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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

JUN 23 1994

94-RPS-236

Mr. David C. Nylander
Nuclear Waste Program
State of Washington
Department of Ecology
P.O. Box 1386, MSIN 91-05
Richland, Washington 99352-0539

Dear Mr. Nylander:

STATE WASTE DISCHARGE PERMIT APPLICATIONS FOR THE TABLE 4 MISCELLANEOUS STREAMS

Transmitted herein are the State Waste Discharge Permit (SWDP) Applications for the "Miscellaneous Streams." The Miscellaneous Streams are identified on Table 4 of Ecology Consent Order DE 91NM-177 (216 Consent Order). The permit applications include the following:

- State Waste Discharge Permit Application - 100-N Sewage Lagoon (DOE/RL-94-22)
- State Waste Discharge Permit Application - 183-N Backwash Discharge Pond (DOE/RL-94-23)
- State Waste Discharge Permit Application - 200-E Chemical Drain Field (DOE/RL-94-24)
- State Waste Discharge Permit Application - 200-E Powerhouse Ash Pit (DOE/RL-94-25)
- State Waste Discharge Permit Application - 200-W Powerhouse Ash Pit (DOE/RL-94-26)
- State Waste Discharge Permit Application - 400 Area Septic System (DOE/RL-94-28).

Section 6, Table 4 of the 216 Consent Order identifies eleven miscellaneous streams which require the submittal of Washington Administrative Code (WAC) 173-216 SWDP Applications by June 30, 1994. Of the eleven streams identified, the five following streams do not require permitting under WAC 173-216:

- 300 Area Powerhouse Ash Waste Water (will be permitted under a National Pollutant Discharge Elimination System [NPDES] permit)
- 300 Area Filter Backwash streams (will be permitted under a NPDES permit)

- 234-5Z Ventilation Steam Condensate/Dry Air Compressor Cooling Water (will be rerouted to and permitted under the 200 Areas Treated Effluent Disposal Facility)

- 209-E Building Steam Condensate (has been eliminated)

- 300 Area Sanitary Sewer (will be rerouted to the City of Richland Publicly Owned Treatment Works before June 1995).

The enclosed WAC 173-216 permit applications were prepared for the remaining six streams, and thus fulfill the requirements of the 216 Consent Order.

State Environmental Policy Act (SEPA) environmental checklists were not prepared for the "Miscellaneous Streams" listed on Table 4 of the 216 Consent Order. The SEPA regulations [WAC 197-11-855(1)] exempt the existing streams from the SEPA process.

Should you have any questions or require any additional information regarding these permit applications, please contact Mr. J. E. Rasmussen on (509) 376-2247.

Sincerely,

Steven H. Wisness, Acting Program Manager
Office of Environmental Assurance,
Permits, and Policy

EAP:JET

Enclosures

cc w/o encl:
Administrative Records
B. P. Atencio, WHC
J. J. Luke, WHC
M. A. Selby, Ecology
J. E. Turnbaugh, WHC

DOE/RL-94-23
Revision 0

State Waste Discharge Permit Application

183-N Backwash Discharge Pond

Date Published
June 1994

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

MASTER

Approved for Public Release

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Printed in the United States of America

DISCLM-5.CHP (8-91)

FOREWORD

As part of the *Hanford Federal Facility Agreement and Consent Order* negotiations (Ecology et al. 1994), the U.S. Department of Energy, Richland Operations Office, the U.S. Environmental Protection Agency, and the Washington State Department of Ecology agreed that liquid effluent discharges to the ground on the Hanford Site which affect groundwater or have the potential to affect groundwater would be subject to permitting under the structure of Chapter 173-216 (or 173-218 where applicable) of the *Washington Administrative Code*, the State Waste Discharge Permit Program. As a result of this decision, the Washington State Department of Ecology and the U.S. Department of Energy, Richland Operations Office entered into *Consent Order No. DE 91NM-177*, (Ecology and DOE-RL 1991).

The *Consent Order No. DE91NM-177* requires a series of permitting activities for liquid effluent discharges. Liquid effluents on the Hanford Site have been classified as Phase I, Phase II, and Miscellaneous Streams. The *Consent Order No. DE91NM-177* establishes milestones for State Waste Discharge Permit application submittals for all Phase I and Phase II streams, as well as the following 11 Miscellaneous Streams as identified in Table 4 of the *Consent Order No. DE91NM-177.*

- 209-E Building Steam Condensate
- 400 Area Sanitary Waste Water
- 200-W Powerhouse Ash Waste Water
- 200-E Powerhouse Ash Waste Water
- 300 Area Powerhouse Ash Waste Water
- 100-N Sanitary Sewer System
- 300 Area Filter Backwash
- 300 Area Sanitary Sewer System
- 234-5Z Steam Condensate/Dry Air Compressor Cooling
- 272-E, 2703-E Buildings Waste Water
- 183-N Filter Backwash Waste Water.

This document constitutes the State Waste Discharge Permit application for the 183-N Backwash Discharge Pond. The 183-N Filter Backwash Waste Water which discharges to the 183-N Backwash Discharge Pond is composed of four streams:

Coagulator drains
Filter backwash
Cooling water
Collection of storm water

These streams are collected in sumps in the 100-N Area, prior to being discharged to the 183-N Backwash Discharge Pond.

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CONTENTS

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GLOSSARY

BMP	Best Management Practice
BOD	biological oxygen demand
CFR	Code of Federal Regulations
COD	chemical oxygen demand
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
EPA	U. S. Environmental Protection Agency
gpd	gallons per day
GWQC	Ground Water Quality Criteria
mg/L	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
PNL	Pacific Northwest Laboratory
PSPL	Puget Sound Power and Light Company
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
SIC	Standard Industrial Classification
SWDP	State Waste Discharge Permit
TKN	total Kjedldahl nitrogen
ug/L	micrograms per liter
USGS	United States Geological Survey
WAC	Washington Administrative Code
WHC	Westinghouse Hanford Company

METRIC CONVERSION CHART

INTO METRIC UNITS / **OUT OF METRIC UNITS**

If you know	Multiply by	To get	If you know	Multiply by	To get
Length			**Length**		
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			**Area**		
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			**Volume**		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76	cubic meters	cubic meters	1.308	cubic yards
Temperature			**Temperature**		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: Lindeburg 1990.

1.0 PERMIT APPLICATION

This section presents the State Waste Discharge Permit (SWDP) application for the 183-N Backwash Discharge Pond. The 183-N Filter Backwash Waste Water which discharges to the 183-N Backwash Discharge Pond is composed of four streams:

Coagulator drains
Filter backwash
Cooling water
Collection of storm water

These streams are collected in sumps in the 100-N Area, prior to being discharged to the 183-N Backwash Discharge Pond.

1.1 ORGANIZATION

The Washington Administrative Code (WAC) 173-216 SWDP application form for the 183-N Backwash Discharge Pond is presented in this section. Information required by the SWDP application form is provided on the form when adequate space is available. Otherwise, information is provided in the appendices as noted on the completed form. The appendices follow precisely the format of the SWDP application and are designed to supplement the permit application form. Appendix A contains site location maps referenced in Section A of the permit application form. Appendices B through H correspond to Sections B through H in the permit application form. Within each appendix, those questions which require additional space have been restated and the answer directly follows the question. The questions in the appendices are worded precisely as they are in the application form, and are highlighted in bold capital letters which are underlined.

1.2 STATE WASTE DISCHARGE PERMIT APPLICATION FORM

The following pages contain the SWDP application for the 183-N Backwash Discharge Pond.

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WASHINGTON STATE DEPARTMENT OF ECOLOGY

STATE WASTE DISCHARGE PERMIT APPLICATION FOR INDUSTRIAL DISCHARGES TO LAND

FOR STATE USE ONLY

Date Application Received		Date Fee Paid	
Application/ Permit No.			
Date Application Accepted		Facility No.	
Temporary Permit Effective Date		Temporary Permit Expiration Date	

This application is for a waste discharge permit as required in accordance with provisions of Chapter 90.48 RCW and Chapter 173-216 WAC. Additional information may be required. Information previously submitted and applicable to this application should be referenced in the appropriate section.

SECTION A. GENERAL INFORMATION

1. Company Name: U.S. Department of Energy, Richland Operations Office

2. Unified Business Idenditfication Number (UBI#): 91-0565159 (DOE tax exempt number)

3. Mailing Address: P.O. Box 550
   Street
   Richland, Washington 99352
   City/State Zip

4. Facility Location: 100-N Area - Hanford Site
   Street or Other Description
   See Maps in Appendix A.
   City/State Zip

5. Person to contact who is familiar with the information contained in this application:
   J. E. Rassmussen — U.S. DOE, Branch Chief, Regulatory Permits — (509) 376-2247
   Name — Title — Telephone

6. Check One: ☐ Permit Renewal ☒ Existing Unpermitted Discharge
   ☐ Proposed Discharge
   Anticipated date of discharge: ______

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

[signature] — Signature*
6/23/94 — Date
Acting Program Manager, Office of Environmental Assurance, Permits and Policy — Title
Steven H. Wisness — Printed Name

*Applications must be signed as follows: Corporation, by a principal executive officer of at least the level of vice-president; partnership, by a general partner; sole proprietorship, by the proprietor.

SECTION B. PRODUCT INFORMATION

1. Briefly describe all manufacturing processes and products, and/or commercial activities. Provide the applicable Standard Industrial Classification (SIC) Code(s) for each activity. (See *Standard Industrial Classification Manual*, 1987 ed.)

   SIC No(s): 9999

   Description: See Appendix B, Item 1

2. Include a production schematic flow diagram of the process and service activities described above on a separate sheet. **See Appendix B, Figure B-2**

3. List raw materials and products:

Type RAW MATERIALS	Quantity
Raw Water	6,000,000 gallons/month
Aluminum Sulfate Dihydrate (alum)	12 gallons/month
Chlorine	600 pounds/month
Polyacrylamide (Separan)	15 pounds/month
Sodium Hypochlorite	for standby use only
Type PRODUCTS	**Quantity**
Sanitary Water	6,000,000 gallons/month

SECTION C. PLANT OPERATIONAL CHARACTERISTICS

1. Identify the waste stream for each of the production processes or activities described in Section B.1. Assign each waste stream an identification number--use this number in subsequent questions.

Process	Waste Stream Name	Batch or Continuous Process	Waste Stream ID #
Coagulator Drains	Coagulator Waste Water	Batch	1
Filter Backwash	Filter Backwash Waste Water	Batch	2
Cooling	Cooling Water	Continuous	3
Storm Water Collection	Storm Water	Batch	4

2. On a separate sheet, describe in detail the treatment and disposal of all wastewaters as described above. Include a schematic flow diagram for all wastewater treatment and disposal systems. **See Appendix C, Item 2.**

3. Indicate treatment provided to each waste stream identified in C.1. above.

Waste Stream(s) ID #	Treatment	Waste Stream(s) ID #	Treatment
	Air flotation	4	pH correction
	Centrifuge		Ozonation
	Chemical precipitation		Reverse osmosis
1, 2, 3	Chlorination		Screen
	Cyclone		Sedimentation
3	Filtration		Septic tank
	Flow equalization		Solvent separation
	Grease or oil separation		Biological treatment, type:
	Grease trap	4	Rainwater diversion or storage
	Grit removal		Other chemical treatment type:
	Ion exchange		Other physical treatment type:

4. Describe any planned wastewater treatment improvements or changes in wastewater disposal methods and when they will occur *(use additional sheets, if necessary).*

See Appendix C, Item 4.

5. If production processes are subject to seasonal variations, provide the following information. List discharge for each waste stream in gallons per day (GPD). The combined value for each month should equal the estimated total monthly flow.

Waste Stream ID #	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
The waste streams identified in Section C, Item 1 are not subject to seasonal variations.												
Estimated Total Monthly Flow (GPD)												

6. Shift Information:

a. Number of shifts per work day: 3

b. Number of work days per week: 7

c. Average number of work days per year: 365

d. Maximum number of work days per year: 365

e. Number of employees per shift:

Shift	Employees	Shift	Shift start times
1st	1	1st	12:00 am
2nd	1-3	2nd	7:30 pm
3rd	1	3rd	3:30 pm

7. List all incidental materials like oil, paint, grease, solvents, soaps, cleaners, that are used or stored on-site. (Use additional sheets, if necessary.)

Material/Quantity Stored See Appendix C, Item 7 for more information.

Ammonia Hydroxide / < 5 gallons

pH Buffer solution / < 5 gallons

Chlorine Powder Pillows / < 5 gallons

Oil / < 90 gallons

Grease / < 15 gallons

Solvents / < 75 gallons

8. Describe any water recycling or material reclaiming processes:

There are no water recycling or material reclaiming processes.

9. Does this facility have:
   a. Spill Prevention, Control, and Countermeasure Plan (per 40 CFR 112)? [X] Yes [ ] No
   b. Emergency Response Plan (per WAC 173-303-350)? [X] Yes [ ] No
   c. Runoff, spillage, or leak control plan (per WAC 173-216-110(f))? [ ] Yes [X] No
   d. Does your current waste discharge permit require a spill plan? [ ] Yes [ ] No
      If yes, submit an update with your application. **Not Applicable.**
   e. Solid Waste Management Plan? [X] Yes [ ] No

SECTION D. WATER CONSUMPTION AND WATER LOSS

1. Water Source(s):
   [ ] Public System (Specify) ______
   [ ] Private Well [X] Surface Water
   a. Water Right Permit Number: N/A. The U.S. Government has a reserved water right to utilize water for purposes of Hanford Site activities.
   b. Legal Description:

      SW 1/4S, SE 1/4S, 2 Section, 13N TWN, 25E R

2. a. Indicate total water use: Gallons per day (average) 200,000

   Gallons per day (Maximum) 350,000

   b. Is water metered? [X] Yes [ ] No

3. Attach a line drawing showing the water flow through the facility. Indicate source of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item C. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.
   See Appendix D, Item 3 and Figure D-1.

SECTION E. WASTEWATER INFORMATION

1. Provide measurements for treated wastewater prior to land application for the parameters listed below, unless waived by the permitting authority. All analytical methods used to meet these requirements shall, unless approved otherwise in writing by Ecology, conform to the Guidelines Establishing Test Procedures for the Analysis of Pollutants Contained in 40 CFR Part 136.

Parameter	Concentrations Measured	Analytical Method	Detection Limit
pH	See Appendix E, Item 1.		
Conductivity			
Total Dissolved Solids			
Total Suspended Solids			
BOD (5 day)			
COD			
Ammonia-N			
TKN-N			
Nitrate-N			
Ortho-phosphate-P			
Total-phosphate-P			
Total Oil & Grease			
Calcium			
Magnesium			
Sodium			
Potassium			
Chloride			
Sulfate			
Fluoride			
Cadmium (total)			
Chromium (total)			
Lead (total)			
Mercury			
Selenium (total)			
Silver (total)			
Copper (total)			
Iron (total)			
Manganese (total)			
Zinc (total)			
Barium (total)			
Total Coliform			

2. Wastewater characteristics for toxic pollutants.

The intent of this question is to determine which chemicals are or might be present in the process water or wastewater. For each chemical listed below:

a. Use the letter **A** in the Absent column if the chemical is not likely to be present because it is not used in the production process or used on site.

b. Use the letter **S** in the Absent column if the chemical may be present because it is used on site, but the chemical is not used in the production process.

c. Use the letter **P** in the Present column if the chemical is likely to be present because it is used in the production process, but the effluent has not been tested.

d. Use the letter **K** in the Present column if the effluent has been tested and the chemical was found to be present. Attach the analytical results.

Analytical Results
Wastewater Characterization for Toxic Pollutants

Absent	Present	Constituent/CAS No.	Absent	Present	Constituent/CAS No.
	P	Acrylamide/79-06-1	A		1,2 Dichloropropane/78-87-5
A		Acrylonitrile/107-13-1	A		1,3 Dichloropropene/542-75-6
A		Aldrin/309-00-2	A		Dichlorvos/62-73-7
A		Aniline/62-53-3	A		Dieldrin/60-57-1
A		Aramite/140-57-8	A		3,3' Dimethoxybenzidine/119-90-4
A		Arsenic/7440-38-2	A		3,3 Dimethylbenzidine/119-93-7
A		Azobenzene/103-33-3	A		1,2 Dimethylhydrazine/540-73-8
A		Benzene/71-43-2	A		2,4 Dinitrotoluene/121-14-2
A		Benzidine/92-87-5	A		2,6 Dinitrotoluene/606-20-2
A		Benzo(a)pyrene/50-32-8	A		1,4 Dioxane/123-91-1
A		Benzotrichloride/98-07-7	A		1,2 Diphenylhydrazine/122-66-7
A		Benzyl chloride/100-44-7	A		Endrin/72-20-8
A		Bis(chloroethyl)ether/111-44-4	A		Epichlorohydrin/106-89-8
A		Bis(chloromethyl)ether/542-88-1	A		Ethyl acrylate/140-88-5
A		Bis(2-ethylhexyl)phthalate/ 117-81-7	A		Ethylene dibromide/106-93-4
	K	Bromodichloromethane/75-27-4	A		Ethylene thioureae/96-45-7
A		Bromoform/75-25-2	A		Folpet/133-07-3
A		Carbazole/86-74-8	A		Furmecyclox/60568-05-0
A		Carbon tetrachloride/56-23-5	A		Heptachlor/76-44-8
A		Chlordane/57-74-9	A		Heptachlor epoxide/1024-57-3
A		Chlorodibromomethane/124-48-1	A		Hexachlorobenzene/118-74-1

Absent / Present		Constituent/CAS No.	Absent / Present		Constituent/CAS No.
	K	Chloroform/67-66-3	A		Hexachlorocyclohexane (alpha)/ 319-84-6
A		Chlorthalonil/1897-45-6	A		Hexachlorocyclohexane (tech.)/ 608-73-1
A		2,4-D/94-75-7	A		Hexachlorodibenzo-p-dioxin, mix/ 19408-74-3
A		DDT/50-29-3	A		Hydrazine/hydrazine sulfate/ 302-01-2
A		Diallate/2303-16-4	A		Lindane/58-89-9
A		1,2 Dibromoethane/106-93-4	A		2 Methylaniline/100-61-8
A		1,4 Dichlorobenzene/106-46-7	A		2 Methylaniline hydrochloride/ 636-21-5
A		3,3' Dichlorobenzidine/91-94-1	A		4,4' Methylene bis(N,N-dimethyl)aniline/101-61-1
A		1,1 Dichloroethane/75-34-3		K	Methylene chloride (dichloromethane)/75-09-2
A		1,2 Dichloroethane/107-06-2	A		Mirex/2385-85-5
A		Nitrofurazone/59-87-0	A		O-phenylenediamine/106-50-3
A		N-nitrosodiethanolamine/ 1116-54-7	A		Propylene oxide/75-56-9
A		N-nitrosodiethylamine/55-18-5	A		2,3,7,8-Tetrachlorodibenzo-p-dioxin/ 1746-01-6
A		N-nitrosodimethylamine/62-75-9	A		Tetrachloroethylene/127-18-4
A		N-nitrosodiphenylamine/86-30-6	A		2,4 Toluenediamine/95-80-7
A		N-nitroso-di-n-propylamine/ 621-64-7	A		o-Toluidine/95-53-4
A		N-nitrosopyrrolidine/930-55-2	A		Toxaphene/8001-35-2
A		N-nitroso-di-n-butylamine/ 924-16-3	A		Trichloroethylene/79-01-6
A		N-nitroso-n-methylethylamine/ 10595-95-6	A		2,4,6-Trichlorophenol/88-06-2
A		PAH/NA	A		Trimethyl phosphate/512-56-1
A		PBBs/NA	A		Vinyl chloride/75-01-4
A		PCBs/1336-36-3			

SECTION F. STORMWATER

1. Do you have a Washington State Storm Water Baseline General Permit? **See Appendix F, Item 1.** ☐ Yes ☒ No

   If yes, please list the permit number here ______

2. Have you applied for a Washington State Storm Water Baseline General Permit. **See Appendix F, Item 2.** ☐ Yes ☒ No

3. Do you have any storm water quality or quantity data? ☐ Yes ☒ No

Note: If you answered "yes" to questions 1 or 2 above, skip questions 4 through 8.

4. Describe the size of the storm water collection area. **See Appendix F, Item 4.**

   a. Unpaved Area 176,000 sq. ft.

   b. Paved Area 15,000 sq. ft.

   c. Other Collection Areas (Roofs) 58,000 sq. ft.

5. Does your facility's storm water discharge to: *(check all that apply)* **See Appendix F, Item 5.**

   ☐ Storm sewer systems; name of storm sewer system *(operator)*:

   ☐ Directly to surface waters or Washington State *(e.g., river, lake, creek, estuary, ocean).*

   ☐ Indirectly to surface waters of Washington State *(i.e., flows over adjacent properties first).*

   ☐ Directly to ground waters of Washington State: ☐ dry well ☐ drainfield ☐ Other

6. Areas with industrial activities at facility: *(check all that apply)* **See Appendix F, Item 6.**

   ☐ Manufacturing Building

   ☒ Material Handling

   ☒ Material Storage

   ☐ Hazardous Waste Treatment, Storage, or Disposal *(Refers to RCRA, Subtitle C Facilities Only)*

   ☒ Waste Treatment, Storage, or Disposal

   ☒ Application or Disposal of Wastewaters

   ☒ Storage and Maintenance of Material Handling Equipment

   ☐ Vehicle Maintenance

   ☒ Areas Where Significant Materials Remain

   ☒ Access Roads and Rail Lines for Shipping and Receiving

   ☐ Other ______

7. Material handling/management practices. **See Appendix F, Item 7.**

   a. Types of materials handled and/or stored outdoors: *(check all that apply)*

   - [ ] Solvents
   - [x] Scrap Metal
   - [ ] Petroleum or Petrochemical Products
   - [ ] Plating Products
   - [ ] Pesticides
   - [x] Hazardous Wastes
   - [ ] Acids or Alkalies
   - [ ] Paints/Coatings
   - [ ] Woodtreating Products
   - [ ] Other (Please list) ____________

   b. Identify existing management practices employed to reduce pollutants in industrial storm water discharges: *(check all that apply)*

   - [ ] Oil/Water Separator
   - [x] Containment
   - [x] Spill Prevention
   - [ ] Surface Leachate Collection
   - [ ] Overhead Coverage
   - [x] Detention Facilities
   - [ ] Infiltration Basins
   - [x] Operational BMPs
   - [ ] Vegetation Management
   - [ ] Other (Please list) ____________

8. Attach a map showing storm water drainage/collection areas, disposal areas and discharge points. **See Appendix F, Item 8.**

SECTION G. OTHER INFORMATION

1. Describe liquid wastes or sludges being generated that are not disposed of in the waste stream(s) and how they are disposed of. For each type of waste, provide type of waste, name, address, and phone number of hauler.

   See Appendix G, Item 1

2. Describe storage areas for raw materials, products, and wastes.

   See Appendix G, Item 2

3. Have you designated your wastes according to the procedures of Dangerous Waste Regulations, Chapter 173-303WAC? [x] Yes [ ] No

SECTION H. SITE ASSESSMENT

1. Give the legal description of the land treatment site(s). Give the acreage of each land treatment site(s). Attach a copy of the contract(s) authorizing use of land for treatment.

See Appendix H, Item 1.

2. List all environmental control permits or approvals needed for this project; for example, septic tank permits, sludge application permits, or air emissions permits.

See Appendix H, Item 2.

3. Attach a United States Geological Survey (USGS) a topographic map. Show the following on this map:
See Appendix H, Item 3.
   a. Location and name of internal and adjacent streets
   b. Surface water drainage systems within 1/4 mile of the site
   c. All wells within 1 mile of the site
   d. Chemical and product handling and storage facilities
   e. Infiltration sources, such as drainfields and lagoons within 1/4 mile of the site
   f. Wastewater and cooling water discharge points wit waste stream ID numbers (See Section C.1)
   g. Other activities and land uses within 1/4 mile of the site

4. Attach well logs and well I.D.# when available for all wells within 500 feet and any available water quality data.

See Appendix H, Item 4.

5. Describe soils on the site using information from local soil survey reports. (Submit on separate sheet.)
   See Appendix H, Item 5.

6. Describe the regional geology and hydrogeology within one mile of the site. (Submit on separate sheet.)
   See Appendix H, Item 6.

7. List the names and addresses of contractors or consultants who provided information and cite sources of information by title and author.

   See Appendix H, Item 7.

2.0 REFERENCES

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APPENDICES

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APPENDIX A

GENERAL INFORMATION

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CONTENTS

FIGURES

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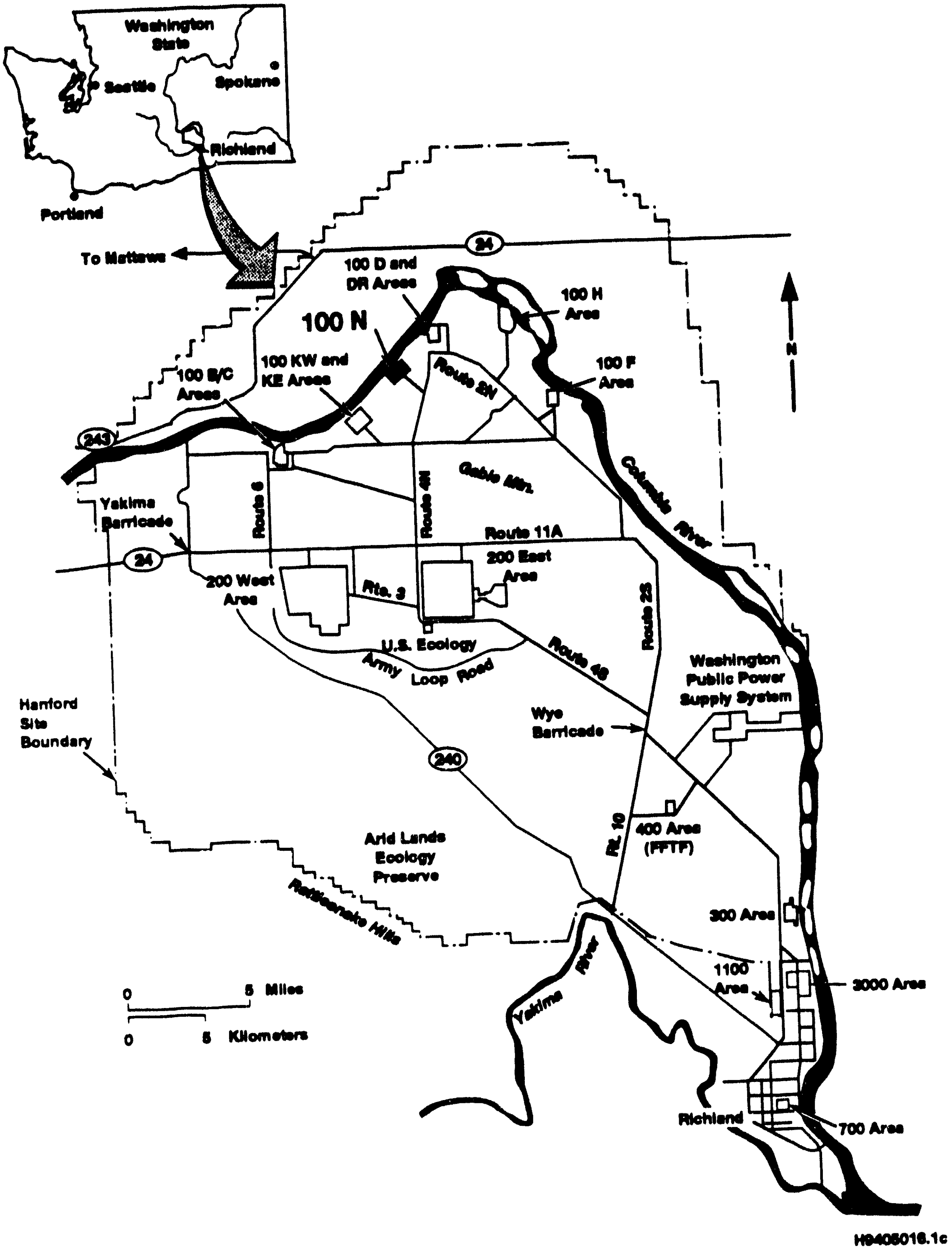

Figure A-1. General Hanford Site Map.

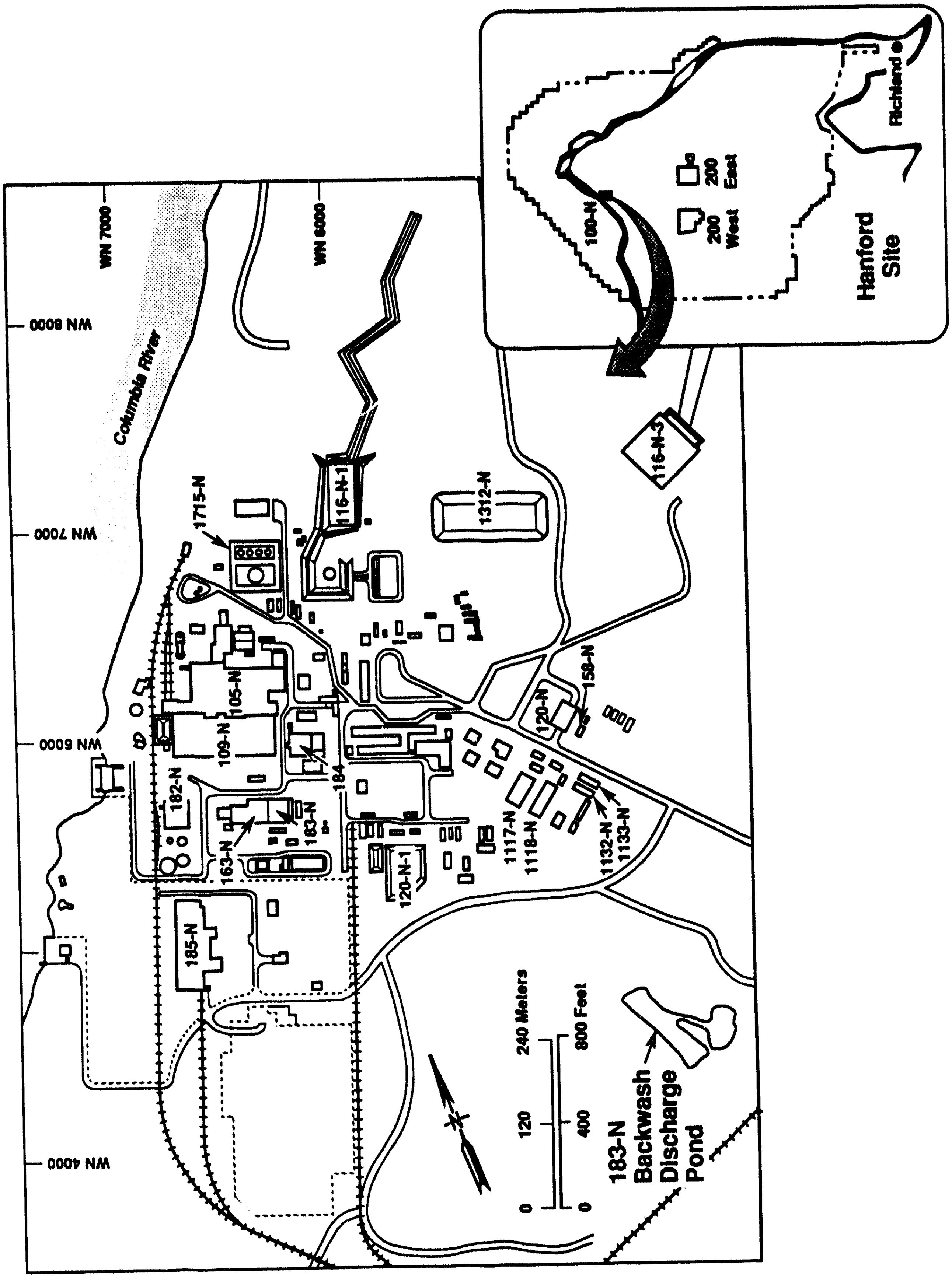

Figure A-2. Location of the 183-N Backwash Discharge Pond.

APPENDIX B

PRODUCT INFORMATION

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CONTENTS

FIGURES

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SECTION B, ITEM 1

BRIEFLY DESCRIBE ALL MANUFACTURING PROCESSES AND PRODUCTS, AND/OR COMMERCIAL ACTIVITIES.

INTRODUCTION

The 183-N Backwash Discharge Pond receives approximately 2,000,000 gallons of waste water per month. This waste water comes from three different processes: converting raw water to potable water at the 183-N Water Treatment Facility, noncontact cooling water for a fire pump and air compressor, and collecting storm water. These three processes generate four waste streams to the 183-N Backwash Discharge Pond (Figure B-1). Each process, the associated waste streams, and the 183-N Backwash Discharge Pond are described in the following sections. This information has been summarized and updated from the *Characterization Report for the Table 4, Miscellaneous Streams in Consent Order No. DE 91NM-177* (WHC 1993a).

FACILITY AND PROCESS DESCRIPTIONS

183-N Water Treatment Facility

A three-step process at the 183-N Water Treatment Facility converts raw water from the Columbia River into potable water for the 100-N Area on the Hanford Site. Equipment used to perform this process includes a stainless steel mixing tank, two coagulator settling basins, and three multimedia gravity filters, all located outside the 183-N Building. There are six multimedia filters at the 183-N Water Treatment Facility; however, only three filters are currently in service.

In the first step of the treatment process, raw water from the Columbia River is supplied to the 29,000-gallon mixing tank. Chlorine gas, primarily used to control algae and odor, is added to the raw water as it enters the mixing tank.

Next, water flows from the mixing tank to one of the two coagulator settling basins. Aluminum sulfate (alum) is added in the coagulator settling basins as needed. Alum acts as a coagulant, causing flocculate particles to grow in size and density, or agglomerate, and ultimately precipitate to the bottom of the coagulator settling basin. These coagulator settling basins are drained and washed annually. The waste water resulting from the cleaning process is discharged to the 183-N Backwash Discharge Pond and is identified as Waste Stream Number 1 on the flowchart (Figure B-2).

In the final step multimedia gravity filters are used to remove the remaining fine particles. The multimedia gravity filters consist of multiple layers of sand, charcoal, and gravel. There are six gravity filters; three are currently operational. Gravitational force allows water to pass through gravity filters causing the finer particles to adhere to the sand grains, charcoal grains, or gravel. A few parts per billion of polyacrylamide is added to water in the gravity filters to aid infiltration of the water in the multimedia gravity filters. Polyacrylamide helps prevent premature plugging in the upper layers of the gravity filter. Once the water has passed through the multimedia gravity filters, it is considered potable and is stored in an underground concrete tank, known as the clearwell, which has a 200,000-gallon capacity. Chlorine may be added to the potable water in the clearwell to maintain a concentration of one part per million.

After the gravity filters have been used for approximately 100 hours, the filter surface becomes clogged and must be bulk washed. The waste water generated from washing the gravity filters is referred to as the 183-N Filter Backwash Waste Water. The filter backwash waste water discharges to the 183-N Backwash Sump (Figures B-1 and B-2) and then to the 183-N Backwash Discharge Pond. The 183-N Filter Backwash Stream is identified as Waste Stream Number 2 on the flowchart (Figure B-2).

WASTE STREAM DESCRIPTIONS

The following provides a descripton of Waste Stream Numbers 1 and 2 generated from the 183-N Water Treatment Facility. Waste Stream Numbers 3 and 4, and the corresponding contributers generated from noncontact cooling of equipment and storm water collection are also described.

Waste Stream 1. Coagulator Drains Waste Water

Draining and washing the coagulator settling basins contributes a waste stream to the 183-N Backwash Discharge Pond. Complete drainage of the two 600,000-gallon coagulator settling basins is performed annually during the summer months. Waste water from draining the coagulator basins is collected in the 183-N Sludge Sump (Figures B-1 and B-2). Once the coagulator settling basin is drained, the sludge is washed out with a fire hose. The sludge and waste water are discharged to the 183-N Sludge Sump which pumps directly to the 183-N Backwash Discharge Pond at approximately 300 gallons per minute. This cleaning process generates an average of 1,200,000 gallons of waste water per year. Although this is an annual batch process, the volume has been divided by 12 to obtain a monthly average for the water balance (Figure D-1).

Waste Stream 2. Filter Backwash Waste Water

The water used to backwash the gravity filters is supplied from the clearwell. Gravity filters are washed by draining the gravity filter basin and backwashing the gravity filter grains with a reverse flow of potable water. The level of water is raised in the gravity filter basin until it overflows into the waste troughs. The water passing upward through the gravity filter media expands and agitates the gravity filter bed, thus releasing particles that have adhered to the sand and charcoal grains. The 183-N Filter Backwash Waste Water is washed into the waste troughs through the waste main and pumped to the 183-N Backwash Sump (Figures B-1 and B-2). The filters are backwashed on an average of twice per week. Each backwash generates waste water at a rate of 7,400 gallons per minute and lasts approximately eight minutes, resulting in 59,200 gallons of waste water per backwash. In addition, the filter basins are drained with each backwash generating 19,000 gallons more of waste water per backwash. This results in an approximate average of 630,000 gallons of waste water generated each month from the filter backwash process.

In addition, storm water run off from the 183-N building roof is collected in the 183-N Backwash Sump and discharged to 183-N Backwash Discharge Pond.

Waste Stream 3. Non-Contact Cooling Water

Non-contact cooling of equipment generates waste water from two contributors. Sanitary water is used to cool an air compressor in the 184-N Building (contributor 3A) and a fire pump in the 182-N Building (contributor 3B). The contributors to Waste Stream Number 3 are described below:

Contributor 3A. Air Compressor Waste Water

Waste water is generated from cooling the air compressor in the 184-N Building. The air compressor is used to supply air to instrumentation and other equipment throughout the 100-N Area. Sanitary water supplied from the clearwell provides non-contact cooling of oil in the compressor. The cooling water flows constantly at 40 pounds of pressure using an average of 1,000,000 gallons of waste water per month and a maximum of 2,000,000 gallons per month. The used cooling water discharges to the 183-N Backwash Sump through a portable hose (Figures B-1 and B-2). From the 183-N Backwash Sump, the cooling water is pumped to the 183-N Backwash Discharge Pond.

Contributor 3B. Fire Pump Cooling Waste Water

Waste water is also generated from non-contact cooling of the electric fire pump located in the 182-N Building. Sanitary water from the clearwell is used as once-through non-contact cooling water for the fire pump to prevent the pump casing from overheating during pump operation. During non-operational periods a constant minimum flow of cooling water is supplied to the fire pump. The fire pump is designed to begin pumping water when the water pressure from the downstream fire system drops. Water pressure drops in the fire system will also occur during system leaks and testing procedures, activating the fire pump for a minimum of 7 to 10 minutes. Cooling water flow increases during actual operation of the fire pump. The fire pump cooling waste water is discharged to the 183-N Backwash Sump. From the 183-N Backwash Sump, the waste water is routed to the 183-N Backwash Discharge Pond (Figures B-1 and B-2). The average generation rate for the electric fire pump cooling water is 265,000 gallons per month and the maximum generation rate is approximately 360,000 gallons per month.

The electric fire pump is in the process of being replaced by the new export water system (See Appendix C, Item 4). In case of a fire, raw water would by pumped from the export system, rather than using potable water from the clearwell as they do now. Currently, the new export system is installed and undergoing testing. The new export water fire system has the potential to overpressurize, depending on the water pressure and the number of fires the system has to supply. In case the export system overflows, an overflow tank will be used to collect the raw water. This raw water would be pumped to the 183-N Backwash Sump and eventually to the 183-N Backwash Discharge Pond. This is an unpredictable, intermittent process and, therefore, flow rates cannot be estimated.

Waste Stream 4. Collection of Storm Water

The 163-N Demineralizer Sump, 163-N Trench Sump, and 108-N Neutralizing Sump are primarily used to collect storm water. Previously, these sumps were used to collect potential leaks from an acid tank and feeder lines used in an ion exchange process. Although the ion exchange process is no longer operational there is a possibility of acid residue in the pipes or gaskets entering the sumps. Therefore, in addition to storm water, these sumps may collect waste waters from pipe leaks and joint gasket leaks in the 163-N/183-N and 108-N Buildings. To avoid discharging potentially hazardous waste, the pH is tested and adjusted (if needed) prior to pumping waste water from these sumps. The pH must be between 6 and 9 before the waste water is pumped to the 183-N Backwash Sump. Average pH values range from 6.9 to 7.2.

The 163-N Demineralizer Sump, 163-N Trench Sump and 108-N Neutralizing Sump are the three contributors to Waste Stream Number 4.

Contributor 4A. 163-N Demineralizer Sump Waste Water

Storm water from roof drains and waste water from building washdowns are drained to the 8,000-gallon 163-N Demineralizer Sump (Figures B-1 and B-2). The 163-N Demineralizer Sump is pumped an average of once every two months, resulting in 4,000 gallons of waste water per month being discharged to the 183-N Backwash Discharge Pond.

Contributor 4B. 163-N Trench Sump Waste Water

The 163-N Trench Sump collects storm water that accumulates in the trench which is sloped from the 163-N and 108-N Buildings toward the sump (Figures B-1 and B-2). The 900-gallon sump is pumped to the 183-N Backwash Sump an average of once every two months, resulting in an average of 450 gallons of waste water per month to the 183-N Backwash Discharge Pond.

Contributor 4C. 108-N Neutralizing Sump Waste Water

The 108-N Neutralizing Sump collects storm water runoff from the tank basin. The 1,000-gallon sump is pumped to the 183-N Backwash Sump an average of once every two months, resulting in an average of 500 gallons of waste water per month to the 183-N Backwash Discharge Pond.

DISPOSAL SITE DESCRIPTION

The 183-N Backwash Discharge Pond is an unlined, natural depression in the topography that is located approximately 1,200 feet southeast of the 1324-N Facility and consists of three adjoining portions: a rectangular portion, a neck, and a dry pond. The rectangular portion trends in a north-south direction and is approximately 100 yards long and 40 yards wide. The neck portion is approximately 20 yards long and 15 yards wide and is attached to the east side of the rectangular portion of the disposal site. Natural vegetation (including cattails) covers the first two portions of the disposal site. At the north end of the rectangular portion is the discharge point, which consists of a vertical outlet pipe (8 inches in diameter) rising above the ground about 4 inches. The outlet pipe is surrounded on four sides and above by chain link fence that is about five feet square. Presently, no water can be seen in the rectangular portion or the neck of the disposal site; however, cattails are observed. The 183-N Backwash Discharge Pond is shown on Drawing H-13-000088 in Appendix H.

The 50-yard-diameter dry pond is located to the east of the rectangular portion. During full operation of N Reactor, the filters in the water purification system were backwashed two or three times per shift, resulting in enough backwash water discharged to fill the dry pond. With N-Reactor now shutdown, an insufficient volume of backwash waste water is discharged to the disposal site to reach the dry pond.

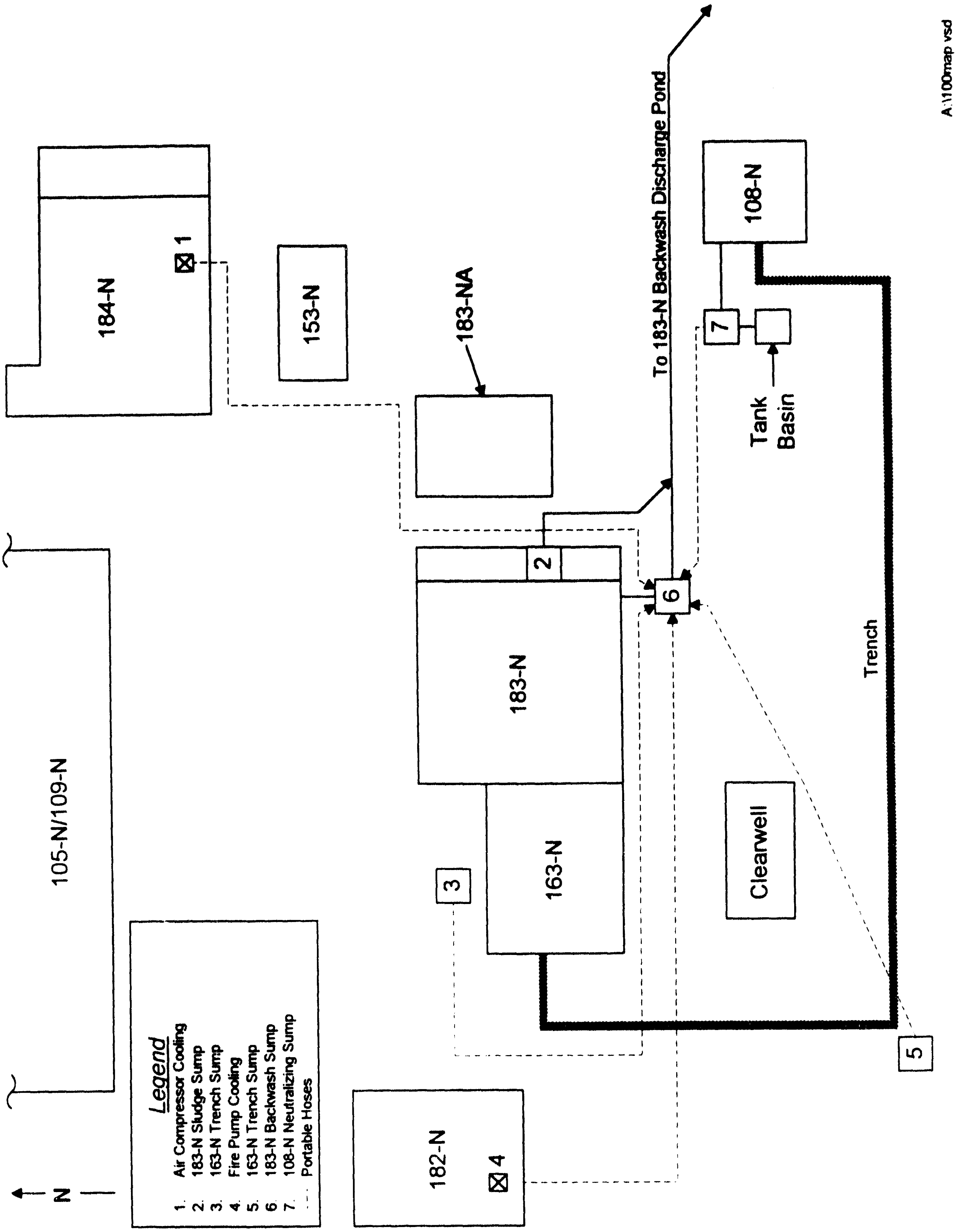

Figure B-1. 183-N Waste Stream Locations.

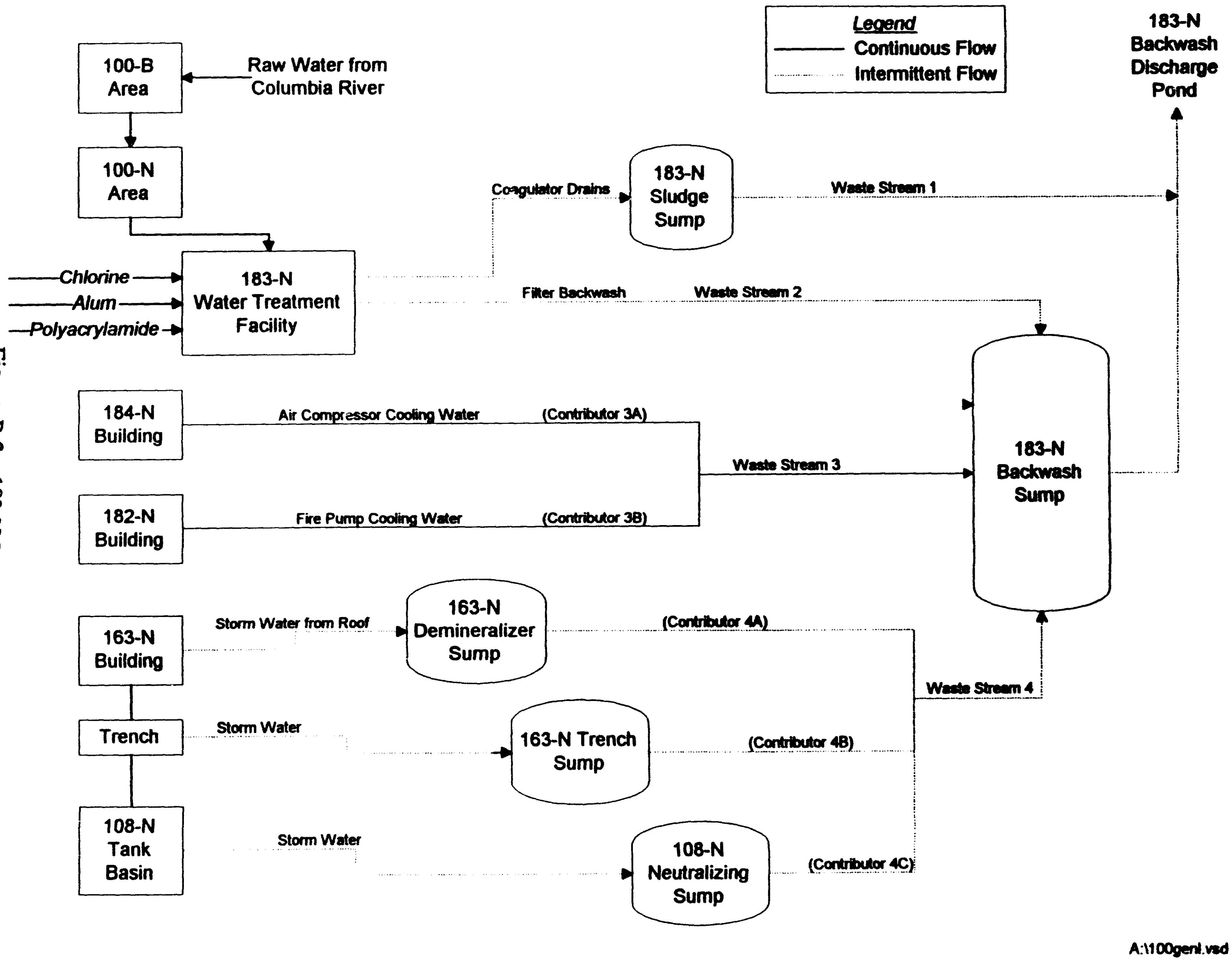

Figure B-2. 183-N Process Flow Diagram.

APPENDIX C

PLANT OPERATIONAL CHARACTERISTICS

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CONTENTS

FIGURE

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SECTION C, ITEM 2

ON A SEPARATE SHEET, DESCRIBE IN DETAIL THE TREATMENT AND DISPOSAL OF ALL WASTE WATERS AS DESCRIBED ABOVE. INCLUDE A SCHEMATIC DIAGRAM FOR ALL WASTE WATER TREATMENT AND DISPOSAL SYSTEMS.

The waste water is not treated after the waste water enters the 183-N Backwash Sump or 183-N Sludge Sump before discharging into the 183-N Backwash Discharge Pond. The 163-N Demineralizer Sump, 163-N Trench Sump, and 108-N Neutralizing Sump are presently used to collect storm water. However, in the past these sumps were used to collect potential leaks from an acid tank and feeder lines used in an ion exchange process. Although the ion exchange process is no longer operational there is a possibility of acid residue in the pipes or gaskets entering the sumps. To avoid discharging potentially hazardous waste, the contents of these three sumps are tested for pH before the contents are pumped to the 183-N Backwash Sump. The sumps that are pH tested are shown on Figure C-1. If the pH is below 6, soda ash is used to neutralize the waste water. The pH of waste water must be between 6 and 9 before being transferred to the 183-N Backwash Sump.

SECTION C, ITEM 4

DESCRIBE ANY PLANNED WASTE WATER TREATMENT IMPROVEMENTS OR CHANGES IN WASTE WATER DISPOSAL METHODS:

Two cooling waste water streams are planned to be eliminated. Also, seven new waste water streams may be discharged to the 183-N Backwash Discharge Pond as a result of eliminating the 009 Outfall [currently regulated under a Natural Pollutant Discharge Elimination System Permit] to the Columbia River. Waste water currently discharging to the 009 Outfall is tentatively scheduled to be rerouted to the 183-N Backwash Discharge Pond by 1996. The two eliminated waste water streams and the seven possible contributors from the closure of the 009 Outfall to the Columbia River are described as follows.

Eliminated Waste water

1. The waste water from cooling the air compressor in the 184-N Building will be removed in 1995. Two new air compressors (one primary and one secondary) that do not require cooling water will replace the old air compressor. This upgrade will eliminate 1,000,000 gallons per month from discharging to the 183-N Backwash Discharge Pond.

2. A new export water fire system will supply the fire water from the raw water supply. This will eliminate the need for fire pump cooling water. The 265,000 gallons per month currently contributed by the fire pump cooling water would be eliminated from the 183-N Backwash Discharge Pond sometime in 1995.

Added Waste Water

1. One of the current contributors to the 009 Outfall is sanitary water used during routine sampling activities to verify the process is in control. This sampling of sanitary water in the 183-N Building, presently generates 450,000 gallons per month to the 009 Outfall.

2. The Heating Ventilation and Air Conditioning system presently contributes 20 to 30 gallons per minute or 850,00 gallons per month to the Columbia River.

3. Air ventilation is provided by two supply fans that are located in the 105-N Building. Each supply fan uses a heat exchanger to cool the oil required by the system. Sanitary water supplied from the clearwell provides non-contact cooling of oil in the heat exchanger. One supply fan is operated at a time generating 25 gallons per minute of waste water. At full time operation, this process discharges 36,000 gallons per day or 1,080,000 gallons per month to the Columbia River.

4. The air conditioning system in the 105-N Building uses a compressor and heat exchanger. Sanitary water supplied from the clearwell provides non-contact cooling of oil in the heat exchanger. Currently, the air conditioning system is not operational. However, the water has not been disconnected and a small amount of water (4 to 5 gallons per minute) is discharging from the system. When the system is fully operational, 50 gallons per minute of waste water will be discharging to the Columbia River. This results in 72,000 gallons per day or 2,160,000 gallons per month.

5. The elevator in the 105-N Building was used as a work platform for workers and equipment in the reactor area. Sanitary water was used to cool the oil gears through a heat exchanger. However, this system has not been operating for two years. If the elevator were to begin full operation, 10 gallons per minute of non-contact cooling waste water would be generated resulting in 14,400 gallons per day or 432,000 gallons per month.

6. Floor drains are located in the 105-N Building and currently drain to the Columbia River. The only constant contributor to the floor drains are water fountains. The discharge from water fountains is negligible. However, in the case of a fire emergency sprinklers would turn on and discharge to the floor drains. This discharge is not estimated.

7. Storm water from roof drains is drained to the 2,000-gallon capacity 184-N Sump. This sump is pumped an average of once every 2 months resulting in 1,000 gallons of waste water being generated per month to the Columbia River.

SECTION C, ITEM 7

LIST ALL INCIDENTAL MATERIALS LIKE OIL, PAINT, GREASE, SOLVENTS, SOAPS, CLEANERS, THAT ARE USED OR STORED ON SITE.

All incidental materials and the quantity stored are listed in Section C, Item 7, of the permit application. This section describes how those numbers were determined.

A walk-through was performed for each building that contributes a stream to the 183-N Backwash Discharge Pond. This includes the 183-N, 163-N, 184-N, 182-N, and 108-N Buildings. Fireproof storage cabinets and miscellaneous buckets and barrels were inventoried. The quantity of incidental materials was estimated if more than 5 gallons were stored. If the quantity was below 5 gallons, "<5 gallons" was noted. When the inventory of the five buildings was completed, the quantities of like materials were added together. If a "<5 gallons" was in the total, a "<" symbol was included with the total. Therefore, there are quantities such as "<90 gallons". Quantities of the incidental materials may vary slightly.

Soaps and cleaners are stored in the janitor closets throughout the various buildings in minor amounts. Soap is stored in the 183-N Building only on an as needed basis. Bulk supplies (soaps, cleaners, etc.) are stored with the janitorial supplies in the 105-N Building. This building does not contribute a waste water stream to the 183-N Backwash Discharge Pond, and thus the minor amounts were not inventoried.

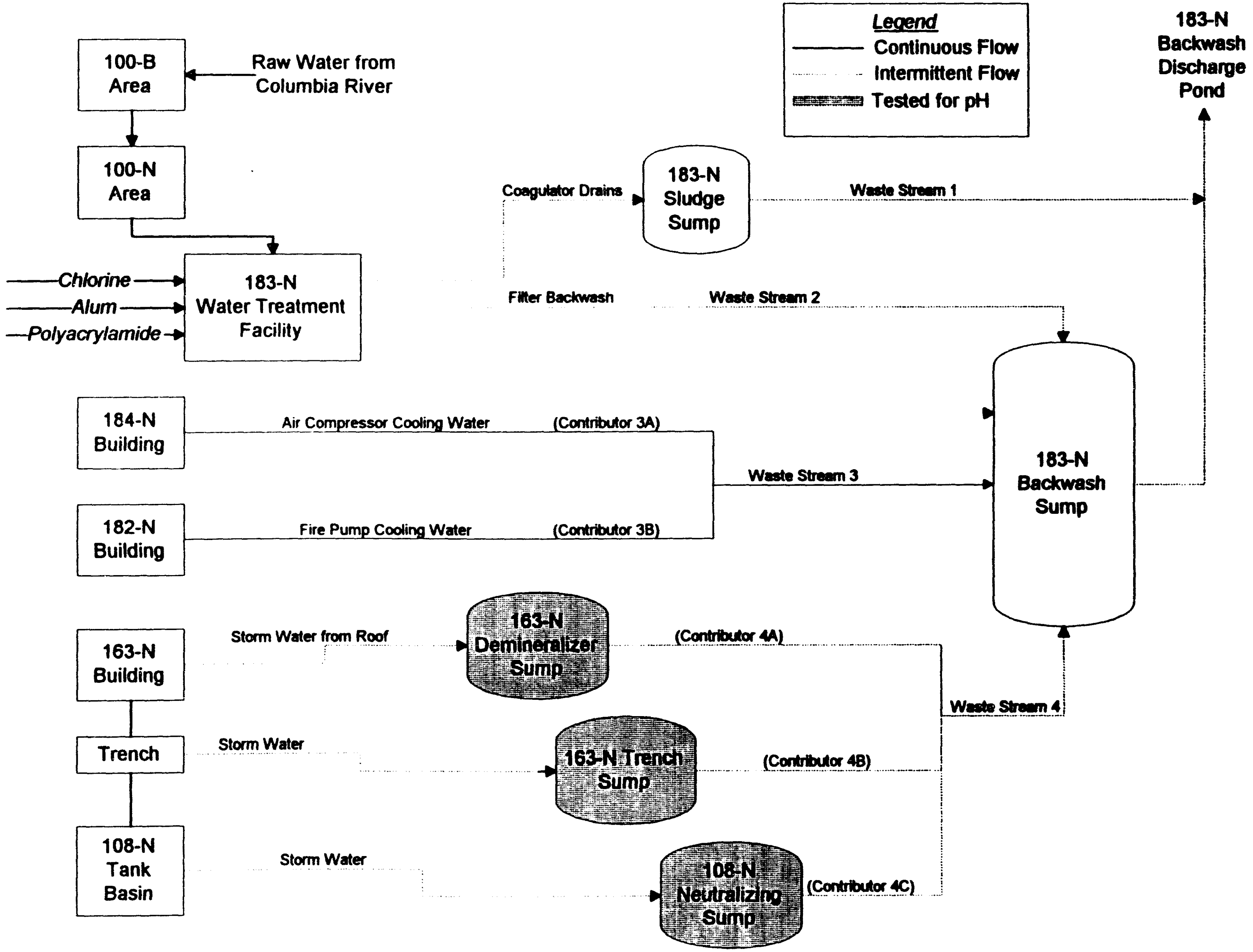

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Figure C-1. 183-N Schematic Diagram for Waste Water Treatment.

APPENDIX D

WATER CONSUMPTION AND WATER LOSS

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CONTENTS

FIGURE

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SECTION D, ITEM 3

ATTACH A LINE DRAWING SHOWING THE WATER FLOW THROUGH THE FACILITY. INDICATE SOURCE OF INTAKE WATER, OPERATIONS CONTRIBUTING WASTE WATER TO THE EFFLUENT, AND TREATMENT UNITS LABELED TO CORRESPOND TO THE MORE DETAILED DESCRIPTIONS IN ITEM C. CONSTRUCT A WATER BALANCE ON THE LINE DRAWING BY SHOWING AVERAGE FLOWS BETWEEN INTAKES, OPERATIONS, TREATMENT UNITS AND OUTFALLS. IF A WATER BALANCE CANNOT BE DETERMINED, PROVIDE A PICTORIAL DESCRIPTION OF THE NATURE AND AMOUNT OF ANY SOURCES OF WATER AND ANY COLLECTION OR TREATMENT MEASURES.

A line drawing showing water flow through facilities is included in Figure D-1. This water balance is based on estimates made in September of 1993. For details on the 183-N Backwash Discharge Pond contributors, refer to the process descriptions in Appendix B.

Waste water discharges to three other disposal sites besides the 183-N Backwash Discharge Pond. These include the 009 Outfall to the Columbia River, the 100-N Sanitary Sewer and General Service water. Waste water contributing to each disposal site is described as follows.

009 Outfall

Sampling and heating ventilation and air conditioning waste water are currently the only contributors to the National Pollutant Discharge Elimination System permitted 009 Outfall to the Columbia River. Waste water generated from cooling the supply fan is discharged down stream from the 009 Outfall. For the purposes of this water balance, this waste water will be included with the 009 Outfall.

Sanitary Sewer

The waste water discharging to the 100-N Sanitary Sewer is based on data from lift stations measuring influent into the lagoon. In 1993, this data was measured at an average of 3,400 gallons per day.

General Service Water

General Service Water consists of many miscellaneous sources, including sprinklers in the summer, replacement for water that has evaporated from basins, pump leakage, miscellaneous water for maintenance and instrument purposes, and water running constantly to prevent freezing in the winter. Due to unpredictable equipment maintenance problems, the maintenance/cooling water may vary significantly. Miscellaneous leaks or repairs may require unforeseen water use.

Water Balance in Gallons per Month at the 100-N Area in September 1993

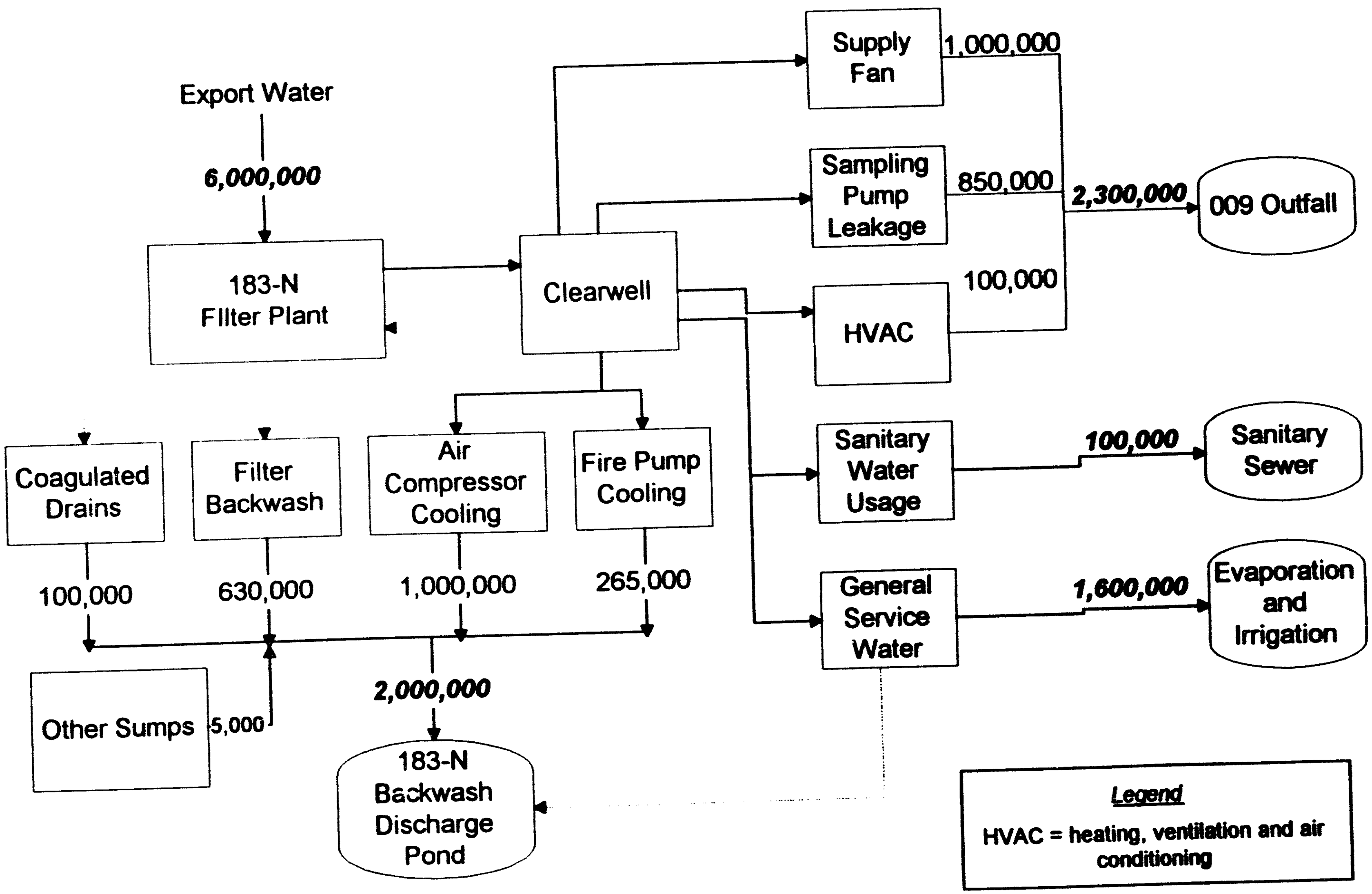

Figure D-1. 183-N Water Balance Diagram.

APPENDIX E

WASTE WATER INFORMATION

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CONTENTS

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SECTION E, ITEM 1

<u>PROVIDE MEASUREMENTS FOR TREATED WASTE WATER PRIOR TO LAND APPLICATION FOR THE PARAMETERS LISTED BELOW, UNLESS WAIVED BY THE PERMITTING AUTHORITY. ALL ANALYTICAL METHODS USED TO MEET THESE REQUIREMENTS SHALL, UNLESS APPROVED OTHERWISE IN WRITING BY ECOLOGY, CONFORM TO THE *GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS CONTAINED IN 40 CFR PART 136.*</u>

Data are presented as two separate tables (E-1 and E-2) to represent the sampling of two different locations, both of which feed to the 183-N Backwash Discharge Pond. The data was not combined due to inadequate flow information at the time of sampling. Data presented Table E-1 titled "183-N Filter Backwash Composite Data" is a result of sampling the 183-N Backwash Sump. At the time of sampling, the waste water present in the 183-N Backwash Sump was composed of Filter Backwash (Waste Stream 2, Figure C-1), cooling water (Waste Stream 3, Figure C-1) and waste water from the 163-N Demineralizer Sump (Waste Stream 4A, Figure C-1). Data presented in Table E-2 titled "108-N Sump Data" is a result of sampling the 108-N Neutralizing Sump (Contributor 4C, Figure C-1).

The 183-N Sludge Sump was not sampled. The 183-N Sludge Sump is drained twice a year and will be scheduled for sampling in the next year. The 183-N Sludge Sump receives the drainage from the coagulator basin and would be expected to contain a higher level of Total Dissolved Solids, Total Suspended Solids, aluminum and sulfate than the sampled waste water. However, the 183-N Sludge Sump waste water contributes less than 5 percent of the estimated total volume of waste water discharging to the 183-N Backwash Discharge Pond. The 163-N Trench Sump was also not sampled because it was dry. This sump collects waste water similar to that of the 163-N Demineralizer Sump.

The samples and resultant data presented were obtained in accordance with a sampling and analysis plan (WHC 1993d). The composite data represent sampling on two occasions, one in January and one in February. In general the data confirm process knowledge information and show that constituent concentrations are generally consistent with typical dilute industrial waste water streams as discussed in Metcalf and Eddy (1991) and the EPA design manual (EPA 1980).

A number of constituents detected in the 108-N and the 183-N Filter Backwash Sumps data, were greater than the Ground Water Quality Criteria (GWQC) in WAC-173-200. These are discussed below.

pH

The pH of the 108-N Sump was 2.3 (GWQC pH=6.5-8.5). The low pH is most likely the result of residual acid previously used in an ion exchange process (Appendix B, WHC 1993a). This sump pH is monitored prior to discharge to the 183-N Filter Backwash Pond and is adjusted to neutral if found to be less than 6 or greater than 9. The 108-N Sump was sampled prior to neutralization, which is performed before transferring to the 183-N Filter Backwash Pond.

TDS

The high TDS concentration of 1700 mg/L (GWQC=500 mg/L) in the 108-N Sump is most likely due to dissolved minerals from the soil that is blown into the trench that rainwater must traverse to reach the sump as well as residual sulfuric acid. Sulfuric acid was used previously in an ion exchange process (Appendix B, WHC 1993a).

Chromium (Cr)

Chromium was detected at 231 ug/L (GWQC=50 ug/L) in the 108-N Sump. It is not known where the chromium could have come from but there are a number of stainless steel tanks and piping contacted by the rainwater runoff and the chromium may be leaching from them.

Lead (Pb)

Lead was detected at 203 ug/L (GWQL=50 ug/L) in the 108-N Sump. It is not known where the Pb could have come from.

Iron (Fe) and Manganese (Mn)

Iron was detected at 40,450 ug/L in the 108-N Sump and 2905 ug/L in the 183-N Filter Backwash Sump. (GWQC = 300 ug/L) Manganese was detected at 1297 mg/L in the 108-N Sump and 60 mg/L in the 183-N Filter Backwash Sump (GWQC = 50 mg/L). The source of the high iron and manganese are not known but may be related to the stainless steel tanks and pipeing discussed in conjunction with chromium above.

Sulfate

Sulfate was detected at 1297 mg/L (GWQL = 250 mg/L). The source of the sulfate is most likely residual sulfuric acid. Sulfuric acid was previously used in the ion exchange processes (Appendix B and WHC 1993a).

Organics

Methylene chloride was detected in two of five samples from the 108-N Sump for an average of 8.2 ug/L (GWQC = 5 ug/L). It should be noted however that three of the samples were qualified as "U" (not detected) and the two remaining samples were qualified with a "J",indicating an estimated value.

Chloroform was detected at 30 ug/L (GWQC = 7 ug/L) and bromodichloromethane was detected at 2 ug/L (GWQC = 0.3 ug/L) in the 183-N Filter Backwash Sump. It is suspected that both of these compounds are a result of the chlorination of the influent potable water since potable water samples taken at the same time contained 28 ug/L and 2 ug/L of chloroform and biomodichlorothane respectively.

Table E-1. 183-N Filter Backwash Sump Composite Data.
Sheet 1 of 3

EFFLUENT [a]						
CONSTITUENT	n	MEAN CONC.	S.D.	UNITS	METHOD [b]	D.L.[c]
Waste Water Parameters [d]						
Conductivity	4	168	3	umho/cm	120.1	6
pH	4	7.2	0.2	pH	9040	0.1
TDS	4	96	16	mg/L	160.1	5
TSS	4	25 (U)	N/A	mg/L	160.2	5
BOD	6	37	21	mg/L	5210	2
TKN	4	0.40 (J)	0.18	mg/L	351.3	0.15
Total Phosphorous	4	0.12	N/A	mg/L	365.2	0.05
Metals						
Ca	4	21950	661	ug/L	6010	10 (P)
Mg	4	6915 (B2)	3992	ug/L	6010	30 (P)
Na	4	2608 (B2,J2)	138	ug/L	6010	29 (P)
K	4	887 (B4)	61	ug/L	6010	N/A
Cd	4	1.7 (U4)	N/A	ug/L	6010	1.7
Cr	4	4.5 (B2,U2)	2.5	ug/L	6010	7 (P)
Pb	4	11.1 (U4)	N/A	ug/L	6010	11.1
Hg	4	0.10 (U4)	N/A	ug/L	7470	0.10
Se	2	32.8 (UJ2)	N/A	ug/L	6010	32.8
Ag	4	2.1 (U2,UJ2)	N/A	ug/L	6010	2.1
Cu	4	42 (U2)	14	ug/L	6010	1.8
Fe	2	2905 (J2)	1452	ug/L	6010	13
Mn	4	60 (B2)	56	ug/L	6010	2 (P)

Table E-1. 183-N Filter Backwash Sump Composite Data.
Sheet 2 of 3

EFFLUENT [a]						
CONSTITUENT	n	MEAN CONC.	S.D.	UNITS	METHOD [b]	D.L.[c]
Metals (continued)						
Zn	4	36.7 (U2)	3.6	ug/L	6010	14
Ba	4	35 (B4)	3	ug/L	6010	2 (P)
As	4	16 (B1,U3)	2	ug/L	6010	16
Anions						
Fl^-	4	0.13 (J2)	0.05	mg/L	EPA 300.0	0.1
Cl^-	3	6.0	0.3	mg/L	EPA 300.0	0.2
$SO_4^=$	4	26	6	mg/L	EPA 300.0	1
$NO_2^=$, NO_3^-	4	0.25 (U4)	N/A	mg/L	EPA 353.2	0.25
Organics						
Methylene Chloride (VOC)	3	2.33 (J3)	0.58	ug/L	8240	5
Acetone (VOC)	5	22.4 (J1)	13.6	ug/L	8240	10
Chloroform (VOC)	4	30	10	ug/L	8240	5
Bromodichloromethane (VOC)	4	2 (J3,UJ)	N/A	ug/L	8240	5
Screening						
TOC	5	5	7	mg/L	9060	1
TOX	7	337 (J3)	156.7	ug/L	9020	1.0-20.0
Radionuclides [e]						
Gross Alpha	4	1.2 (J,U2,UJ)	0.7	pCi/L	EP-10	0.9-3
Gross Beta	4	0.7 (U4)	0.2	pCi/L	EP-10	2-4

Table E-1. 183-N Filter Backwash Sump Composite Data.
Sheet 3 of 3

BOD= Biological Oxygen Demand
PAH = Polycyclic Aromatic Hydrocarbons
SVOC= Semi-Volatile Organic Compound
TDS =Total Dissolved Solids
TIC = Tenatively Identified Compound
TKN= Total Kjeldahl Nitrogen
TOC = Total Organic Carbon
TOX = Total Organic Halide
TSS = Total Suspended Solids
VOC = Volatile Organic Compound

mg/L = milligrams per liter
pCi/L = picocuries per liter
ug/L = micrograms per liter
umho/cm = micromhos per centimeter
N/A = Not Applicable
ND = Not Detected

a n = Number of sample results averaged.
mean conc = mean concentration
S.D. = one standard deviation about the mean

b Three digit numbers with a decimal (i.e. 120.1, 300.0 etc.) are from EPA 1979. Four digit procedure numbers (i.e. 6010, 9131 etc.) are from EPA 1992. Four digit numbers with a letter following (i.e., 5210B) are from "Standard Methods for the Examination of Water and Wastewater", 18th Edition, (APHA, 1992).

c D.L. detection level as reported by the laboratory or procedures (P) if no D.L. was reported with the data.

d Qualifiers which may appear in this table are:
(U) - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit (D.L.) corrected for sample dilution by the laboratory.
(J) - Indicates the compound or analyte was analyzed for and detected, but due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate. This flag is also used when estimating concentrations of TICs or when the presence of a target compound is confirmed at a concentration of less than the D.L. but greater than the instrument detection limit.
(B) - This flag applies to results in which the analyte was detected in both the sample and the associated blank. For the metals, (B) also indicates the analyte concentration is less than the D.L. but greater than the instrument detection level.
Data qualifiers may appear in combinations. An alpha numeric combination (i.e., U2) indicates that two of the sample results used in the mean had a (U) qualifier. Two qualifiers separated by a comma (i.e., B,U) indicates that one of the samples in the mean has a (B) qualifier and one has a (U) qualifier.

e Contractor internal laboratory procedures are used for radiochemical analysis.

Table E-2. 108-N Sump Data.
Sheet 1 of 3

EFFLUENT [a]						
CONSTITUENT	n	MEAN CONC.	S.D.	UNITS	METHOD [b]	D.L. [c]
Waste Water Parameters [d]						
Conductivity	4	21347	20557	umho/cm	120.1	6
pH	4	2.3 (J4)	0.1	pH	9040	0.1
TDS	4	1700	77	mg/L	160.1	5
TSS	4	5 (U4)	N/A	mg/L	160.2	5
BOD	3	46	12	mg/L	5210	2
TKN	4	4.9	0.1	mg/L	351.3	0.15
Total Phosphorous	4	0.95	0.12	mg/L	365.2	0.05
Metals						
Ca	4	116750	3304	ug/L	6010	10 (P)
Mg	4	10927 (B1)	4223.0	ug/L	6010	30 (P)
Na	4	166250	4717	ug/L	6010	29 (P)
K	4	13275	640	ug/L	6010	N/A
Cd	4	3.7 (B2,U2)	1.2	ug/L	6010	1.7
Cr	4	231	7	ug/L	6010	2.5
Pb	4	203	15	ug/L	6010	11.1
Hg	4	0.20 (B2,J2)	0.11	ug/L	7470	0.1
Se	2	32.8 (UJ2)	N/A	ug/L	6010	32.8
Ag	4	3.7 (U3,B1)	1.3	ug/L	6010	2.1
Cu	4	143	3.9	ug/L	6010	1.8
Fe	2	40450 (J2)	1269	ug/L	6010	13.4
Mn	4	1297	35	ug/L	6010	2 (P)
Zn	4	1155	42	ug/L	6010	14

**Table E-2. 108-N Sump Data.
Sheet 2 of 3**

EFFLUENT [a]						
CONSTITUENT	n	MEAN CONC.	S.D.	UNITS	METHOD [b]	D.L.[c]
Metals (continued)						
Ba	4	14 (B4)	6	ug/L	6010	2 (P)
As	4	16 (U4)	N/A	ug/L	6010	16
Anions						
Fl^-	4	0.55 (J2)	0.06	mg/L	300.0	0.1-0.4
Cl^-	4	2.1	0.3	mg/L	300.0	0.2-0.4
$SO_4^=$	4	1297	106	mg/L	300.0	1-100
$NO_2^=$, NO_3^-	6	2.31	0.18	mg/L	353.2	0.25
Organics						
Methylene Chloride (VOC)	5	8.2 (J2,U3)	0.9	ug/L	8240	5
Acetone (VOC)	1	11	N/A	ug/L	8240	10
Screening						
TOC	5	16.4	0.6	mg/L	9060	1
TOX	2	436	4	ug/L	9020	1.0-20.0
Radionuclides [e]						
Gross Alpha	4	5.3 (UJ,J1)	5.3	pCi/L	EP-10	1-3
Gross Beta	4	13 (J2)	3	pCi/L	EP-10	2-4

Table E-2. 108-N Sump Data.
Sheet 3 of 3

BOD = Biological Oxygen Demand	mg/L = milligrams per liter
PAH = Polycyclic Aromatic Hydrocarbons	pCi/L = picocuries per liter
SVOC = Semi-Volatile Organic Compound	ug/L = micrograms per liter
TDS = Total Dissolved Solids	umho/cm = micromhos per centimeter
TIC = Tenatively Identified Compound	N/A = Not Applicable
TKN = Total Kjeldahl Nitrogen	ND = Not Detected
TOC = Total Organic Carbon	
TOX = Total Organic Halide	
TSS = Total Suspended Solids	
VOC = Volatile Organic Compound	

a n = Number of sample results averaged.
mean conc = mean concentration
S.D. = one standard deviation about the mean

b Three digit numbers with a decimal (i.e. 120.1, 300.0 etc.) are from EPA 1979. Four digit procedure numbers (i.e. 6010, 9131 etc.) are from EPA 1992. Four digit numbers with a letter following (i.e., 5210B) are from "Standard Methods for the Examination of Water and Wastewater", 18th Edition, (APHA, 1992).

c D.L. detection level as reported by the laboratory or procedures (P) if no D.L. was reported with the data.

d Qualifiers which may appear in this table are:
(U) - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit (D.L.) corrected for sample dilution by the laboratory.
(J) - Indicates the compound or analyte was analyzed for and detected, but due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate. This flag is also used when estimating concentrations of TICs or when the presence of a target compound is confirmed at a concentration of less than the D.L. but greater than the instrument detection limit.
(B) - This flag applies to results in which the analyte was detected in both the sample and the associated blank. For the metals, (B) also indicates the analyte concentration is less than the D.L. but greater than the instrument detection level.
Data qualifiers may appear in combinations. An alpha numeric combination (i.e., U2) indicates that two of the sample results used in the mean had a (U) qualifier. Two qualifiers separated by a comma (i.e., B,U) indicates that one of the samples in the mean has a (B) qualifier and one has a (U) qualifier.

e Contractor internal laboratory procedures are used for radiochemical analysis.

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APPENDIX F

STORM WATER

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CONTENTS

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SECTION F

Due to the overlap between Items 1 and 2, the items were combined and addressed in the following statement.

SECTION F, ITEM 1

DO YOU HAVE A WASHINGTON STATE STORM WATER BASELINE GENERAL PERMIT?

SECTION F, ITEM 2

HAVE YOU EVER APPLIED FOR A WASHINGTON STATE STORM WATER BASELINE GENERAL PERMIT.

Federal facilities are excluded from coverage under the Washington State Storm Water Baseline Permit, as are industrial facilities which have no point source discharge to surface water or a municipal storm sewer. However, a National Pollutant Discharge Elimination System (NPDES) General Permit was developed by EPA on September 9, 1992 for federal facilities located in Washington State, engaged in discharging storm water associated with industrial activities. To obtain site coverage under the NPDES General Permit, DOE-RL filed a Notice Of Intent application before the EPA on October 1, 1992. Subsequently, the Hanford Site has been issued an NPDES General Permit Number WA-R-00-A17F for site-wide coverage of storm water discharge. As required by the NPDES General Permit, the Hanford Site is implementing a storm water pollution prevention program according to the *Hanford Site Stormwater Pollution Prevention Plan* (1993b). Storm water discharges from the 200 East, 200 West and 400 Areas have no potential discharge to the Columbia or Yakima Rivers and thus were not included in the *Hanford Site Stormwater Pollution Prevention Plan* (1993b).

SECTION F, ITEM 4

DESCRIBE THE SIZE OF THE STORM WATER COLLECTION AREA.

Storm water is collected in four sumps in the vicinity of the 183-N Water Treatment Facility. These four sumps are shown on Drawing H-13-000094 as the 163-N Demineralizer Sump, the 108-N Neutralizing Sump, the 163-N Trench Sump, and the 183-N Backwash Sump. Storm water is collected in the four sumps from pavement runoff, roof downspouts, and/or partially open trenches. When the sumps are full, portable hoses and a portable pump are used to pump the water to the 183-N Backwash Sump. The water is pumped to the 183-N Backwash Discharge Pond.

One storm water collection area has been established for all four of the sumps (Drawing H-13-000094). A walkdown was performed to establish the storm water collection area. Topography and paved areas were examined around each sump that collects storm water. This boundary is conservative and reflects the likelihood of storm water collecting in the sumps.

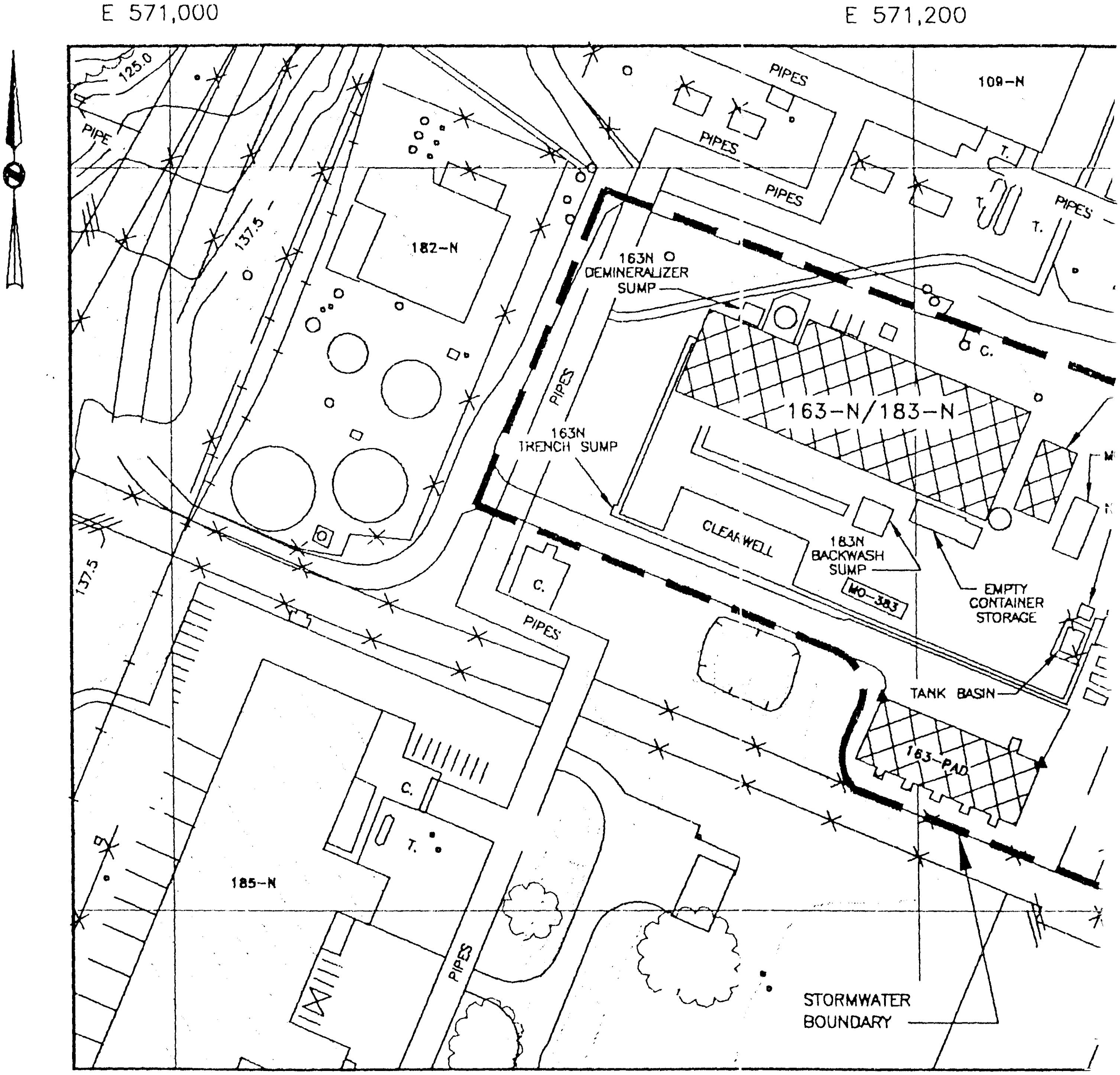
SECTION F, ITEMS 5-7

Items 5 through 7 in Section F are answered for the storm water collection area defined on Drawing H-13-000094. The notes and legend are on Drawing H-13-000095.

SECTION F, ITEM 8

ATTACH A MAP SHOWING STORM WATER DRAINAGE/COLLECTION AREAS, DISPOSAL AREAS AND DISCHARGE POINTS.

Drawing H-13-000094 shows storm water drainage/collection areas, disposal areas and discharge points.



SITE PLAN

SCALE: 1:1500

0 15 30 60 90 120   0 100 200 300 400

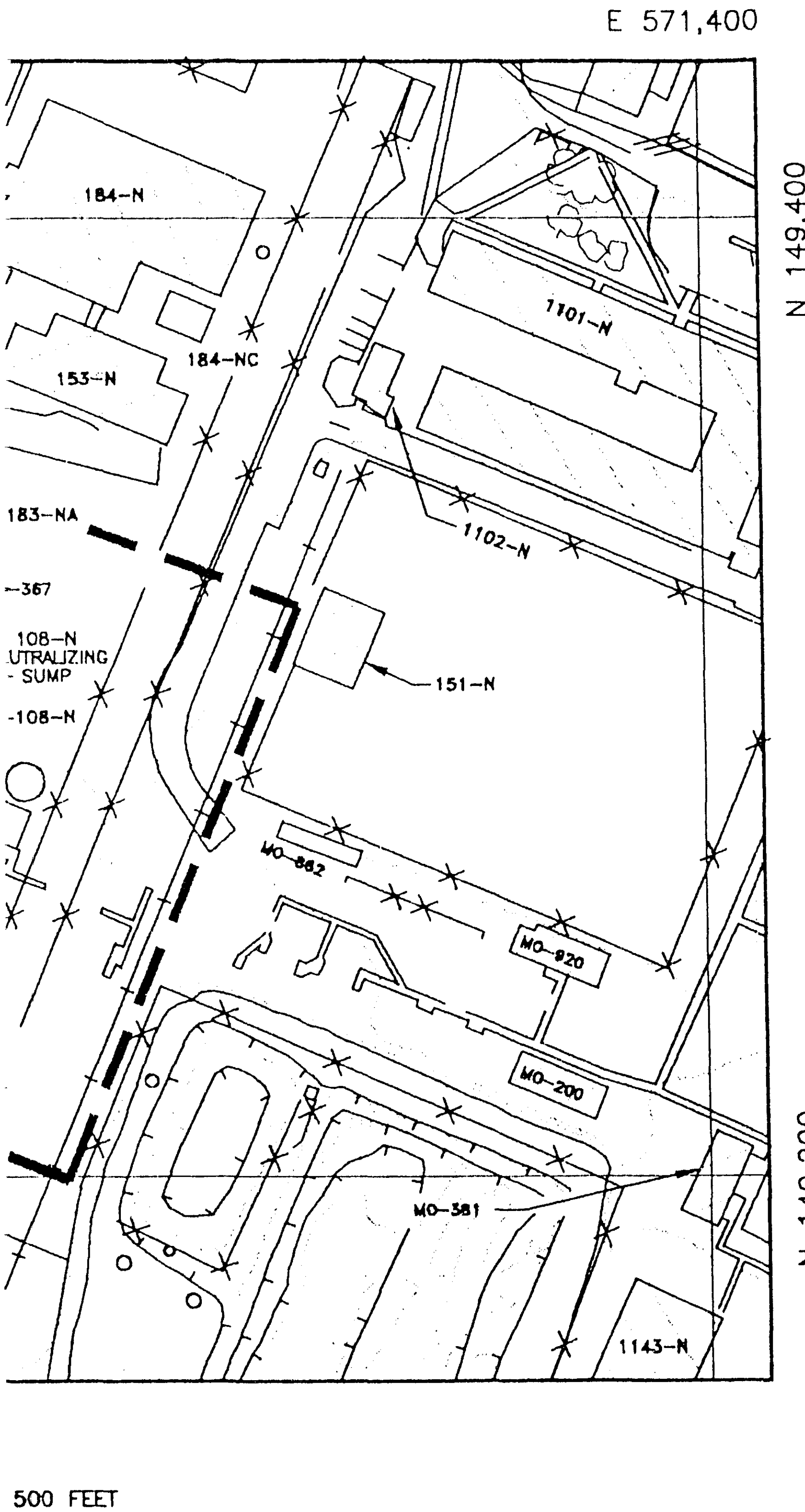
1 cm = 15 meters

H-13-000119	100 AREA TOPOGRAPHIC MAP
H-13-000120	100 AREA TOPOGRAPHIC MAP
REF NUMBER	TITLE
REFERENCE	
NEXT USED ON	H-13-000100

MFG REV REL	REV NO	DESCRIPTION	REV BY DATE	CH BY DA
REVISIONS				
CADFILE	N00001'4A		CADCODE	DOS:6

ZDJB0006

FOR GENERAL NOTES AND LEGEND SEE: H-13-000095



DFTG APRVD DATE	COG ENGR	OTHER	OTHER
APPROVALS BY/DATE			

CD2:12.0:SS

DRAWN RAFAEL TORRES	DATE 5/11/94	
CHECKED Larry L. Robertson	5/11/94	
DFTG APVD	5/11/94	
COG ENGR B.P. Atencio		
APPVD		
APPVD		
APPVD		

U.S. DEPARTMENT OF ENERGY
DOE Field Office, Richland
Westinghouse Hanford Company

BACKWASH POND STORMWATER MAP

SIZE	BLDG NO	INDEX NO	DWG NO	REV
B	183-N	0110	H-13-000094	0

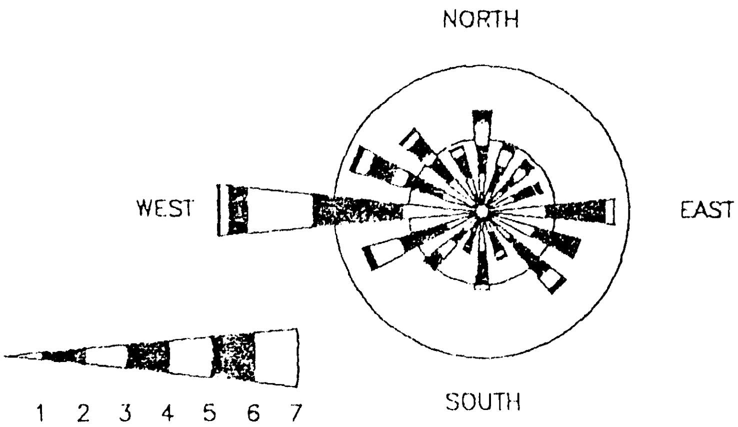
SCALE SHOWN | EDT 604305 | SHEET 1 OF 1

CHK PRINT ☐ | COMMENT PRINT ☐

DWG NO H-13-000094 SH 1 OF 1 REV 0

WIND ROSE FOR: 100N-AREA
% CALM WINDS = 1.3
STATION NO.13

PERIOD COVERED
1/1/93 - 12/31/93



PADDLES INDICATE DIRECTION WIND IS COMING FROM.
RADIAL GRIDS REPRESENT 5.0% AND 10.0% OCCURRENCE.

WIND CLASS	MILES/HOUR
1	>1.0 - 3.0
2	4.0 - 7.0
3	8.0 - 12.0
4	13.0 - 18.0
5	19.0 - 24.0
6	25.0 - 31.0
7	32.0 +

WIND ROSE

LEGEND

E 17,000 N 43,000	HANFORD PLANT COORDINATES (FEET)
E 576,250 N 138,000	WASHINGTON STATE COORDINATES (METERS)
	INDEX CONTOUR (METERS)
	INTERMEDIATE CONTOUR
	IMPROVED ROAD
	UNIMPROVED ROAD
	DIRT ROAD
	SIDEWALKS\PARKING LOTS
	RAILROADS
	SECURITY,WARNING,MISC FENCES
	POST & CHAIN (CRIB,BURIAL GROUND FENCES)
	PERIMETER FENCES
	BUILDINGS/STRUCTURES & TOWERS
242-A	BUILDING NUMBER
N-27	WELL
	TANKS
216-A-42	CRIB
218-E-10	BURIAL GROUND
	CHEMICAL\HANDLING AND STORAGE FACILITIES
DP	DISCHARGE POINT
▲	DOWNSPOUTS

REF NUMBER	TITLE
H-13-000094	183-N BACKWASH POND STORMWATER MAP

REFERENCE

NEXT USED ON H-13-000100

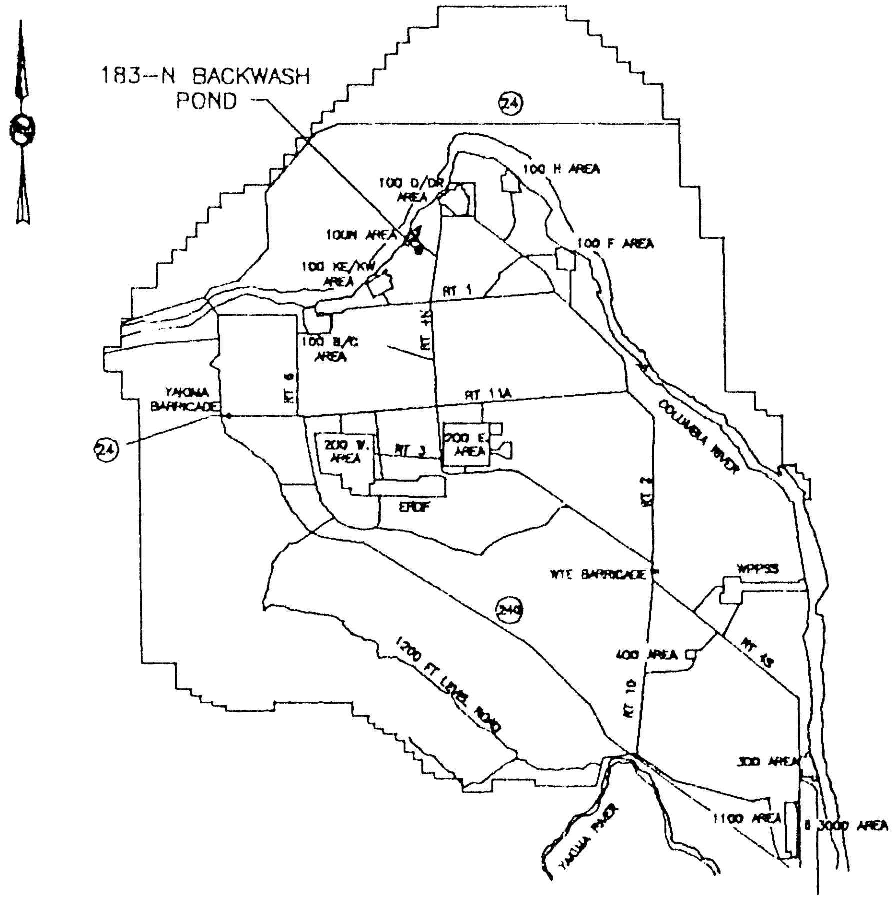
MFG / REV REL	REV NO	DESCRIPTION	REV BY DATE	CHK BY DAT

REVISIONS

CADFILE NC00095A

CADCODE DOS:6

ZDJB0006



KEY PLAN

SCALE: NONE

GENERAL NOTES

1. THESE GENERAL NOTES AND LEGEND ARE FOR H-13-000094.
2. THIS MAP IS BASED ON AERIAL PHOTOGRAPHY FLOWN ON 6-20-90. THE ORIGINAL TOPOGRAPHIC MAP WAS PREPARED BY WILLIAM E. BROWN AND CERTIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS. OFFICIAL COPIES OF THE GEONEX SACRAMENTO MAPS THAT SHOW THE CERTIFICATE ARE LOCATED IN THE WESTINGHOUSE ENGINEERING FILES AS DRAWING NUMBERS H-1-52166 SHEET 1 THROUGH 55. NAMES OF ADDITIONAL FEATURES AND THE TITLE BLOCK WERE ADDED BY WESTINGHOUSE HANFORD COMPANY. MAPS WERE ADDED BY WESTINGHOUSE HANFORD COMPANY.
3. WASHINGTON STATE PLANE COORDINATE SYSTEM: THE OFFICIAL COORDINATE SYSTEM AS DEFINED BY THE REVISED CODE OF WASHINGTON (RCW). THE HANFORD SITE LIES WITHIN THE WASHINGTON COORDINATE SYSTEM, SOUTH ZONE. THIS GRID COVERS THE ENTIRE SITE AND USES X (EASTINGS) AND Y (NORTHINGS) COORDINATES.

   HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION. WASHINGTON STATE PLANE COORDINATES SHOWN IN METERS.

   CONTOUR INTERVAL: 0.5 METERS.
4. THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY. DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

DFTG APRVD DATE	COG ENGR	OTHER	OTHER
APPROVALS BY/DATE			

		DATE
DRAWN	RAFAEL TORRES	5/10/94
CHECKED	[signature]	5/10/94
DFTG APVD	[signature]	5/10/94
COG ENGR	[signature]	5/10/94
APPVD		
APPVD		
APPVD		

U.S. DEPARTMENT OF ENERGY
DOE Field Office, Richland
Westinghouse Hanford Company

HANFORD SITE STORMWATER MAP GENERAL NOTES AND LEGEND

SIZE	BLDG NO	INDEX NO	DWG NO	REV
B	100N	0110	H-13-000095	0

SCALE SHOWN | EDT 604304 | SHEET 1 OF 1

):ACD2:12.0:SS

CHK PRINT ☐ COMMENT PRINT ☐

DWG NO H-13-000095 SH 1 OF 1 REV 0

APPENDIX G

OTHER INFORMATION

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CONTENTS

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SECTION G, ITEM 1

DESCRIBE LIQUID WASTES OR SLUDGES BEING GENERATED THAT ARE NOT DISPOSED OF IN THE WASTESTREAMS AND HOW THEY ARE DISPOSED OF. FOR EACH TYPE OF WASTE, PROVIDE TYPE OF WASTE, NAME, ADDRESS, AND PHONE NUMBER OF HAULER.

Two types of waste are generated at the 100-N Area that are not disposed of in the 183-N Backwash Discharge Pond. These include sanitary sewage and dangerous waste. The sanitary sewage is discharged to the 100-N Sewage Lagoon. The sludge that accumulates in the 100-N Sewage Lagoon will be cleaned out every 5 to 10 years and disposed of in an approved disposal site.

Sludge also accumulates in cesspools from the five smaller septic systems remaining in the 100-N Area. These septic tanks are pumped out periodically and transported to the 100-N Sewage Lagoon. Westinghouse Sanitary Systems Maintenance hauls the sewage from the septic systems to the 100-N Sewage Lagoon. Currently, Westinghouse Hanford Company (WHC) also has a contract with Roto-Rooter Sewer Service Co. to help haul the sewage. The addresses are as follows:

Sanitary Systems Maintenance
Westinghouse Hanford Company
P.O. Box 1970
MSIN S4-61
Richland, WA 99352
(509) 373-5786

Roto-Rooter Sewer Service Co.
Route 4, Box 4000-D
Kennewick, WA 99336
(509) 783-7311

The 163-N pad is a 90-day dangerous waste storage pad that collects dangerous waste from the 100-N Area. Dangerous waste is hauled from the 90-day dangerous waste storage pad by the following:

Solid Waste Disposal
Westinghouse Hanford Company
P.O. Box 1970
MSIN N3-11
Richland, WA 99352
(509) 376-4646

SECTION G, ITEM 2

DESCRIBE STORAGE AREAS FOR RAW MATERIALS, PRODUCTS, AND WASTES.

Raw Materials - Raw water comes into the 183-N Water Treatment Facility from the 100-B Area and is pumped directly to the steel chemical mixing tank. Alum is stored in an 8,240-gallon capacity steel tank in the 183-N Building. Chlorine is stored in two steel cylinders in the 183-N Building. Polyacrylamide is stored in the coagulator room until it is mixed with water and pumped from the plastic polyacrylamide mixing tank as needed. Sodium hypochlorite is stored in a fire-proof storage cabinet.

Products - Sanitary water is stored in the concrete 200,000-gallon clearwell.

Wastes - Dangerous waste generated at the 100-N Area is stored at the 90-day dangerous waste storage pad. The 90-day dangerous waste storage pad is an open area covered by a roof. The area in which the wastes are handled is bermed to provide containment in case of a spill.

APPENDIX H

SITE ASSESSMENT

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CONTENTS

AIIM

Association for Information and Image Management
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202

Centimeter

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 mm

1 2 3 4 5

Inches

1.0 1.1 1.25 1.4 1.6 1.8 2.0 2.2 2.5 2.8 3.2 3.6 4.0 4.5 5.0 5.6 6.3 7.1 8.0

MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

2 of 2

CONTENTS

FIGURE

SECTION H, ITEM 1

GIVE THE LEGAL DESCRIPTION OF THE LAND TREATMENT SITE(S). GIVE THE ACREAGE OF EACH LAND TREATMENT SITE(S). ATTACH A COPY OF THE CONTRACT(S) AUTHORIZING USE OF LAND FOR TREATMENT.

Legal Description:

NW 1/4, SE 1/4, Section 28, Township 14N, Range 26E, Benton County, Washington.

The 183-N Backwash Discharge Pond has a total area of 1.29 acres.

A specific contract authorizing use of the 183-N Backwash Discharge Pond for a land treatment site does not exist, but the Hanford Site was created by the U.S. Government to serve as a research and production facility for federal government nuclear projects. The Hanford Site has been in use since the early 1940's and all disposal facilities, such as the 183-N Backwash Discharge Pond, have been authorized by the U.S. Government.

SECTION H, ITEM 2

LIST ALL ENVIRONMENTAL CONTROL PERMITS OR APPROVALS NEEDED FOR THIS PROJECT; FOR EXAMPLE, SEPTIC TANK PERMITS, SLUDGE APPLICATION PERMITS, OR AIR EMISSIONS PERMITS.

There are no permits specifically for this project. The following permits are general permits for the Hanford Site:

- Hanford Site Radioactive Air Emissions Permit: Number FF-01
- Hanford Site Dangerous Waste Permit: Number WA7890008967
- NPDES General Permit: Number WA-R-00-A17F.

SECTION H, ITEM 3

ATTACH A UNITED STATES GEOLOGICAL SURVEY (USGS) TOPOGRAPHIC MAP. SHOW THE FOLLOWING ON THIS MAP:

- **a. Location and name of internal and adjacent streets**
- **b. Surface water drainage systems within 1/4 mile of the site**
- **c. All wells within 1 mile of the site**
- **d. Chemical and product handling and storage facilities**
- **e. Infiltration sources, such as drainfields and lagoons within 1/4 mile of the site**
- **f. Waste water and cooling water discharge points with waste stream ID numbers (See Section C.1)**
- **g. Other activities and land uses within 1/4 mile of the site**

Drawing H-13-000088 addresses the above items as applicable. Although this drawing is not a USGS topographic map, it was derived from the Hanford Site topographic map database. The Hanford Site map database provides more detail and allows the items to be addressed at a more appropriate scale than a USGS map. The waste water discharge point shown for the waste stream on Drawing H-13-000088 includes all component substreams prior to discharge. The chemical and product handling and storage areas are difficult to see on a map of this scale and are shown on Drawing H-13-000094 in Appendix F.

SECTION H, ITEM 4

ATTACH WELL LOGS AND WELL I.D.# WHEN AVAILABLE FOR ALL WELLS WITHIN 500 FEET AND ANY AVAILABLE WATER QUALITY DATA.

Drawing H-13-000088 shows all of the wells drilled within a one-mile radius of the 183-N Backwash Discharge Pond. Well numbers beginning with 'N' are preceded by a 199. All other wells are preceded by a 699. Most of the 699 wells have been abandoned and filled in or were not completed. The abandoned wells were given a different symbol. There are no existing wells within 500 feet of the 183-N Backwash Discharge Pond. No well logs are available for the abandoned wells located within 500 feet of the 183-N Backwash Discharge Pond.

SECTION H, ITEM 5

DESCRIBE SOILS ON THE SITE USING INFORMATION FROM LOCAL SOIL SURVEY REPORTS.

The most recent study of the soil on the Hanford Site was done by Hajek (1966). This study presents a soil map and descriptive report of soils in the Benton County portion of the Hanford Site. On the basis of morphologic and genetic characteristics, 13 soil types were identified. An approximate land use capability classification is provided for these soils on the basis of soil limitations for, and damage risks associated with, agricultural use. Approximate engineering classifications for these soils, using the Unified Soil Classification System, are also provided in Hajek (1966). The soil types mapped on the Hanford Site are shown on Figure H-1. There is no soil data for the north slope of the Hanford Site. The soils in the vicinity of the 183-N Backwash Discharge Pond consist of Ephrata stony loam and Ephrata sandy loam. A map depicting the soils within one mile of the 183-N Backwash Discharge Pond is provided as Figure H-2.

The Ephrata stony loam is a dark grayish brown, medium-textured soil which contains boulders up to several feet in diameter. The topography is composed of large hummocky ridges made up of debris released from the melting of glaciers. Areas between the hummocks contain many boulders several feet in diameter. The Ephrata stony loam is underlain by gravelly material which may continue for many feet. The surface of the Ephrata stony loam is classified as Group SM (silty sand) ML (silt) under the Unified Soil Classification System. The subsoil is to classified a Group ML (silt). Group ML (silt) is fine-grained soils composed of silts and clays with little or no plasticity.

The Ephrata sandy loam, occurring to an average depth of 12 inches, is a dark grayish brown, medium-textured soil underlain by deep gravely material. The topography is generally level. The surface of the Ephrata sandy loam belongs to Group SM (silty sand) to ML (silt), and the subsurface belongs to Group ML (silt). Group ML (silt) is fine-grained soils composed of silts and clays with little or no plasticity.

SECTION H, ITEM 6

DESCRIBE THE REGIONAL GEOLOGY AND HYDROGEOLOGY WITHIN ONE MILE OF THE SITE.

REGIONAL GEOLOGY

A summary of the regional geologic characteristics of the Pasco Basin and the Hanford Site is presented below in terms of stratigraphy and structure. WHC (1992a), WHC (1991a), and WHC (1991c), may be consulted for additional detail. Figure H-3 shows a map depicting the geology of the Hanford Site. Figure H-4 is a legend explaining Figure H-3.

REGIONAL STRATIGRAPHY

The Hanford Site lies within the Pasco Basin, a regional structural and topographic, sediment-filled depression. The sediments of the Pasco Basin are underlain by Miocene-age basalt of the Columbia River Basalt Group, a thick sequence of flood basalts that covers a large area in eastern Washington, western Idaho, and northeastern Oregon. The sediments overlying the basalts, from oldest to youngest, include: the Miocene-Pliocene Ringold Formation, local alluvial deposits of possible late Pliocene or early Pleistocene age, local "Palouse" soil of mostly eolian origin, glaciofluvial deposits of the Pleistocene Hanford formation, and surficial Holocene eolian and fluvial sediments. The generalized stratigraphy of the Hanford Site is described from the oldest to youngest formation in the following paragraphs. The regional stratigraphy is depicted on Figure H-5.

Columbia River Basalt Group and the Ellensburg Formation

The Columbia River Basalt Group consists of an assemblage of tholeiitic, continental flood basalts of Miocene Age with an accumulated thickness in excess of 10,000 feet within the Pasco Basin. These flows cover an area of more than 63,000 square miles in Washington, Oregon, and Idaho and have an estimated volume of about 40,800 cubic miles. The majority of the flows were erupted 14.5 to 17 million years ago (WHC 1991a).

The Columbia River Basalt Group is formally divided into five formations (from oldest to youngest): Imnaha Basalt, Picture Gorge Basalt, Grande Ronde Basalt, Wanapum Basalt, and Saddle Mountains Basalt. Of these, all are present within the Pasco Basin except for the Picture Gorge Basalt. The Saddle Mountains Basalt, divided into the Ice Harbor, Elephant Mountain, Pomona, Esquatzel, Asotin, Wilbur Creek, and Umatilla Members, forms the uppermost basalt unit throughout most of the Pasco Basin.

The Elephant Mountain Member is the uppermost unit beneath most of the Hanford Site except near the 300 Area where the Ice Harbor Member is found and north of the 200 Areas where the Saddle Mountains Basalt has been eroded down to the Umatilla Member in the Gable Gap area (WHC 1991a). The Elephant Mountain Member has also been locally eroded in the vicinity of the northeast corner of the 200 East Area (WHC 1991a). On anticlinal ridges bounding the Pasco Basin, erosion has removed the Saddle Mountains Basalt, exposing the Wanapum and Grande Ronde basalts (WHC 1991a).

The Ellensburg Formation consists of all sedimentary units that occur between the basalt flows of the Columbia River Basalt Group in the central Columbia Basin (Reidel and Fecht 1981). The Ellensburg Formation generally consists of two main lithologies: volcaniclastics and siliciclastics. The volcaniclastics consist mainly of primary pyroclastic air fall deposits and reworked epiclastics derived from volcanic terrains west of the Columbia Plateau. Siliciclastic strata consist of clastic, plutonic, and metamorphic detritus derived from the Rocky Mountain terrains located to the east.

At the Hanford Site, the three uppermost units of the Ellensburg Formation are the Levy interbed, the Rattlesnake Ridge interbed, and the Selah interbed. The Levy interbed is confined to the vicinity of the 300 Area. The Rattlesnake Ridge and Selah interbeds are found beneath most of the Hanford Site (WHC 1992a).

Suprabasalt Sediments

The suprabasalt sedimentary sequence at the Hanford Site is up to approximately 750 feet thick in the west-central Cold Creek syncline, while it pinches out against the anticlinal ridges that bound or are present within the Pasco Basin (WHC 1991b). The suprabasalt sediments are dominated by laterally extensive deposits of the late Miocene to Pliocene-age Ringold Formation and the Pleistocene-age Hanford formation. Locally occurring strata separating the Ringold and Hanford formations are assigned to the informally defined Plio-Pleistocene unit, early "Palouse" soil, and pre-Missoula gravels, which comprise the remainder of the sequence (DOE-RL 1993b).

Ringold Formation. Overlying the Columbia River Basalt Group is the late Miocene to Pliocene-age Ringold Formation (Fecht et al. 1987, DOE 1988). The Ringold Formation accumulated to a thicknesses of up to 1,200 feet in the Pasco Basin (Tallman et al. 1979). On the Hanford Site, the Ringold Formation is up to 600 feet thick in the deepest part of the Cold Creek syncline south of the 200 West Area and 560 feet thick in the western Wahluke syncline near the 100-B Area (WHC 1991a). The Ringold Formation pinches out against the anticlinal flanks that bound or are present within the Pasco Basin, and is largely absent in the northern and northeastern parts of the 200 East Area and adjacent areas to the north (WHC 1991a, WHC 1992a). The recent studies of the Ringold Formation (WHC 1991d) indicate it is best described on the basis of sediment facies associations and their distribution. The facies associations have been divided into fluvial gravel, fluvial sand, overbank deposits, lacustrine deposits, and alluvial fans. The lower Ringold contains five separate stratigraphic intervals dominated by fluvial gravels, which have been designated units A, B, C, D, and E, from oldest to youngest. These gravel units are separated by basin-wide overbank and lacustrine deposits (WHC 1992a). A more detailed discussion of the Ringold Formation stratigraphy can be found in WHC (1991c).

Post-Ringold Pre-Hanford Sediments. Thin alluvial deposits situated stratigraphically between the Ringold Formation and Hanford formation are found within the Pasco Basin. The three informally defined units include: the Plio-Pleistocene unit, the early "Palouse" soil, and the Pre-Missoula gravels. The Plio-Pleistocene unit and early "Palouse" soil are not found in or near the 200 East Area; they are found to the west of the site area near the eastern boundary of the 200 West Area. The pre-Missoula gravels are not found in the site area. The Plio-Pleistocene unit and early "Palouse" soil are described in detail in PNL (1989) and WHC (1991c). The pre-Missoula gravels are discussed in PSPL (1982) and Fecht et al. (1987).

Hanford Formation. The informally designated Hanford formation consists of unconsolidated, glaciofluvial sediments that were deposited during several episodes of cataclysmic flooding during the Pleistocene Epoch. The sediments are composed of pebble to boulder-size gravel, fine- to coarse-grained sand, and silt. These sediments are divided into three facies: gravel dominated, sand-dominated, and silt-dominated (WHC 1992a). These facies are referred to as coarse-grained deposits, plane-laminated sand facies, and rhythmite facies, respectively (Baker et al. 1991). The silt-dominated deposits are also referred to as "Touchet" Beds, and the gravel-dominated facies generally correspond to the Pasco gravels.

The Hanford formation is thickest in the vicinity of the 200 Areas where it is up to 350 feet thick (WHC 1992a). The formation was deposited by cataclysmic flood waters that originated from glacial lake Missoula (Fecht et al. 1987, DOE 1988, Baker et al. 1991). The deposits are absent from ridges above approximately 1,180 feet above mean sea level, the highest level of cataclysmic flooding in the Pasco Basin (WHC 1991a).

Holocene Surficial Deposits. Holocene surficial deposits consist of silt, sand, and gravel that form a <16 feet veneer across much of the Hanford Site. These sediments were deposited by eolian and alluvial processes (WHC 1991a).

REGIONAL GEOLOGIC STRUCTURE

The Hanford Site is located within the Pasco Basin near the eastern edge of the Yakima Fold Belt. The Yakima Fold Belt consists of a series of segmented, narrow, asymmetric, east-west trending anticlines separated by broad synclines or basins that, in many cases, contain thick accumulations of Neogene- to Quaternary-aged sediments

(DOE 1988, Smith et al. 1989). The Pasco Basin is one of the larger structural basins of the fold belt.

The northern limbs of the anticlines of the Yakima Fold Belt generally dip steeply to the north or are vertical. The southern limbs generally dip at relatively shallow angles to the south. Thrust or high-angle reverse faults with fault planes that strike parallel or subparallel to the axial trends are principally found on the north sides of the anticlines. The amount of vertical stratigraphic offset associated with these faults varies (WHC 1991a).

Deformation of the Yakima Folds occurred under north-south compression and was contemporaneous with the eruption of the basalt flows. The fold belt was enlarging during the eruption of the Columbia River Basalt Group and continued to enlarge through the Pliocene, into the Pleistocene, and perhaps to the present (WHC 1991a).

The Pasco Basin is a structural depression bounded on the north by the Saddle Mountain anticline; on the west by the Umtanum Ridge, Yakima Ridge, and Rattlesnake Hills anticlines; and on the south by the Rattlesnake Mountain anticline. The Palouse slope, a west-dipping monocline, bounds the Pasco Basin on the east. The Pasco Basin is divided into the Wahluke and Cold Creek synclines by the Gable Mountain anticline, the eastern extension of the Umtanum Ridge anticline.

The Cold Creek syncline lies between the Umtanum Ridge-Gable Mountain uplift and the Yakima Ridge uplift, and is an asymmetric and relatively flat-bottomed structure. The bedrock of the northern limb dips gently to the south, and the southern limb dips steeply to the north. The deepest parts of the Cold Creek syncline, the Wye Barricade depression and the Cold Creek depression, are located approximately 7.5 miles southeast of the 200 Areas and just west-southwest of the 200 West Area, respectively (Tallman et, al. 1979).

LOCAL GEOLOGY

The depth to the top of the Elephant Mountain Member basalt in the vicinity of the 100-N Area is approximately 520 feet. Overlying the basalt are sediments of the Ringold Formation, Hanford formation, and Holocene surfical deposits. The Plio-Pleistocene unit, early "Palouse" soil, and the Pre-Missoula gravels are absent in the vicinity of the 100-N Area (WHC 1992b). The following discussion focuses on the suprabasalt sediments in the vicinity of the 100-N Area. Figure H-6 is a map depicting the geology within one mile of the 183-N Backwash Discharge Pond. A local cross section has also been included for more detailed information. The line of cross section is shown on Figure H-7 and the cross section is provided on Figure H-8.

Ringold Formation

The Ringold Formation unconformably overlies the Elephant Mountain Member basalt and is approximately 470 to 480 feet thick in the 100-N Area. Overlying the basalt are fluvial gravels of unit A which are generally less than 32 feet thick. Unit A thickens to the west and south, towards the axis of the Wahluke syncline. Unit A is generally described as a clast-supported granule to cobble gravel with a sandy matrix. Clast composition varies, with basalt, quartzite, porphyritic volcanics, and greenstone being the most common. Associated sands are generally quartzo-feldspathic with basalt content ranging from 5 to 25 percent (WHC 1991d).

The lower mud sequence overlies unit A. The lower mud sequence is approximately 98 feet thick around 100-N and also thickens towards the axis of the Wahluke Syncline. The lower mud sequence is composed of lacustrine deposits (WHC 1992b). Plane-laminated to massive clay with thin silt and sand interbeds characterize the lacustrine deposits.

The second gravel-dominated facies, unit B, overlies the lower mud sequence and is from 65 to 80 feet thick. This unit is much finer grained in the 100-N Area and is composed predominately of fluvial sands with interbedded gravels. The fluvial sands are generally quartzo-feldspathic and display cross-bedding and cross-lamination (WHC 1991d).

Overlying unit B is a thick sequence of interbedded overbank deposits composed of silt and fine-grained silty sand. Pedogenic calcium is present in the overbank deposits near the top of the sequence (WHC 1991d). The thickness of this sequence is approximately 131 feet.

Unit C overlies the overbank deposits and is composed of sandy fluvial strata. This unit is less than 32 feet thick around the 100-N Area. The sand is primarily quartzo-feldspathic in composition (WHC 1991d).

Overlying unit C is a 49- to 98-feet-thick sequence of interbedded overbank deposits and lacustrine mud facies (WHC 1991d). The overbank deposits consist of laminated to massive silt, silty fine-grained sand, and paleosols. The lacustrine deposits consist of plane-laminated to massive clay with silt and sand interbeds. Pedogenic carbonate can be found near the base of this unit (WHC 1991d).

The uppermost Ringold Formation unit in the 100-N Area is unit E. This unit is a clast-supported pebble-cobble gravel in a quartzo-feldspathic sandy matrix. Clast composition varies, with basalt, quartzite, porphyritic volcanics, and greenstone being the most common. Unit E ranges in thickness from 49 to 65 feet (WHC 1991d).

Hanford Formation

The contact between the underlying Ringold Formation and the Hanford formation is irregular in the 100-N Area. The Hanford formation is 32 to 65 feet thick and is composed primarily of the gravel-dominated facies with some lenticular silty interbeds (WHC 1992b). The gravel-dominated facies generally consists of coarse-grained basaltic sand and granule to boulder gravel. These gravels are generally matrix poor and display an open-framework texture. Gravel clasts are dominated by basalt with minor amounts of Ringold and Plio-Pleistocene rip-ups, granite, quartzite, and gneiss (WHC 1991d).

Holocene Surficial Deposits

Surfical eolian deposits locally overlie the Hanford formation in the 100-N Area. These deposits are typically heterogenous and poorly mixed and are primarily derived from reworked Hanford formation sediments (WHC 1992b). The surfical deposits are less than 3.2 feet in the 100-N Area.

REGIONAL HYDROGEOLOGY

The hydrogeology of the Pasco Basin has been broadly characterized as consisting of four primary hydrogeologic units (DOE 1988). These units correspond to the upper three formations of the Columbia River Basalt Group (Grande Ronde Basalt, Wanapum Basalt, and Saddle Mountains Basalt) and the suprabasalt sediments. The basalt aquifers consist of the flood basalts of the Columbia River Basalt Group and relatively minor amounts of intercalated fluvial and volcaniclastic sediments of the Ellensburg Formation. Confined zones in the basalt aquifers are present in the sedimentary interbeds and/or interflow zones that occur between dense basalt flows. The main water-bearing portions of the interflow zones are networks of interconnecting vesicles and fractures of the basalt flow tops and bottoms (DOE 1988).

The uppermost aquifer is part of a flow system that is local to the Pasco Basin, as are the uppermost basalt interbed aquifers (Gephart et al. 1979, DOE 1988). The uppermost aquifer system is regionally unconfined and occurs within the glaciofluvial sands and gravels of the Hanford formation and the fluvial/lacustrine sediments of the Ringold Formation. Confined to semi-confined aquifers of more limited extent also occur in the suprabasalt sediments of the Pasco Basin. These confined zones are generally located within the local flow system, between the unconfined aquifer and the underlying basalt surface. Groundwater in these aquifer systems is most likely recharged and discharged locally. Deeper in the basalt, interbed aquifer systems are part of the regional, or interbasin, flow system, which extends outside the margins of the Pasco Basin (DOE 1988). A water table map of the Hanford Site is provided as Figure H-9.

LOCAL HYDROGEOLOGY

The primary hydrostratigraphic units in 100-N Area are the confined aquifer system of the Saddle Mountain Basalt Formation and Ellensburg Formation and the unconfined to confined aquifer system of the Ringold Formation and the Hanford formation. The following discussion focuses on the hydrogeology of the suprabasalt sediments.

The vadose zone is contained in the Hanford formation and the Ringold unit E. The thickness of the vadose zone in the 100-N Area is up to 80 feet. The presence of perched water was noted in one well drilled near a liquid waste disposal facility approximately 1/2 mile from the 183-N Backwash Discharge Pond (WHC 1992c).

The uppermost aquifer system is largely composed of the unconfined aquifer, but also includes semiconfined and confined areas. The upper part of the unconfined aquifer is in the fluvial sands and gravels of Ringold unit E. The unconfined aquifer is approximately 40 to 50 feet thick (WHC 1992c).

The central and lower parts of the unconfined aquifer are composed of a series of confining layers and confined aquifers. The top of the confined aquifer series is defined by the overbank/lacustrine deposits underlying unit E. The base of the confined aquifer series is the top of the Elephant Mountain Member. The thickness of the confined aquifer series is up to 400 feet (WHC 1992c).

Groundwater flow in the 100-N Area was greatly influenced by artificial recharge caused by effluent disposal. Effluent discharged to the 116-N-1 trench and crib (1963 to 1985), the 120-N-1 percolation ponds (1977 to 1989), and 116-N-3 trench and crib (1983 to 1991) provide large volumes of artificial recharge in the 100-N Area, resulting in the formation of groundwater mounds. The groundwater mounding created a radial flow pattern in the 100-N Area (DOE-RL 1993). Effluent discharges have steadily decreased from 1989 to the present and the groundwater mounds have virtually dissipated. Groundwater flow presently is toward the north-northwest, in the direction of the Columbia River (DOE-RL 1993).

SECTION H, ITEM 7

LIST THE NAMES AND ADDRESSES OF CONTRACTORS OR CONSULTANTS WHO PROVIDED INFORMATION AND CITE SOURCES OF INFORMATION BY TITLE AND AUTHOR.

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

Kaiser Engineers Hanford
P.O. Box 888
Richland, WA 99352

Science Applications International Corp.
1845 Terminal Drive
Richland, WA 99352

Golder Associates Inc.
1933 Jadwin Avenue, Suite 125
Richland, WA 99352

Enserch Environmental Corp.
1201 Jadwin Avenue, Suite 202
Richland, WA 99352

References: Sources of information used for Section H are included in REFERENCES.

8

7

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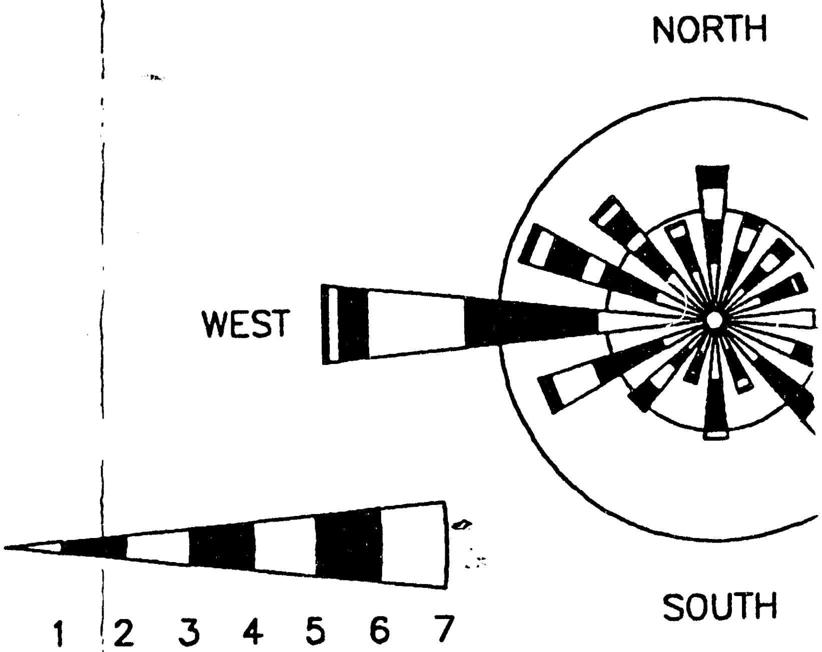

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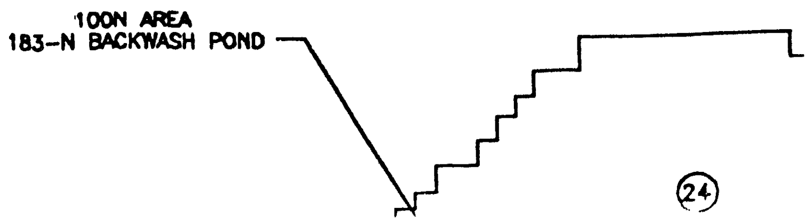

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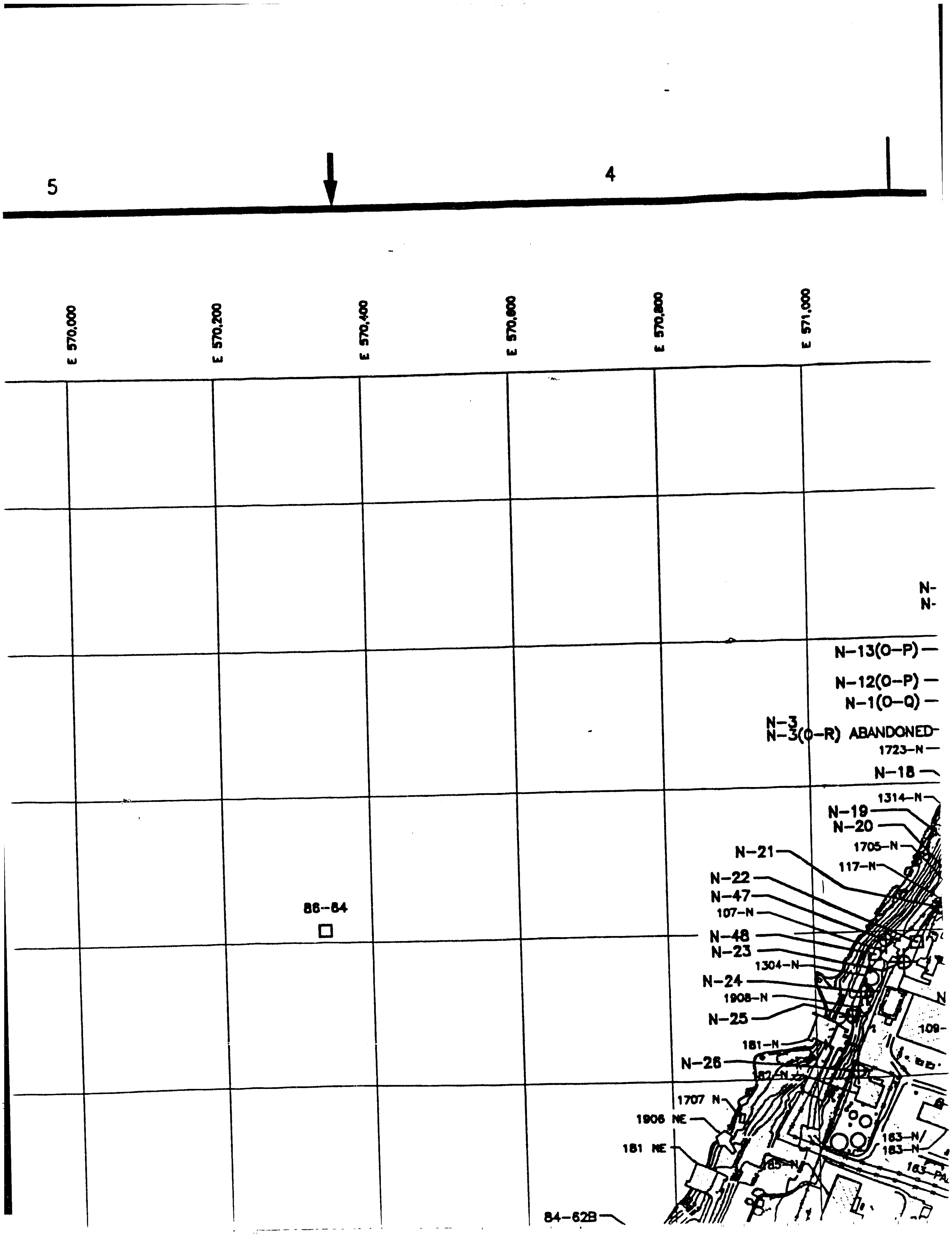

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E 570,200
E 570,400
E 570,600
E 570,800
E 571,000
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N-1(O-Q)
N-3
N-3(O-R) ABANDONED
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N-18
1314-N
N-19
N-20
1705-N
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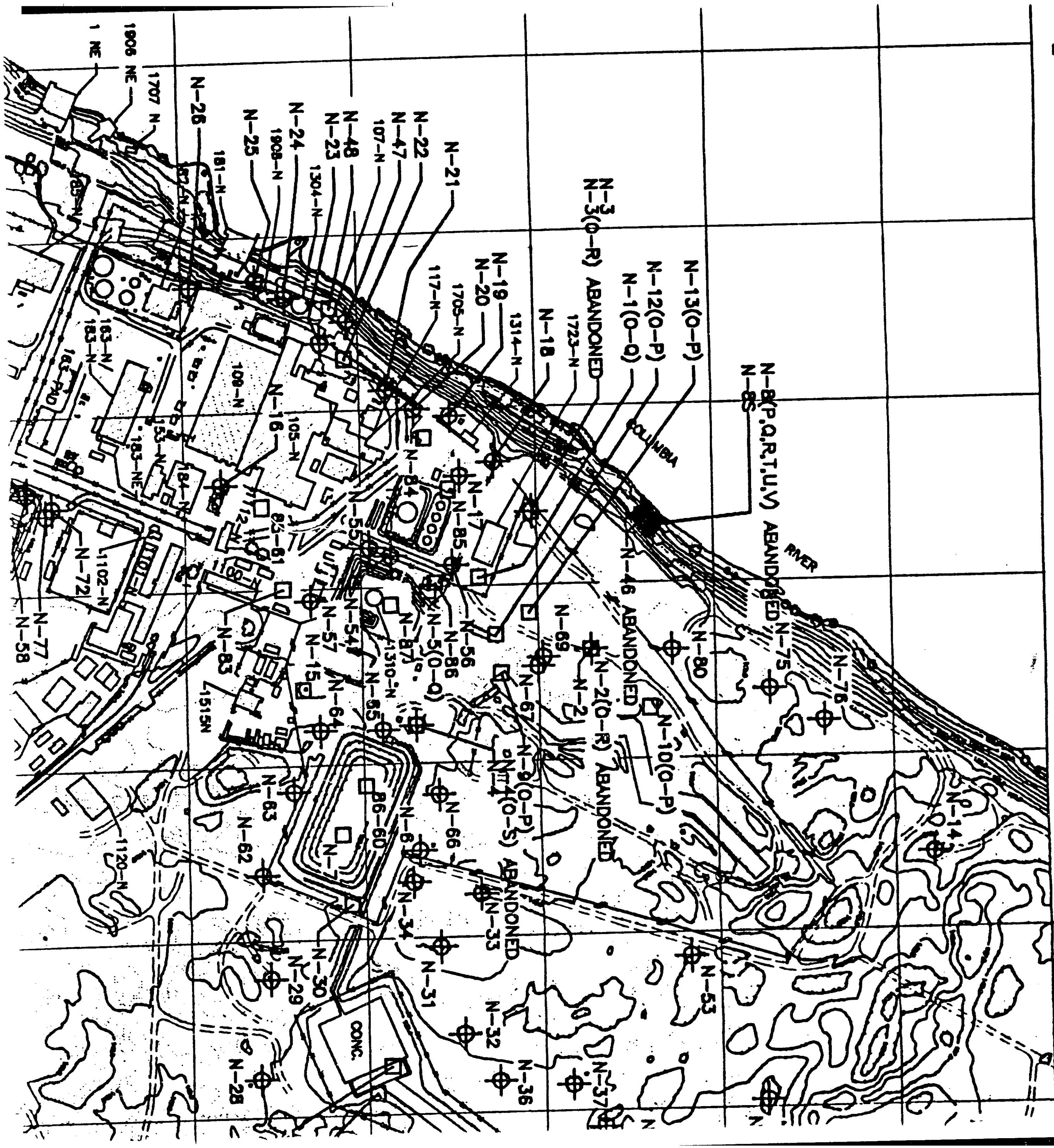

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N-12(O-P)
N-1(O-Q)
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1906 NE
1 NE
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1304-N
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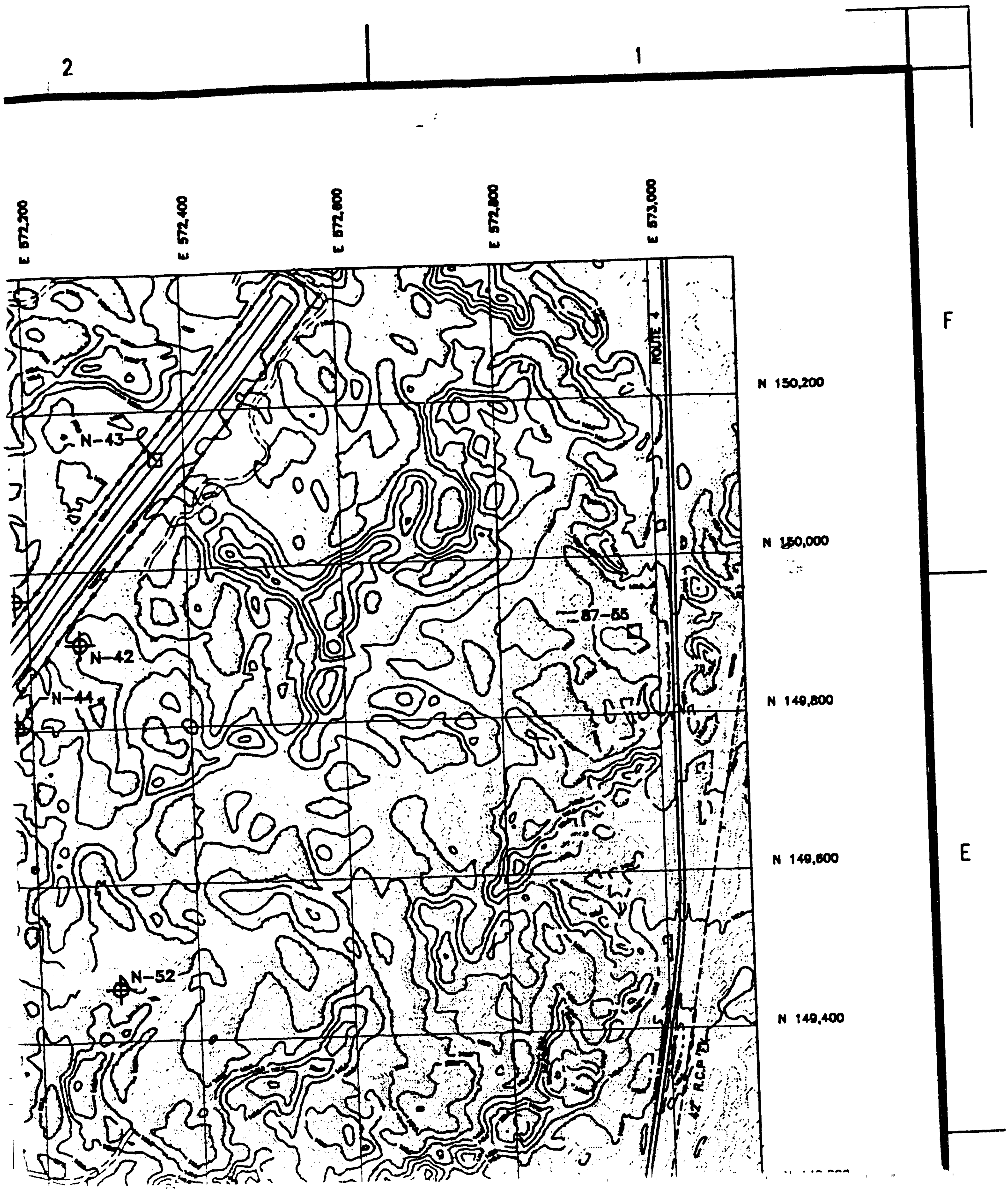

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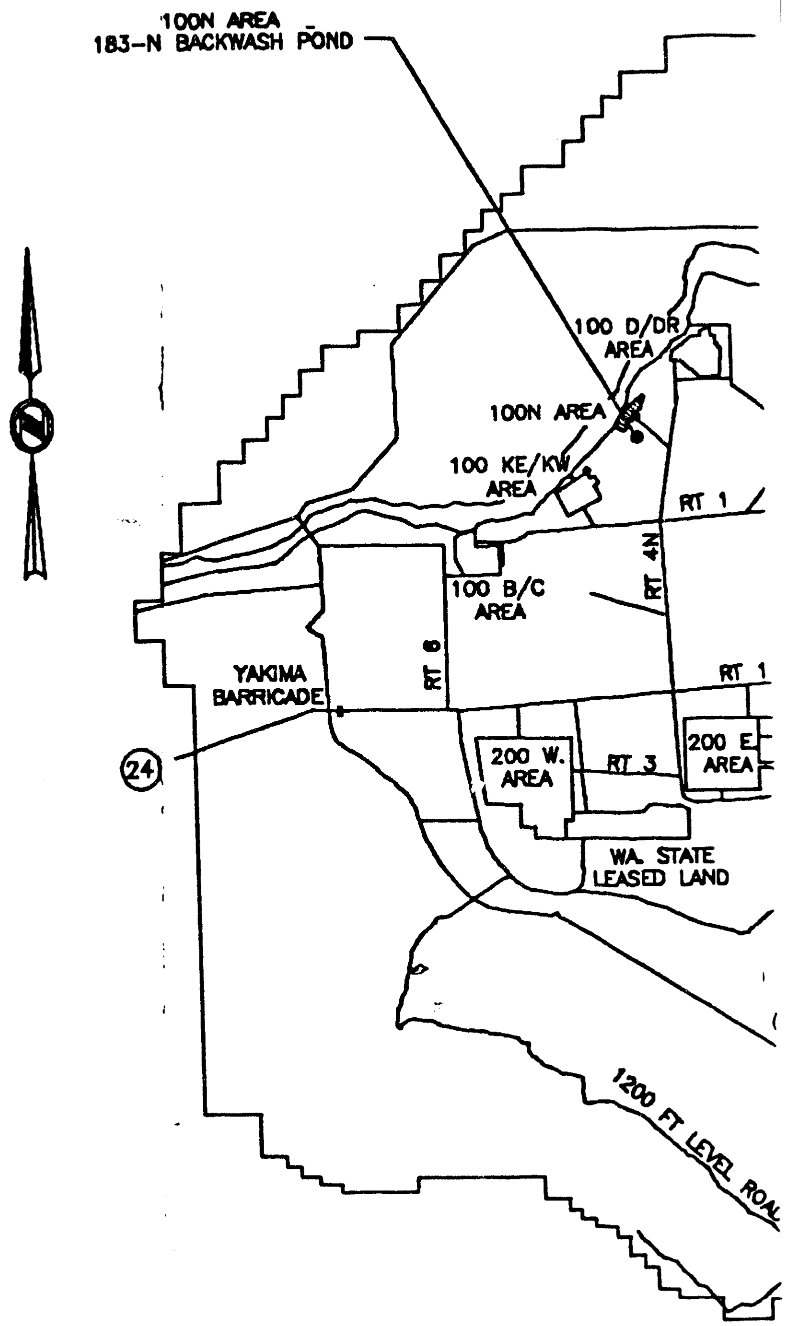
E 572,200
E 572,400
E 572,600
E 572,800
E 573,000
ROUTE 4
N 150,200
N 150,000
N 149,800
N 149,600
N 149,400
N-43
N-42
N-44
N-52
87-55
42" R.C.P.

WIND



D

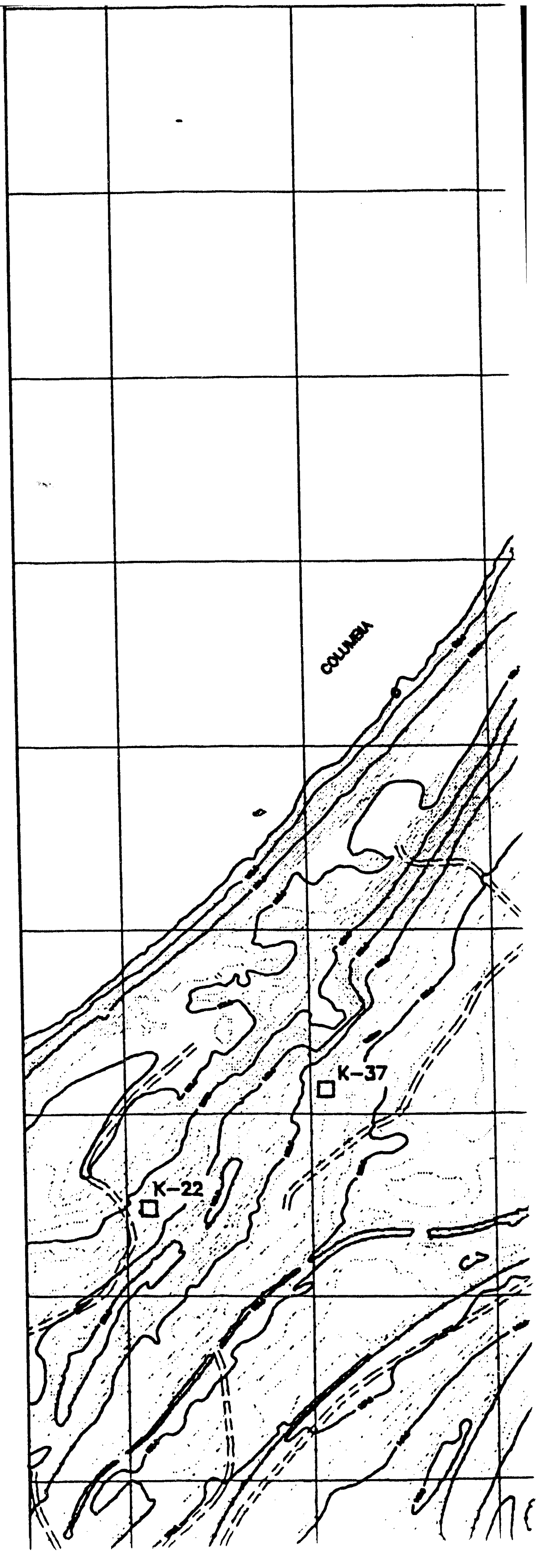
C

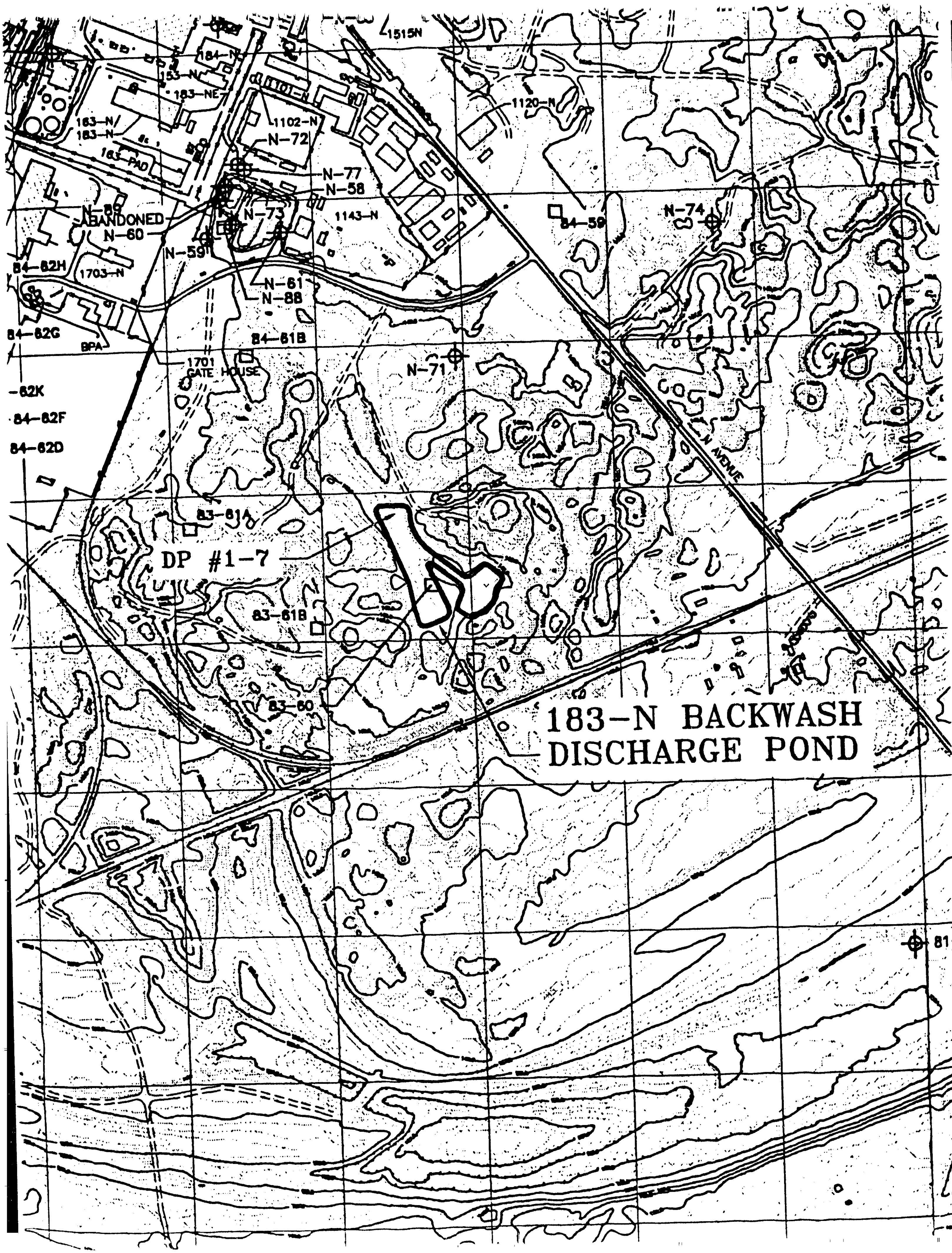
KEY F

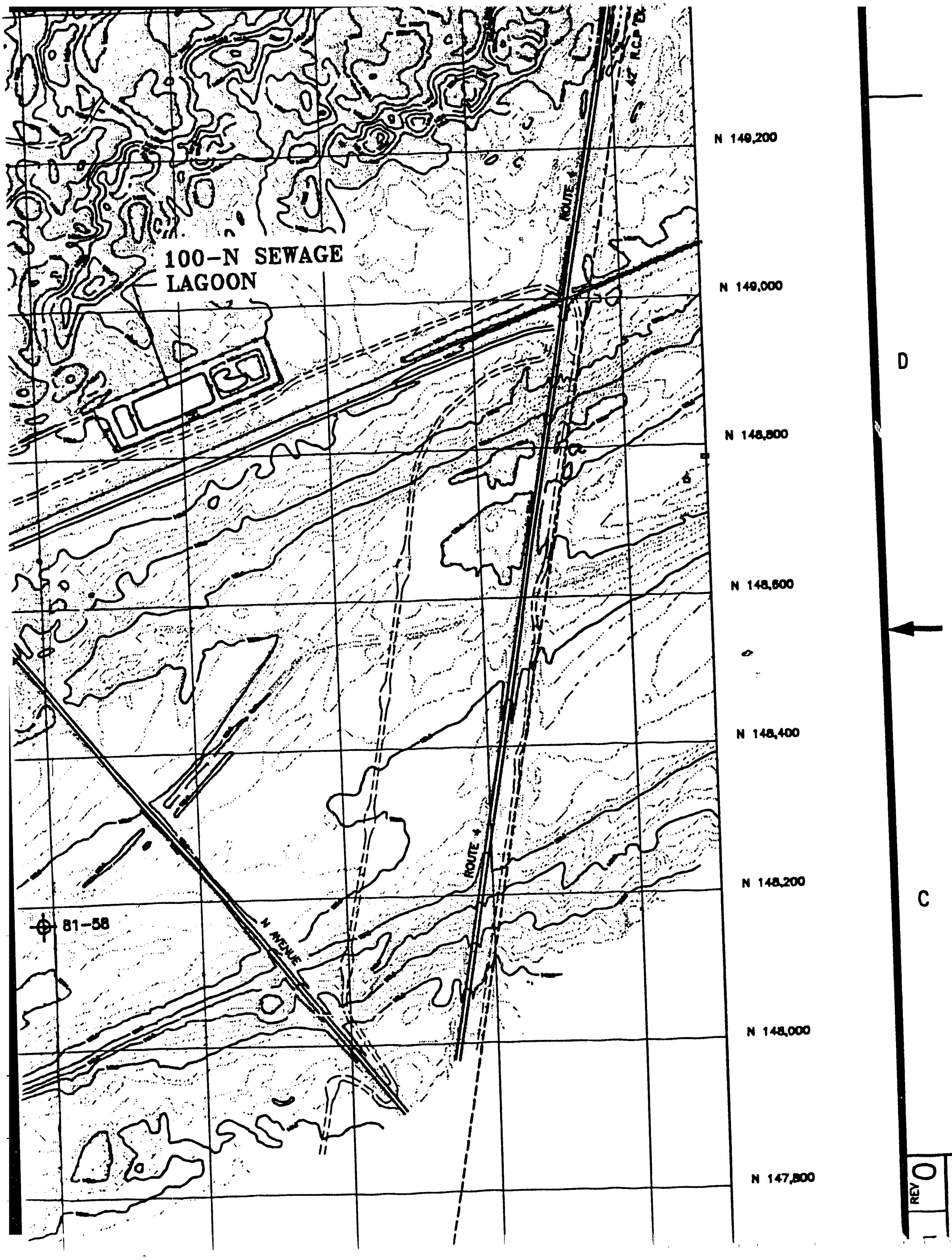
SCALE: N

LEGEN

W.47,000
N.43,000 HANFORD PLANT COORDINATES (FEET)


COLUMBIA
K-37
K-22


1515N
184-N
153-N
183-NE
1101-N
1120-N
1102-N
183-N/
183-N
N-72
183-PAD
N-77
N-58
N-89
ABANDONED
N-73
1143-N
84-59
N-74
N-60
N-59
84-62H
1703-N
N-61
N-88
84-62G
BPA
84-61B
N-71
1701
GATE HOUSE
-62K
84-62F
84-62D
N AVENUE
83-61A
DP #1-7
83-61B
83-60
183-N BACKWASH
DISCHARGE POND
81-



100-N SEWAGE
LAGOON
ROUTE 4
ROUTE 4
N AVENUE
81-58
N 149,200
N 149,000
N 148,800
N 148,600
N 148,400
N 148,200
N 148,000
N 147,800
D
C
REV
0

KEY F

SCALE: N

LEGEN

W.47,000 N.43,000	HANFORD PLANT COORDINATES (FEET)
E.576,250 N.136,000	WASHINGTON STATE COORDINATES (METERS)
	INDEX CONTOUR (METERS)
	INTERMEDIATE CONTOUR
	IMPROVED ROAD
	UNIMPROVED ROAD
	DIRT ROAD
	SIDEWALKS\PARKING LOTS
	RAILROADS
	SECURITY,WARNING,MISC FENCES
	POST & CHAIN (CRIB,BURIAL GROUND FENCES)
	PERIMETER FENCES

B

GENERAL NOTES

1. THIS MAP IS BASED ON AERIAL PHOTOGRAPHY FLOWN ON 6-20-90. THE ORIGINAL TOPO BY WILLIAM E. BROWN AND CERTIFIED TO MEET NATIONAL MAP ACCURACY STANDARDS. OFFICIAL COPIES OF THE GEONEX SACRAMENTO MAPS THAT SHOW THE CERTIFICATE ARE WESTINGHOUSE ENGINEERING FILES AS DRAWING NUMBERS H-1-52166 SHEET 1 THROUG NAMES OF ADDITIONAL FEATURES AND THE TITLE BLOCK WERE ADDED BY WESTINGHOUSE MAPS WERE ADDED BY WESTINGHOUSE HANFORD COMPANY.

2. WASHINGTON STATE PLANE COORDINATE SYSTEM: THE OFFICIAL COORDINATE SYSTEM AS REVISED CODE OF WASHINGTON (RCW). THE HANFORD SITE LIES WITHIN THE WASHINGTO SOUTH ZONE. THIS GRID COVERS THE ENTIRE SITE AND USES X (EASTINGS) AND Y (NO

A

HORIZONTAL DATUM: NAD-83 LAMBERT PROJECTION. WASHINGTON STATE PLANE COORDIN

CONTOUR INTERVAL: 0.5 METERS.

JILDINGS/STRUCTURES
TOWERS

JILDING NUMBER

OBILE OFFICES

ELL

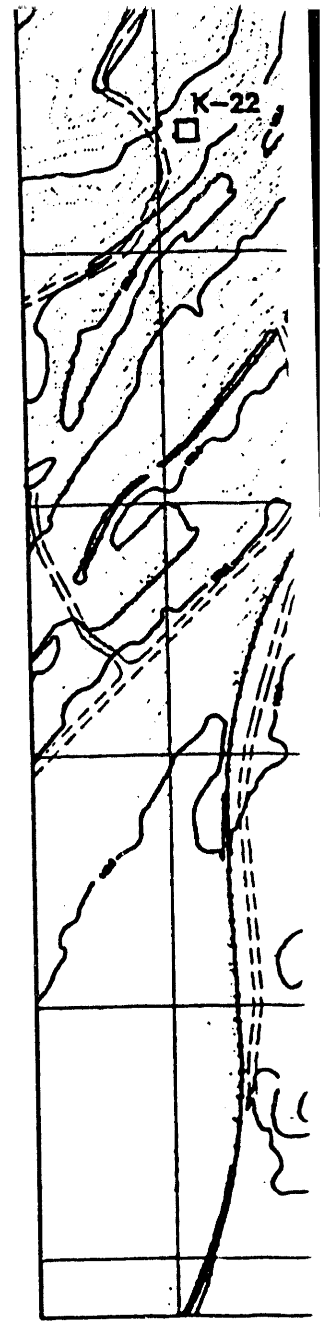
BANDONED WELL

ANKS

RIB

JRIAL GROUND

ISCHARGE POINT



SITE PLAN

SCALE: 1:6000

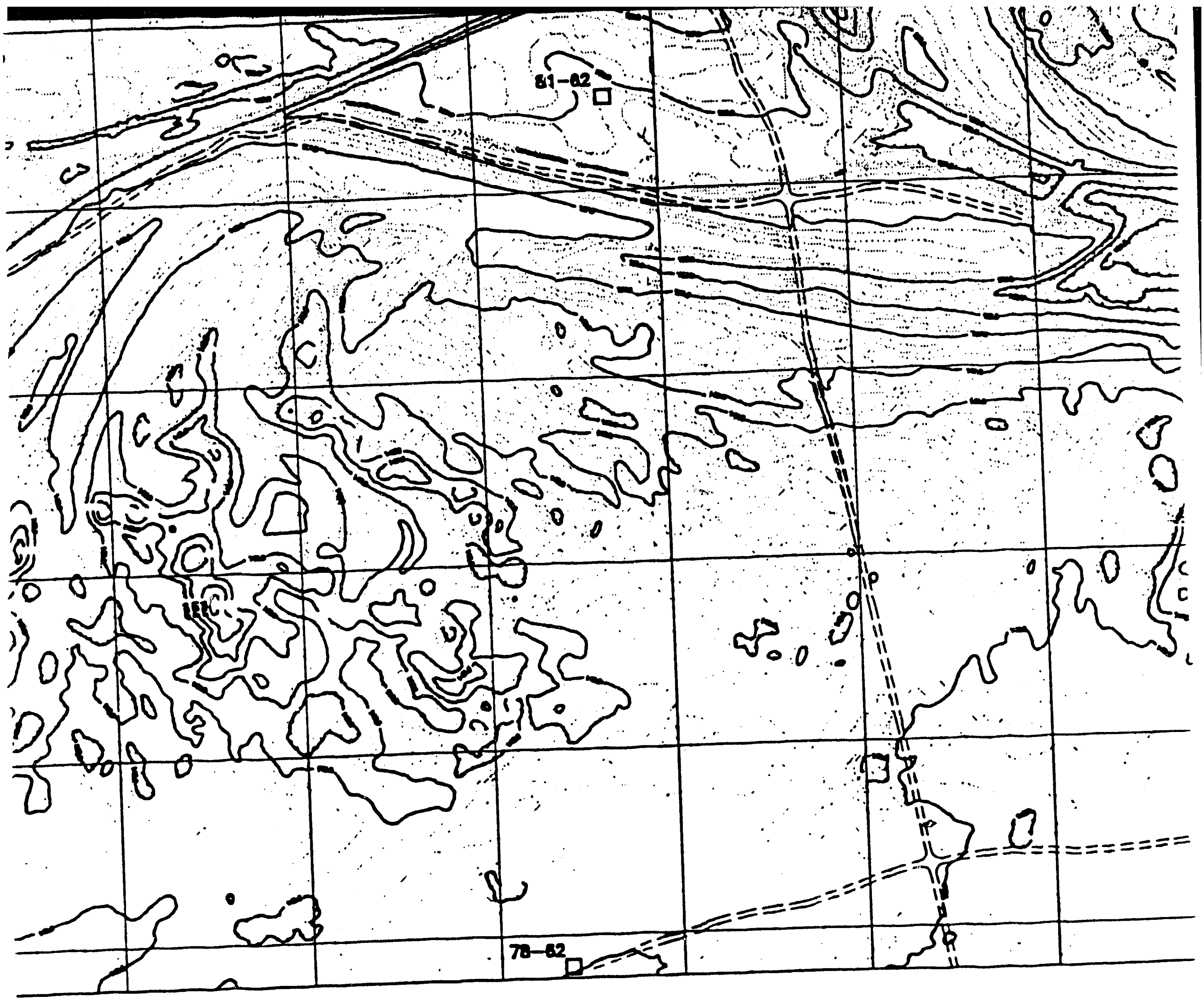
ARED

0 60 120 240 360 480

1 cm = 60 meters

0 400 600 800 1200 1600 2000 FEET

DWG NO



REF NUMBER	TITLE
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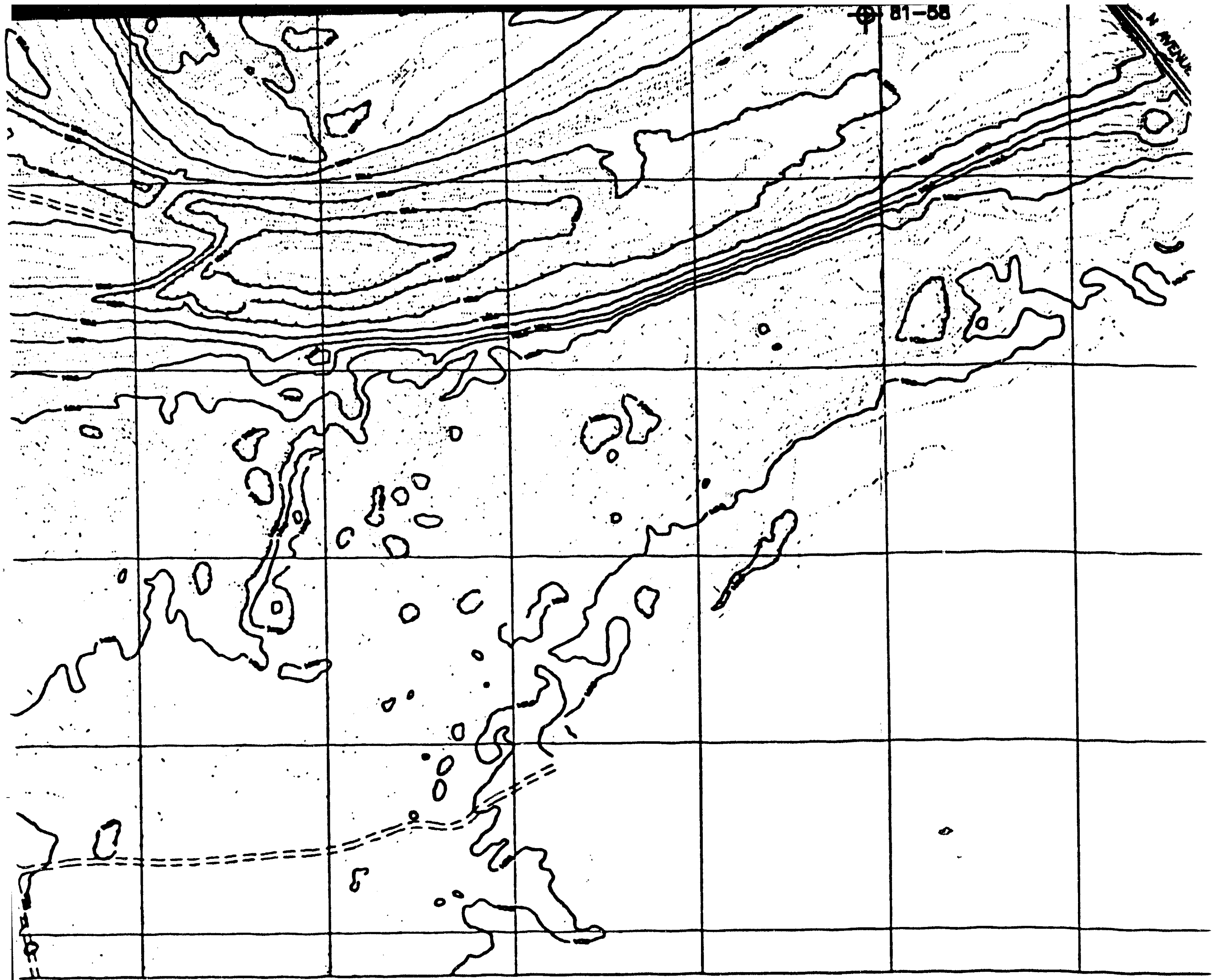
H-13-000115	100 AREA TOPOGRAPHIC MAP
H-13-000116	100 AREA TOPOGRAPHIC MAP
H-13-000118	100 AREA TOPOGRAPHIC MAP
H-13-000119	100 AREA TOPOGRAPHIC MAP
H-13-000120	100 AREA TOPOGRAPHIC MAP
H-13-000123	100 AREA TOPOGRAPHIC MAP
H-13-000124	100 AREA TOPOGRAPHIC MAP
H-13-000125	100 AREA TOPOGRAPHIC MAP

REFERENCES

MFD / REV REL	REV NO	DESCRIPTI

LE



THIS MAP IS T
DO NOT USE

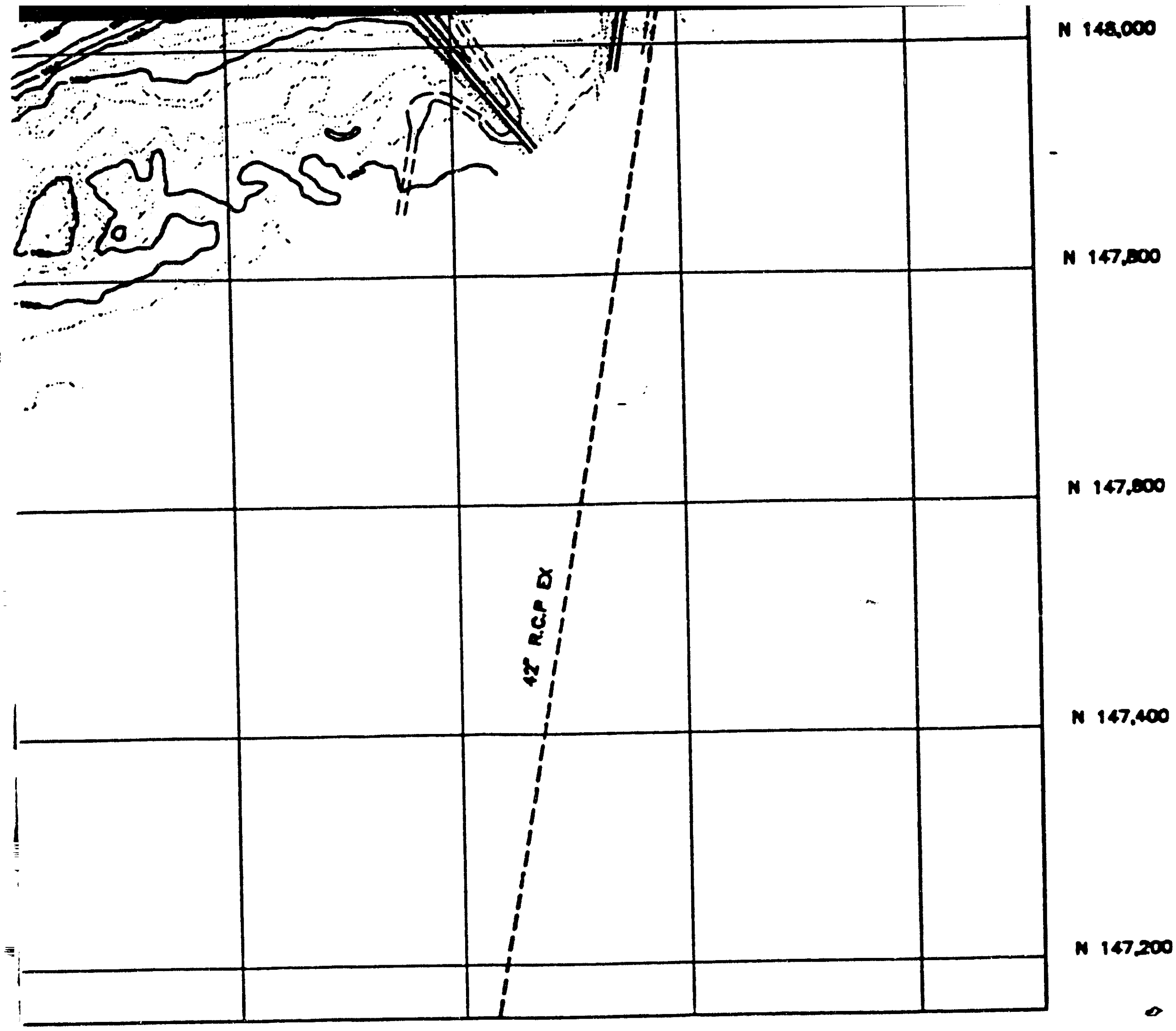
DRAWN RAFAEL TORRES	DATE 5-11-94
CHECKED Larry J. Robinson	5-11-94
DFTG APVD	5-11-94
COG ENGR B.P.	5-11-94
APVD	
APVD	
APVD	
APVD	
APVD	

REV NO	DESCRIPTION	REV BY DATE	CHK BY DATE	DFTG APVD DATE	COG ENGR	OTHER	OTHER
					APPROVALS BY/DATE		

REVISIONS

N000088A

CADCODE... DOS:6.0:ACD2:12



THIS MAP IS TO BE USED FOR REFERENCE PURPOSES ONLY.
DO NOT USE THIS MAP FOR CONSTRUCTION PURPOSES.

	DATE
AWN RAFAEL TORRES	5-11-94
:CKED Larry J. Robinson	5-11-94
TG APVD	5-11-94
ENGR B.P.	5-11-94
VD	
VD	
VD	
VD	
VD	
VD	

U.S. DEPARTMENT OF ENERGY
DOE Field Office, Richland
Westinghouse Hanford Company

BACKWASH DISCHARGE POND

SIZE	BLDG NO	INDEX NO	DWG NO	REV
F	183-N	0110	H-13-000088	0
SCALE SHOWN	EDT 604320		SHEET 1 OF 1	

CHK PRINT ☐ DATE

COMMENT PRINT ☐ DATE

2 1

DWG NO H-13-000088 SH 1 of 1 REV 0

A

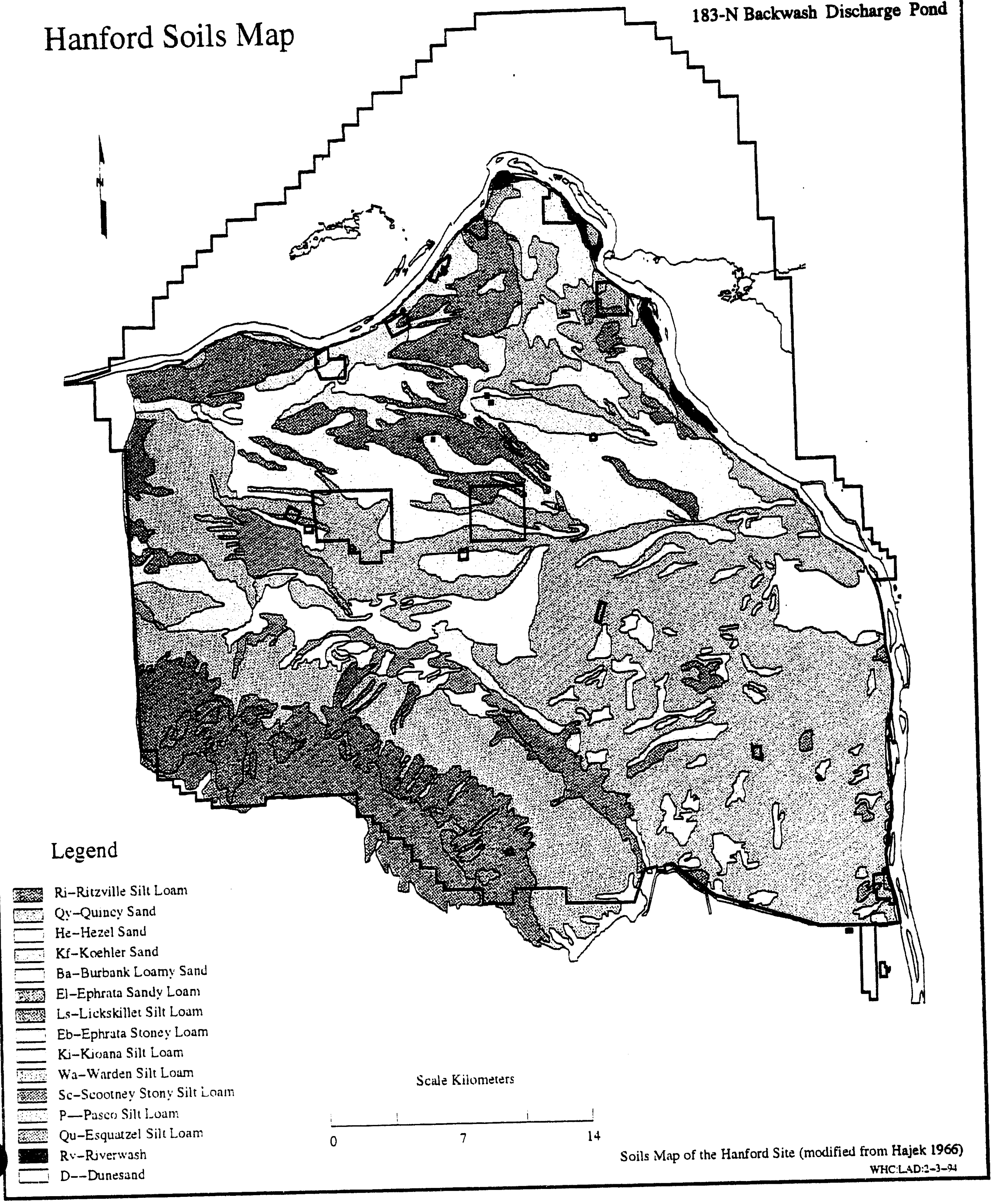
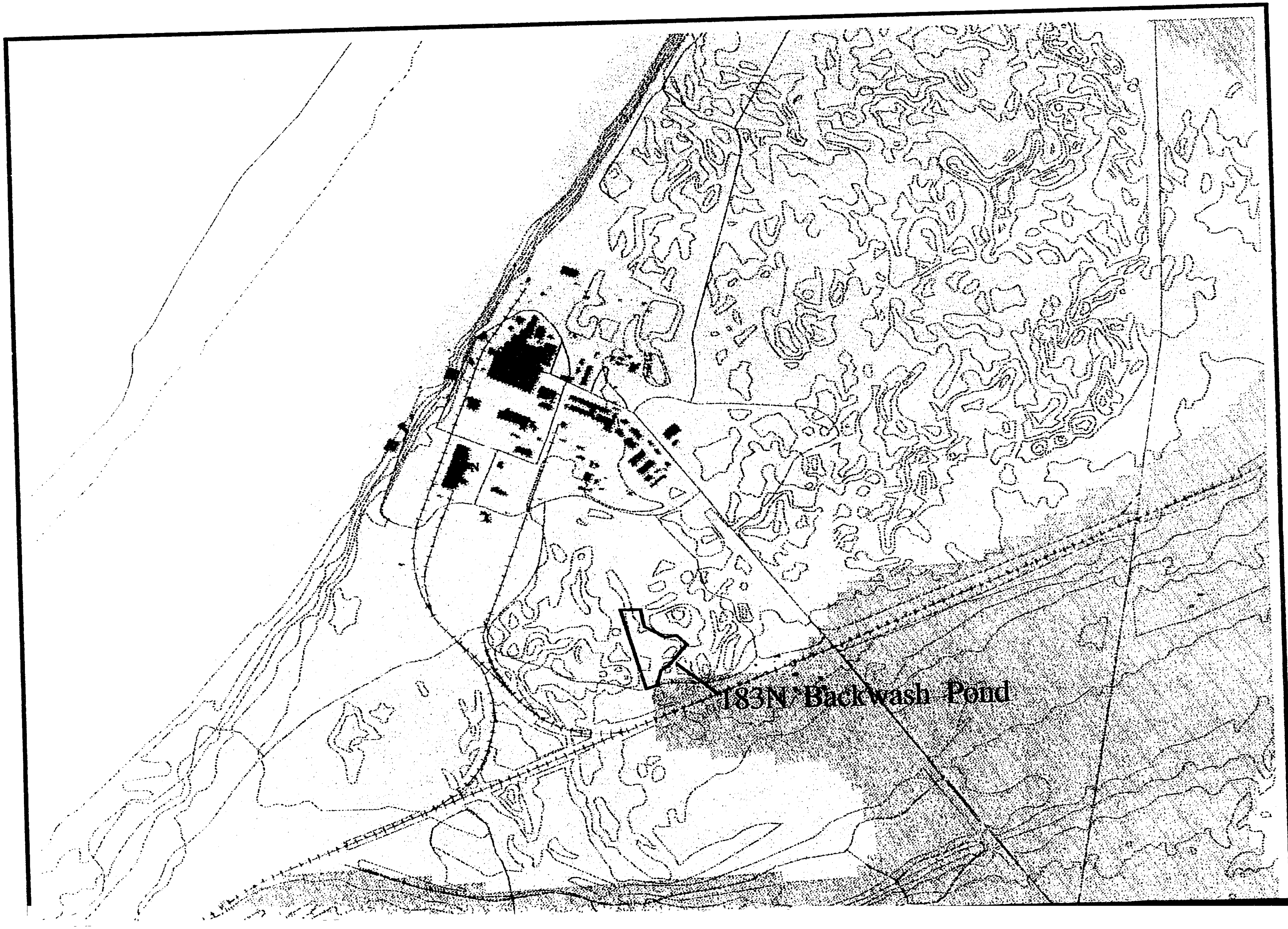


Figure H-1. Hanford Soils Map.


183N Backwash Pond

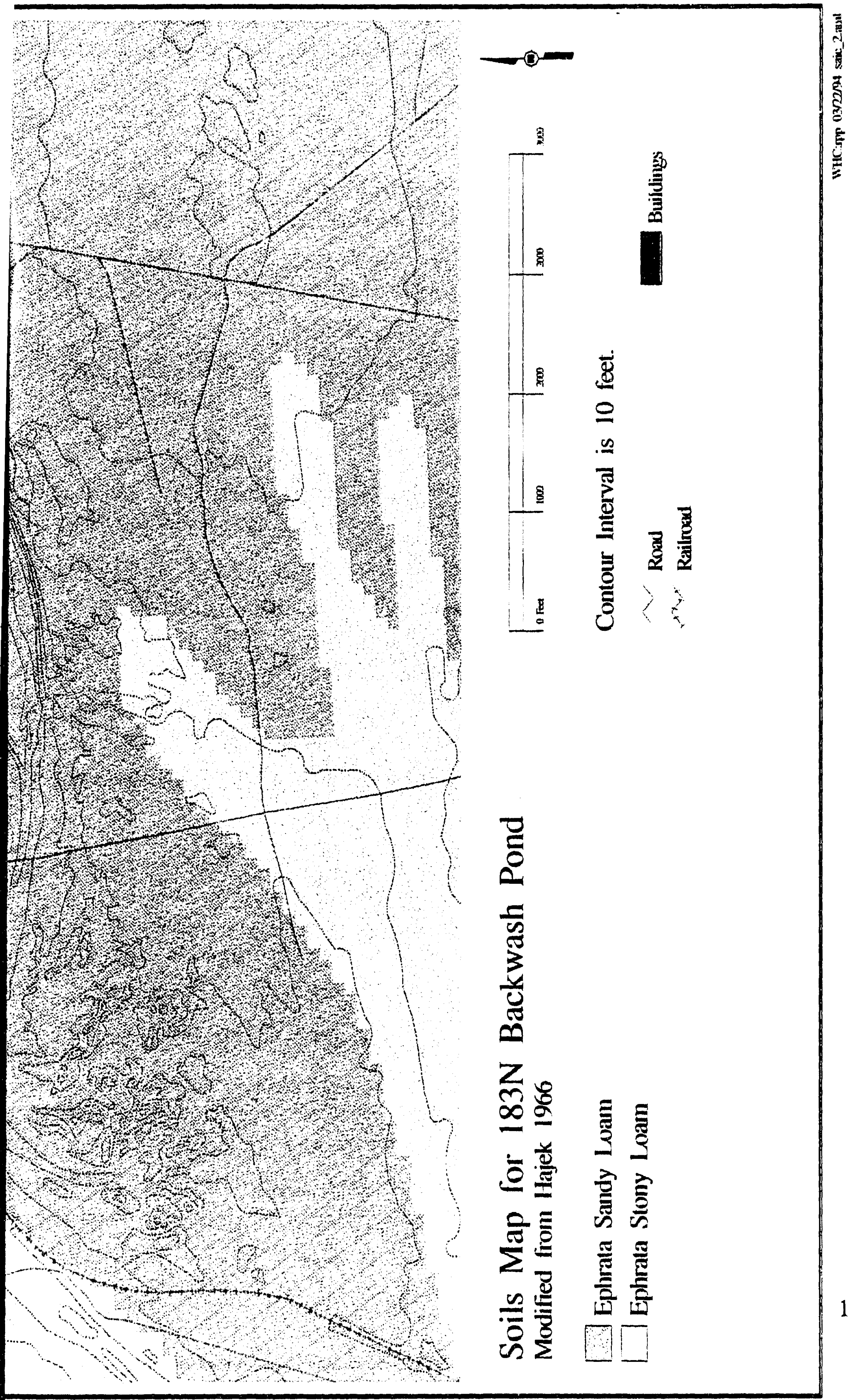


Figure H-2. Soils Map for the 183-N Backwash Dischage Pond.

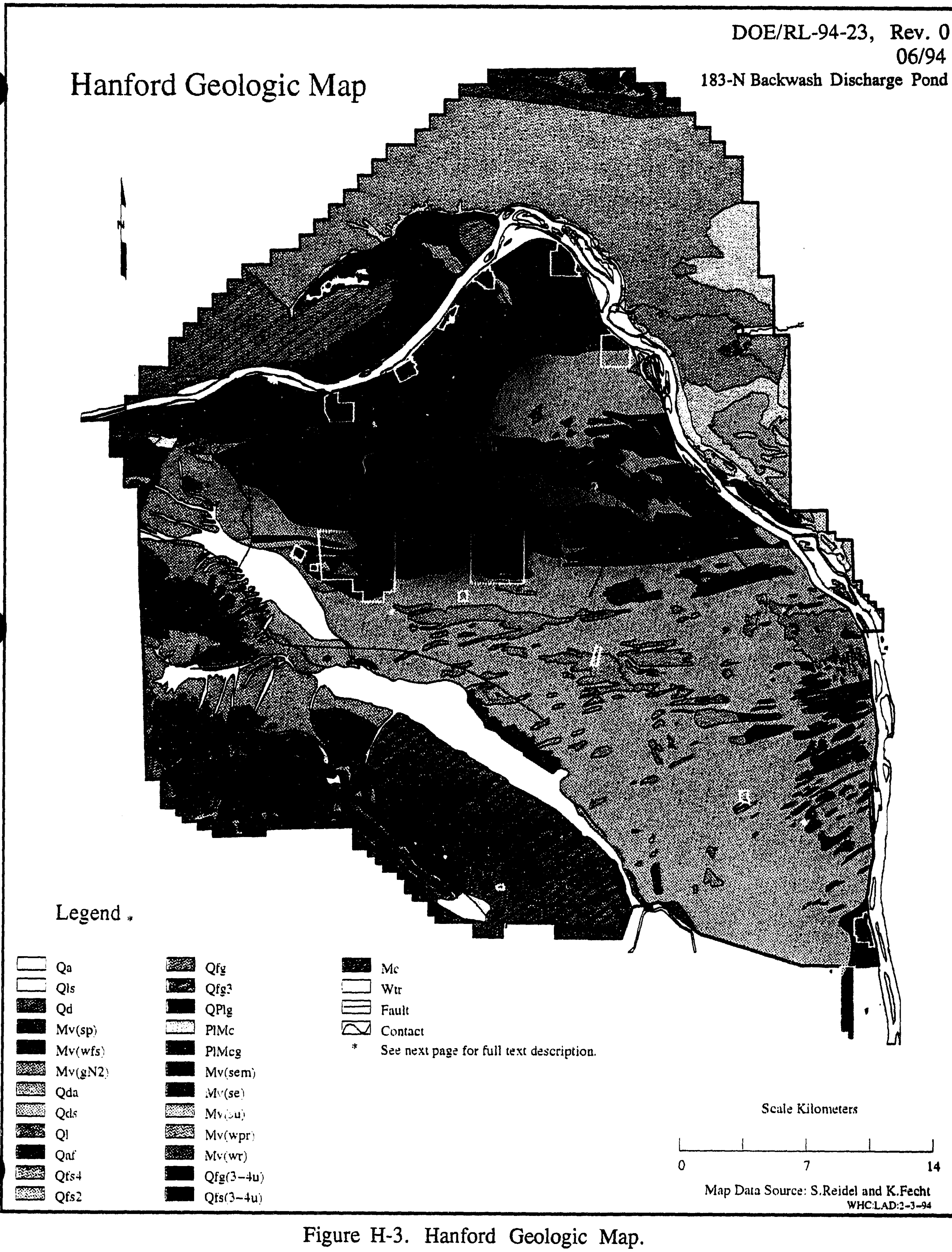


Figure H-3. Hanford Geologic Map.

Legend

- Qa–Alluvium (Holo.–Pleis.)
- Qls–Mass–wasting deposits (Holo.–Pleis.)
- Qd–Dune sand (Holocene)
- Mv(sp)–Saddle Mt Basalt, Pomona Mbr (M. Mio.)
- Mv(wfs)–Wanapum Basalt, Frenchman Spr. Mbr (M. Mio.)
- Mv(gN2)–Grande Ronde Basalt, U. flow–normal pol. (M. Mio.)
- Qda–Dune sand, active (Holocene)
- Qds–Dune sand, stabilized (Holocene)
- Ql–Loess (Holocene to Pleistocene)
- Qaf–Alluvial fans (Holo.–Pleis.)
- Qfs4–Outburst flood dep.(Pleis.), silt & sand, youngest
- Qfs2–Outburst flood dep.(Pleis.), silt & sand, 2nd oldest
- Qfg–Outburst flood dep.(Pleis.), gravels, undiv.
- Qfg3–Outburst flood dep.(Pleis.), gravels, 2nd youngest
- QPlg–Gravel (Pleistocene to Pliocene)
- PlMc–Ringold Fm., Continental sed. (Plio.–Mio.)
- PlMcg–Ringold Fm., Conglomerate (Plio.–Mio.)
- Mv(sem)–Saddle Mt Basalt, Elephant Mt Mbr (U. Mio.)
- Mv(se)–Saddle Mt Basalt, Esquatzel Mbr (M. Mio.)
- Mv(su)–Saddle Mt Basalt, Umatilla Mbr (M. Mio.)
- Mv(wpr)–Wanapum Basalt, Priest Rapids Mbr (M. Mio.)
- Mv(wr)–Wanapum Basalt, Roza Mbr (M. Mio)
- Qfg(3–4u)–Outburst flood dep., gravels, undif.
- Qfs(3–4u)–Outburst flood dep., sands, undif.
- Mc–Cont. sed. dep.–interbeds in Columbia R. Basalt
- WTR–Water
- FAULT–Fault
- CONTACT–Contact between geologic units

Map source data: S.Reidel and K.Fecht
Map source data date: January 1994
Map source data scale: 1:100,000

WHC:LAD:3-22-94

Figure H-4. Legend for Hanford Geologic map.

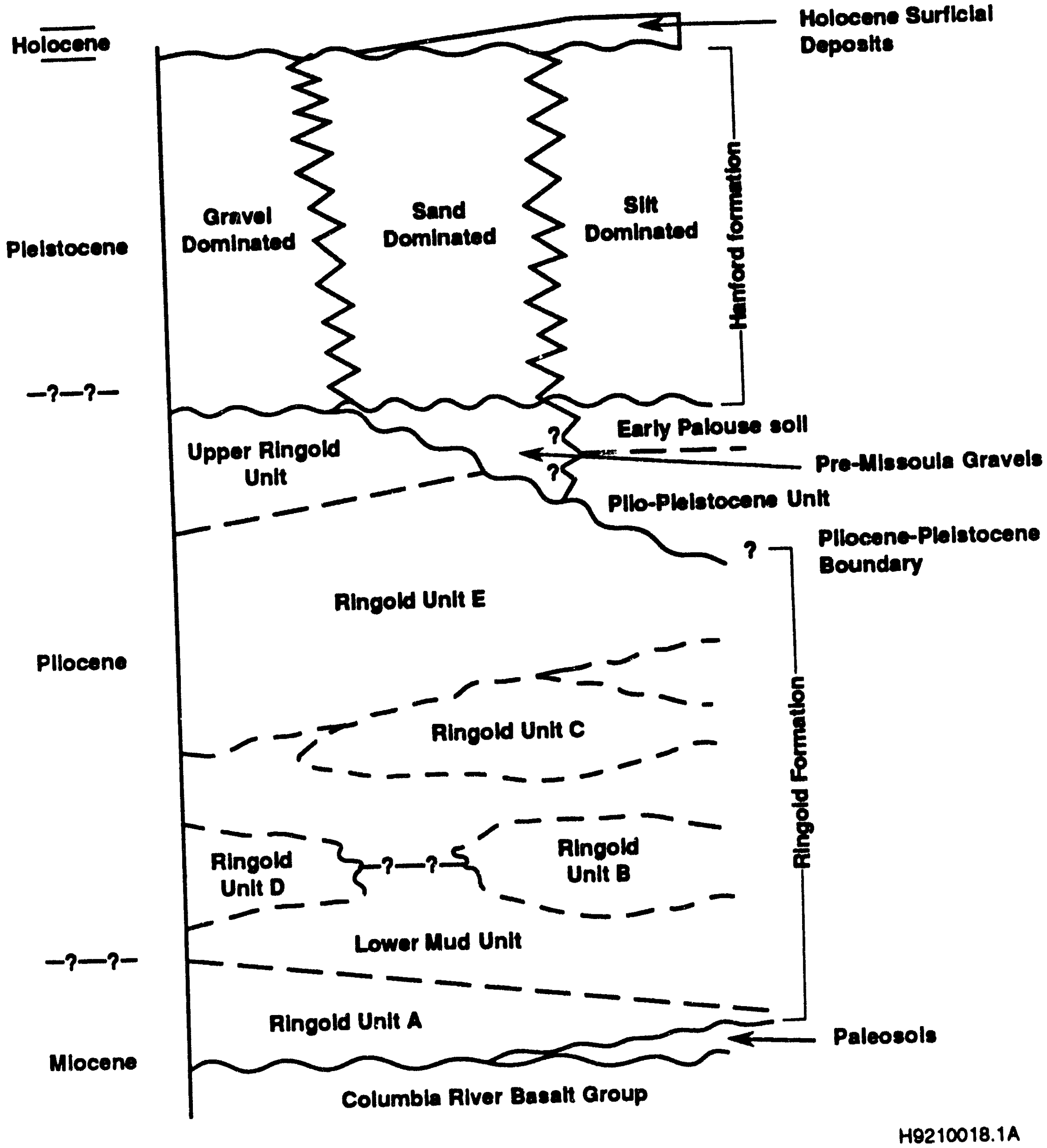
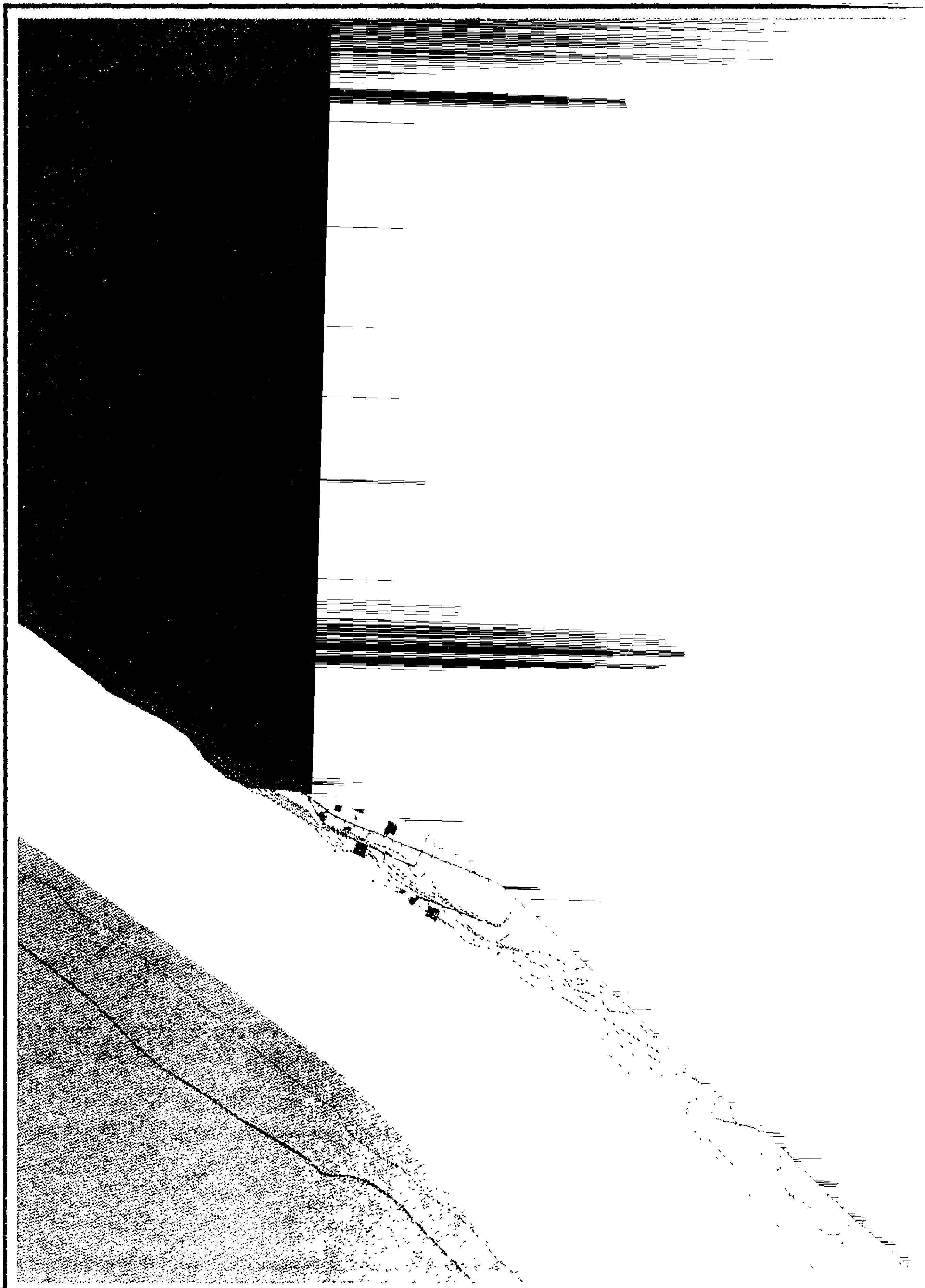


Figure H-5. Regional Stratigraphic Column.



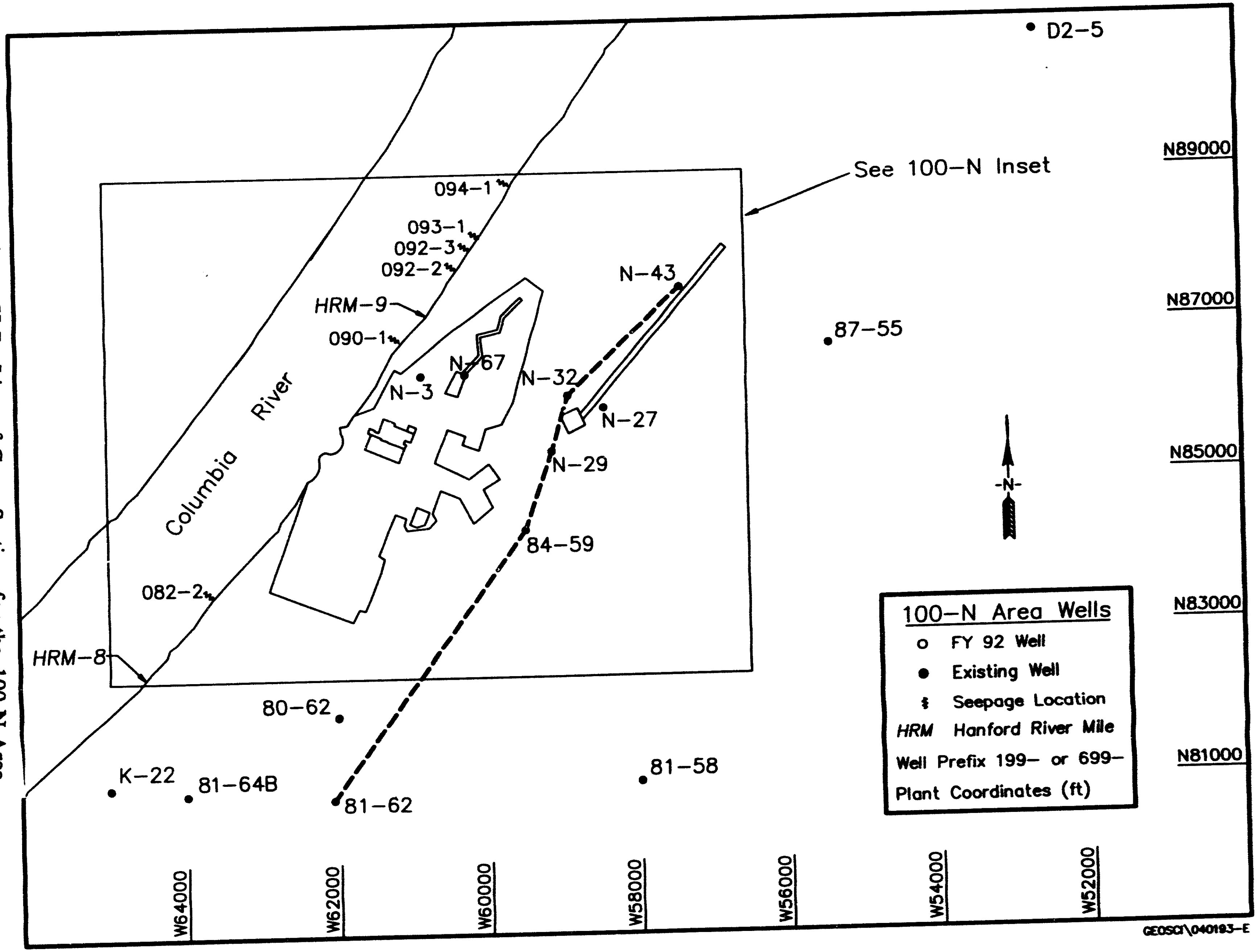


Figure H-7. Line of Cross-Section for the 100-N Area.

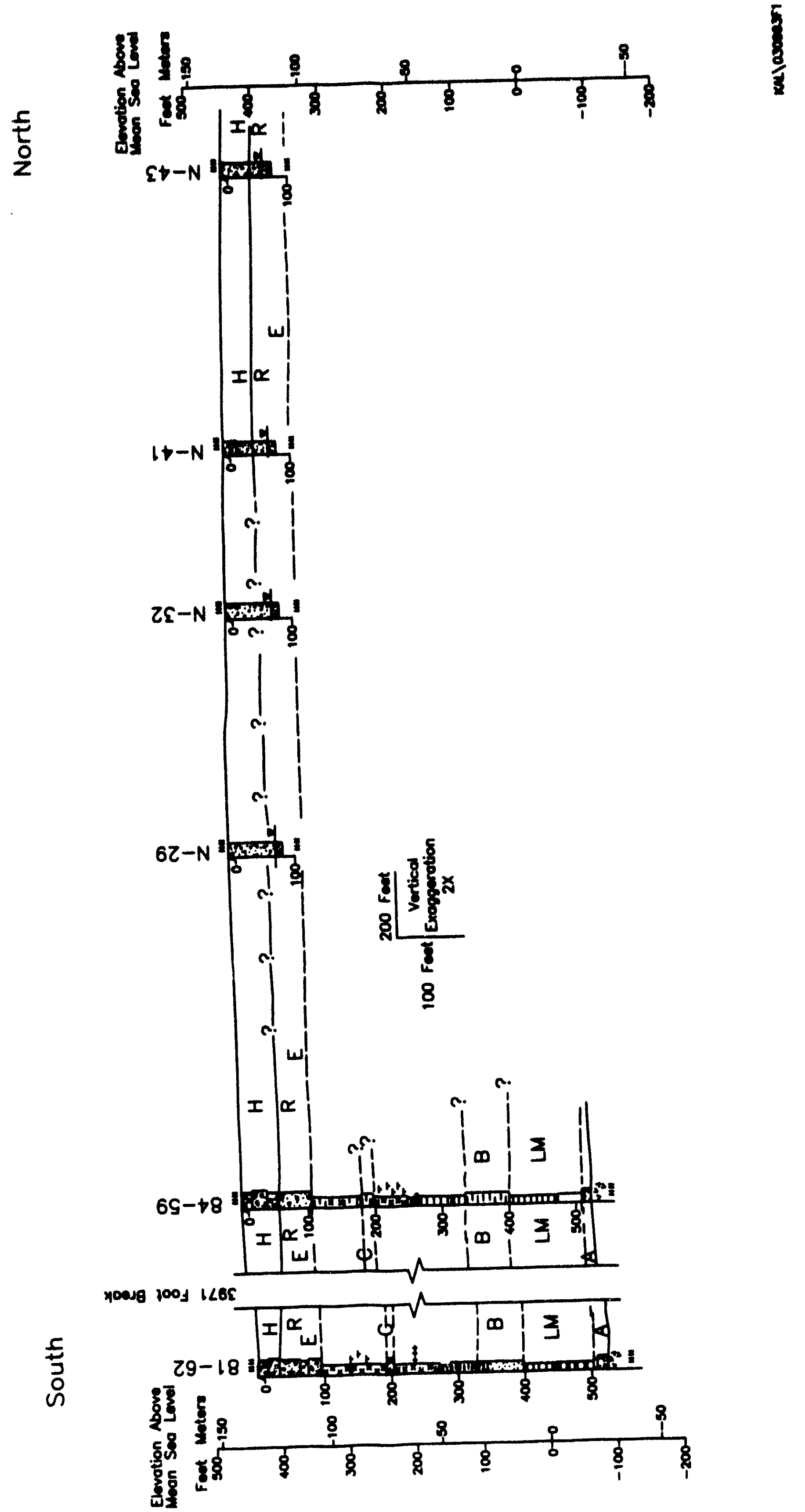
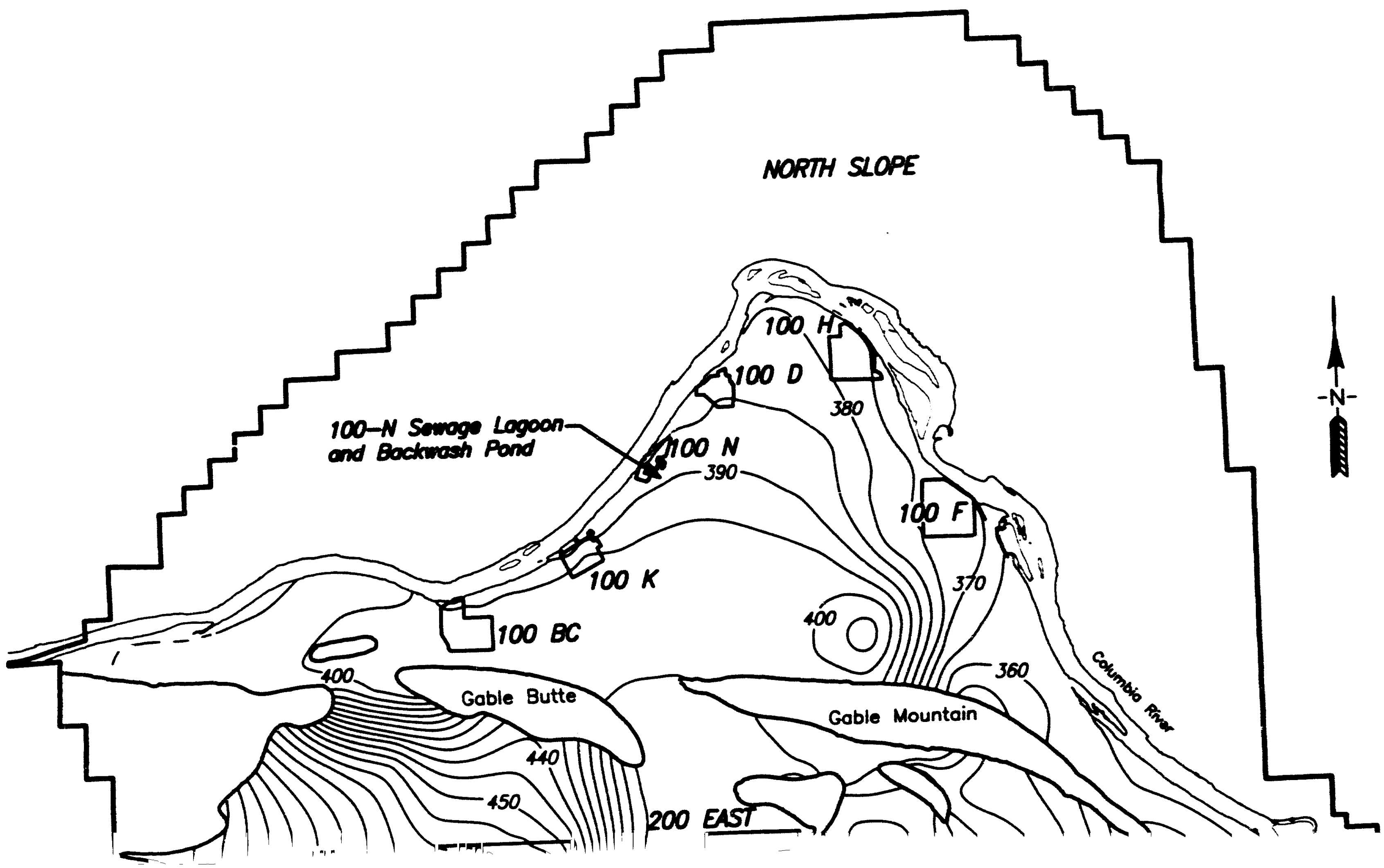


Figure H-8. Cross-Section for the 100-N Area.

Hanford Water Table Map



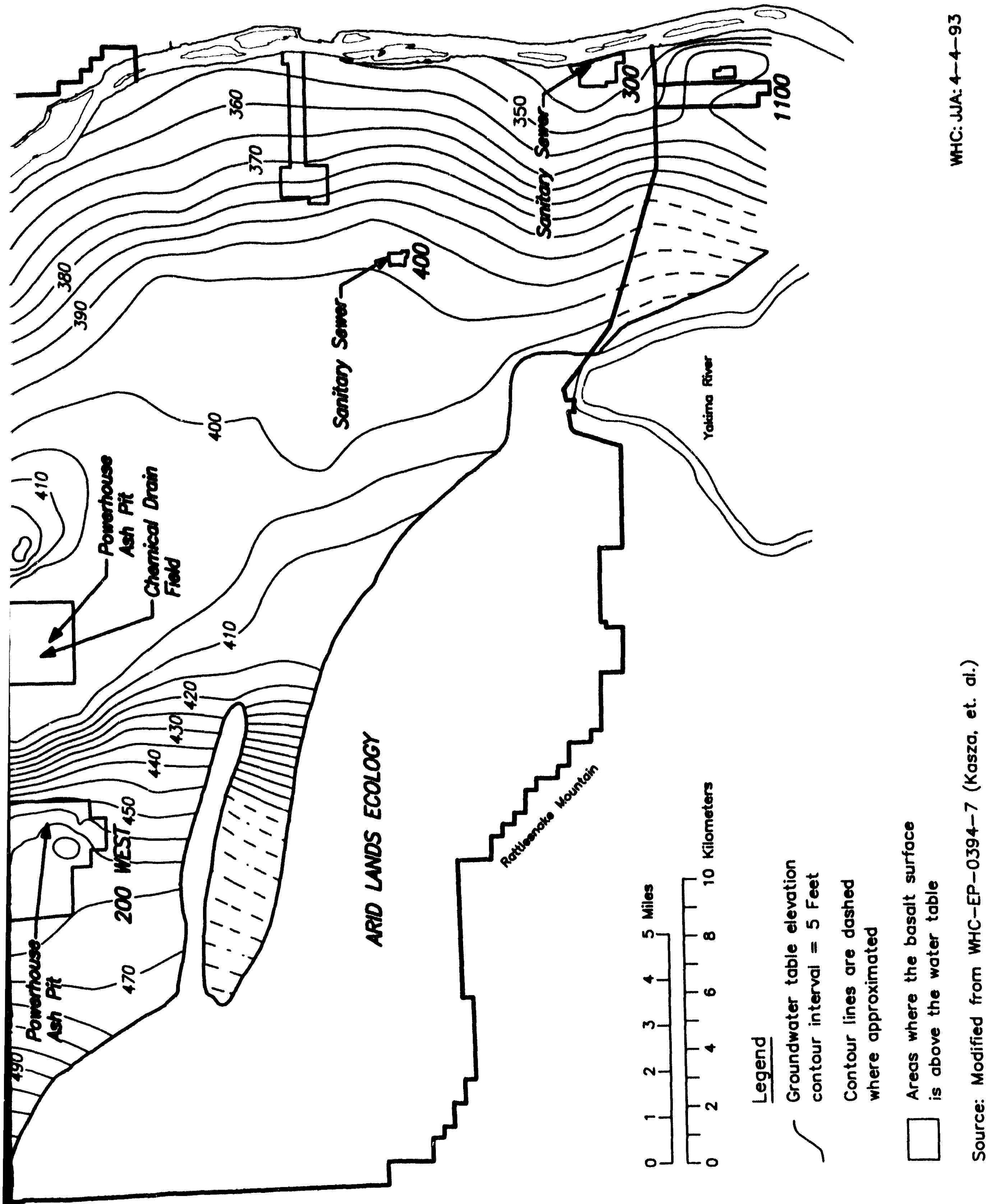


Figure H-9. Hanford Water Table Map.