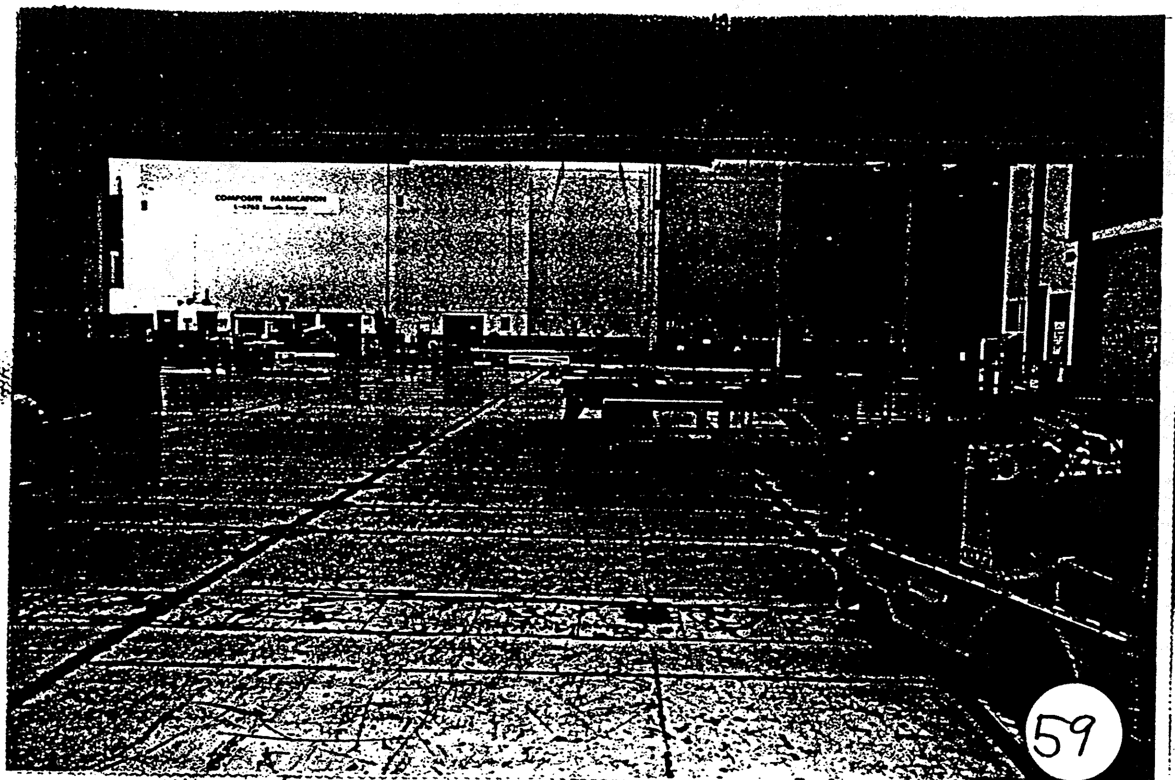
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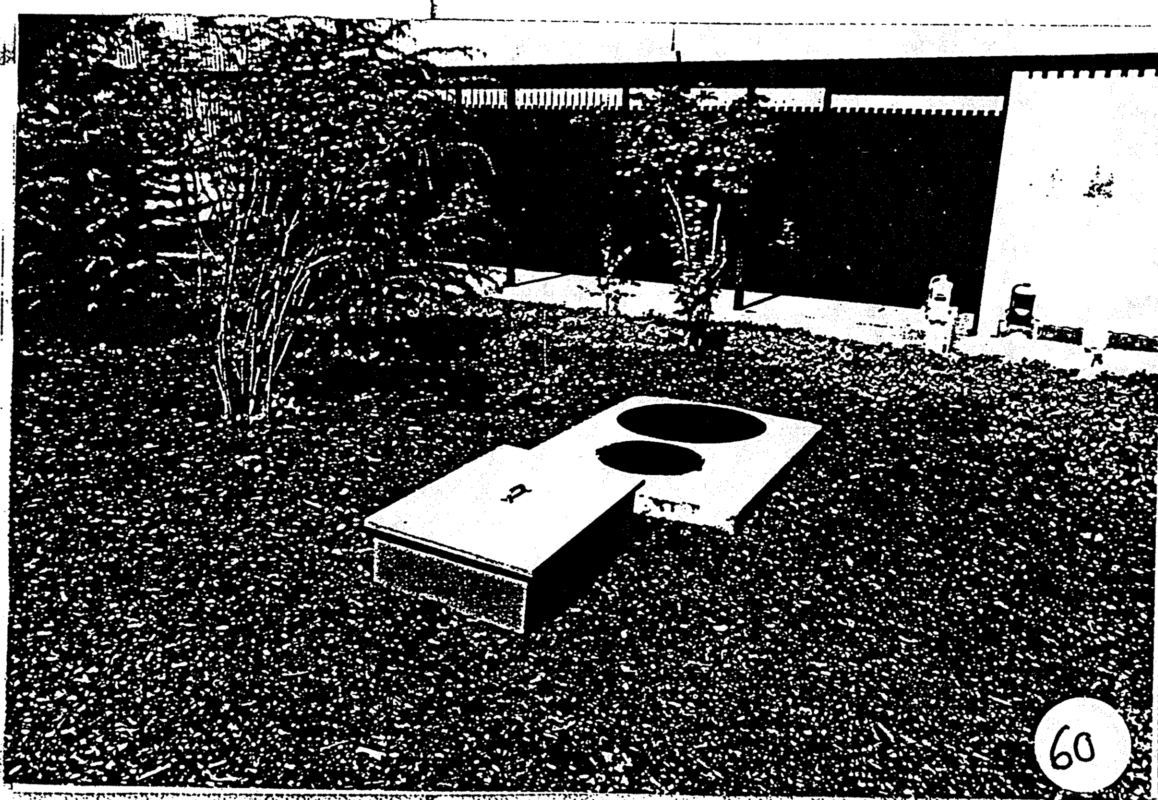
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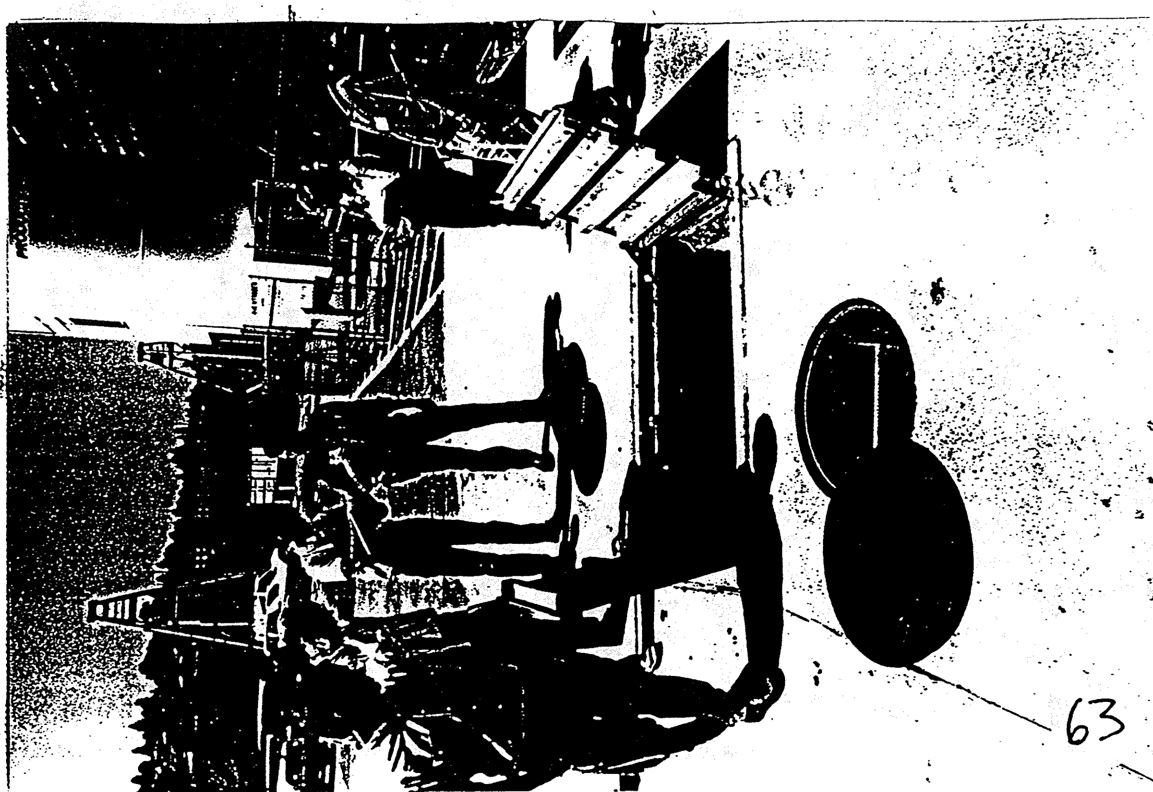

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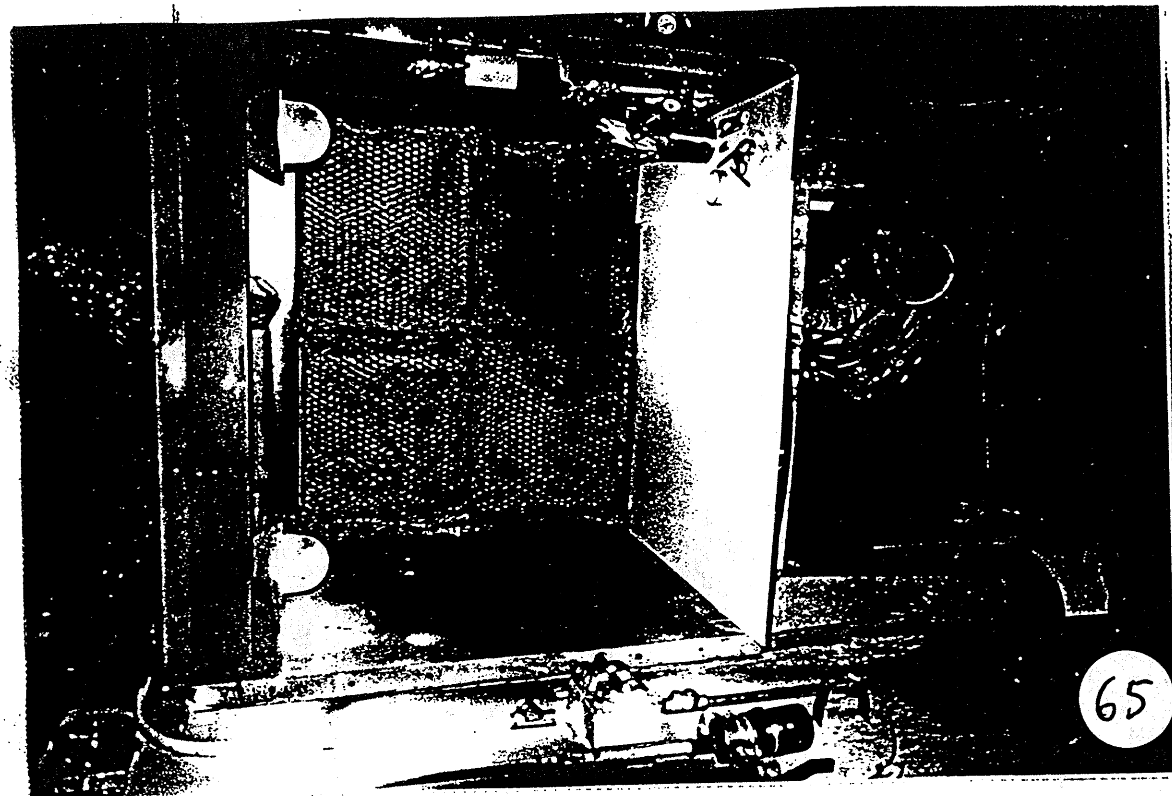
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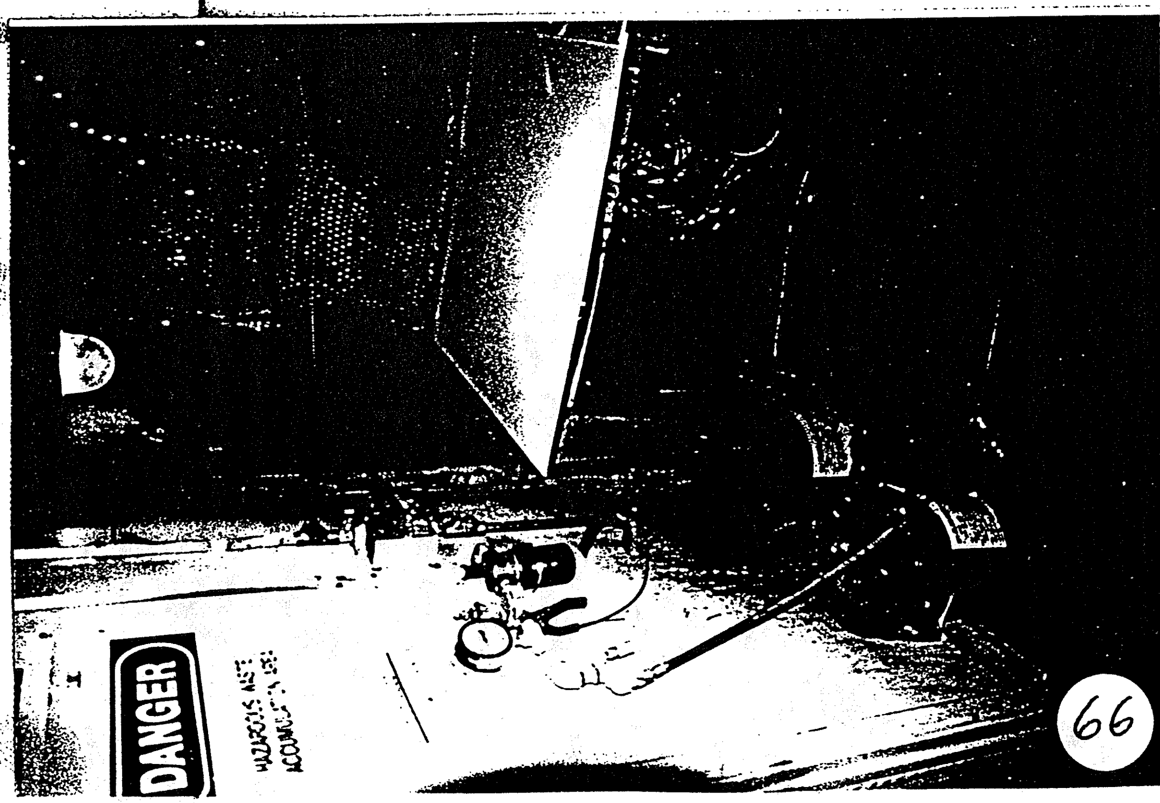
DANGER
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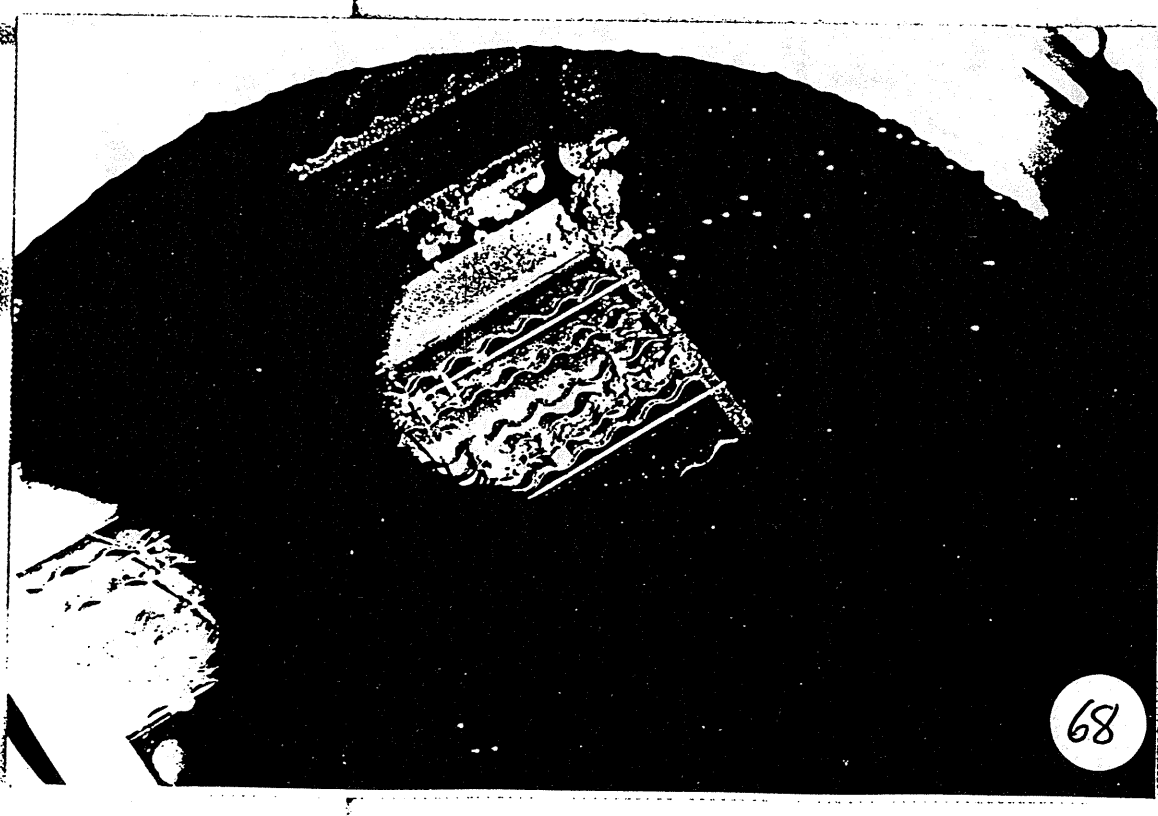
67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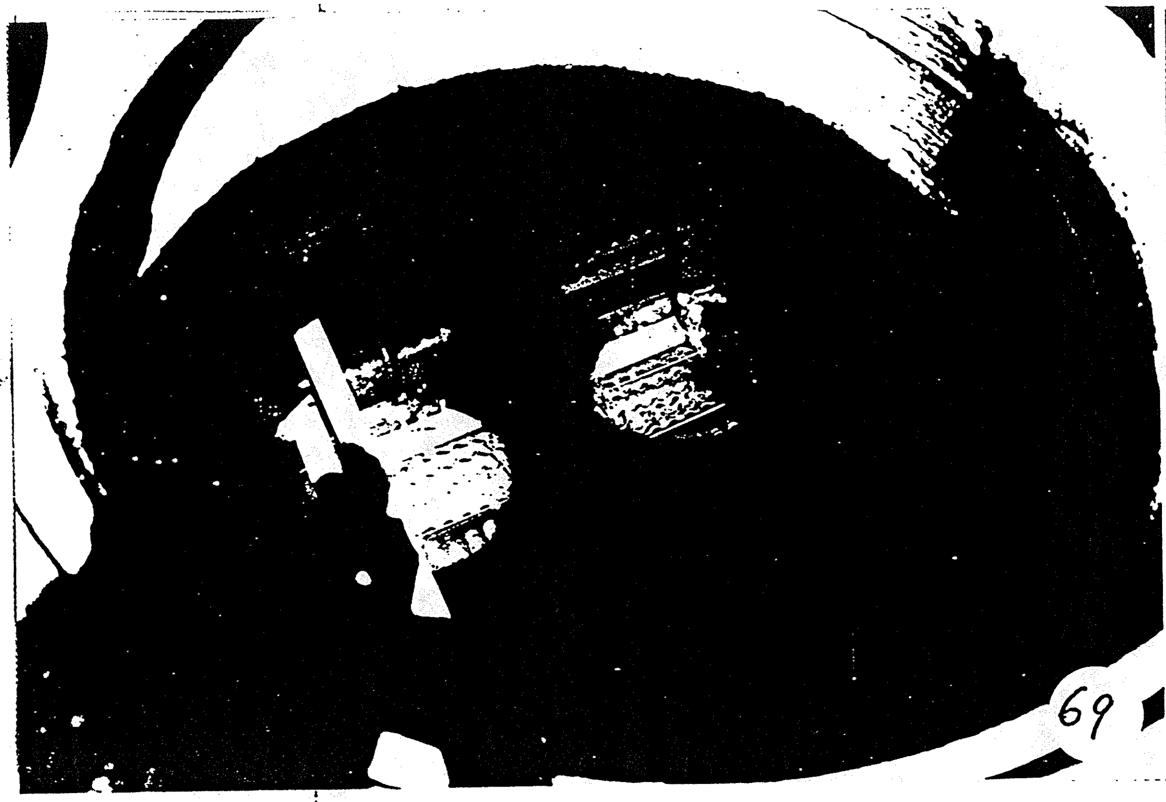
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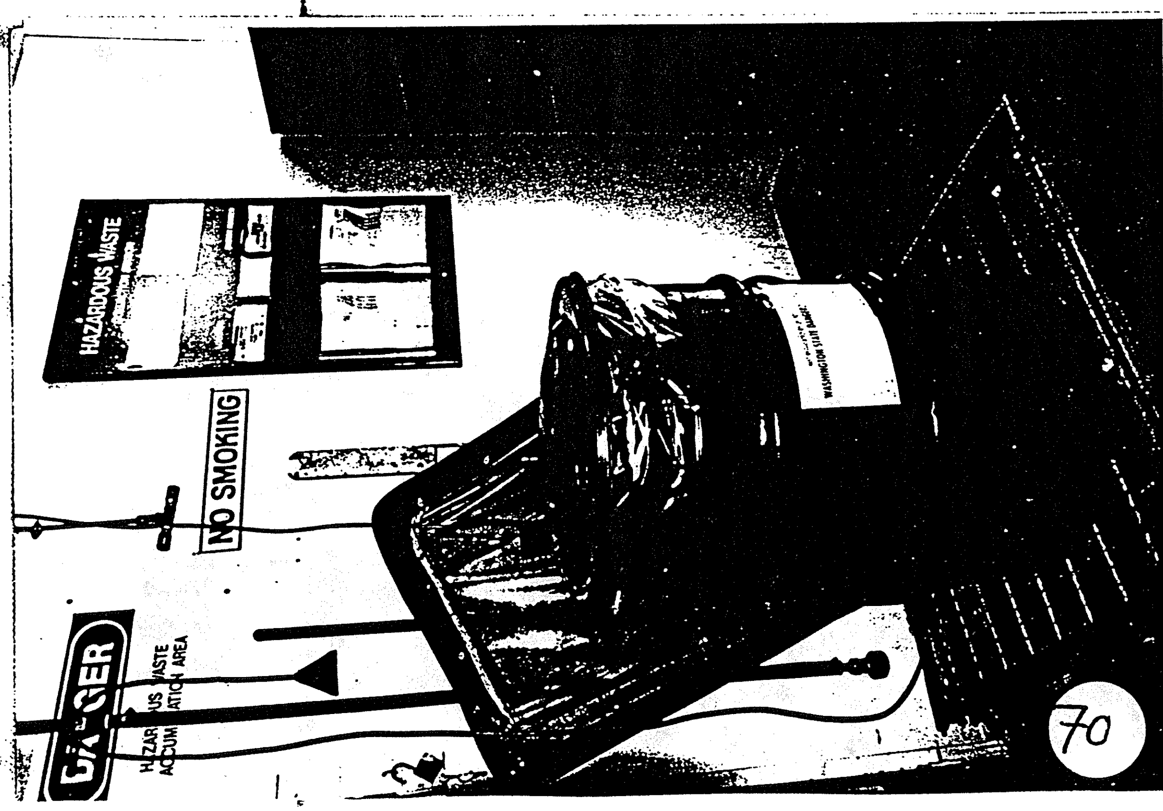
HAZARDOUS WASTE
NO SMOKING
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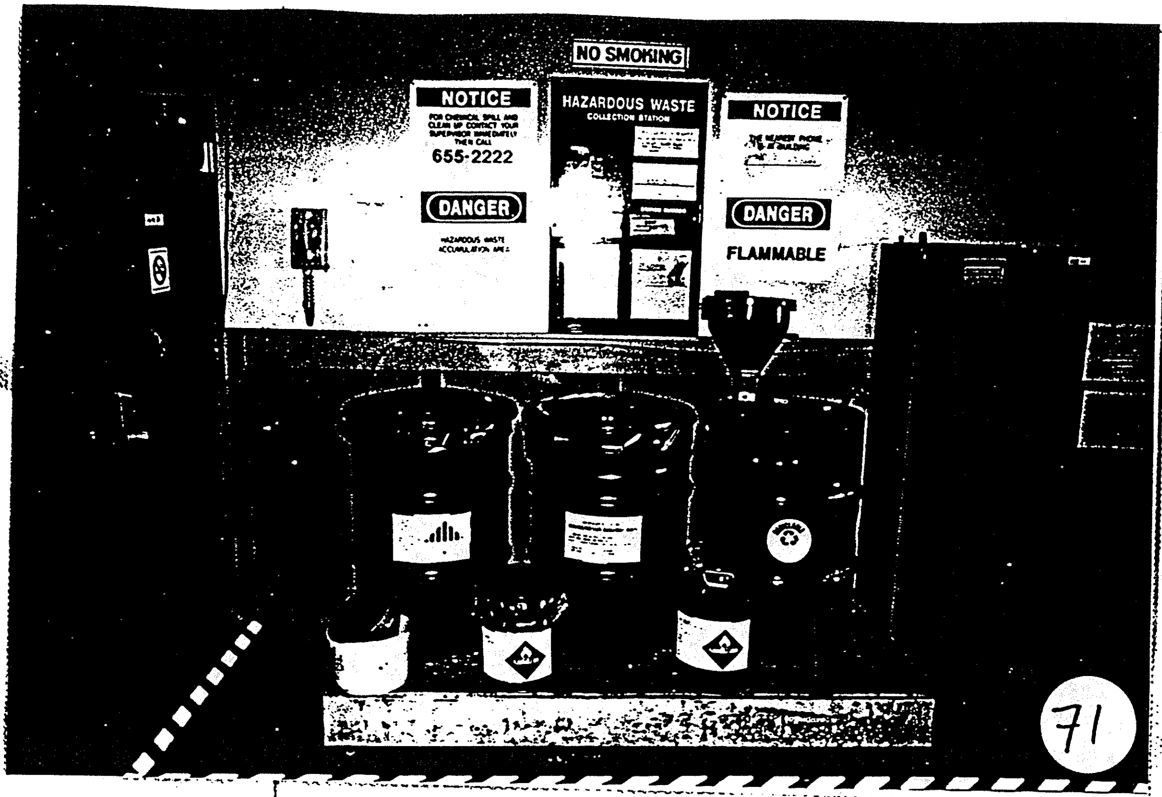
NO SMOKING
NOTICE
655-2222
DANGER
HAZARDOUS WASTE
COLLECTION STATION
NOTICE
DANGER
FLAMMABLE
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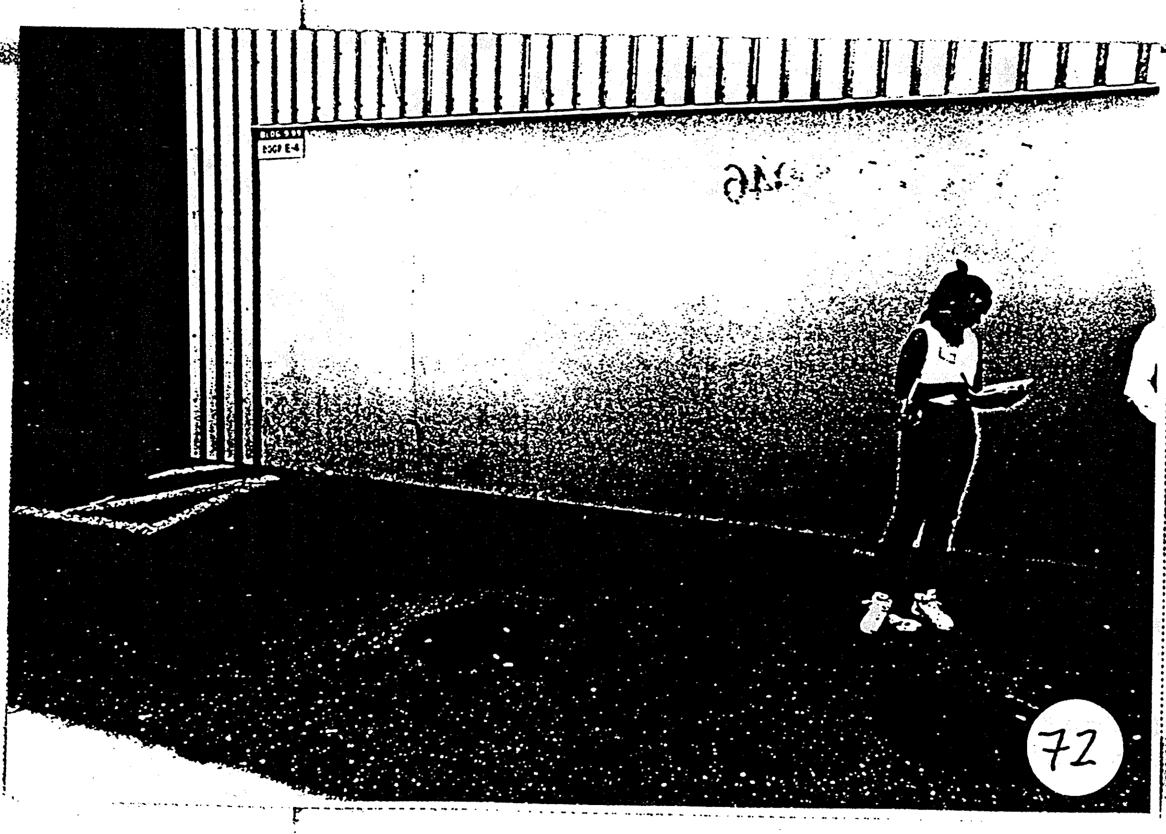
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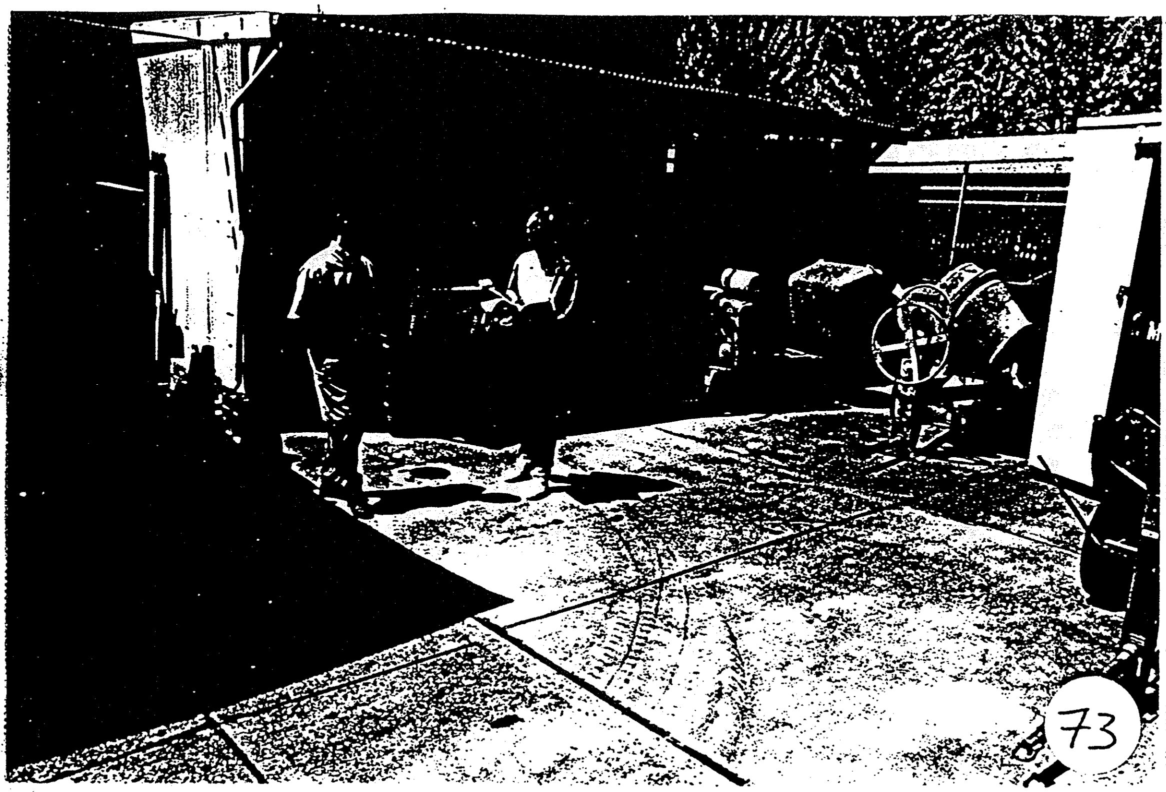
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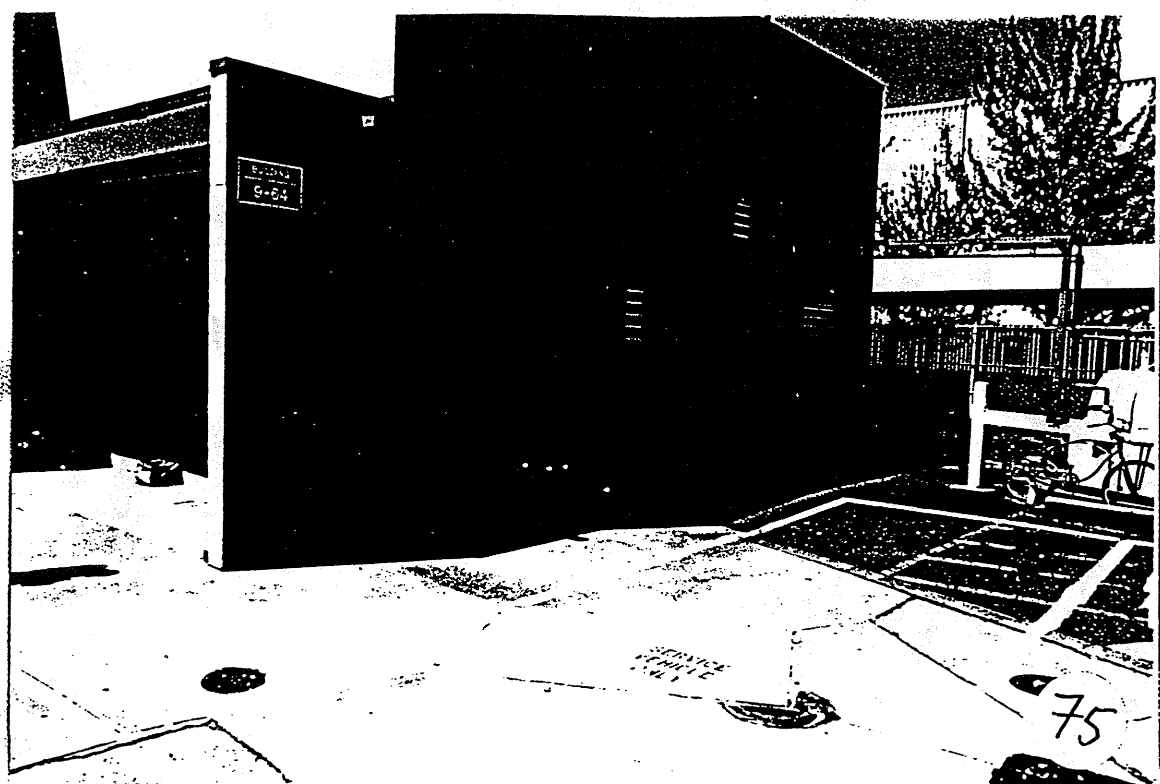
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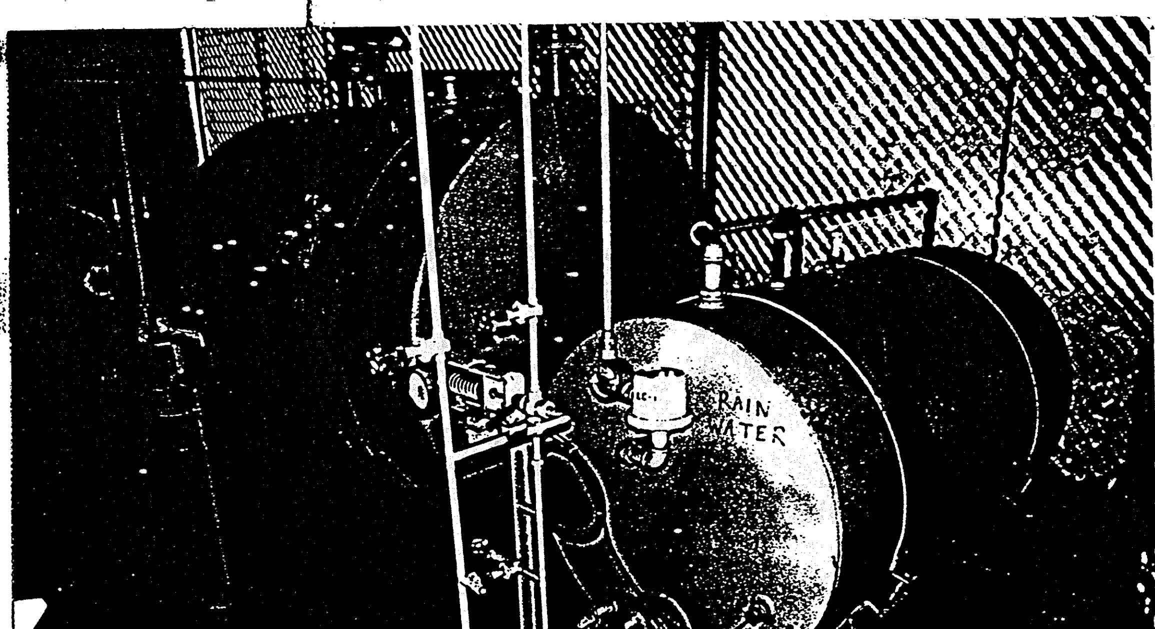
RAIN
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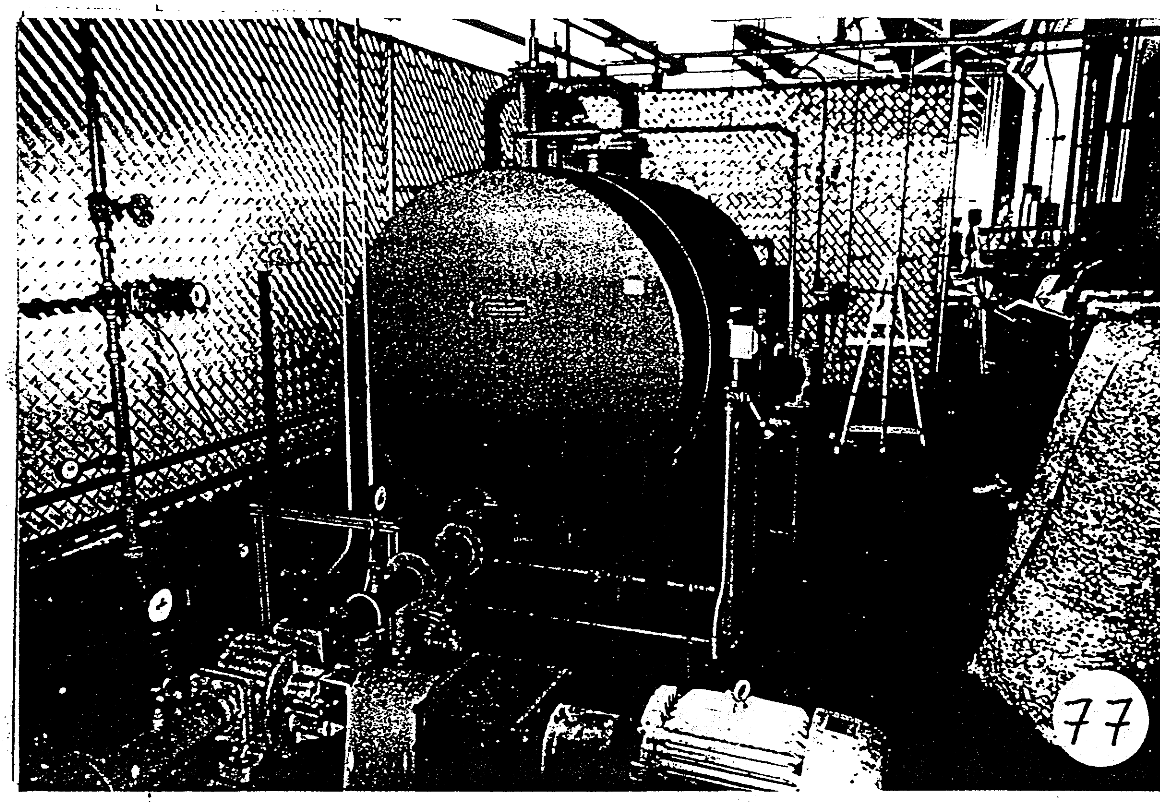
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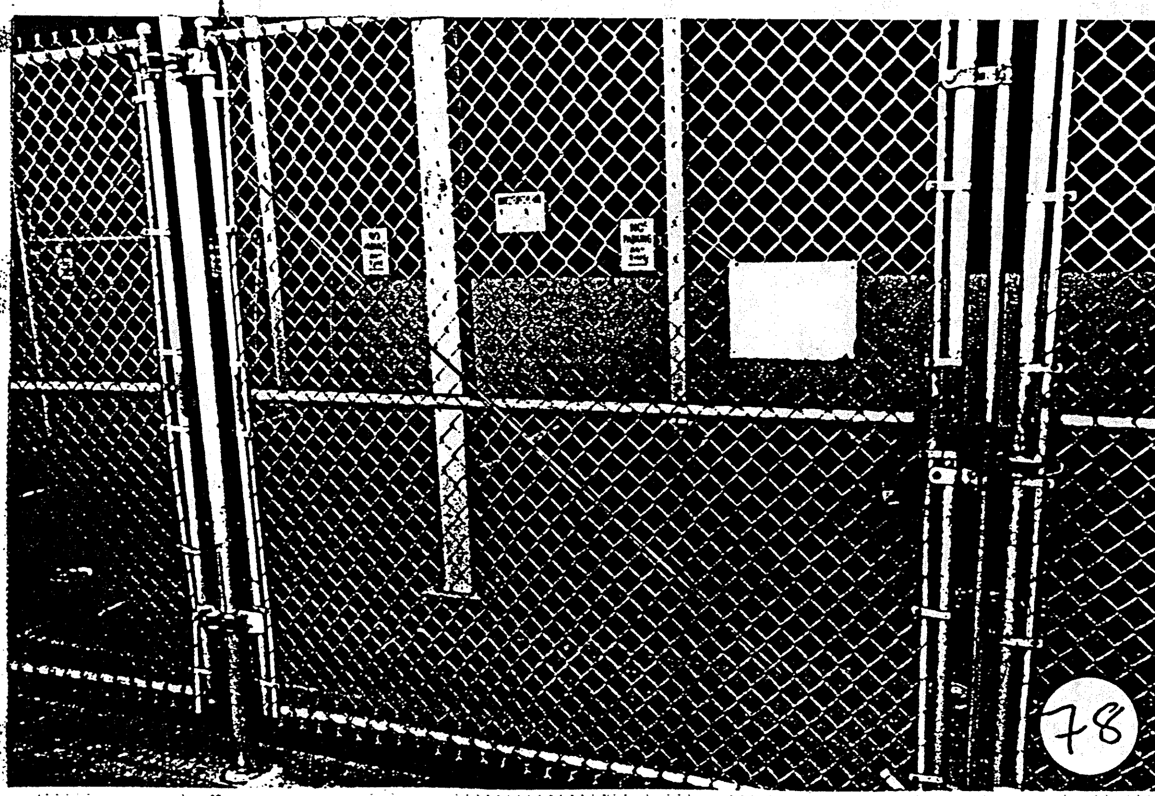
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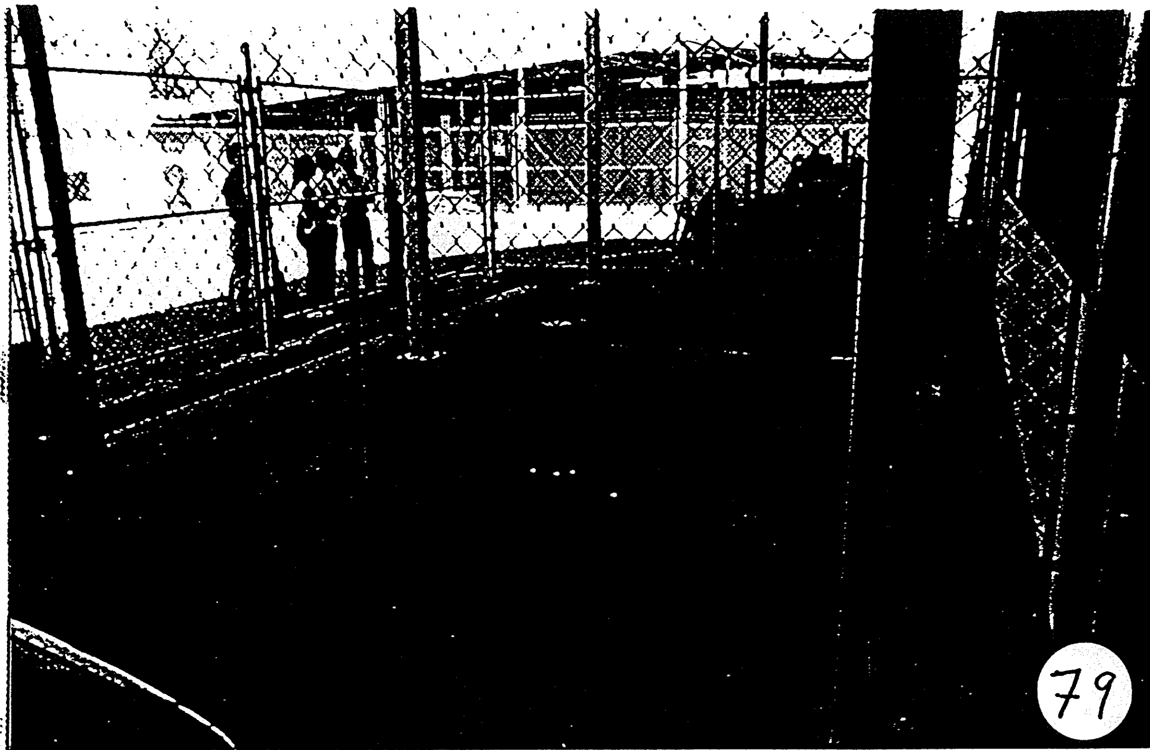

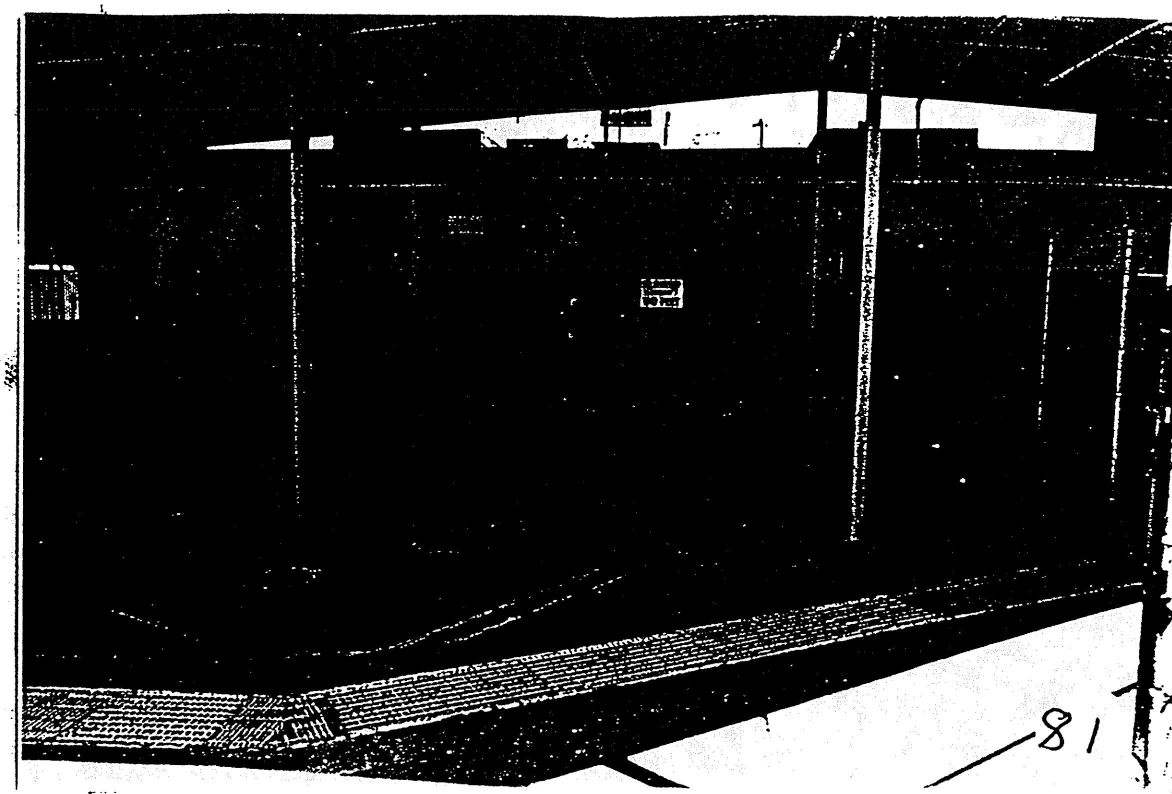
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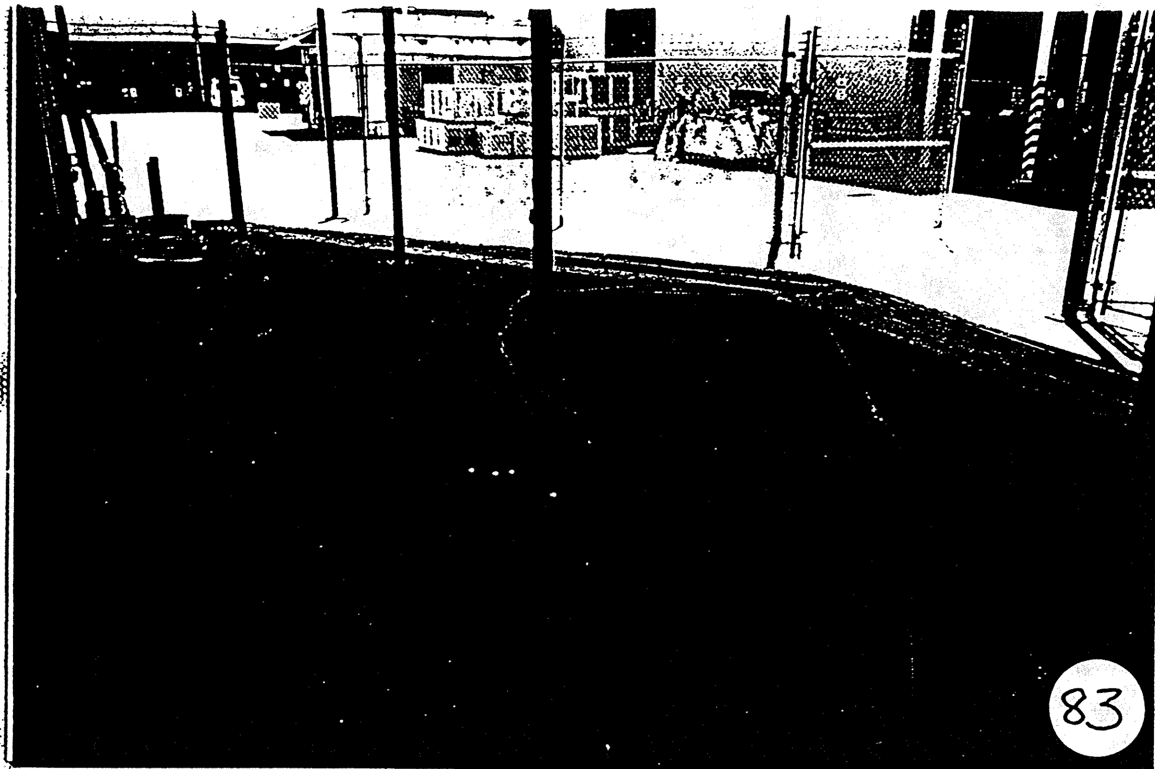
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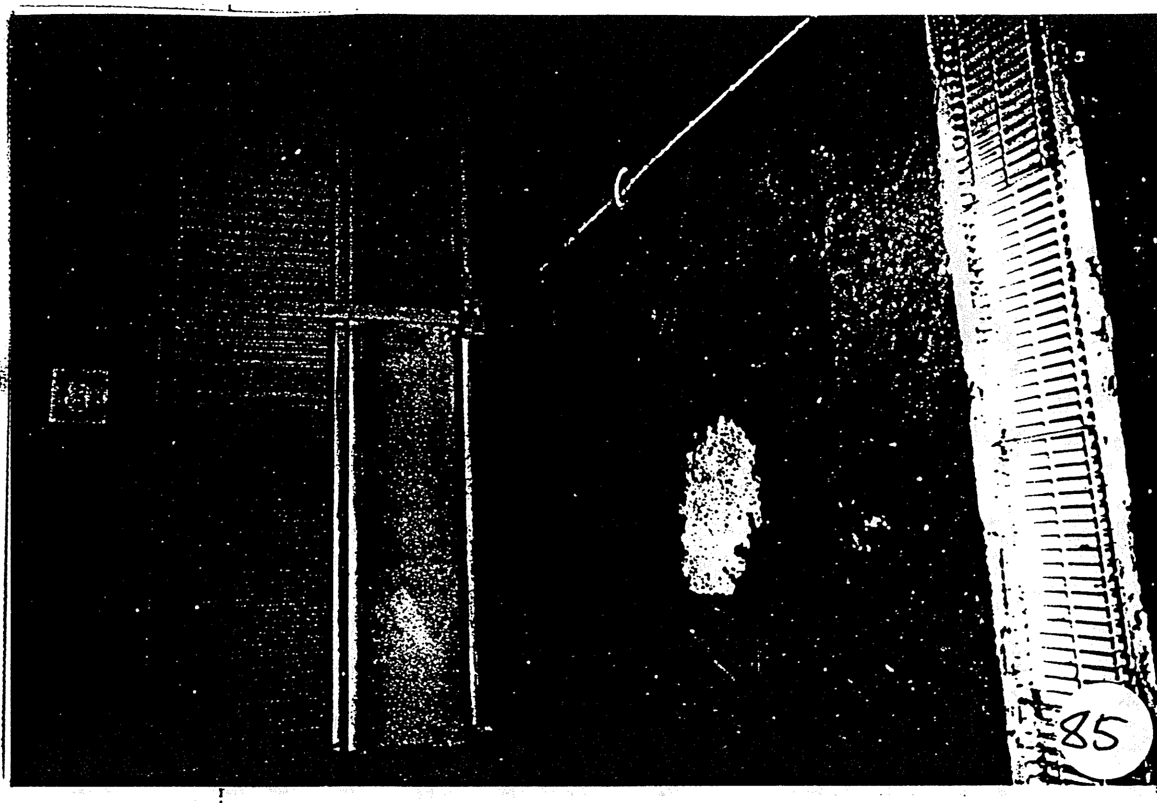
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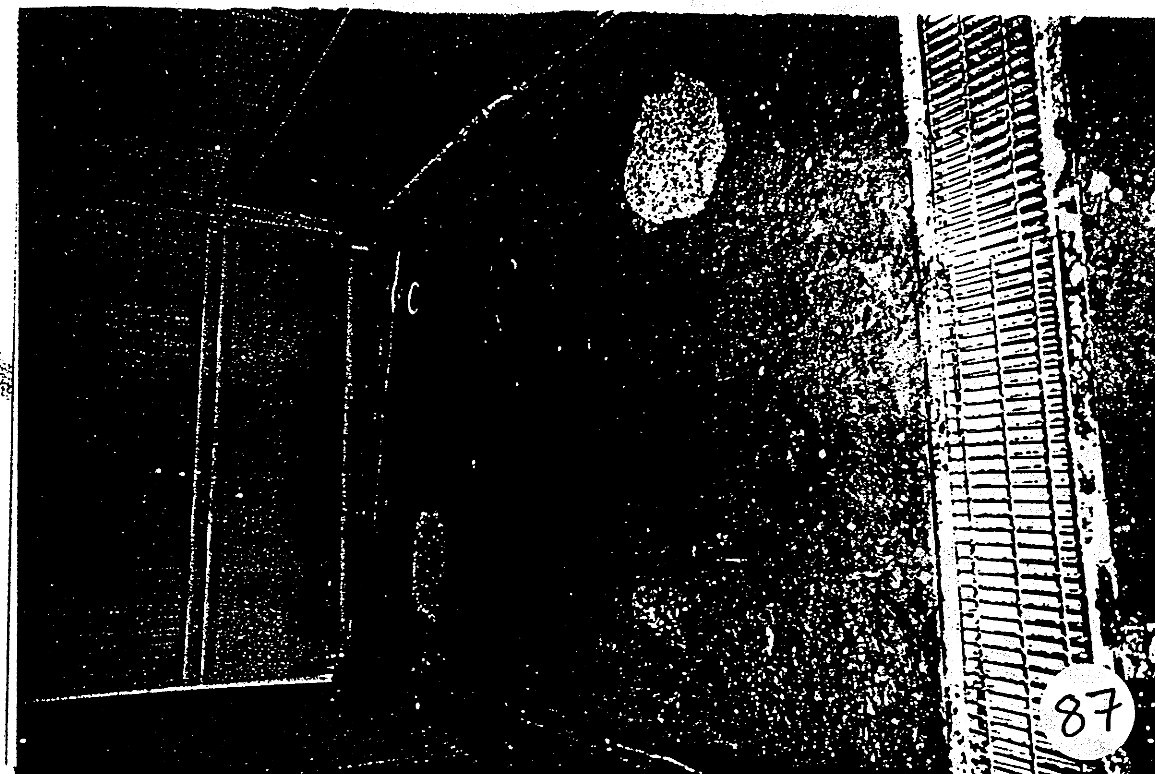
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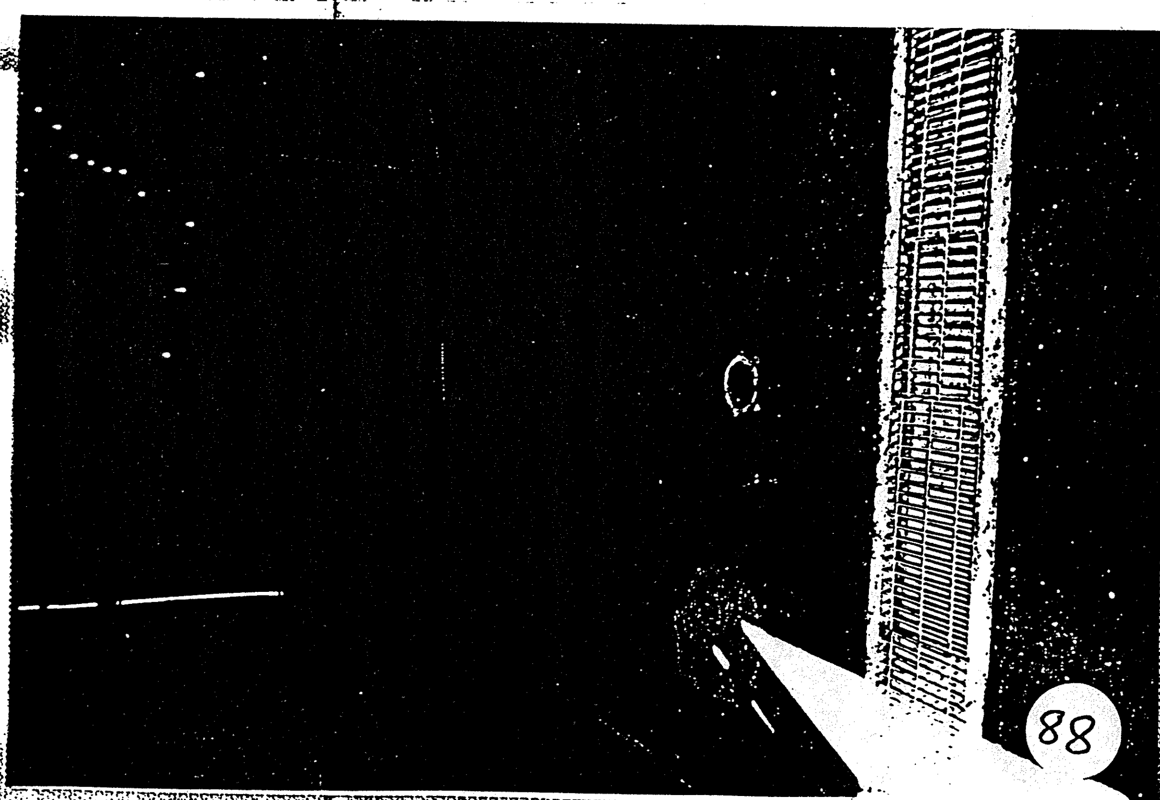
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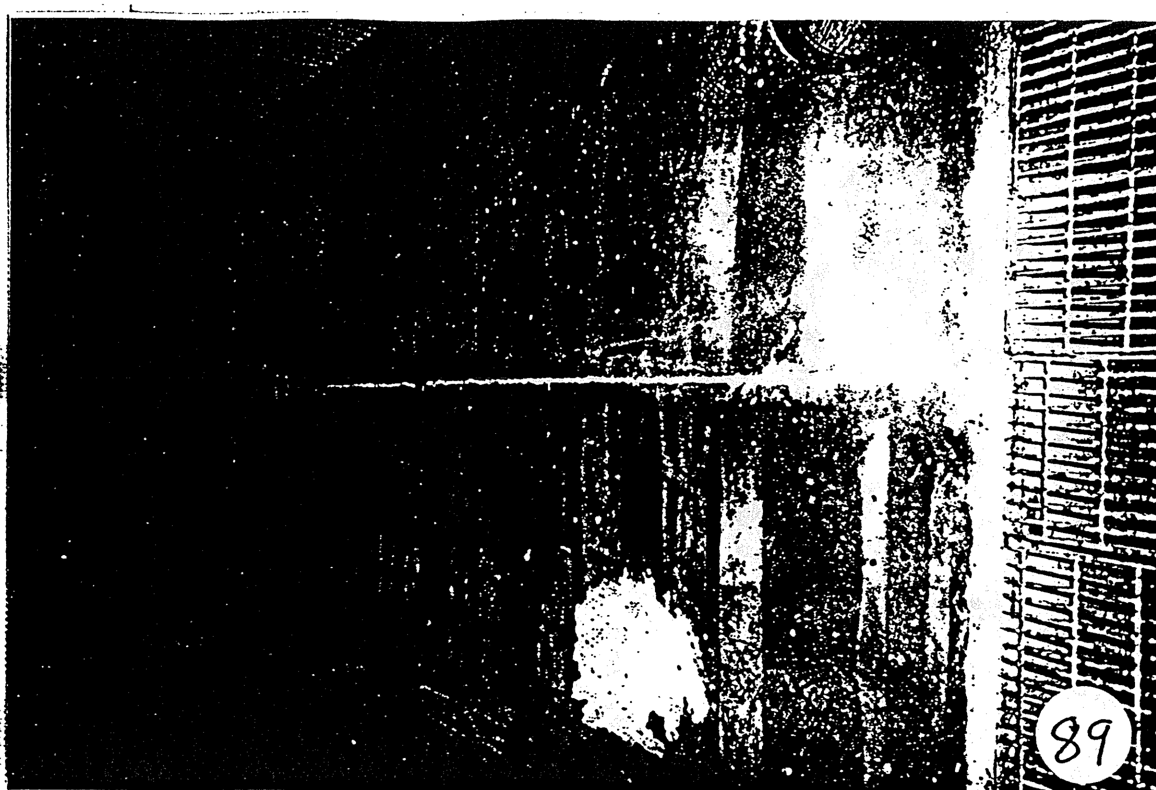

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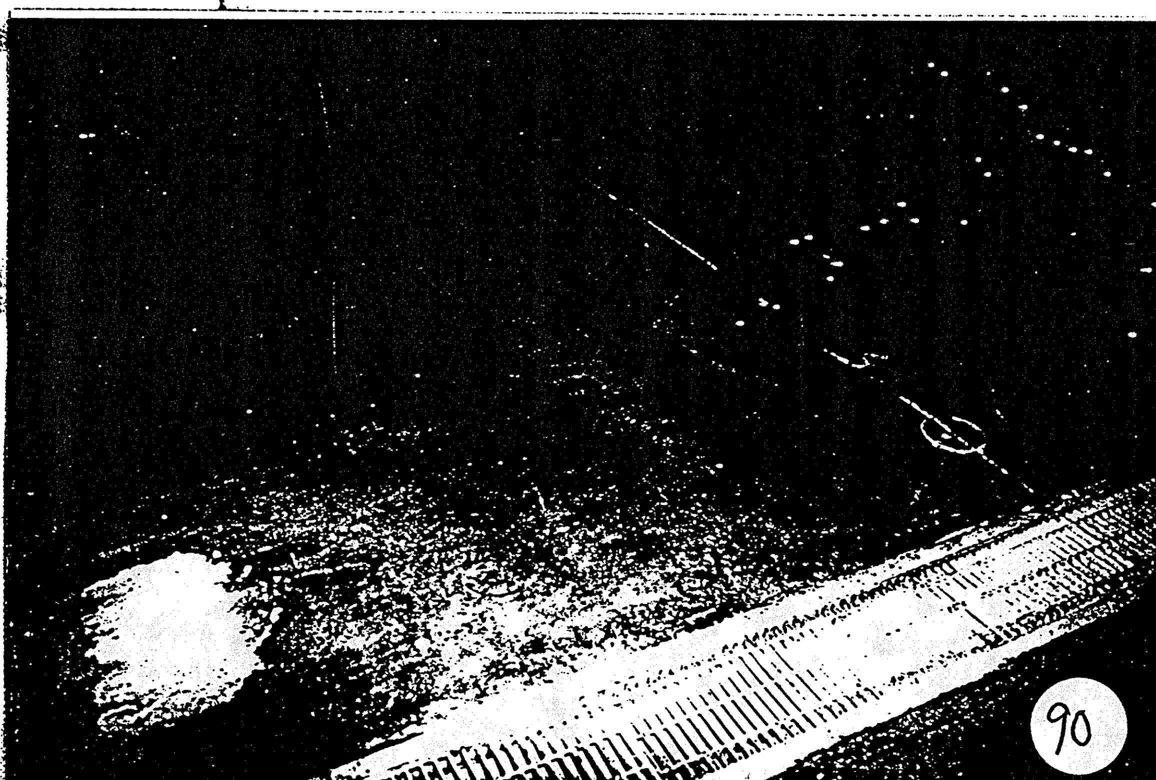

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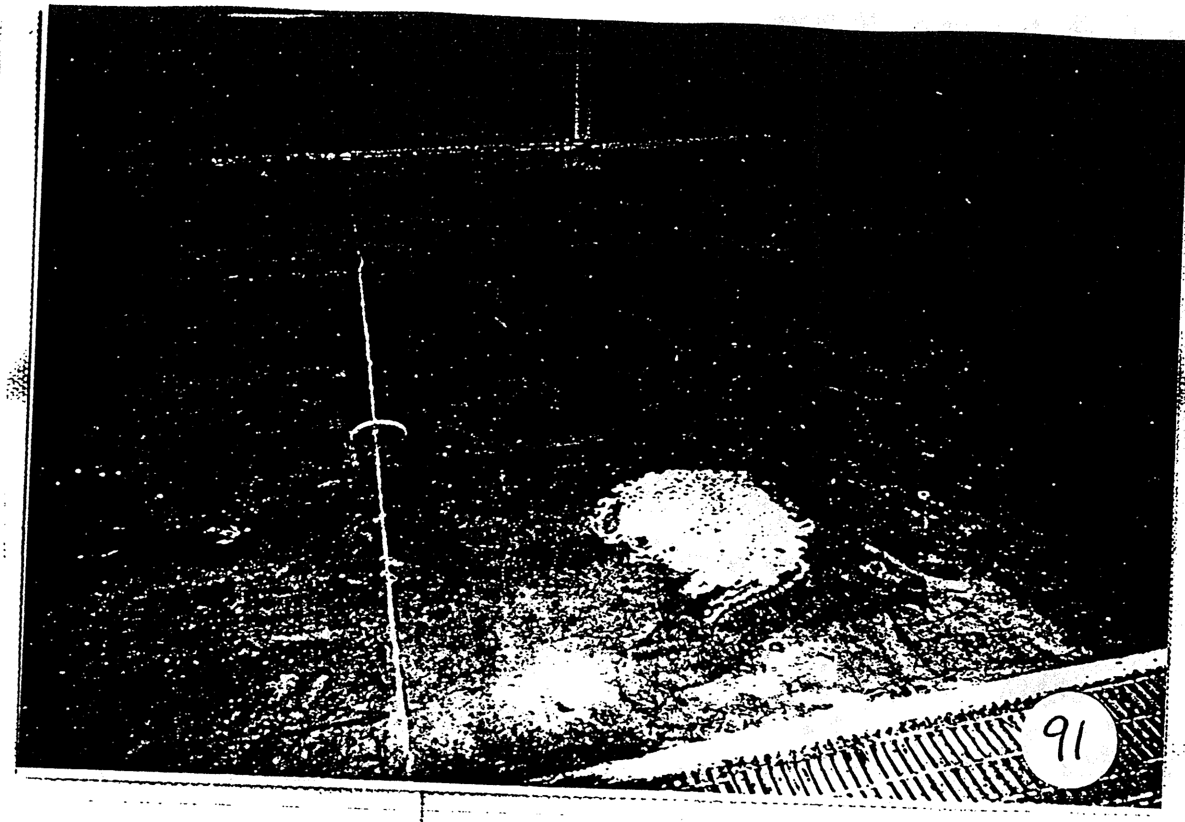
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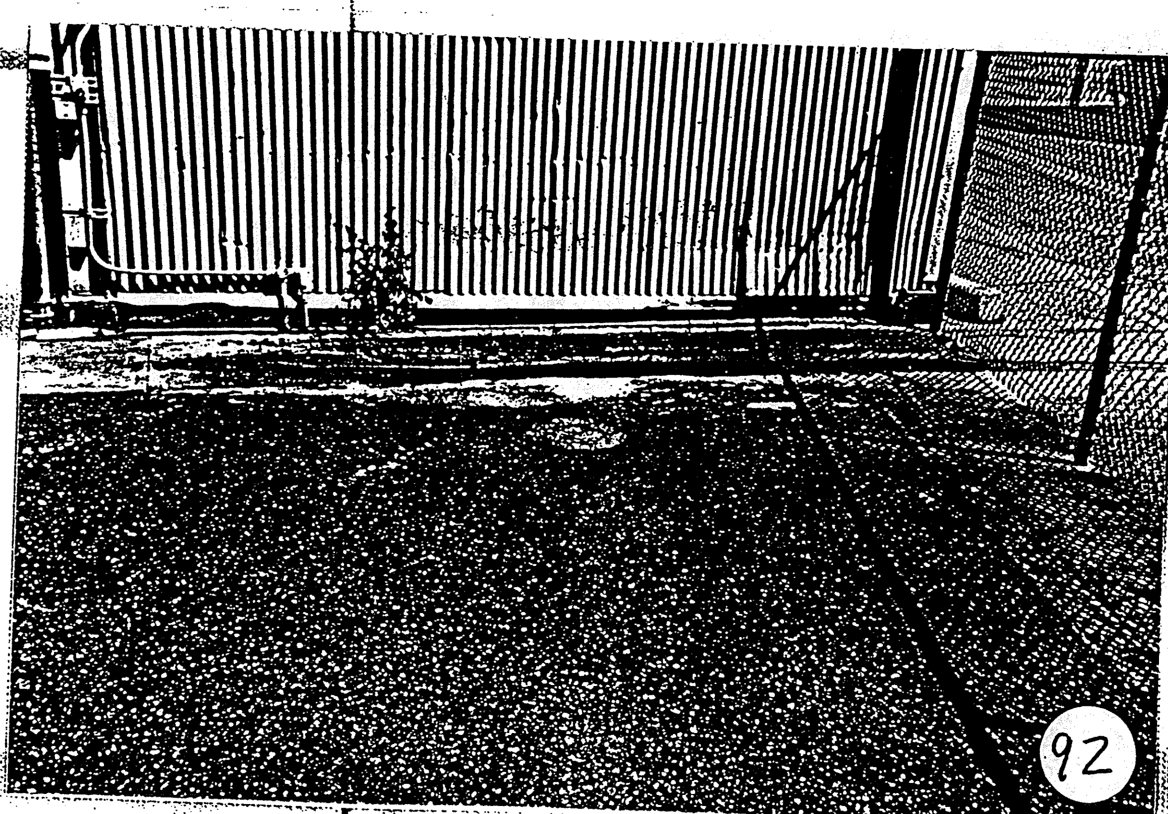
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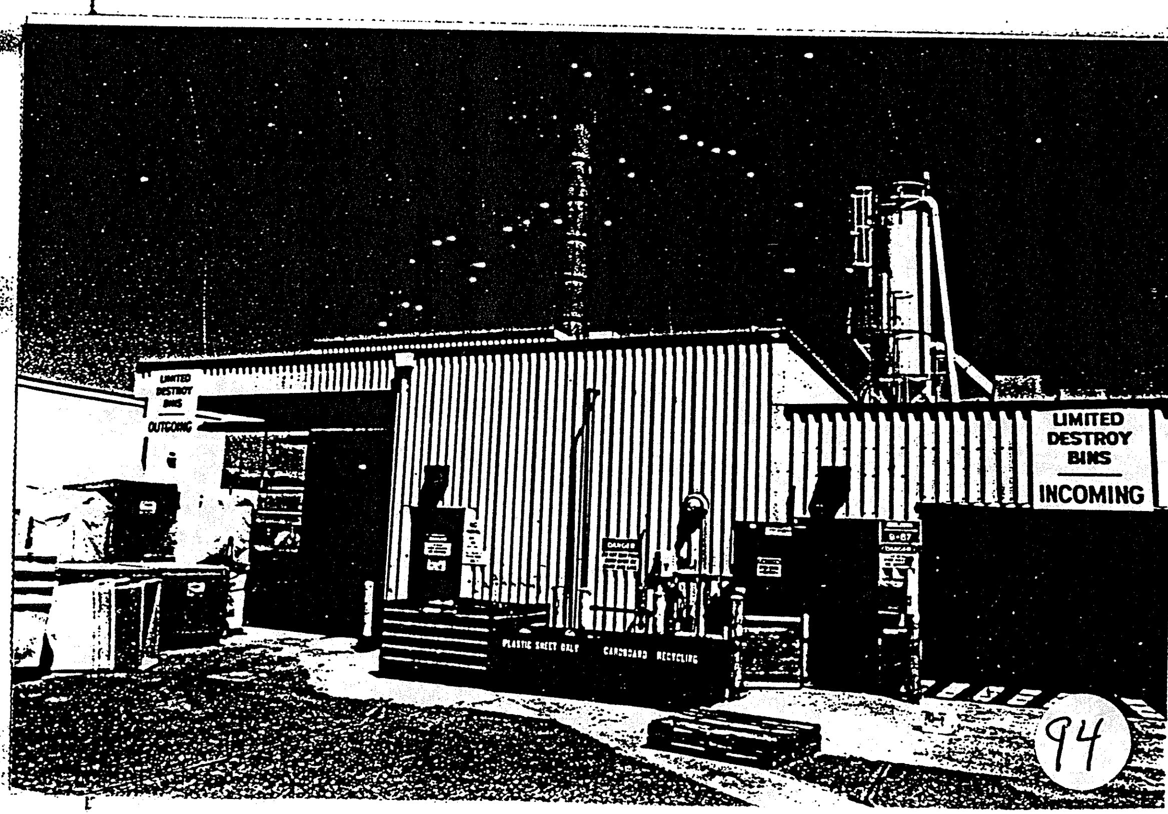
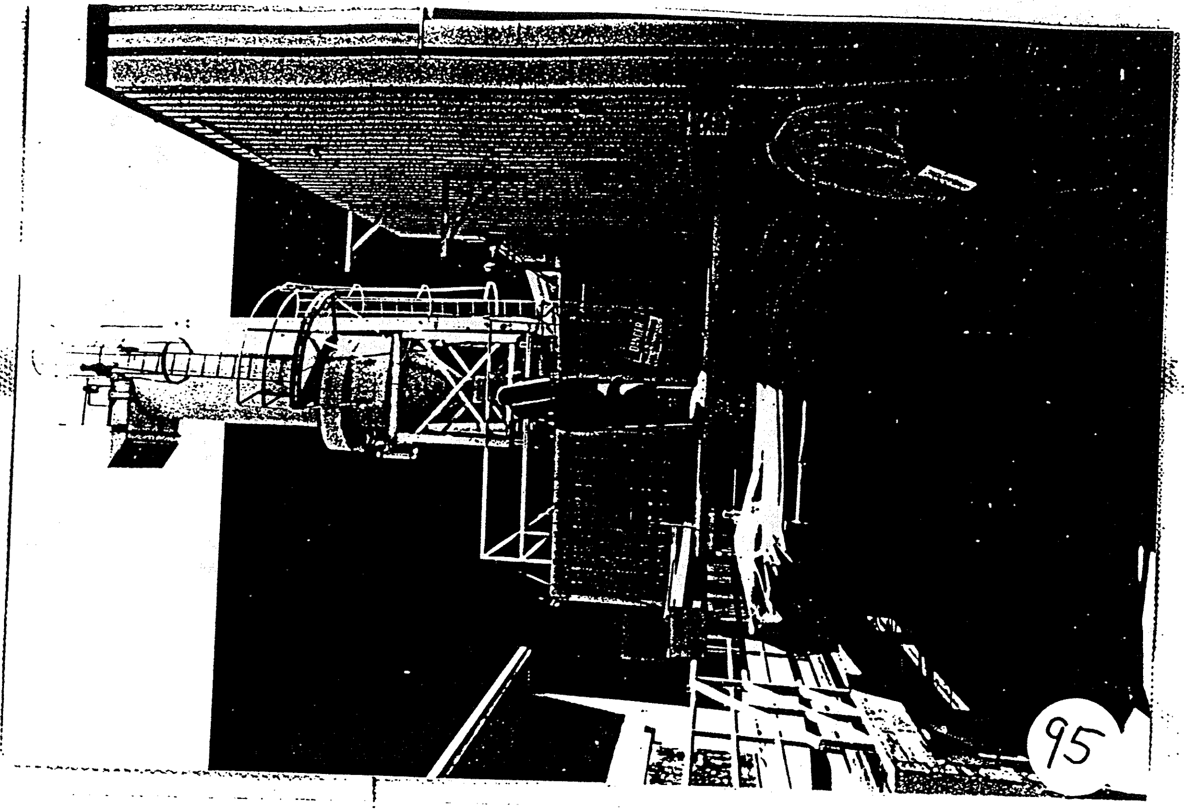

LIMITED
DESTROY
BINS
INCOMING
LIMITED
DESTROY
BINS
OUTGOING
PLASTIC SHEET ONLY
CARDBOARD RECYCLING

94



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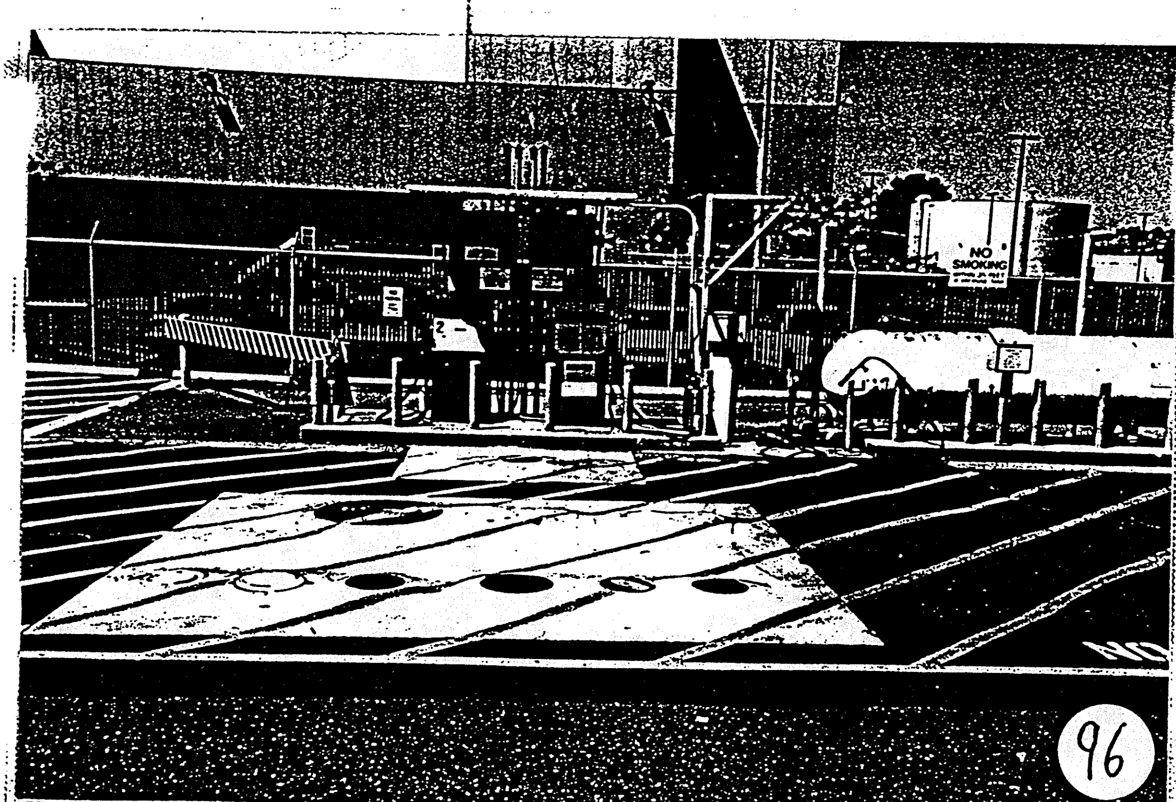

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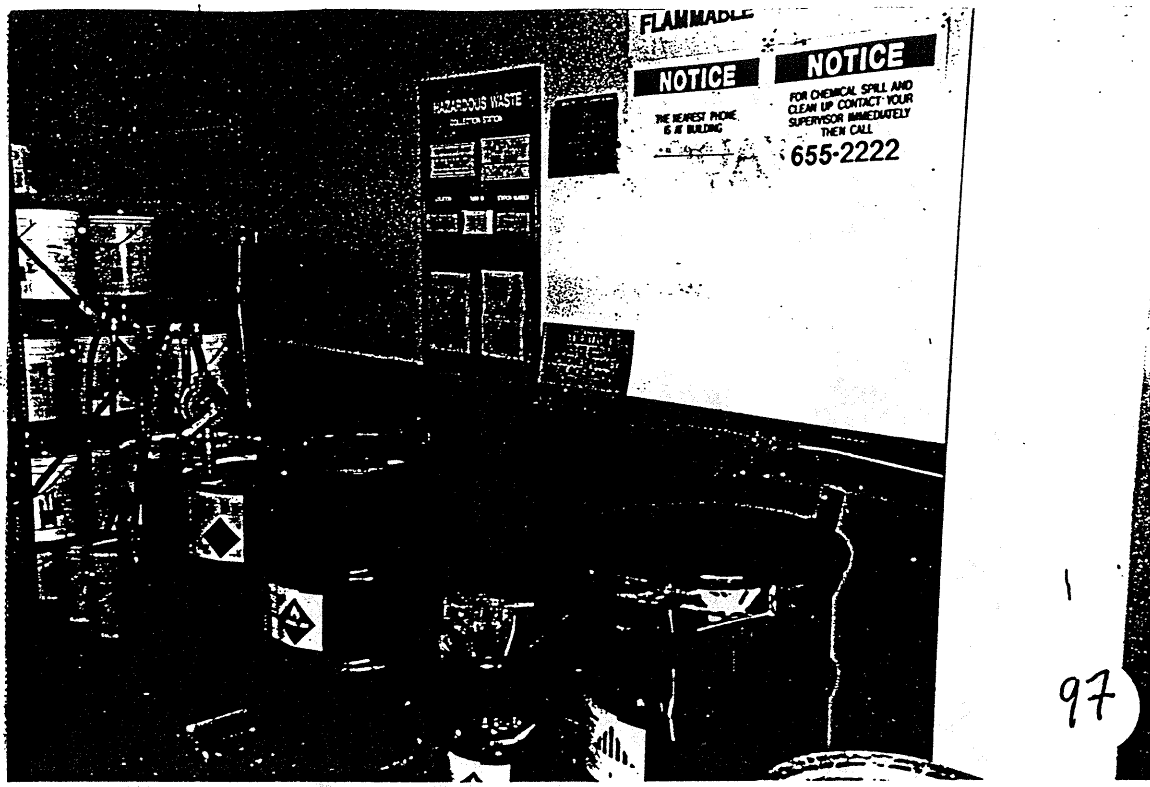
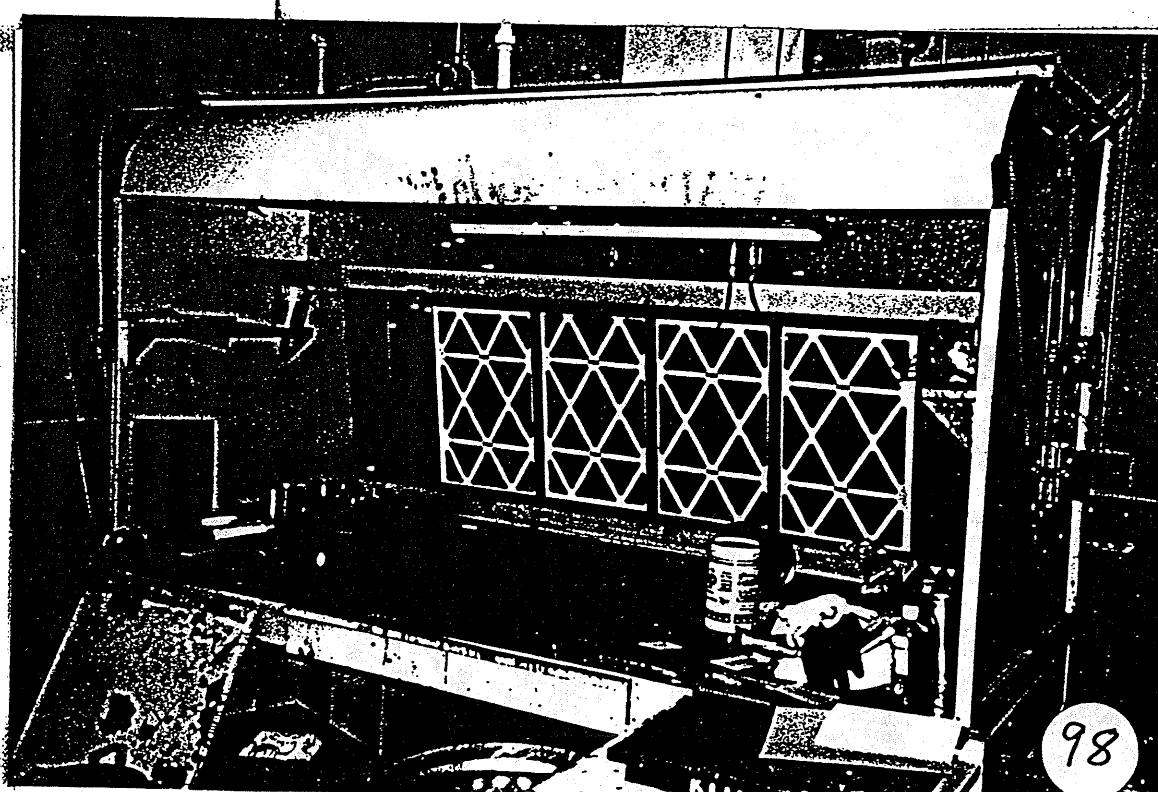

FLAMMABLE
HAZARDOUS WASTE
NOTICE
THE NEAREST PHONE IS AT BUILDING
NOTICE
FOR CHEMICAL SPILL AND CLEAN UP CONTACT YOUR SUPERVISOR IMMEDIATELY THEN CALL
655-2222

97



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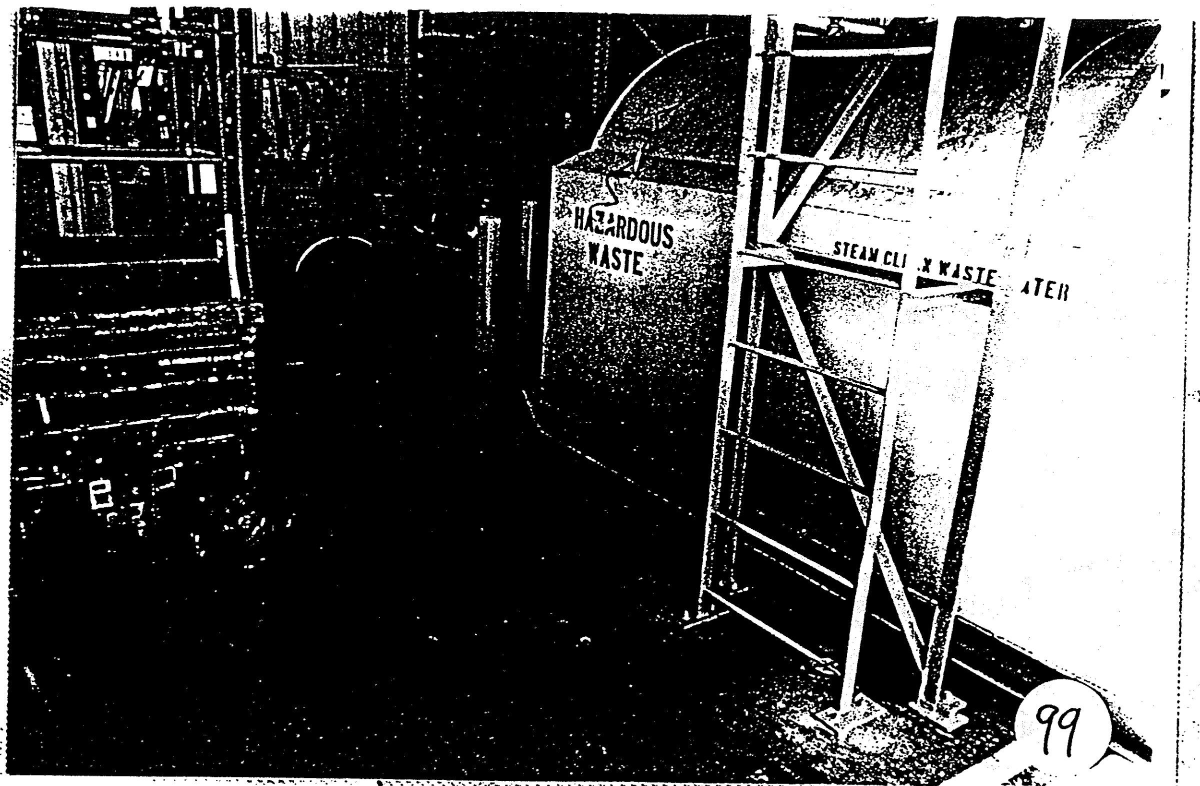
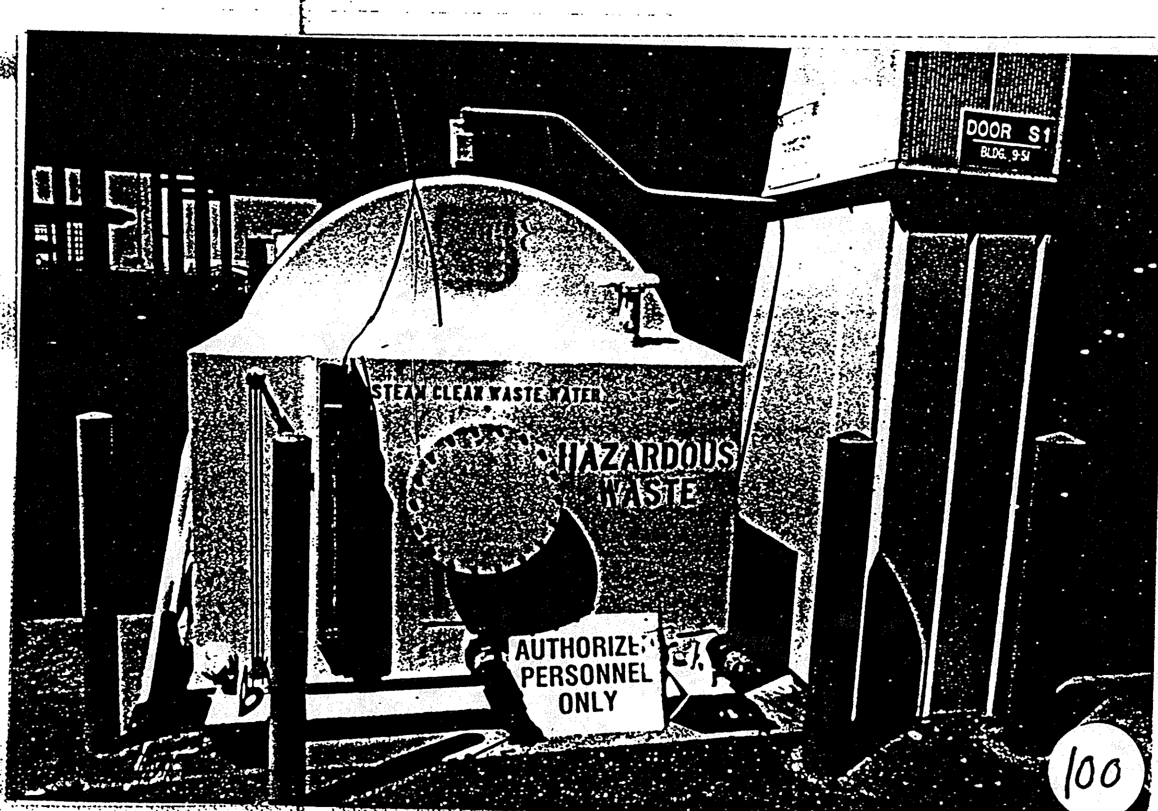
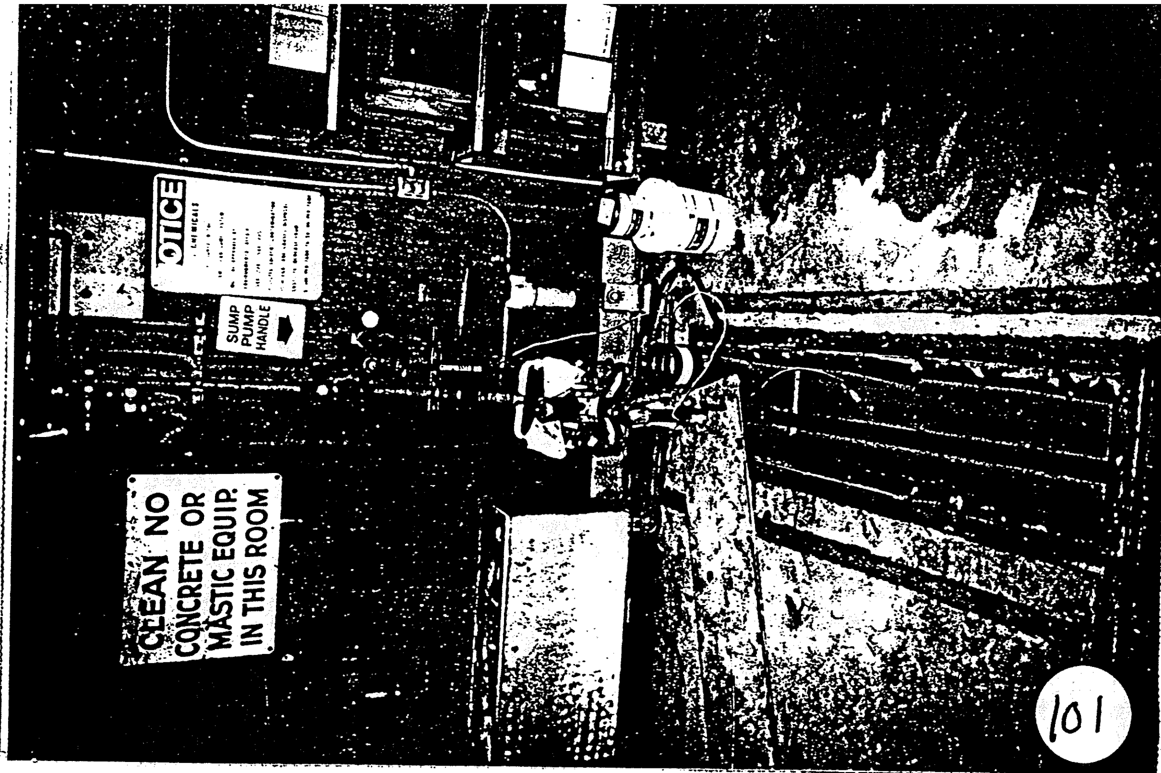
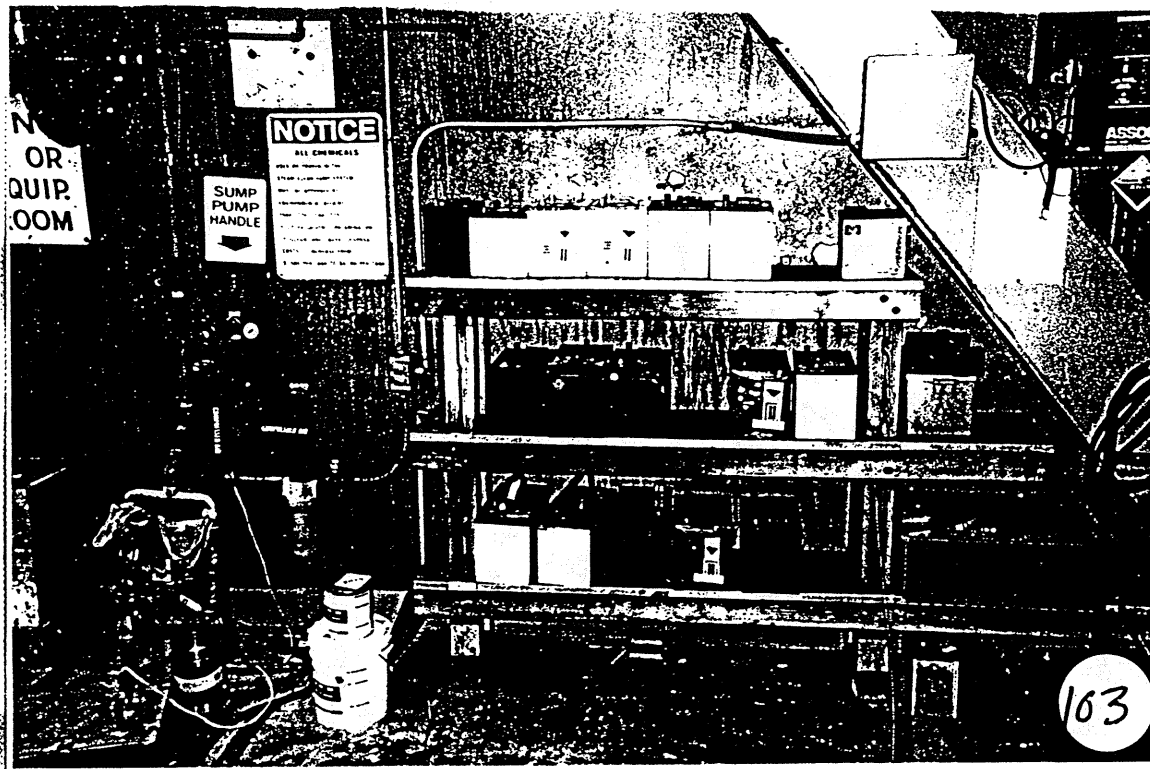

HAZARDOUS
WASTE
STEAM CLEAN WASTE WATER
99

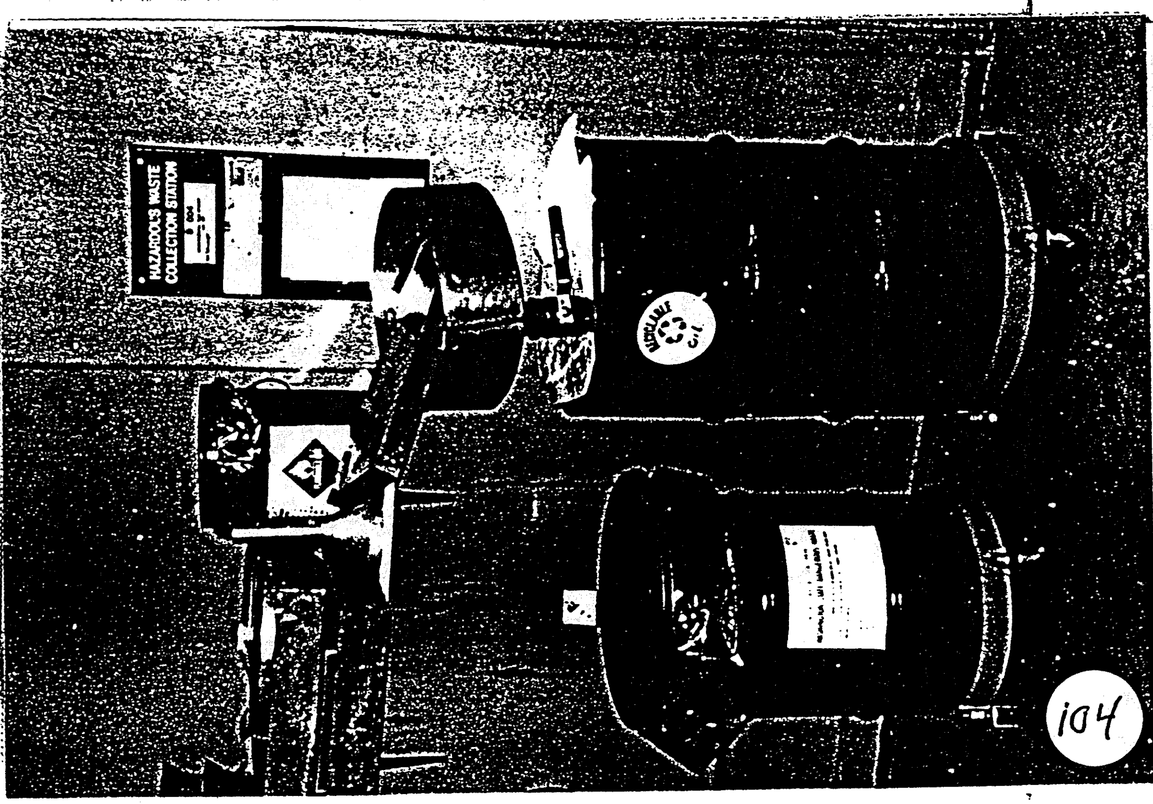

DOOR S1
BLDG. 9-51
STEAM CLEAN WASTE WATER
HAZARDOUS
WASTE
AUTHORIZE
PERSONNEL
ONLY
100

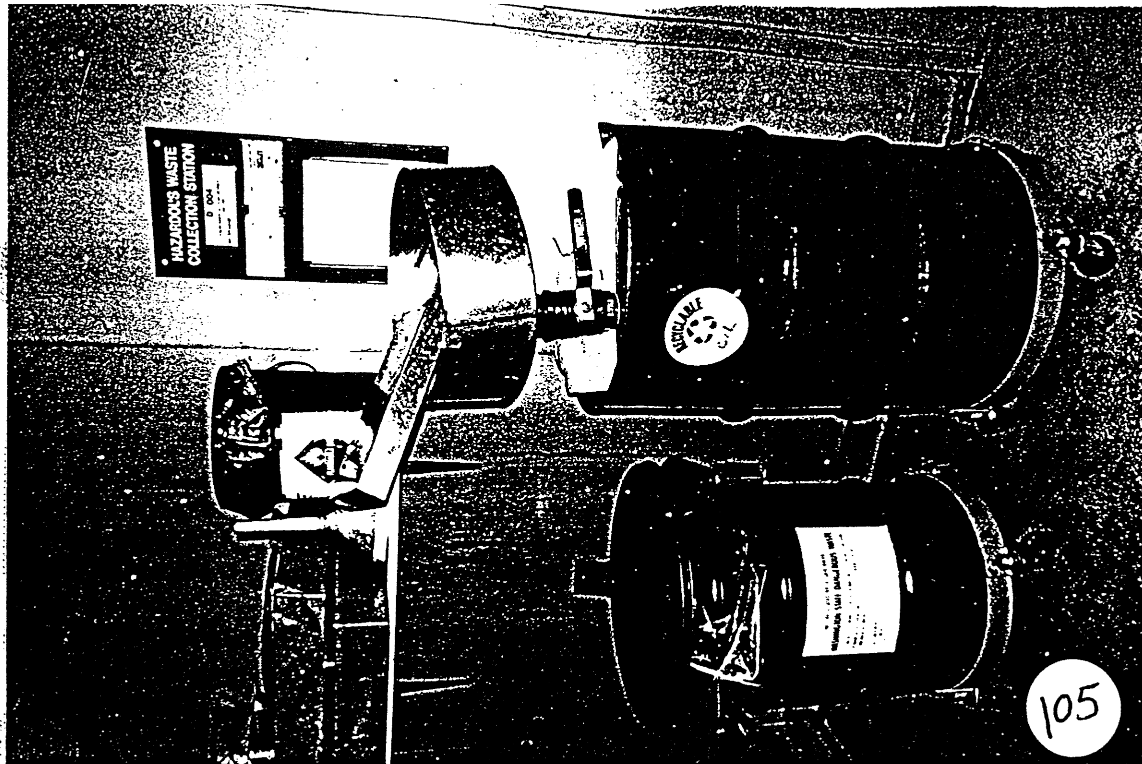

CLEAN NO
CONCRETE OR
MASTIC EQUIP.
IN THIS ROOM
OTICE
CHEMICALS
SUMP
PUMP
HANDLE

101

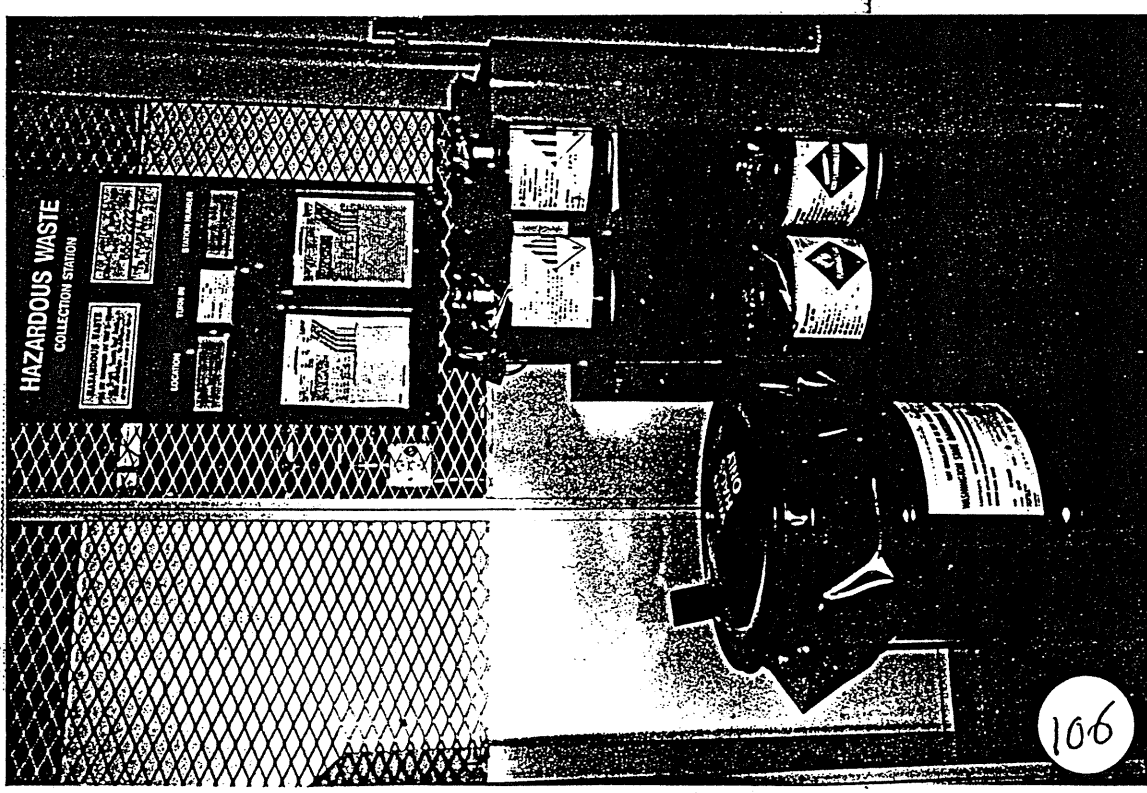
102


OR
QUIP.
OOM
NOTICE
ALL CHEMICALS
SUMP
PUMP
HANDLE
ASSOC
103


HAZARDOUS WASTE
COLLECTION STATION
104


HAZARDOUS WASTE
COLLECTION STATION
RECYCLABLE

105


HAZARDOUS WASTE
COLLECTION STATION
LOCATION
STATION NUMBER

106

APPENDIX B

VSI Field Notes

NOTES FOR VISUAL SITE INSPECTION FOR
BOEING DEVELOPMENTAL AND MILITARY FLIGHT CENTERS

The VSI was conducted on July 26, 1994 beginning at 7:00 am with a meeting.

Those present during the inspection include:

Tom Post, EPA
Stephen Oliver, EPA Intern
Dean Yasuda, Department of Ecology
John Gala, Boeing
Mike Hoff, Boeing
Dave Pass, SAIC
Lynn Brimmer, SAIC
Steven Foley, Boeing
Gary Rehberg, Boeing
Andy Whipplinger, Boeing, temporarily
Carl Bach, Boeing joined at Bldg. 9-101

BOEING DEVELOPMENTAL CENTER

Following an introduction by Tom Post we started our inspection at Bldg 9-04.

SWMU 1, the accumulation area is divided into three bays or rooms. Waste is pulled from each station throughout the plant and taken to the first room where it is weighed and entered into an inventory on a computer. All bags, which contain solid wastes, are numbered and identified with a tag as they are removed from their stations.

SWMU 2, is the consolidation room where the bagged wastes are taken, after they are weighed to be consolidated into drums. There were 17 drums in the consolidation room, primarily solids, which contained,

chromium and xylene, rags
chromium and Methyl Ethyl Ketone, rags
pads and rags with oil, sealant, alcohol etc.
garbage
disinfectan, a WDOT waste
aerosol cans
PCB Ballist absorbent
Toluene
Xylene, MEK
Acetone, Xylene
Petroleum distillant, kerosene
oil
aerosol cans
mercury mixture
water latex paint
potassium hydroxide and mercury
chromium trioxide

In SWMU 2 the consolidation room, the floors are sealed with trenches that have pipes that connect to an underground vault in the room. The vault is a lined sump that would receive the wastes from the trenches.

There is a trash compactor in the consolidation room.

In room 1 of SWMU 1, there are three bays where wastes are divided by compatible hazard classes.

Bay 15 contains 10 drums of solid wastes that are ready for shipment. One of the drums contains sodium dichromate dated 7/6/94. There is a blind trench across the front that does not connect to a vault.

Bay 14 contains solid wastes and product it also has a blind trench.

Bay 13 contains materials but no wastes. There is a trench.

Room 2 part of SWMU 1 contains 2 bays. Bay 16 contains flammable liquids and product. Bay 21 has one 55-gallon drum and seven 5-gallon containers, flammable liquids. There are two storage cabinets. Both bays have sumps, trenches, that drain to a vault.

Floors are sealed in the entire building and sloped to drains. The walls are concrete and the ceiling is metal.

Room 3 part of SWMU 1. There are 4 bays corrosives are contained in Bays 20 and 17.

Bay 20 contains one 5-gallon container of waste sodium hydroxide dated 5/6/94.

Bay 17 contains one 5-gallon container of Nitric and sulfuric acid dated 5/31/94.

Both bays have blind sumps, trenches.

Bay 18 contains empty barrels, concrete slurry (a waste) and resin product.

Bay 19 is the same as Bay 18. Both bays could be used to store wastes as overflow areas. They both have blind sumps, trenches.

SWMU 3 the loading dock is sloped and has two blue valves and a blind sump. The valves are to keep rodents out but allow any materials to flow into the loading dock. These valves would release wastes from the vaults if they filled. If the loading dock overflowed, the liquid would flow to a sump that is locked but can be opened to drain to the river. The drain was in the area where materials are received.

A vacuum was observed that is used for removing rain water from blind sumps in the product receiving area.

Totes or bins are used for trash accumulation.

There are two blind sums in the covered dock area.

One drum of waste acetone and xylene dated 5/27/94 on a pallet was observed. It was not to be combined with other wastes since it was a liquid. Liquids are usually transported to bldg 9-04 in drums. The solids are primarily the wastes that are combined.

SWMU J is a 500 gallon waste oil tank. Basin Oil Company recycles the oil. The tank is located over blind sumps. 55-gallon drums are pumped into this tank, which is located on the dock area.

This is the end of Bldg. 9-04.

Begin Bldg 9-101.

SWMU 23, (D-020) has 3 drums that contain solids, no liquids:

Oily rags, 55-gallon
Solvent rags, 55-gallon
Aerosol cans, 5-gallon

The plastic bags are pulled out of all three drums on a daily basis and taken to accumulation areas with tags that identify the waste and location.

Graphite waste was observed in a tote.

Garbage was also observed in a tote.

There is a cyclone air system for fiber board. A vacuum is used to clean up the remaining fiber board.

Boeing is going to be making F22s and AWAX 767s that go to Japan.

Accumulation area D-043 contained three drums Alodine Rags, oily rags, and solvent rags. The area was the same as D-020. No photo was taken.

A vacuum cleaner was used for cleaning up primarily metal shaving. The metal shavings go to plant 2 for reclamation. Composites (graphite dust) goes to Arlington.

D-063 contained oil in a 5-gallon container on a grate over a raised sump and a vacuum with water contaminated with coolant and sludge. The vacuum is on wheels and is taken to the work station then returned to the accumulation area in the maintenance oiler area. The start date is 5/13/94. There were totes nearby, one contained scrap metal.

D-051 contained alkaline batteries labeled mercury potassium hydroxide and dated July 1, 1994. The floor in the area had some marking. There were floor sweepers and totes with card board located adjacent to the area.

SWMU 24 had been moved to another section of the building.

D-016 is at the dye penatrant line. When the dye is bad is emptied into a 55-gallon drum via a hosed. The drum is on a grate with a tray. There are three other drums nearby that are part of the same accumulation area. They are:

Oily rags, 5-gallon
Aerosol cans, 5-gallon
MEK chrom rags, 35-gallon

All drains in bldg 9-101 are blocked. Some dye was present on the floor in the dye penatrant line.

The D-074 station is located throughout the lab. The containers are as follows:

Nitric and chromic 5-gallon container in tote
Caustic sodium hydroxide chromium container plastic <5 gallons in tote
Sodium cyanide container plastic <5 gallons in tote
Sodium hydroxide container plastic <5 gallons in tote (containers empty with tape over the lids with note to start accumulation dates)
Acetone xylene 5-gallon with tote (plastic pan) beneath can dated 7/26/94 located beneath a hood in cupboard.

Station D-066 has a step can with rags that are taken to D-016 each night. There are two 5-gallon containers in a cabinet with a metal tray. One can contains methylene chloride (F002) the other contains acetone and xylene (D001).

Station D-061 is in the silver reclamation area. Silver reclamation is a three step process which includes two 5-gallon containers located in wet floor containers (plastic buckets). The final waste is silver ammonium thiosulfate in a 5-gallon container (DOT NA3082) it is emptied approximately every two weeks. There is a backup waste container in the room. Water from the reclamation box discharges to METRO. Air is vented through a pipe.

There are approximately 15 to 20 more accumulation areas on the first floor of bldg 9-101 similar to those areas already seen.

Second floor of bldg 9-101.

Station D-025 contains three containers with solids without any additional containment and one 5-gallon container of oil that has a can as containment. The three drums of solids are as follows:

Solvent rags, 55-gallon date 7/1/94
Absorbent oils resins etc., 55-gallon date 7/1/94
Aerosol cans, 5-gallon

In each area waste rags and other solids are inspected daily if there is sufficient waste the bags are pulled. If the bags have not been pulled they are pulled the first of each month and all containers are dated the first of each month. Liquid waste containers are dated when the waste accumulation starts.

AOC 7, the degreaser, contains 1,1,1-trichloroethane, methyl chloroform, it is never flushed completely except one time when it was new and water had been added. At that time it was drained. Other than that pieces of metal are periodically removed to metal scrap. The degreaser is heated with steam.

There is a still for the degreaser with drums connected for the sludges. The still had not been used in the past two years. The degreaser and still are to be removed in December.

There is a ventilation system for drip trays on either side of the degreaser.

There are red kick cans throughout the shops that accumulate rags for the day and are then emptied into 55-gallon drums by the operators each night. Each shop has a hazardous waste monitor who is responsible for emptying each kick can at night.

First floor Bldg 9-101

Scrap metal was in boxes on wheels.

SWMU 22 is no longer a wash water paint booth but is now an air paint booth. It was changed in 1990. The filters are changed when the pressure gauge indicates the filters are dirty. The filters are changed approximately every 2 months.

There are a total of 5 paint booths three are approximately 1/2 the size of this paint booth and one is a fume hood. (Note: Really there are 2 that are fume hood size)

SWMU 27 the waste accumulation area for the paint booth is an enclosed room with blind sumps across two doors. There is a 4 inch curb beneath an outside vent. The rest of the room is concrete and block. The floor is somewhat paint stained. The following waste containers were observed:

A garbage can with paint cans
MEK and chromium rags
Xylene and chromium rags
Aerosol cans
Acetone and xylene solvents

A parts washer at the paint booth is emptied into the solvent drum by the operator. The parts washer has MEK.

SWMUs 28 and 29 are tanks that have been removed. They were originally outside of the paint area of bldg 9-101. They had been moved to the outside corner of bldg 9-101. SWMU 30 had been around the other side of the corner.

There is a pump and treat system in a brown building on this corner. There are two wells hooked up to this system but they are only using one. The water drains to the sanitary sewer. They are looking at an NPDES discharge so they can discharge more water. They have already applied for the permit. PCE, vinyl chloride etc. are pumped and treated.

One of the pump and treat wells is inside Bldg 9-101 where a recessed sump area used to be. The solvents in the ground water probably came from a degreaser in the same area. (Note: The other well that is currently being pumped is located outside the building near the corner.)

AOCs 5 and 6 are two USTs located outside that contain diesel?? that were replaced in 1991 when the previous two tanks were leaking. As much oil as could be removed was, with some oil remaining. The oil was PS-300 or #5 heavy fuel oil which is between diesel and crude in weight. Nothing has been detected in any nearby monitoring wells. Two 20,000 gallon tanks were pulled.

Building 9-90.2.

SWMU 18, in the photo developing lab, is a 5-gallon plastic container in a pan that contains used water. The water is used for about one month in the developer machine before it is replaced.

There is another photo machine that is being taken out of service. Used developer was removed as needed. This machine will not be replaced. Another facility will be used.

Building 9-101

SWMU B, the spill collection tank for hydraulic fluid has a capacity of approximately 250 gallons and is emptied approximately twice a year.

D-010 had portable containment for two 55-gallon, one 35-gallon, and one 5-gallon drums that contained oil with a capped funnel, rags with solvents, rags with oil, and aerosol cans.

SWMU C was a previous oil/water separator that is no longer there.

Building 9-102

SWMU 31 is area D-039. It has a mobile drip pan with the following drums:

oil, 55-gallon
solvent rags, 55-gallon
oil rags, 55-gallon
aerosol, 5-gallon

A separate recycled oil drum in a drip pan is located in a separate part of the room and is considered part of this station. It is possibly the former location of SWMU 31.

AOC 1 is located outside Bldg 9-102. It is a UST that was closed in place and replaced with an above ground tank for fuel oil.

SWMU D is inside bldg 9-101 and is the former SST tankline for titanium chem milling. It was located near the current autoclaves.

AOC 2 is a UST that is still active. It is double walled with interstitial monitoring and catch basins.

SWMU 34 (D037) is the Building 9-140 loading dock area. There were two 55-gallon drums on drip pans and two empties. The two drums contained phosphoric acid dated 6/24/94 and potassium hydroxide and sodium hydroxide.

Building 9-120

SWMU E is the former waste water treatment plant. Boeing has drawings.

SWMU 35 (9-120 oil/water separator) has manholes on either side of a vault with oily water flowing from one manhole through the vaulted area where there are baffles out through the other manhole where it is clean.

In Building 9-120, in the model shop is a paint booth (no SWMU #) with an accumulation area (D034) inside the paint booth. There are five 5-gallon containers:

Rags with resins
Rags with MEK
Rags and empty containers
Aerosol cans
Acetone and xylene in a container in a pan

In building 9-120 is the smallest paint booth. There are two 5-gallon containers. One has solvent rags dated 7/1/94 and the other has acetone and xylene (D001).

Station D031 is a hazardous waste accumulation area in a small room. There were containers of aerosol cans, batteries, solvent rags, and oily rags. The room had a small vent but there was an odor.

SWMU 36 was an oil/water separator. There was loose debris visible on the baffles. The oil/water separator is cleaned thoroughly once a year.

Building 9-99

Station D008 contained one 55-gallon drum with oil on a drip pan with a grating and one drum of absorbent pads and rags.

Station D007 contained five containers on a drip pan as follows;

Oil, 55-gallon
Oily rags, 55-gallon
Solvent rags, 55-gallon
Acetone and xylene, 5-gallon, dated 7/19/94
Aerosol cans, 5-gallon

Leave Building 9-99

SWMU H an oil/water separator adjacent to Bldg 9-99 discharges to the sanitary sewer. Floor drains and eye washes in Building 9-99 drained to this oil/water separator. Now most are plugged.

Building 9-75, SWMU F is a 4,000 gallon UST that was removed and has associated monitoring wells. There was also an associated 75 gallon sump. The tank was removed in 1985 or 86. There was solvent in the ground so the oil was contaminated with solvent.

Recyclables and garbage are located behind building 9-50 in totes, some have wheels. There is also a trash compactor.

Building 9-50 had a steam cleaning area. The water was piped to an oil/water separator (SWMU G) near Building 9-64. The steam cleaning operation ceased in approximately 1985 and the oil/water separator was removed in approximately 1987.

Building 9-50

SWMU 4, a rain water tank was used to store rain water collected from blind sumps in the area. There is an adjacent tank that was to store solvents and SWMU 4 was originally installed to collect spills from this tank. However, the solvent tank was not used so SWMU 4 the rain water tank was used to collect rainwater. It is currently not used and is going to be removed.

SWMU 5, a former container storage area has a sump across the front, approximately 6 inch curbs on two sides, Building 9-50 to the back, and a roof. Borings have been installed and sampled. The area is fenced.

Building 9-60, SWMU 16 in undergoing closure, only Bay 1 and the staging area contained wastes. Bay 1 had approximately 6 inch curbing on three sides and a sump across the front. There was staining present. The staging area had 1 to 2 inch curbs for small sections with a trench along the edges. The floor slopes towards a sump. One side is not curbed and would drain to a drain that goes to an oil/water separator with an valve. There were cracks in the floor and the area was covered.

Building 9-70 is undergoing closure. It has 8 bays with 6 inch curbing, sumps across the front, steel dividers and a covered steel shed. There were stains and cracks in the floors. There was an uncontained area behind the shed that was used for consolidation and to drop off wastes. The wastes were not stored overnight. The area is fenced.

SWMU K in Building 9-67, is an incinerator with two chambers and ram feed used for burning microfiche, mylar, and microfilm. The two stage burners are arranged such that the primary burner is on the floor level and the secondary burner is above. The unit has been in operation since 1988. It uses natural gas as a fuel. The ash is disposed as a non-hazardous waste. It has been tested.

There is a paper shredder in the same building. The shredded paper is suspended in air and goes out the top of the building suspended in air. It passes through a cyclone, is mixed with water, and then through a screw press. The waste water is collected in a sump and is recycled in the system. The paper is sent to Yidings for soil compost.

AOCs 3 and 4 are USTs located behind Building 9-52. They are active and contain diesel fuel and gasoline. They replaced tanks that leaked.

Building 9-52

SWMU 13 is an accumulation area in the paint storage room that has a blind sump across two doors. The following three drums were located on a mobile drip pan:

Acetone, 55-gallon
MEK rags, 55-gallon
Aerosol cans, 5 gallon

There were also paints and solvents present.

Two paint booths (SWMUs 10 and 11) in Building 9-52 were in use so they could not be viewed. There were no accumulation areas in these booths.

SWMU 12 was a paint booth in the stencil shop. It was a small booth on a bench. There was a rag kick can next to the booth.

SWMUs 14 and 15 (accumulation areas) were no longer present.

The list of waste stations was started in 1991. It includes both active and inactive accumulation stations. One will be provided by Boeing.

SWMU 6 the steam cleaning waste water tank is an above ground tank contained in steel that replaced a 300 gallon UST that had been used for the same purpose. This tank is adjacent to Building 9-51.

Building 9-51

SWMU 7 the steam cleaning sump is used to collect steam cleaning water. The sump used for secondary containment has a water sensor and pipe. Sand fills the secondary sump and a plate over the top is flush with the floor.

SWMU 8, station D004, is in the steam cleaning room it contained one 55-gallon drum of oil, one 35-gallon drum of rags, and one 5-gallon can of aerosol cans.

There were also 17 batteries in the steam cleaning room on shelves and the floor that were to be recycled.

In the shop next to the steam cleaning room, was a NAPA parts washer that is pumped into a drum when it is spent, approximately every 6 months. There are approximately 8 parts washers throughout the plant.

Building 9-51 is the facilities building.

SWMU 9, station D033, contained the following five containers:

MEK rags, 5-gallon
Mercury potassium hydroxide batteries, 5-gallon
Aerosol cans, flammable, 5-gallon
Aerosol cans, non-flammable, 5-gallon
Oily rags, 35-gallon

There was no additional containment.

SPILL REPORTS

Date	Substance/Quantity
1/6/94	Oil/3 gallons
1/4/94	Ethylene glycol/0.5 qts
1/19/94	Hydraulic fluid/100 lbs
1/22/94	Hydraulic fluid/1.5 gallons
1/25/94	Diesel fuel/20 gallons
2/3/94	Hydraulic oil/400 gallons
2/4/94	Hydraulic oil/150 gallons
2/12/94	Coolant/25,000 gallons (copied)
2/21/94	Gas/6-8 oz
2/21/94	Diesel/75 gallons (copied)
2/25/94	Hydraulic oil/0.5 gallons
4/21/94	Hydraulic oil/10 gallons
5/24/94	Gas (copied)
5/23/94	Mercury switch/ all recovered no quantity
6/30/94	Paper Slurry (copied)
2/12/92	Picric acid/1 qt
3/2/92	Hydraulic fluid/1 gallon
3/19/92	Mercury/0.01 lbs
4/20/92	Hydraulic fluid/15 gallons
5/24/92	Hydraulic fluid/75 gallons
8/14/92	Hydraulic fluid/10 gallons
9/1/92	Ethylene glycol/240 lbs or 30 gallons
10/27/92	Hydraulic fluid/split hose not quantity
10/3/92	Hydraulic fluid/30 gallons
11/16/92	Caustic soda/4 gallons
12/22/92	Ethylene glycol/1.1 lbs
12/20/91	Hydraulic fluid/20 gal
12/3/91	Hydraulic fluid/700 lbs or 100 gallons
11/20/91	Coolant and graphite dust/145 gallons
11/4/91	Fuel/4-5 gallons
10/21/91	Hydraulic fluid/100-125 gallons
10/4/91	Hydraulic fluid/15 gallons
1/16/91	Hydraulic fluid/3 gallons
1/18/91	Diesel/1 gallon
2/7/91	Hydraulic Fluid/3 gallons
2/8/91	Oil/0.5 gallons
3/6/91	Latex Paint/18-19 gallons
3/15/91	Hydraulic fluid/10 gallons
3/21/91	Mercury Thermometer/10 grams
3/26/91	Hydraulic Oil/Not recorded
3/29/91	Hydraulic oil/5 gallons
3/31/91	Liquid nitrogen tank leaked approximately 95 inches
4/19/91	Hydraulic fluid/15 gallons
4/20/91	Dearborn 547 (coolant and water)/25 gallons
5/3/91	Paint/1 gallon
5/16/91	Hydraulic fluid/0.5 gallons
5/24/91	copied
6/4/91	Hydraulic fluid/1 gallon
6/25/91	Acetone/2 gallons
6/8/91	Diesel/20 gallons

Date	Substance/Quantity
7/5/91	Hot Asphalt/1 pint
7/24/91	Hydraulic oil/Not recorded
8/4/91	Hydraulic oil/1 gallon
8/6/91	Hydraulic oil/30 gallons
8/11/91	Sodium Dichromate sulfuric acid/0.5 gallon
8/12/91	Hydraulic oil/30 gallons
3/21/90	Hydraulic oil/5 gallons
3/15/90	Hydraulic oil/5 gallons
3/1/90	Hydraulic oil/10 gallons
2/28/90	Hydraulic oil/20 gallons
2/28/90	Gasoline/2 gallons
2/21/90	Diesel/1 pint
2/20/90	Gasoline/1-2 gallons
2/9/90	Hydraulic fluid/5 gallons
1/29/90	Computer battery sulfuric acid/1 oz
2/9/90	Battery acid/9-12 volt batteries
1/25/90	Hydraulic oil/2 gallons
1/24/90	BMS 7-11 solvent/0.5 gallons
1/12/90	Oil/1 gallon
1/8/90	Desothane (Aliphatic polyurethane enamel)/0.5 gallons
1/8/90	Transmission fluid/1 gallon
12/18/89	Hydraulic oil/1 qt
12/18/89	Antifreeze/1 pint
12/15/89	Coolube (coolant for Milling machine)/15 gallons
10/30/89	Alkyl trimethyl diamine (copied)

1993	
12/3	Oil/water/15 gallons to storm sewer
12/7	Hydraulic Oil/30 gallons
12/8	Antifreeze/250 gallons
11/1	Hydraulic Oil/20 gallons
11/1	Hydraulic Oil/40-60 gallons
10/17	Hydraulic Oil/2 gallons
10/22	Motor Oil/3.5 lbs.
10/11	Diesel/7 gallons
9/27	Diesel/15 gallons
8/24	Hydraulic Oil/2 gallons
8/17	H2SO4/3 lbs.
6/25	Hydraulic Oil/240 lbs.
6/25	H2SO4/2 oz.
6/9	Diesel Fuel Separator/140 lbs.
5/30	Oil/Water Separator/3-5 gallons
5/20	Hydraulic Oil/20-25 gallons
4/16	Hydraulic Oil/15 gallons
3/24	Hydraulic Oil/1 gallon
3/24	Hydraulic Oil/455 lbs.
3/16	Hydraulic Oil/21 lbs.
3/15	Hydraulic Oil/3 gallons
2/23	Hydraulic Oil/30 gallons
2/11	Gasoline/4 gallons
2/9	Oil/2 gallons
2/8	Hydraulic Oil/25 gallons
1/13	Hydraulic Oil/10 gallons
1/11	Gasoline/14 lbs.
1990	
12/13	H2SO4/0.5 gallons
12/11	Antifreeze/0.5 gallons
12/7	Antifreeze/300 gallons
12/4	PH-O/0.5 gallons
11/5	WSDW Liquid/2-5 gallons
10/12	Degreaser/1 gallon
10/11	Transmission Fluid/0.5 cup
10/10	Oil/2 cups
10/4	Asphault Sealer/1 gallon
9/13	Laquer Thinner/5 gallons
9/12	Hydraulic Oil/15 gallons
8/30	Hydraulic Oil/1 gallon
8/22	Mercury/1 oz. to 1 quart
8/14	Diesel Fuel
8/3	WSDW Liquid/1 quart
7/30	Hydraulic Oil/10 gallons
7/26	CuSO4/5 gallons
7/24	Dearborne 547/60 gallons
7/22	Battery Acid/1 cup
7/20	Motor Oil/1 quart
6/28	Battery Acid/1 quart
6/12	Defoamer/10 gallons
6/4	Hydraulic Oil/1 gallon
6/1	Polyenamel Drying Fluid/1 gallon

5/24	Coolube/1 quart
5/17	Oil/10 quarts
5/15	Avonofoam/500 gallons
5/8	Gear Oil/0.5 gallons
5/4	Diesel/25 gallons
5/2	Hardener/1 gallon
4/20	Coolube 21/1 gallon
4/5	Gasoline/0.5 gallons
3/30	H2SO4/0.5 quart

APPENDIX C

Waste Accumulation Areas List

TABLE A-2

1994 9-04 BUILDING

COLLECTION POINT	BUILDING	COL/ROW	STATUS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DAILY INSP.	9--04	WASTE BAY	OPEN	X	X	X	X	X	X						

TOTAL OPEN STATIONS - 1

WAZSITE.XLS

TABLE A-2

D-031	9-120	A-3	OPEN	X	X	X	X	X	X						
D-032	9-120	ROOM 116	OPEN	X	X	X	X	X	X						
D-033	9--51	M-4	OPEN	X	X	X	X	X	X						
D-034	9-120	MODEL LAB	OPEN	X	X	X	X	X	X						
D-035	9-120	C-5	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-036	9-120.3	A-2	OPEN	X	X	X	X	X	X						
D-037	9-140	OAD DOC	OPEN	X	X	X	X	X	X						
D-038	AUSTIN ST	NE 9-101	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-039	9-102	B-5	OPEN	X	X	X	X	X	X						
D-040	9--70	IL HOUS	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-041	9--50	DR N-9	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-042	9-08.4	REPRO	OPEN	X	X	X	X	X	X						
D-043	9-101	Y-7	OPEN	X	X	X	X	X	X						
D-044	9-101	D-14	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-045	9-90.2	K-3	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-046	9-101	K-15	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-047	9--51	ST CL SM	OPEN	X	X	X	X	X	X						
D-048	9--51	ST CL TNK	OPEN	X	X	X	X	X	X						
D-049	9-101.1	M-13	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-050	9-101	X-9	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-051	9-101	S-9	OPEN	X	X	X	X	X	X						
D-052	9--52	C-3	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-053	9-101.1	E-2	OPEN	X	X	X	X	X	X						
D-054	9-101	T-19	OPEN	X	X	X	X	X	X						
D-055	9-101	E-22	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-056	9-101.2	D-11	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-057	9-101.2	L-5	CLOSED	X	X	X	X	X	X/C	C	C	C	C	C	C
D-058	9--53	SH-SA	OPEN	X	X	X	X	X	X						
D-059	9-77.3	H-17	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-060	9-101.1	P-3	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
D-061	9-101.1	N-13	OPEN	X	X	X	X	X	X						
D-062	9-96.2	F-20	OPEN	X	X	X	X	X	X						
D-063	9-101.1	U-9	OPEN	X	X	X	X	X	X						
D-064	9-101.2	R-11	OPEN	X	X	X	X	X	X						

PART 2
BOEING MILITARY FLIGHT CENTER

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1.0 INTRODUCTION

This section of the Boeing Military Flight Center Preliminary Review/Visual Site Inspection (PR/VSI) report outlines the purpose and scope of the RCRA Facility Assessment (RFA). Other report sections are also described below.

1.1 PURPOSE AND SCOPE OF THE RFA PROGRAM

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) provide authority to the Environmental Protection Agency (EPA) to require comprehensive corrective action on all solid waste management units (SWMUs) and other areas of concern (AOCs) at interim status hazardous waste management facilities where a release(s) of hazardous constituents has occurred. These include RCRA interim status facilities, those applying for Part B permits, and those undergoing closure. The intent of this authority is to address previously unregulated constituents released to air, surface water, ground water, and soil, as well as the generation of subsurface gases.

A major activity of the EPA's corrective action program consists of the RFA. According to the EPA's RCRA Facility Assessment Guidance Document (1), the purposes of the RFA are to:

1. Identify and gather information on releases at RCRA-regulated facilities;

2. Evaluate solid waste management units (SWMUs) and other areas of concern (AOCs) for releases to all media and regulated units for releases to media other than ground water;

3. Make preliminary determinations regarding releases of concern and the need for further actions and interim measures at the facility; and

4. Screen from further investigation those SWMUs which do not pose a threat to human health or the environment.

The three basic steps of the RFA consist of a preliminary review (PR) of existing files and other generally available information, a visual site inspection (VSI) to confirm and/or obtain additional information on past or present releases, and when warranted, a sampling visit to fill file information data gaps by obtaining field and analytical data.

1.2 <u>REPORT CONTENTS</u>

This report provides a summary of the PR of files and the Visual Site Inspection for the Boeing Military Flight Center in Seattle, Washington. Primary sources of information utilized in this review include files and correspondence of EPA Region 10 and the Washington State Department of Ecology (Ecology).

Section 2.0 of this report describes the Military Flight Center and its operations. Information pertaining to the environmental setting is presented in Section 3.0. Finally, Section 4.0 provides a description of SWMUs identified in the course of the assessment. The discussion of each SWMU includes unit description, period of operation, wastes managed, release controls, and release history.

Appendix A contains photographs taken as part of the VSI. The field notes from the VSI are in Appendix B. Finally, Appendix C contains a list of current and former accumulation areas.

2.0 FACILITY DESCRIPTION

2.1 LOCATION AND HISTORY

The Boeing Military Flight Center is located at 10008 East Marginal Way South in Seattle, Washington (Figure 1). The facility consists of four buildings, six trailers, and 10 flight stalls on less than 20 acres. Electronic equipment is calibrated and installed at this facility on Boeing 707s purchased by the military.(2,3,4)

Prior to 1991, the Military Flight Center operated as part of the Boeing Developmental Center under the same EPA identification number. In 1990, Boeing Aerospace and Electronics underwent a reorganization, at which time the Military Flight Center was separated from the Developmental Center. Following Boeing's 1990 request for a unique identification number attached to a Notification of Dangerous Waste Activities form, the Military Flight Center was given its own identification number.(2,5,6,7)

The Military Airplane Company Division of Boeing has operated the Military Flight Center since 1952. The Boeing Developmental Center began operations on October 1980, with the operation of this facility transferring to the Boeing Advanced Systems Company Division in November 1987.(8,9,10)

The Meadows, a horse racing track that operated from 1902 to the late 1920's, occupied this site prior to the Military Flight Center. An auto wrecking yard (still active) is located on the southern boundary of the site. The wrecking yard overlapped onto the site prior to Boeing's use, starting in 1952. The auto wrecking business is Calkin's Towing and Auto Wrecking.(8)

2.2 IDENTIFICATION OF SOLID WASTE MANAGEMENT UNITS

During the course of this assessment, 21 solid waste management units (SWMUs) were identified. These are listed below in Table 1. Locations of the SWMUs are shown on Figure 2.

2.3 FACILITY OPERATIONS

The Military Flight Center generates wastes associated with testing and installing electronic equipment on Boeing 707s and other Boeing planes; these wastes include oil, jet fuel, solvents, paint sludges, and rags. These waste are accumulated near their point of generation in accumulation areas (SWMUs 1 through 5) located in sheds near the flight stalls, in the maintenance area, and in a calibration laboratory, where cleaning solvents and adhesives are used during calibration of the airplane electronics. Wastes from the accumulation areas are sent to a staging area (SWMU 6) prior to being shipped off site for disposal at a local TSD facility, Burlington Environmental.(2,3,8,9)

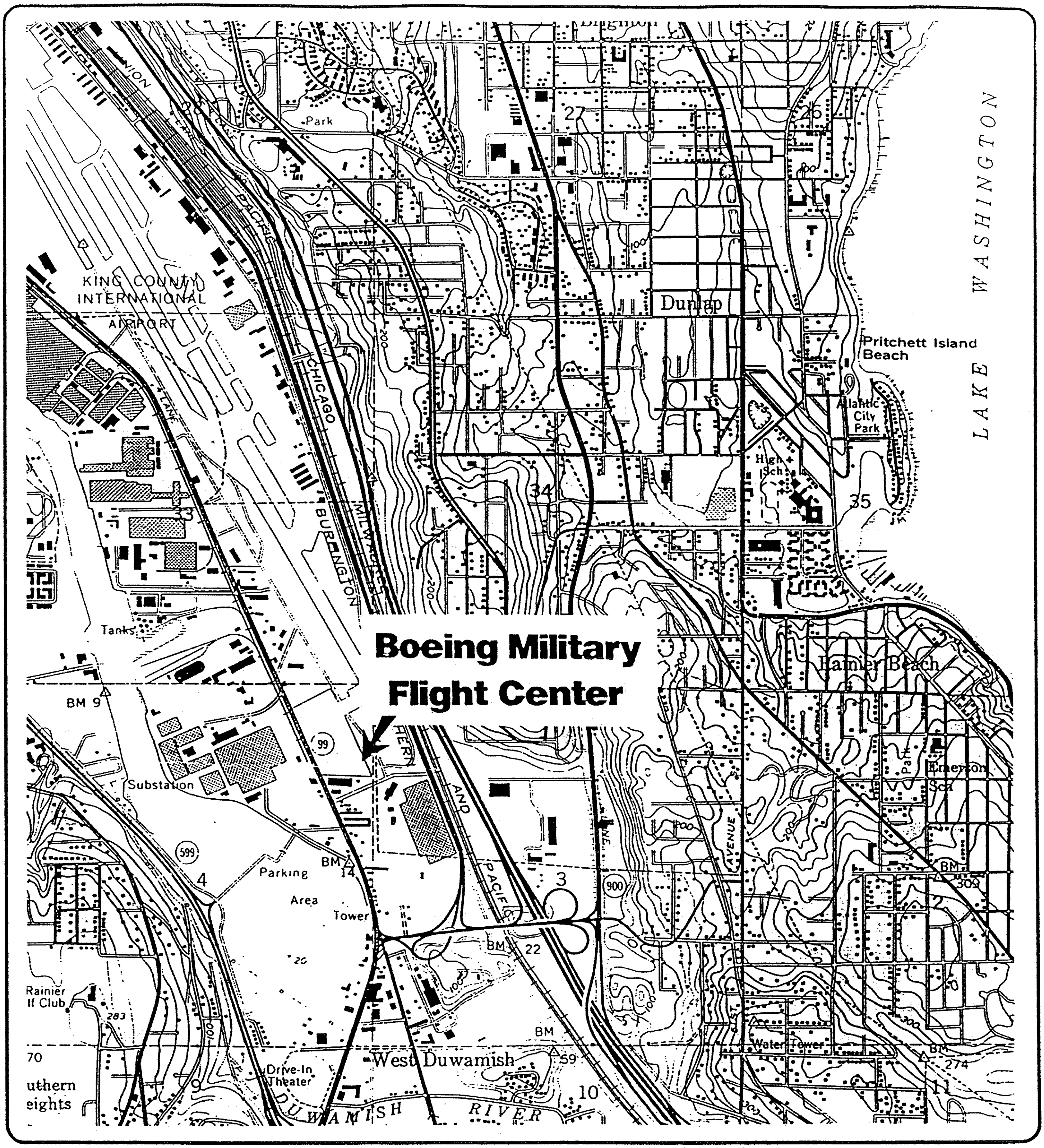

Figure 1

SITE LOCATION MAP
BOEING MILITARY FLIGHT CENTER

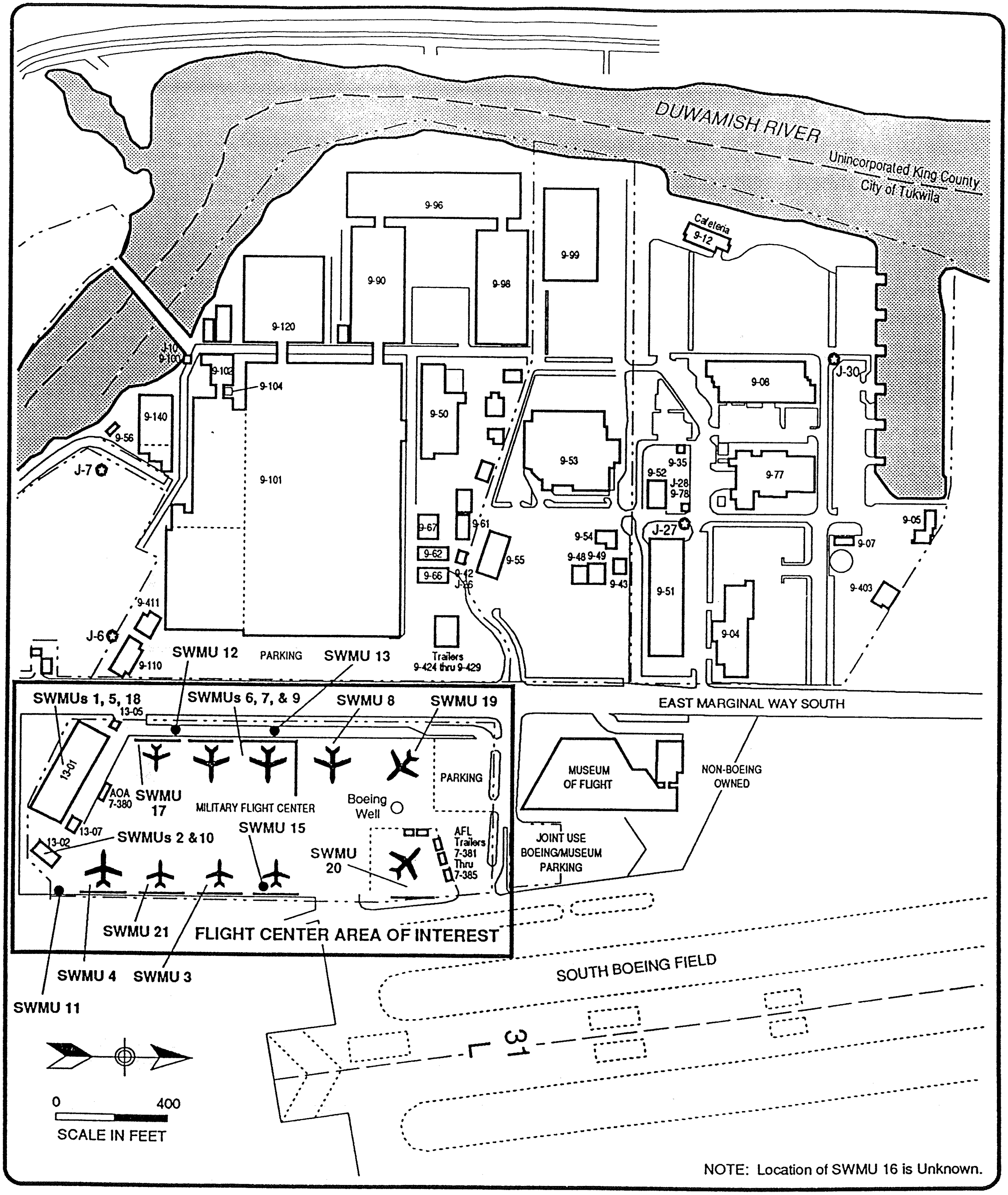

Figure 2

LOCATION OF SWMUs AT
BOEING MILITARY FLIGHT CENTER

TESMISC\BOEING2.DRW 9/19/94

Table 1

SOLID WASTE MANAGEMENT UNITS AT THE BOEING MILITARY FLIGHT CENTER

SWMU NO.	DESCRIPTION
SWMU 1	Accumulation Area M001
SWMU 2	Accumulation Area M002
SWMU 3	Accumulation Area M007
SWMU 4	Accumulation Area M008
SWMU 5	Accumulation Area M013
SWMU 6	Current Staging Area M005
SWMU 7	Former Staging Area
SWMU 8	Condensate Receiving Vault
SWMU 9	Former Wash Stall Collection Tanks
SWMU 10	Former Steam Cleaning Area
SWMU 11	Storm Water Oil/Water Separator 1
SWMU 12	Storm Water Oil/Water Separator 2
SWMU 13	Wash Water Oil/Water Separator
SWMU 14	Storm Water Sewer System
SWMU 15	Former Accumulation Area M003
SWMU 16	Former Accumulation Area M004
SWMU 17	Former Accumulation Area M006
SWMU 18	Former Accumulation Area M009
SWMU 19	Former Accumulation Area M010
SWMU 20	Former Accumulation Area M011
SWMU 21	Former Accumulation Area M012

2.3.1 Hazardous Waste Management

The Military Flight Center generates the following general categories of waste streams:

- Paints and solvents,
- Resins,
- Used batteries,
- Alodine solution,
- Contaminated debris,
- Contaminated waste oil and fuel,
- Contaminated waste water, and
- Contaminated rags.

Table 2 presents additional information on Boeing's management of these waste streams at the Military Flight Center, including hazardous waste codes for the various waste streams, and annual quantities managed. The above information and Table 2 are based on the Notification of Dangerous Waste Activities form that was filed by Boeing in 1990 and Boeing's 1993 Generator Annual Dangerous Waste Report.(5,8)

All hazardous wastes are accumulated in accumulation areas (SWMUs 1 through 5), then moved to the staging area (SWMU 6). They are consolidated and prepared for shipment in the staging area. Resource Recovery picks up the wastes and transports them to Burlington Environmental.(8,11)

Table 2

HAZARDOUS WASTE MANAGEMENT AT THE BOEING MILITARY FLIGHT CENTER

Waste Category	Hazardous Waste Codes	Dates Managed	Annual Quantity Managed (lb/yr)
Oily water, soap, JP4 (Jet fuel), Grease, Dirt (FP 200F) and ethylene glycol	WT02	1991 (1993)	395,965 (39,002.9)
Used Batteries; mercury, potassium hydroxide	D009, D002, WT01	1993	42.2
Rags and debris contaminated with oil and diesel fuel	WT02	1991 (1993)	1,385 (5,160.4)
Oil mixtures	WT02	1991 (1993)	7,073 (3,993.6)
Containers with paints, inks, barium, chromium, lead, acetone, methyl ethyl ketone, 1,1,2-trichloro-trifluoroethane, sealants	F002, F005, D007, D008, D035, WT01, WP01, WC02	1993	2.059.1
Paint, methyl ethyl ketone, resins, and sealants with debris	WT02, F005	1991	200
Oil contaminated debris and paint sludge	WT02	1991	229
Jet fuel A/JP4/JP5/JP10	WT02	1991	1,090
Rags contaminated with solvents	F002, F005, D007, D008, D035, WT02, WP01	1991 (1993)	563 (1,531.6)
Gas, diesel, oil (contaminated)	WT02	1991	376
Debris with gas and oil	WT02	1991	876
Rags and debris contaminated with alodine 1200: chromic acid, potassium fluoborate	D007, WT01, WC01	1993	176.8
Alodine Solution: chromic acid	D002, D007, WT01, WC01	1993	43.8
Aerosol cans of paint adhesive: acetone, barium, benzene, isobutane, methyl ethyl ketone, propane, 1,1,1-trichloroethane; solvent products: 1,1,2-trichloro-1,2,2-trifluoroethane	D001, D005, D018, D035, WT01, WP01, WC01	1993	736
Aerosol cans and sprayer units: dichlorodifluoromethane, chlorodifluoromethane; 1,1,2-trichloro-1,2,2-trifluoroethane	U057, WT02, WP01	1993	185.8
Solvents/solvent products: methylene chloride, 1,1,1-trichloroethane, trichloroethylene; contaminated with oils and dirt	F001, D040, WT01, WP01, WC01	1993	175.2

Source: Reference (5,8)

2.3.2 Non-Hazardous Solid Waste Generation

Based on the available waste stream file information, the following types of non-hazardous wastes have been identified as being present at the Boeing facility:

- Oil water mixture from oil/water separators and maintenance,
- Spent Anti-freeze,
- Oil, hydraulic fluid, and jet fuel,
- Rags contaminated with oil and grease,
- Cardboard,
- Trash,
- Wood Waste,
- Confidential papers,
- Magnetic media,
- Aluminum cans,
- Scrap metal,
- Plastic sheeting, and
- Newspapers.

The Military Flight Center has two oil/water separators on the two main storm water sewer system lines that collect oil from storm water prior to discharge to the Duwamish River. There is also an oil/water separator that removes oil from wash water from the wash stall prior to discharge to Metro. The oil/water separators are cleaned annually.(3,8)

Waste oil, antifreeze, fuels, and contaminated rags are collected in drums in the accumulation areas with the hazardous wastes.(8,11)

The other waste types, cardboard, trash, wood waste, confidential papers, magnetic media, aluminum cans, scrap metal, plastic sheeting, and newspapers are transported across the street to the Developmental Center and handled with the Developmental Center wastes.(8,11)

2.4 REGULATORY HISTORY

2.4.1 RCRA Notification and Permit History

Since the Military Flight Center was part of the Boeing Developmental Center until they were separated in 1991, the following descriptions include both the Boeing Developmental Center and Military Flight Center.

Boeing Developmental Center submitted a Notification of Hazardous Waste Activity form to EPA, identifying the facility as a generator, in August 1980. Approximately 660,000 pounds of waste per year was reported along with a storage capacity of 11,000 gallons in containers and 5,000 gallons in tanks. Neither the container waste accumulation area nor the tanks were located at the Military Flight Center.(12)

In November 1980, the Boeing Developmental Center, Inc., submitted a Part A permit application as a storage facility and was granted Interim Status by EPA. The facility's Part A permit was revised in April 1985, increasing the annual waste quantity to 1,017,000 pounds. In April 1988, the Part A was again revised to reduce the waste quantity to 488,000 pounds and indicated that the tanks were no longer used to store waste.(13,14,15)

The facility never submitted a Part B permit application. In April 1989, the Boeing Developmental Center formally withdrew their Part A permit and reverted to generator status.(12,16)

In July 1990, Boeing submitted a Notification of Dangerous Waste Activities form to the Washington State Department of Ecology (Ecology) and EPA Region 10 requesting generator status for the Military Flight Center; at the same time, Boeing requested that a separate facility identification number be issued for the Military Flight Center that would take effect as of January 1, 1991. A separate number was issued by EPA with the stipulation that any RFA would involve both facilities.(5)

2.4.2 RCRA Interim Status Compliance History

During the time period the Military Flight Center was part of the Developmental Center (1980 - 1990), five RCRA CEIs and one other Ecology inspection were conducted at the Boeing Developmental Center facility, including: December 1981 (Ecology), February 1984 (Ecology), June 1988 (EPA), August 1989 (Ecology), August 1991 (Ecology), and February 1991 (Ecology). Results of these inspections are summarized below:

- December 1981 - No information was found in the files indicating there were violations as a result of this CEI. (22)

- February 1984 - No information was found in the files indicating there violations as a result of this CEI.(21)

- June 1988 - A Notice of Violation was sent to Boeing noting that during the CEI Boeing was found to have inadequate warning signs, inadequate training, lack of notification to local agencies regarding Boeing Developmental Center's layout and hazardous wastes locations, no evacuation plan, an incomplete closure plan, and one hazardous waste container without an accumulation date.(20)

- August 1989 - As a result of the CEI, a letter was sent to Boeing citing Boeing for failure to attach Notification of Certification for Land Ban Dangerous Wastes to manifests and for failure to maintain continuous inspection records.(18,19)

- August 1991 - This CEI cited Boeing as having an incomplete training plan at the Military Flight Center.(17)

- February 1991 - Ecology met with Boeing personnel and toured the Military Flight Center, following Boeing's request to separate the facilities. After the site tour, Ecology and Boeing personnel discussed separating the Military Flight Center from the Developmental Center. It was decided by Ecology that since both facilities had contributed to the storage areas at the Developmental Center, if an RFA was performed, both facilities would be inspected.(7)

2.4.3 Other Permits

2.4.3.1 WPCC Permit

In 1970, Washington Pollution Control Commission issued a temporary permit for discharge to the sanitary sewer. Boeing was permitted to discharge sanitary, storm water, airplane wash water, and water from fueling areas that had passed through an oil/water separator. This permit expired in December 1972.(8)

2.4.3.2 Metro Permits

The Municipality of Metropolitan Seattle (Metro) issued a Discharge Authorization for Special/Minor Discharger, Permit Number 135, to Boeing. It was in effect from October 1, 1988 through October 1, 1990. Metro again issued a Discharge Authorization for Special/Minor Discharger, Permit Number 363, to Boeing effective April 17, 1992 through April 17, 1997. There was no permit provided for the period between October 1990 and April 1992.(8)

2.4.3.3 NPDES Permits

In 1975, an NPDES permit was issued to Boeing by Ecology for discharge of non-storm water to the Duwamish River. At that time, the Military Flight Center was part of the Boeing Developmental Center. There was no expiration or start dates on the permit provided. In March 1988, Boeing requested that their NPDES permit (a second permit), which had expired in November 1987 be reissued. Later in August 1988, Boeing stated that they were no longer discharging non-storm water and asked Ecology to cancel their NPDES permit. Boeing is currently operating under an Ecology issued NPDES and State Waste discharge Baseline General Permit for Storm Water Discharges Associated with Industrial Activities. It is effective from December 18, 1992 through November 18, 1995.(8,23)

2.4.3.4 PASAPCA

In 1987, when Puget Sound Air Pollution Control Agency's (PASAPCA) Notice of Construction/Registration became functional, many pieces of air contaminant emitting equipment were included simply by being on a list maintained by Boeing. Those that were listed for the Military Flight Center included two boilers, one fume hood, and a solvent cleaning tank. Only the solvent cleaning tank was formally removed from the air sources registration. The other three sources are no longer used. There are currently no PASAPCA registered sources at the Military Flight Center.(8)

3.0 ENVIRONMENTAL SETTING

3.1 LOCATION AND SURROUNDING LAND USE

The Boeing Military Flight Center is located in an industrial area along East Marginal Way South in Seattle, Washington (Figure 1). The facility is located in the NE 1/4, Section 4, T23N, R4E W.M. (latitude 47° 30' 54", longitude 122° 17' 55").(4,10)

The Boeing Development Center is located across Marginal Way, west-southwest of the Military Flight Center; the Museum of Flight is immediately to the north of the Military Flight Center, with Boeing Field to the east. South Norfolk Street defines the southern border of the Military Flight Center (Figures 1 and 2).(12)

3.2 METEOROLOGY

The Puget Sound/Seattle area is marked by cool, dry summers and mild, rainy winters. The dry season occurs from about April through September, with the wet season from October to March. Average annual precipitation is approximately 34 inches at the site. Temperatures range from a daily average of 35° F in January, to 70° F in July and August.(24)

3.3 SURFACE HYDROLOGY

The Military Flight Center is situated approximately 1,000 feet northeast of the Duwamish River Waterway (Figure 1), which discharges into Elliot Bay of Puget Sound. The Duwamish River, which discharges at an annual average rate of 1,660 ft^3/sec into the Bay, is influenced by tidal action over its lower 10 miles, where it becomes a salt wedge estuary. The toe of the wedge fluctuates along the lower 10 miles of the Duwamish as a function of river flow rates and tides. Statistically, river flow is below the annual average flow rate through the months of July to October, with lowest flow typically occurring during the month of August. The highest flows are usually in the months of January and December.(25)

Runoff of surface drainage from the Military Flight Center is routed to storm sewer lines along the east and west sides of the facility. The east side drainage flows into a ditch, the outfall of which is connected to one of the oil/water separator. Two oil/water separators are used to treat surface drainage from the field area, before it is discharged to storm sewers which outfall into the Duwamish River.(25)

3.4 GEOLOGY AND GROUND WATER HYDROLOGY

3.4.1 Geology

The Military Flight Center is located in the Duwamish Valley lowland, which is an alluvium filled remnant of a Pleistocene marine embayment. The Valley, which in the area of the Boeing Military Flight Center is generally at or below 25 feet above mean sea level in elevation, is bordered by glacial drift plain uplands both to the east and west where occasional outcrops of Tertiary bedrock occur.(24)

The stratigraphy beneath the site is, from oldest to youngest: 1) consolidated Tertiary sedimentary and volcanic rocks, 2) semiconsolidated to unconsolidated strata of Pleistocene to Recent ages, and 3) Quaternary alluvium. The stratigraphy recorded in an abandoned 686-foot deep Boeing Airplane Company well drilled in 1947 (Figure 2) indicated an interbedded succession of sand, clay, gravel and "mud" down to 200 feet below ground surface, whereupon the well penetrated 220 feet of blue and sandy clay. Below this clay was a series of sands and clays within which the well was perforated adjacent to a 100-foot thick sand layer to produce artesian water.(24,28)

3.4.2 Ground Water Hydrology

Ground water at the Boeing facility occurs within unconfined aquifers in the Quaternary alluvium in the Duwamish Valley, and in confined aquifers within the deeper consolidated sediments, as evidenced by the drilling records of the Boeing Airplane Company well. Washington State records indicate shallow depth ground water had been developed for irrigation use in the 1950's near the Military Flight Center, where six well points were driven between 17 and 22 feet below ground surface to yield water. A sample of water collected from this system in March 1955 contained 83 mg/l chloride.(24)

A sample of water from the Boeing well was tested by the U.S. Geological Survey in April 1954 and was found to have a concentration of chloride at 348 mg/l, which is above the 250 mg/l Secondary Drinking Water Level (SDWL) for chloride. The calculated total dissolved solids (876 mg/l) from the same sampling event for this well also exceeded the SDWL of 500 mg/l.(24)

Approximately 2 miles southwest of the site is the Highline well field where the City of Seattle extracts water for public use from confined aquifers within the glacial till sequence; the glacial till sequence forms the border for the Duwamish Valley.(27)

4.0 DESCRIPTION OF INDIVIDUAL UNITS

Twenty-one solid waste management units (SWMUs) were identified and evaluated during the preliminary review (PR) and the July 26, 1994 visual site inspection (VSI) at the Boeing Military Flight Center. The following sections provide descriptive and historical information on each identified SWMU. Photographs taken during the VSI are included in Appendix A.

4.1 SWMUs 1 through 5 and 15 through 21 - ACCUMULATION AREAS

4.1.1 Information Summary

Unit Description: There are five active waste accumulation areas located throughout the Military Flight Center (SWMUs 1 through 5) and seven former accumulation areas (SWMUs 15 through 21). These accumulation areas consist of 5-, 30-, and 55-gallon drums where wastes are accumulated prior to being transported to the staging area (SWMU 6). Historically, when the Military Flight Center was part of the Developmental Center, wastes from these accumulation areas were sent to drum storage areas at the Developmental Center.(8,11)

Flight line stalls 76 and 80 (Figure 2), where planes are modified, have sheds for accumulating wastes associated with them, SWMUs 3 and 4 (M007 and M008), respectively. The sheds contain drums used for accumulating waste jet fuel, oil, rags, aerosol cans, antifreeze, used batteries, and other small quantities. The sheds have drip pans to contain spills built into the bottom and are enclosed.(8,11)

Building 13-01 (Figure 2) contains two accumulation areas, SWMUs 1 and 5. SWMU 1, accumulation area M001 is used to accumulate rags, aerosol cans, and used batteries. At the time of the VSI, five containers were present. One 55-gallon drum container of coveralls, one 5-gallon container of batteries, one 5-gallon container of flammable aerosol cans, one 5-gallon can of non-flammable aerosol cans, and one 5-gallon can of oily rags. The containers were sitting on the floor with no additional containment (photo 1). SWMU 5, accumulation area M013, is used to collect condensate water and oil from a compressor. At the time of the VSI, there was one 55-gallon drum of oily water sitting in a drip pan with sides that were approximately 6-inches high (photo 2).(8,11)

SWMU 2, accumulation area M002, is located behind Building 13-02 (Figure 2). It is an accumulation area for rags, aerosol cans, spent antifreeze, and oil. At the time of the VSI there were five drums in an enclosed steel shed with a grating over a built in drip pan. There was one 55-gallon drum of oily rags, one 30-gallon drum of waste oil, one 30-gallon drum of spent antifreeze, one 5-gallon drum of MEK solids (rags), and one 5-gallon drum of aerosol cans (photo 3).(8,11)

There have been a total of thirteen different accumulation areas used since Boeing started maintaining an accumulation area list in approximately 1991. SWMUs 15 though 21 (M003, M004, M006, M009, M010, M011, and M012) are all former accumulation areas. A list of the thirteen accumulation areas is attached in Appendix C. (2,7,8,9,11)

Dates of Operation: The five accumulation areas, SWMUs 1-5 were active at the time of the VSI. The seven former accumulation areas were inactive without known end dates. The start dates were not provided since the accumulation areas frequently change. Accumulation areas have probably been used since the Military Flight Center began operating, however, the number of accumulation areas and locations have changed as operations change.(8,11)

Wastes Managed: These units are used to manage wastes generated in Buildings 13-01, 13-02, and the flight stalls. These units manage all types of waste generated throughout the facility including waste jet fuel, oil, rags, aerosol cans, spent antifreeze, used batteries, and solvents.(8,9,11)

Release Controls: The sheds all have built-in drip pans to collect spills. Any drums not in the sheds that contain liquid are in drip pans. Some drums that contain solids were placed on the concrete floor of Building 13-01.(8,11)

History of Releases: There is no information indicating that releases from these units have occurred.

4.1.2 Conclusions

The potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas is low based on the quantity of materials stored and the containment.

4.2 SWMU 6 - STAGING AREA

4.2.1 Information Summary

Unit Description: SWMU 6 (area M005) is the staging area which receives hazardous wastes from the accumulation areas (SWMUs 1 through 5). The staging area is a portable shed located on the edge of the Stall 75, the aircraft wash stall (Figure 2). At the time of the VSI, the shed contained one 55-gallon drum of oily rags, two 30-gallon drums of oily rags, one 30-gallon drum of solvent rags, one 5-gallon container of batteries, one 5-gallon drum of waste fuel, and one 5-gallon drum of solvent (photo 4).(2,8,11)

Dates of Operation: 1993 through 1994.

Wastes Managed: Waste from all the accumulation areas (SWMUs 1 - 5) are sent to the staging area. The wastes managed could be anything generated throughout the Military Flight Center, including oil, fuel, rags, aerosol cans, spent antifreeze, used batteries, and solvents.(2)

Release Controls: The unit is a portable shed with a drip pan built into the bottom of the shed.(8,11)

History of Releases: There is no information indicating releases from this unit has occurred.

4.2.2 Conclusions

The potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas are low based on the containment and quantities of wastes handled.

4.3 SWMU 7 - FORMER STAGING AREA

4.3.1 Information Summary

Unit Description: SWMU 7, the former waste staging area, received hazardous wastes from the accumulation areas (SWMUs 1 through 5 and SWMUs 15 through 21). This SWMU was a portable trailer located on the edge of Stall 75, the aircraft wash stall (Figure 2). The trailer was used to store full drums of waste for less than 90 days prior to shipment off site for disposal. There was a built in secondary containment that was not described in the information Boeing provided.(8)

Dates of Operation: 1990 through 1993.(8)

Wastes Managed: Waste from all the accumulation areas (SWMUs 1-5 and 15-21) were sent to the staging area. The wastes managed could be anything generated throughout the Military Flight Center including, oil, fuel, rags, aerosol cans, spent antifreeze, used batteries, and solvents.(2,8)

Release Controls: Built in containment not described in the information provided by Boeing.(8)

History of Releases: There is no indication releases from this unit occurred.(8)

4.3.2 Conclusions

The potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas are low based on no past releases, the quantities of wastes managed and the fact that the unit is no longer used.

4.4 SWMU 8 - CONDENSATE RECEIVER VAULT

4.4.1 Information Summary

Unit Description: SWMU 8, the condensate receiver vault (Figure 2) is used to collect water containing less than 100 ppm of oil from an air compressor condensate receiver tank (photos 6 & 7). The unit consists of a concrete vault located in the ground near the air compressor. The vault can hold approximately 100 gallons of water which is pumped to a 55-gallon drum that is visually inspected for an oil sheen prior to being pumped to the sanitary sewer. Less than 55-gallons of water per month is generated.(8,11)

Dates of Operation: 1960 through 1994.(8)

Wastes Managed: Waste water containing less than 100 ppm of oil is accumulated in the vault prior to being pumped to a 55-gallon drum.(8)

Release Controls: The vault is concrete with no additional containment provided.(8)

History of Releases: There is no indication releases from this unit occurred.(8)

4.4.2 Conclusions

The potential for releases of hazardous constituents to air, surface water, or to generate subsurface gas are low based on the types of materials handled and the containment. The potential for releases to soil and ground water is unknown since the integrity of the concrete vault is unknown. If there are cracks in the concrete there is a potential for water with less than 100 ppm of oil to leak out into the soil and eventually the ground water.

4.5 SWMU 9 - FORMER WASH STALL COLLECTION TANKS

4.5.1 Information Summary

Unit Description: SWMU 9, the former wash stall collection tanks, were two 1,500 gallon steel tanks mounted on a flat bed located in Stall 75, the aircraft wash stall (Figure 2). Approximately 65,000 gallons of water containing detergents and oil from cleaning aircraft and ground equipment were generated each year. The water was shipped off site for treatment.(8)

Dates of Operation: 1986 through 1992.(8)

Wastes Managed: Approximately 65,000 gallons per year of waste water with detergents and oil from washing aircraft and ground equipment were generated.(8)

Release Controls: The tanks were located inside the wash stall. The stall has a concrete curbing ranging from 3 to 10 inches high to contain the wash water. It is not known what condition the containment was in during the time the collection tanks were in the stall. However, at the time of the VSI water was observed to be leaking between the curb and the asphalt allowing the water to leave the area (photo 5).(8,11)

History of Releases: Hose leaks from filling the tanks drained back into the secondary containment, the 8-inch curbing around the wash stall. However, the curbing was observed leaking during the VSI and the information provided by Boeing indicates small quantities of wash water were released outside the containment area.(8,11)

4.5.2 Conclusions

The potential for past releases of hazardous constituents to air or to generate subsurface gas are low based on the wastes managed. The potential for past releases to surface water, ground water, and soil are moderate based on the poor containment. However, the current potential for releases to the environment is low since the unit is no longer active.

4.6 SWMU 10 - FORMER STEAM CLEANING AREA

4.6.1 Information Summary

Unit Description: SWMU 10, the former steam cleaning area, was located in Building 13-02 (Figure 2). Steam cleaning was later done in Stall 75, the aircraft wash stall, and was finally eliminated. There was a concrete blind sump associated with the steam cleaning area, which was periodically pumped out. The sump was removed and filled in with concrete.(8)

Dates of Operation: The catch basin was operational until 1994.(8)

Wastes Managed: Waste water containing detergents and oil from steam cleaning equipment.(8)

Release Controls: The steel catch basin was the containment.(8)

History of Releases: There is no indication releases from this unit occurred.

4.6.2 Conclusions

The current potential for release of hazardous constituents to air, surface water, ground water, or soil or to generate subsurface gas are low since the unit is no longer active. The historic potential for releases to ground water, surface water, and soil were dependent on the integrity of the containment and the operations, which is not possible to assess at this time.

4.7 SWMUs 11 AND 12 - STORM WATER OIL/WATER SEPARATORS

4.7.1 Information Summary

Unit Description: SWMUs 11 (separator 1) and 12 (separator 2), the storm water oil/water separators, are located in the southeast corner of the facility and in the southwest parking lot, respectively (Figure 2). The oil/water separators are located on two storm water sewer lines used to collect storm water. The oil/water separators remove oil from the water prior to being discharged to the Duwamish River. The oil/water separators are constructed of concrete.(3,8,10)

Dates of Operation: Both oil/water separators were installed in 1987 and are currently active.(3,8)

Wastes Managed: This units are used to remove oil from storm water runoff. The waste oil and/or sludges are sent off site for treatment and disposal.(8)

Release Controls: The units are used as containment for storm water runoff. There is no additional containment associated with these units.(8)

History of Releases: There is no information in the file indicating whether releases from these units have occurred.

4.7.2 Conclusions

Based on the available information there is a low potential for release of hazardous constituents to air, ground water, or soil or to generate subsurface gas. If the oil/water separators are not maintained there is a potential that some oil may be released with the water into the Duwamish River.

4.8 SWMU 13 - WASH WATER OIL/WATER SEPARATOR

4.8.1 Information Summary

Unit Description: SWMU 13 is a 800 gallon oil/water separator located next to Stall 75, the aircraft wash stall. When planes are cleaned in the wash stall, this oil/water separator receives water from a 26- by 32- by 33-inch high catch basin located at the front of the wash stall inside curbing. The curbing ranges from 3- to 10-inches high at the front of the wash stall (photo 5). The oil/water separator is part of a containment system associated with wash stall 75. The detergents in the water prevented the oil/water separator from functioning properly. The cleaning process was modified to eliminate the detergents so that the oil/water separator would function.(8,9)

Dates of Operation: 1990 through 1994.(8)

Wastes Managed: This unit is used to collect wash water from plane cleaning operations. The water is then discharged to the sanitary sewer. The oil is periodically removed and disposed.(8,9)

Release Controls: The unit is used to contain wash water. There is no additional containment.(8)

History of Releases: There is no information indicating releases to the environment have occurred from this unit. However, when the oil/water separator was not effectively removing oil from the wash water, prior to modifying the process, some oil was most likely discharged to the sanitary sewer system.(8)

4.8.2 Conclusions

Based on the available information there is a low potential for release of hazardous constituents to air, ground water, surface water, or soil or to generate subsurface gas. If the oil/water separator is not maintained or detergents prevent the oil from being removed, there is a potential that some oil may be released with the water into sanitary sewer.

4.9 SWMU 14 - STORM WATER SEWER SYSTEM

4.9.1 Information Summary

Unit Description: SWMU 14, a storm water sewer system, is used to contain surface water runoff from the facility. Storm water from areas expected to contain oil, such as the flight line and parking lot, is treated in oil/water separators (SWMUs 11 and 12) prior to discharge to the Duwamish River. There are at least two lines in the storm water sewer system that discharge to the Duwamish River. The two known storm water sewer system lines have oil/water separators (SWMUs 11 and 12) associated with them.(3)

Dates of Operation: 1957 through 1994.

Wastes Managed: Surface water runoff.

Release Controls: The storm water sewer system includes ditches, drain lines, catch basins and oil/water separators.

History of Releases: There was a release of approximately 50 gallons of raw sewage to the storm drain on April 14, 1992.(8)

4.9.2 Conclusions

The potential for release of hazardous constituents to air, ground water, or soil are low based on the wastes managed. The potential to generate subsurface gas is low based on storm water being the waste managed. The potential for releases of hazardous constituents to surface water are moderate based on the release of raw sewage.

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16. Boeing Advanced Systems. Letter requesting withdrawal of Part A permit. 1989.

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27. Personal Communication between Mike Cochran and Seattle Water Supply Department, June 2, 1994.

28. Boeing Advanced Systems. Waste Analysis Plan.

APPENDIX A

Photo Documentation

PHOTO LOG: RCRA Facility Assessment (VSI)

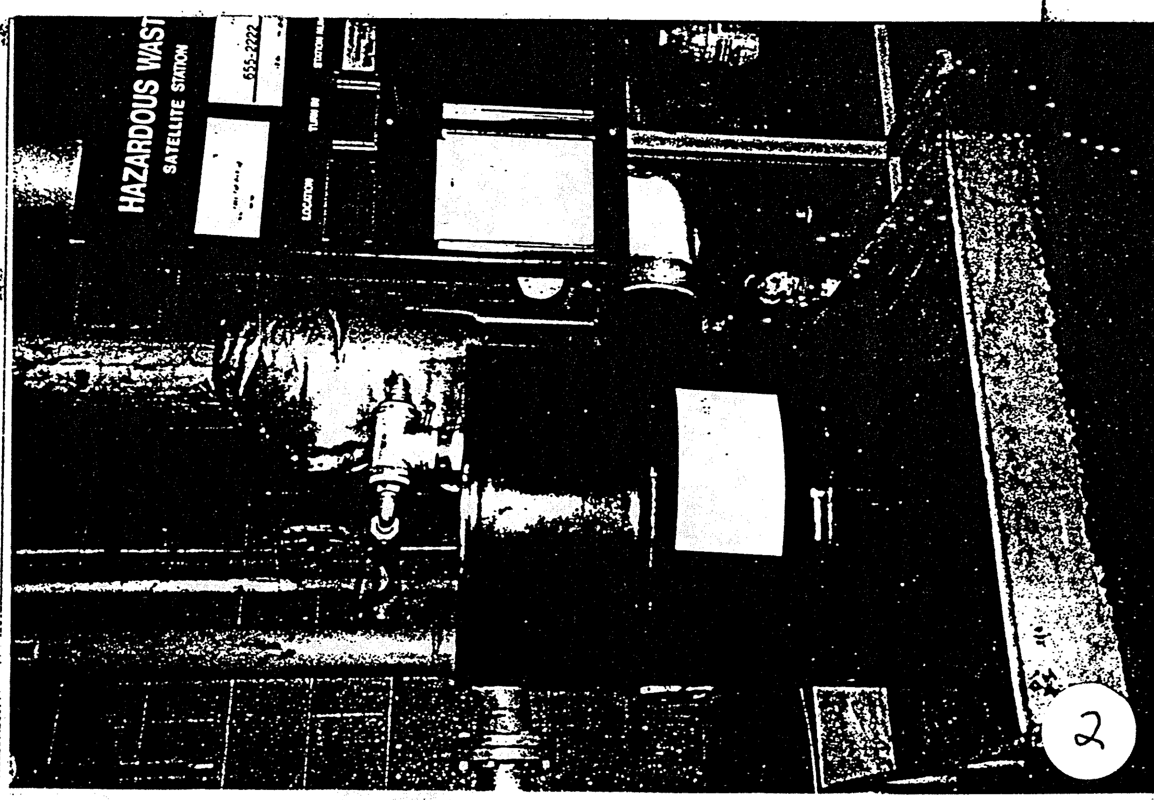
Military Flight Center

July 26, 1994

Roll # 5

Photo	Frame	SWMU/AOC	Location	Description
1	7	SWMU #1	M001 (MFC - 13-01)	S - Main Accum. Station
2	8	SWMU #5	M013 (13-01)	N - Compressor Blow Down Accum. Area
3	9	SWMU #2	M002 (13-02)	W - West View Into Portable Shed (Rags, Oil Antifreeze)
4	10	SWMU #6	M005 (Stall 75)	S - Shed With Batteries, Rags, Solvent, Petroleum Distillates
5	11	SWMU #13 (Bkg)	Stall 75	W - Aircraft Wash Stall (SWMU 13 in background - oil/water separator; foreground is containment for SWMU 9)
6	12	SWMU #8	Stall 75 (North)	W - Condensate Tank (Air Compressor)
7	13	SWMU #8	Stall 75 (North)	W - Condensate Tank & Background With Vault & Compressor


WASTE
COLLECTION STATION
First Aid Station
655-2222
NO SMOKING
NO SMOKING
1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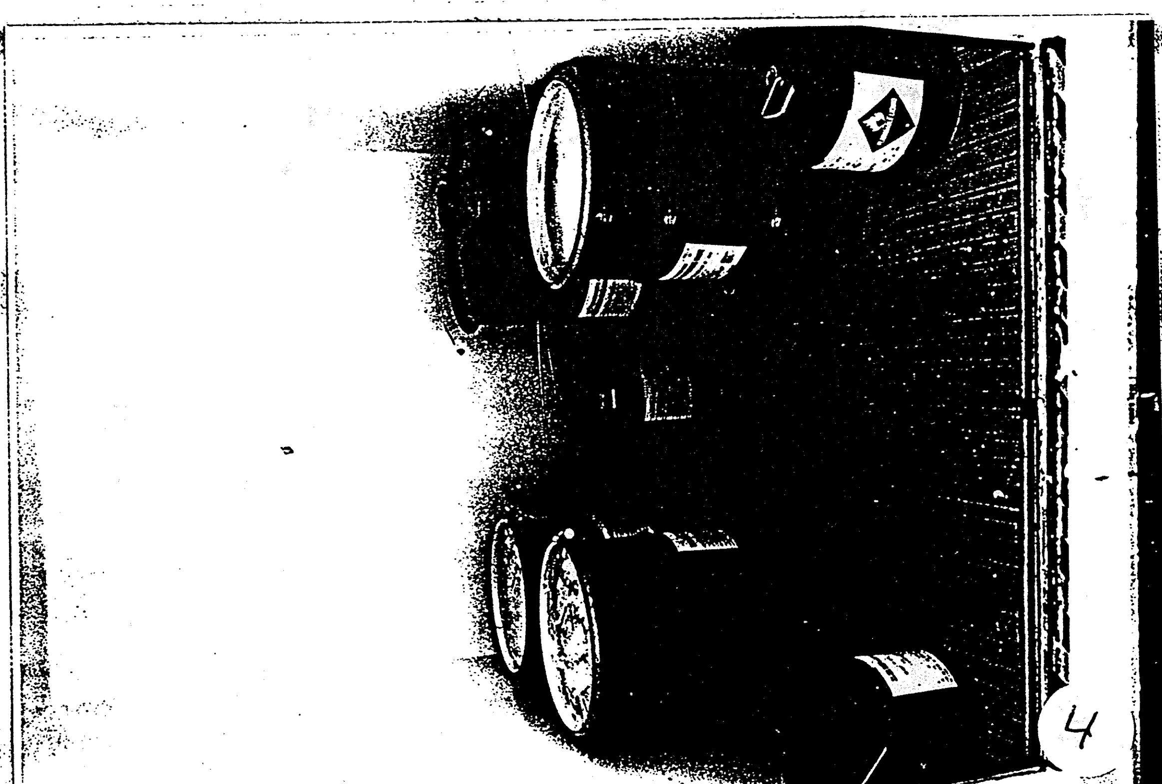
655-2222
LOCATION
2


3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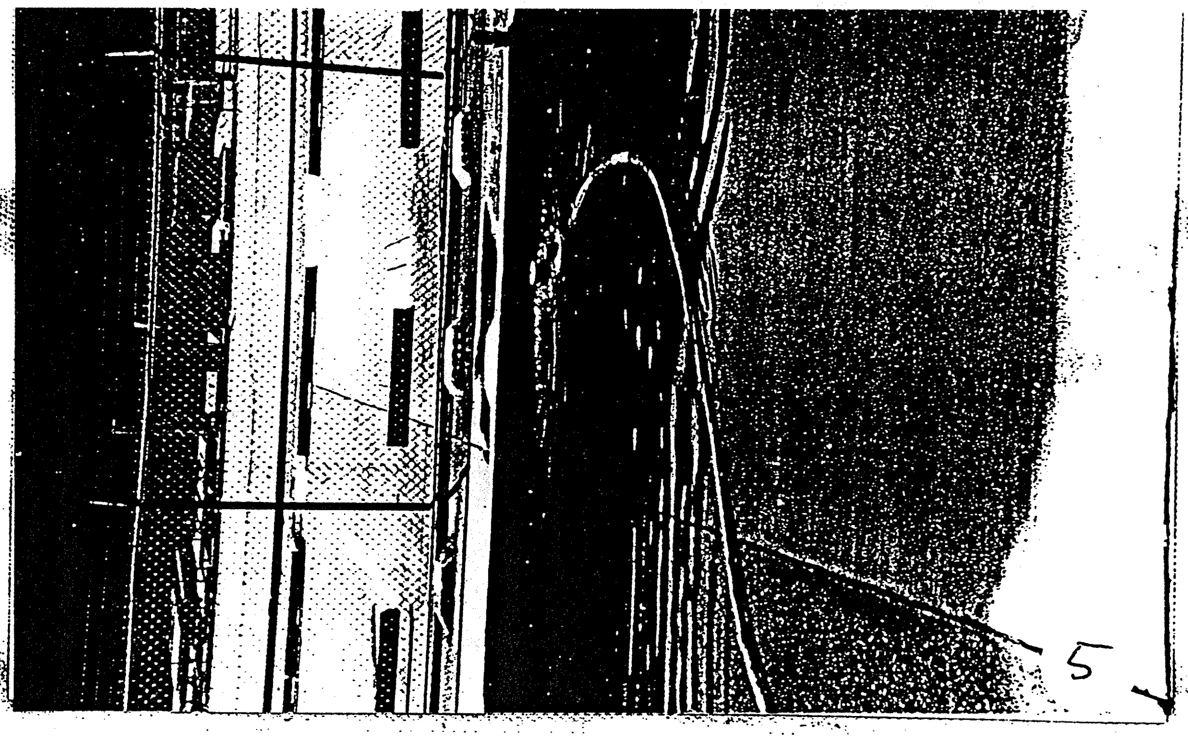
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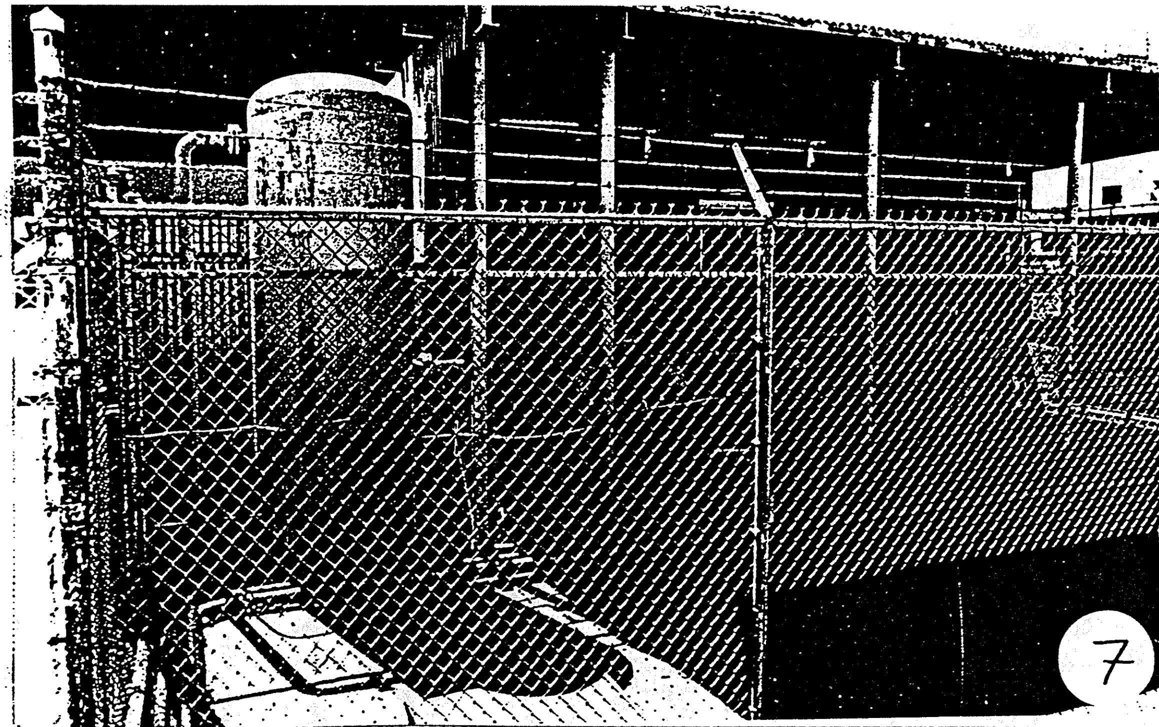
6



ROLL 5 FRAME 12
WAD 988475943

6

APPENDIX B

VSI Field Notes

MILITARY FLIGHT CENTER

Building 13-01

SWMU 1, station M-0001 contained five containers:

Coveralls, 55-gallon
Batteries, 5-gallon, 7/1/94
Aerosol cans flammable, 5-gallon, 7/1/94
Aerosol cans non-flammable, 5-gallon, 7/1/94
Oil rags, 5-gallon, 7/1/94

SWMU 2, station M013, Satellite area had one 55-gallon drum containing water with oil from a compressor.

Building 13-02

Beside Building 13-02 was an oil/water separator that had been removed.

There had previously been a steam cleaning area in Building 13-02.

SWMU 3, station M002 is a steel shed with a grate over a drip pan. SWMU 3 is beside Building 13-02. The following were there:

Oily rags, 55-gallon
Recyclable oil, 35-gallon
Spent antifreeze, 35-gallon
MEK solids, 5-gallon
Flammable Aerosol cans, 5-gallon

In flight stall 75, is station M005, it is SWMU 10 on the VSI list, may be SWMU 4 on the photo documentation. The station is a steel shed with a drip pan under the following drums:

Oily rags, 55-gallon
Oily rags, two 35-gallon
MEK rags, 35-gallon
Batteries, 5-gallon
Waste fuel, benzene kerosene (D001), 5-gallon, dated 5/25/94
1,1,1-trichloroethane and trichloroethylene, 5-gallon, dated 7/22/94

There is an oil/water separator behind the wash stall. There is a concrete berm around the flight stall that was leaking water. The drain in the stall goes to the oil/water separator.

SWMU ?? is a condensate receiving vault. Water is pumped out of the vault into a drum.

There are three more shed accumulation areas in the flight stalls.

APPENDIX C

Waste Accumulation Areas List

Attachment 'A' to RFA Information
Needs Item #14 - MFC
Sheet 3 of 3

WAZSITE.XLS

TABLE A-2

1994 ELECTRICAL MANUFACTURING FACILITY (EMF)

COLLECTION POINT	BUILDING	COL/ROW	STATUS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
EF-001	3-392	DOOR W-2	CLOSED	X	C	C	C	C	C	C	C	C	C	C	C
EF-002	3-392	I-31	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
EF-001	3-392	L-16	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C

1993 PLANT 1

COLLECTION POINT	BUILDING	COL/ROW	STATUS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
PL-1001	7-211	DOOR 20	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C

1994 MILITARY FLIGHT CENTER

COLLECTION POINT	BUILDING	COL/ROW	STATUS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
M-001	13-01	D-6	OPEN	X	X	X	X	X	X						
M-002	BEHIND 1302		OPEN	X	X	X	X	X	X						
M-003	STALL 74		CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-004	TANK B		CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-005	STALL 75		OPEN	X	X	X	X	X	X						
M-006	STALL 79		CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-007	STALL 76		OPEN	C/X	X	X	X	X	X						
M-008	STALL 80		OPEN	X	X	X	X	X	X						
M-009	13-01	C-7	CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-010	STALL 71		CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-011	STALL 72		CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-012	STALL 73		CLOSED	C	C	C	C	C	C	C	C	C	C	C	C
M-013	13-01	DOOR S-19	OPEN						O/X						

TOTAL OPEN STATIONS - 6