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Station # 12

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 600592

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2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Environmental Engineering 81234	4. Related EDT No.: N/A
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(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

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)											
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2/1	2/1	Cog. Eng. K. A. Bergstrom	<i>K.A. Bergstrom</i>	9-13-93	H6-06	EDMC (2) (1)	<i>J.W. Fassett</i>		H6-08		3
3/1	2/1	Cog. Mgr. J. W. Fassett	<i>J.W. Fassett</i>	9-13-93	H6-06	N. M. Naiknimbalkar	<i>N.M. Naiknimbalkar</i>		H6-02		3
		QA				IRA Clearance (2)			H4-17		3
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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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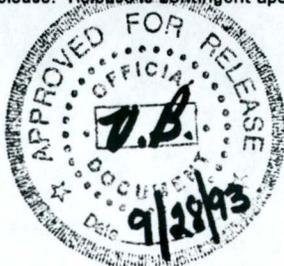
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<p style="text-align: center;"><b>APPROVED FOR PUBLIC RELEASE</b> <i>V. Burkland 9/23/93</i></p>		<p style="text-align: center;"><i>K.A. Bergstrom</i> Signature</p> <p>Organization/Charge Code 81234/PA2AB</p>

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	10. RELEASE STAMP
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9. Impact Level 4	

## 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)<sup>™</sup> 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.

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<sup>™</sup> 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.

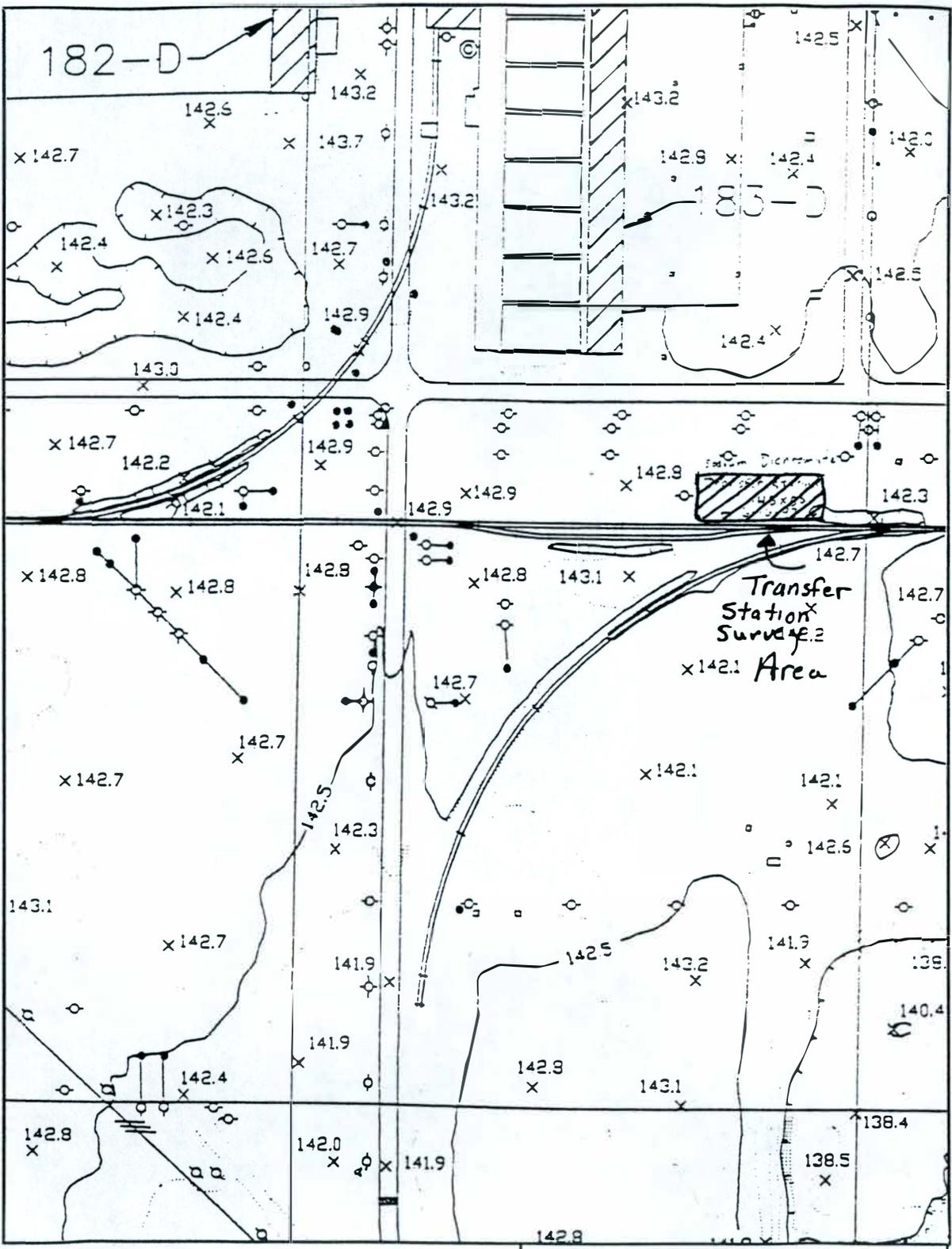
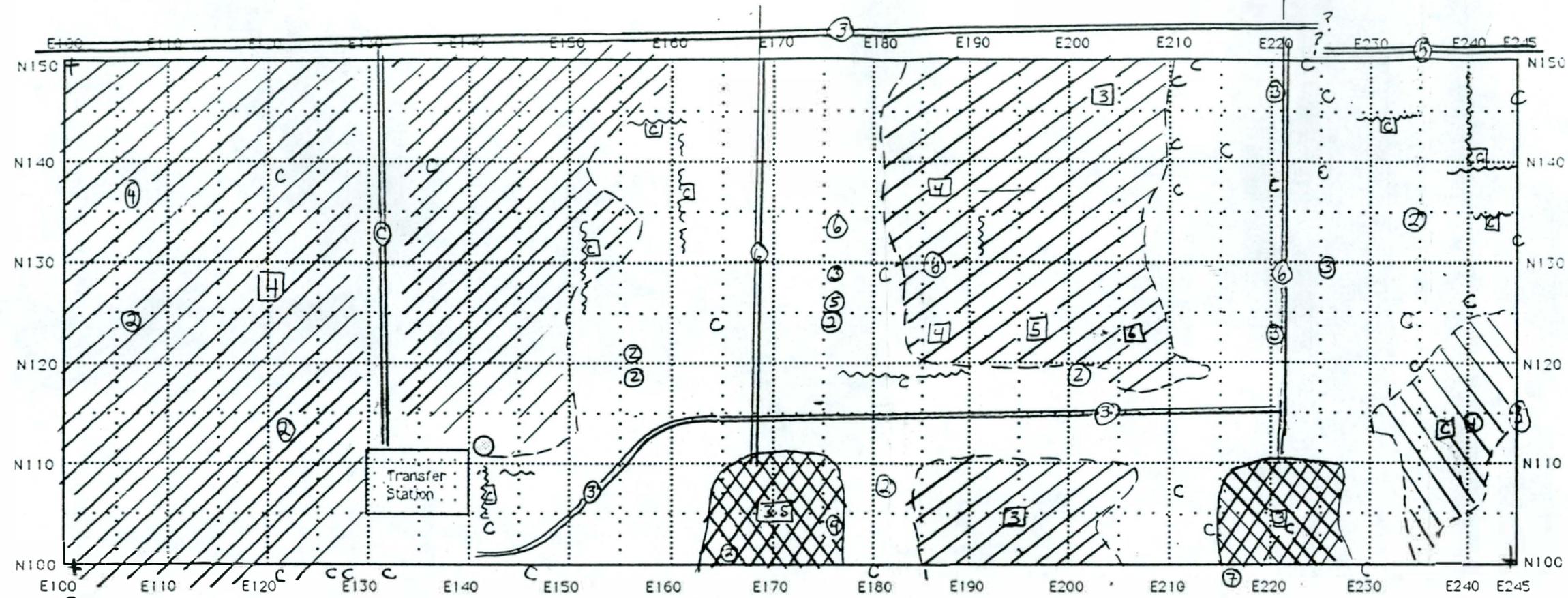


Figure 1. Location Map

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

### 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: [Contactsurfacegeophysics@6-1747](mailto:Contactsurfacegeophysics@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 Recorder 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.	