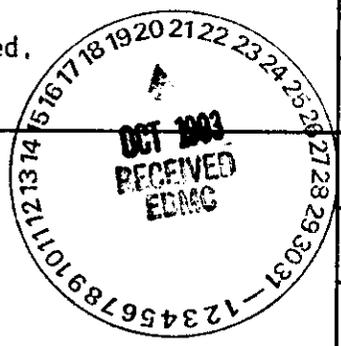


START
 Station # 12

ENGINEERING DATA TRANSMITTAL

BD-7400-172-2 (07/91) GEF097

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Environmental Engineering 81234	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: ER	6. Cog. Engr.: K. A. Bergstrom	7. Purchase Order No.: N/A
8. Originator Remarks: SD document approved and released.		9. Equip./Component No.: N/A
11. Receiver Remarks:		10. System/Bldg./Facility: N/A
		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date:



15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-EN-TI-178		0	Geophysical Investigation of Sodium dichromate Transfer Station, 100 D Area	4	2	1	

16. KEY		
Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

(G)		(H)		17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)								(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.		
2/1	2/1	Cog. Eng. K. A. Bergstrom	<i>K.A. Bergstrom</i>	9-13-93	H6-06	EDMC (1)	<i>J.W. Fassett</i>		H6-08	3			
2/1	2/1	Cog. Mgr. J. W. Fassett	<i>J.W. Fassett</i>	9-13-93	H6-06	N. M. Naiknimbalkar			H6-02	3			
		QA				IRA Clearance (2)			H4-17	3			
		Safety											
		Env.											
3		Geophysical Files (2)			H6-06								
3		Central Files (2)			L8-04								

18. <i>K.A. Bergstrom</i> K. A. Bergstrom Signature of EDT Originator Date 9-13-93	19. _____ Authorized Representative Date for Receiving Organization	20. <i>J.W. Fassett</i> J. W. Fassett Cognizant/Project Engineer's Manager Date 9/13/93	21. DOE APPROVAL (if required) Ltr. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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all

Date Received: 9/20/93	INFORMATION RELEASE REQUEST	Reference: WHC-CM-3-4
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Complete for all Types of Release		
Purpose <input type="checkbox"/> Speech or Presentation <input type="checkbox"/> Full Paper (Check only one suffix) <input type="checkbox"/> Summary <input type="checkbox"/> Abstract <input type="checkbox"/> Visual Aid <input type="checkbox"/> Speakers Bureau <input type="checkbox"/> Poster Session <input type="checkbox"/> Videotape	<input checked="" type="checkbox"/> Reference <input checked="" type="checkbox"/> Technical Report <input type="checkbox"/> Thesis or Dissertation <input type="checkbox"/> Manual <input type="checkbox"/> Brochure/Flier <input type="checkbox"/> Software/Database <input type="checkbox"/> Controlled Document <input type="checkbox"/> Other	ID Number (include revision, volume, etc.) WHC-SD-EN-TI-178, Rev.0 List attachments. Date Release Required <p style="text-align: center;">9/30/93</p>

Title Geophysical Investigation of Sodium Dichromate Transfer Station 100 D Area.	Unclassified Category UC-	Impact Level 4
New or novel (patentable) subject matter? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If "Yes", has disclosure been submitted by WHC or other company? <input type="checkbox"/> No <input type="checkbox"/> Yes Disclosure No(s).	Information received from others in confidence, such as proprietary data, trade secrets, and/or inventions? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Identify)	
Copyrights? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If "Yes", has written permission been granted? <input type="checkbox"/> No <input type="checkbox"/> Yes (Attach Permission)	Trademarks? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (Identify)	

Complete for Speech or Presentation			
Title of Conference or Meeting N/A	Group or Society Sponsoring N/A		
Date(s) of Conference or Meeting	City/State	Will proceedings be published? <input type="checkbox"/> Yes <input type="checkbox"/> No	Will material be handed out? <input type="checkbox"/> Yes <input type="checkbox"/> No
Title of Journal N/A			

CHECKLIST FOR SIGNATORIES			
Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval
			Name (printed) Signature Date
Classification/Uncontrolled Nuclear Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>	} <u>SUBBERGAIN</u> <i>[Signature]</i> 9/23/93
Patent - General Counsel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	} <u>SUBBERGAIN</u> <i>[Signature]</i> 9/23/93
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WHC Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Communications	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
RL Program/Project	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>E. D. Geller</u> <i>[Signature]</i> 9/24/93
Publication Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>L.A. BROWN</u> <i>[Signature]</i> 9/13/93
Other Program/Project	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Information conforms to all applicable requirements. The above information is certified to be correct.																									
<table style="width:100%;"> <tr> <td style="width:50%; padding: 5px;">References Available to Intended Audience</td> <td style="width:50%; padding: 5px;">Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">Transmit to DOE-HQ/Office of Scientific and Technical Information</td> <td style="padding: 5px;">Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">Author/Requestor (Printed/Signature)</td> <td style="padding: 5px;">Date</td> </tr> <tr> <td style="padding: 5px;"><u>K. A. Bergstrom</u> <i>[Signature]</i></td> <td style="padding: 5px;"><u>9-13-93</u></td> </tr> <tr> <td style="padding: 5px;">Intended Audience</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;"><input type="checkbox"/> Internal <input type="checkbox"/> Sponsor <input checked="" type="checkbox"/> External</td> <td style="padding: 5px;"></td> </tr> <tr> <td style="padding: 5px;">Responsible Manager (Printed/Signature)</td> <td style="padding: 5px;">Date</td> </tr> <tr> <td style="padding: 5px;"><u>J. W. Fassett</u> <i>[Signature]</i></td> <td style="padding: 5px;"><u>9/13/93</u></td> </tr> </table>	References Available to Intended Audience	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Transmit to DOE-HQ/Office of Scientific and Technical Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Author/Requestor (Printed/Signature)	Date	<u>K. A. Bergstrom</u> <i>[Signature]</i>	<u>9-13-93</u>	Intended Audience		<input type="checkbox"/> Internal <input type="checkbox"/> Sponsor <input checked="" type="checkbox"/> External		Responsible Manager (Printed/Signature)	Date	<u>J. W. Fassett</u> <i>[Signature]</i>	<u>9/13/93</u>	<table style="width:100%;"> <tr> <th colspan="2" style="text-align: center; padding: 5px;">INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP</th> </tr> <tr> <td colspan="2" style="padding: 5px;">Stamp is required before release. Release is contingent upon resolution of mandatory comments.</td> </tr> <tr> <td colspan="2" style="text-align: center; padding: 10px;">  </td> </tr> <tr> <td style="width:50%; padding: 5px;">Date Cancelled</td> <td style="width:50%; padding: 5px;">Date Disapproved</td> </tr> </table>	INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP		Stamp is required before release. Release is contingent upon resolution of mandatory comments.				Date Cancelled	Date Disapproved
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SUPPORTING DOCUMENT

1. Total Pages 7

<p>2. Title Geophysical Investigation of Sodium Dichromate Transfer Station, 100 D Area.</p>	<p>3. Number WHC-SD-EN-TI-178</p>	<p>4. Rev No. 0</p>
<p>5. Key Words Radar, Geophysics, Ground-Penetrating Radar (GPR)</p> <p align="center">APPROVED FOR PUBLIC RELEASE <i>V. Kirkland 9/23/93</i></p>	<p>6. Author Name: K. A. Bergstrom</p> <p align="right"><i>K.A. Bergstrom</i> Signature</p> <p>Organization/Charge Code 81234/PA2AB</p>	

<p>7. Abstract K. A. Bergstrom, T. H. Mitchell, 1993 Geophysical Investigation of Sodium Dichromate Transfer Station 100 D Area, "WHC-SD-TI-178, Rev. 0, Westinghouse Hanford Company, Richland, Washington</p>	
<p>8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.</p> <p>PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.</p> <p>DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.</p>	<p>10. RELEASE STAMP</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>OFFICIAL RELEASE 11</p> <p>BY WHC</p> <p>DATE OCT 04 1993</p> <p><i>Station # 12</i></p> </div>
<p>9. Impact Level 4</p>	

Geophysical Survey of the Sodium Dichromate Transfer Station, 100-D Area.

Objective

The objective of the survey was to locate subsurface pipes, utilities, and underground structures that might be related to the sodium dichromate transfer station (Figure 1). Based upon the results of the survey, test pit locations will be recommended that have the least likelihood of encountering identified obstructions. Ground-Penetrating Radar was the geophysical method selected to conduct the investigation.

Ground-Penetrating Radar Methodology

The Ground-Penetrating Radar (GPR) system used for this work utilized a 300-megahertz (MHz) antenna to transmit the electromagnetic (EM) energy into the ground. The transmitted energy is reflected back to a receiving antenna where variations in the return signal are recorded. Common reflectors include natural geologic conditions such as bedding, cementation, moisture, and clay, or man-made objects such as pipes, barrels, foundations, and buried wires.

Depth of penetration, which varies from site to site, was 10-15 feet for this survey. The method is limited in depth by transmit power, receiver sensitivity, and attenuation of the transmitted energy. Depth of investigation is also influenced by highly conductive material, such as metal drums, which reflect all the energy back to the receiver. Therefore, the method cannot "see" below such objects.

Display and interpretation of the data are similar to seismic reflection data. In some areas, interpretations can be straight forward, but often unknown parameters within a highly variable subsurface yield complex data.

Data for these surveys were collected with a Geophysical Survey Systems Inc. (GSSI) Subsurface Interface Radar (SIR)[™] System 8, model 4800 and digitally stored on a GSSI DT6000A tape drive. A recording window of 100 nanoseconds, two-way travel time, was used.

[™] A trademark of Geophysical Survey Systems Inc. (GSSI).

Grid Location

The survey boundary is a rectangle, measuring 50 feet by 145 feet (Figure 2). Blue stakes mark the corners of the grid. The long axis of the survey strikes approximately east-west. All distances were measured and posted in feet. The southwestern corner of the grid is designated E100/N100 and serves as the "origin" for the survey locations. The letters "N" or "E" refer to a direction that trends generally north or east, respectively. The number refers to a distance in feet. For example, grid point E135/N120 lies 35 feet "east" and 20 feet "north" of grid point E100/N100.

Data were collected along two sets of profiles perpendicular to each other. The profiles were 5 feet apart.

Quality Control

These data were collected using procedures in WHC-CM-7-7 EII 11.2, Rev. 3, Environmental Investigations and Site Characterization Manual, Westinghouse Hanford Company. The data and records are stored in the Geophysics files. Figure 3 summarizes survey parameters.

Results

Two linear features were detected that appear to be pipes or utilities directly related to the transfer station (Figure 2). The first is a north-south (E132) trending linear that is less than 2 feet below the surface. It runs directly into the north side of the transfer station where some electrical conduit is exposed. This linear continues to the north beyond the extent of the grid. The second linear starts a few feet to the south of the transfer station, about 3 feet below the surface. It trends to the north-east to N115, then bends to the east where it continues on an east-west direction to E222 where it terminates at some valves sticking up at the surface. The purpose of the valves are unknown. This east-west trending linear crosses over two paralleling north-south trending linears at E168 and E222. The north-south linears are similar in character, both 6 feet below the surface. Each is traceable to the south to two anomalies that have the characteristics of buried tanks, next to the railroad tracks. The sources of the "tank-like" anomalies are approximately 3 feet below the surface. There were no data collected to the south of the railroad tracks to determine whether the linears continue to the south. Both linears continue beyond the northern extent of the grid. From the data, it was not possible to resolve the relationship between the east-west, the two north-south, and the "tank-like" anomalies.

Two additional east-west trending linears were identified along the northern edge of the grid. They each have the characteristics of a utility or pipe. The most eastern, east-west linear, is approximately 5 feet below the surface and appears to terminate near the eastern north-south linear at approximately E225. This could be interpreted as a turn into the north-south linear at about E222. It would require additional data to resolve this interpretation.

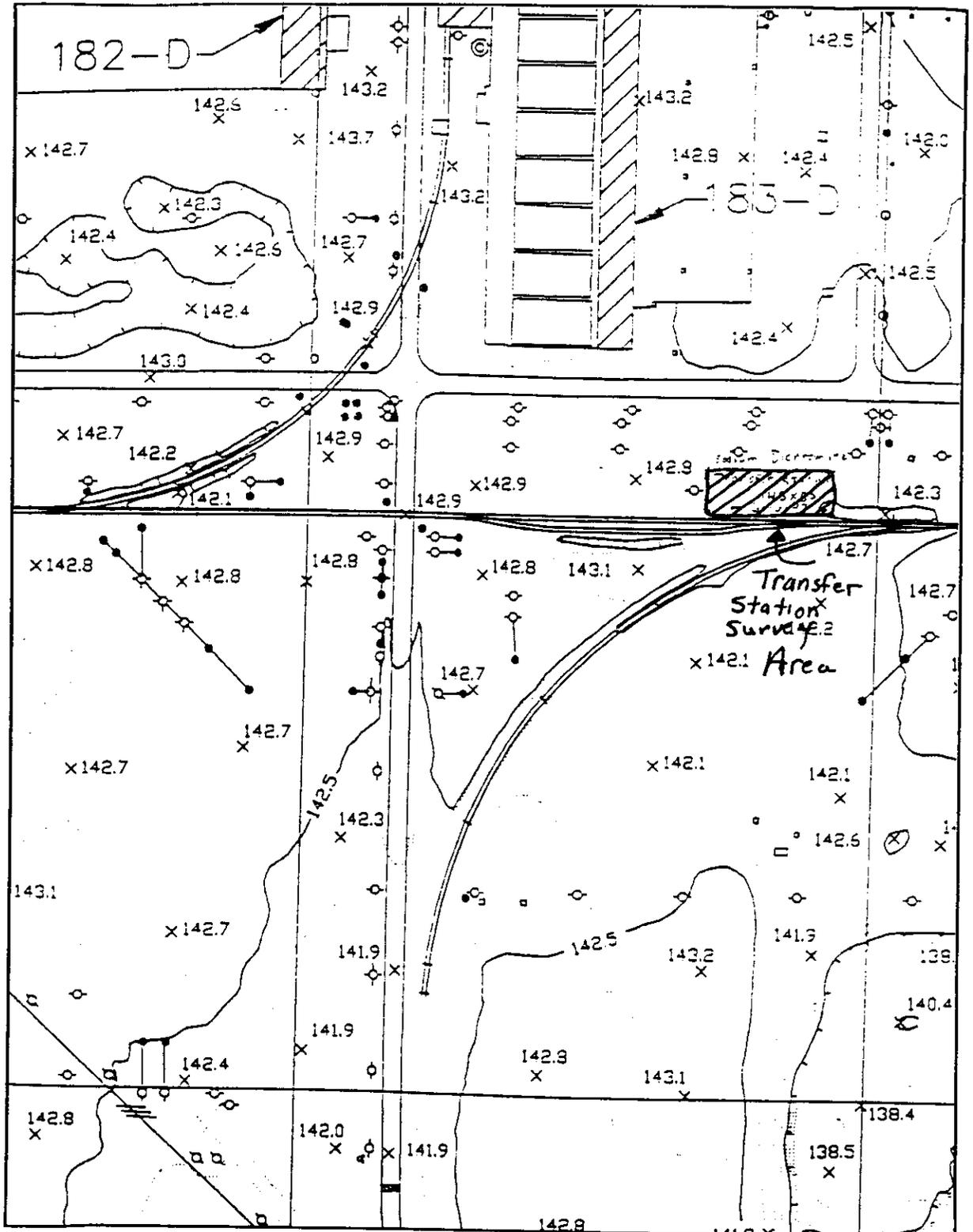


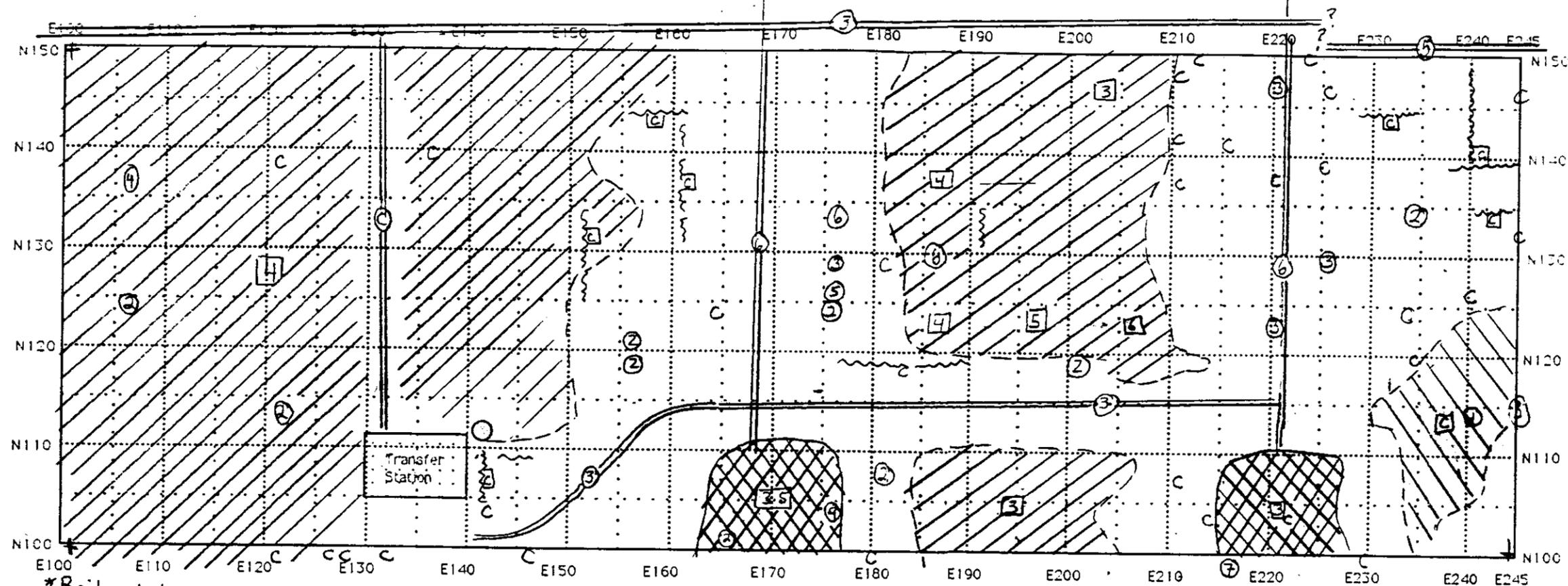
Figure 1. Location Map

Contour Interval 0.5 meters
 1 centimeter = 20 meters
 1:2000
 From H-13 series topographic maps

N ↑

Sodium Dichromate Transfer Station

WHC-SD-EN-TI-178, Rev. 0



*Railroad tracks at N95

-  - Undisturbed Area
-  - Disturbed Area; probable scattered buried debris
-  - Large anomaly

-  Buried anomaly; depth in feet.
 -  Buried anomaly; depth < 1.5 feet
 -  Linear; depth in feet.
 -  Disturbed zone; depth in feet
 -  Continuity of anomaly/zone/horizon etc. uncertain.
 -  Surface cultural feature
- Questions: Contactsurface geophysics @ 6-1747
T.H. Mitchell, K. A. Bergstrom

Figure 2. Summary Interpretation of Sodium Dichromate Transfer Station

GROUND PENETRATING RADAR (GPR) SURVEY

Team Geophysics, Westinghouse Hanford Operations

TITLE: Sodium Dichromate Transfer Station		DATE: 6-16-93
LOCATION: Southwest of 183-D building, between east-west road and railroad tracks.		
CLIENT: N. M. Naiknimbalkar	DATA COLLECTED BY K.A. Bergstrom & T.H. Mitchell	
EQUIPMENT USED: GSSI System 8, model 4800 Calibrator Model P731 Digital Tape Recoder DT6000A	ANTENNA(S) USED: 100 ___ 300 <u>XX</u> 100 BISTATIC ___	
	LOG BOOK: EFL 1052	
	TIME WINDOW (NS): 100	
PROCEDURES FOLLOWED: WHC-CM-7-7 EII 11.2, REV. 3		
GRID : <u>50 X 145'</u> NO. OF PROFILES: <u>41</u> TOTAL FOOTAGE COLLECTED: <u>3100</u>		
PARAMETERS: Two sets of perpendicular profiles; five feet between profiles.		
DATA TAPE NO.: <u>93-16</u> RECORDS LOCATION: <u>Geophysical field files</u>		
TAPE ADDRESS : <u>0-26829</u> CALIBRATION ADDRESS: <u>26223-26829</u>		
INTERPRETED BY : <u>K. A. Bergstrom</u> REVIEWED BY : <u>J.P Kiesler</u>		
INTERPRETATION DELIVERED TO <u>Naiknimbalkar/Spicer</u> DATE : <u>7/93</u>		
OBJECTIVE(S): Map out piping system around Sodium Dichromate Transfer Station.		
NOTES: Antenna pulled by hand at 1-2 mph. 50-meter cable. Pulled on south and east side of survey marks.		