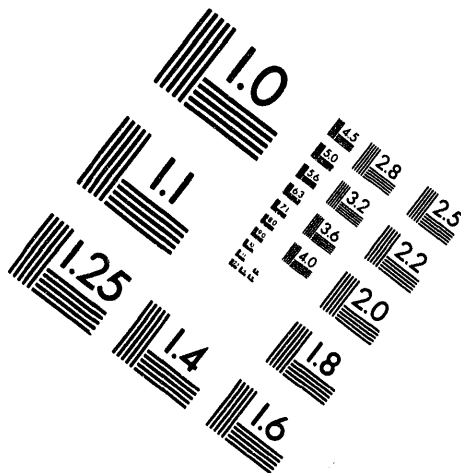
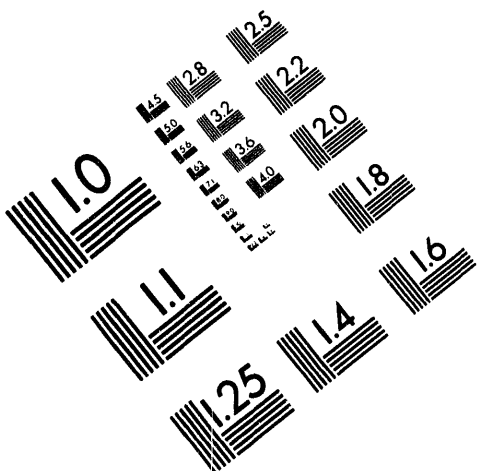




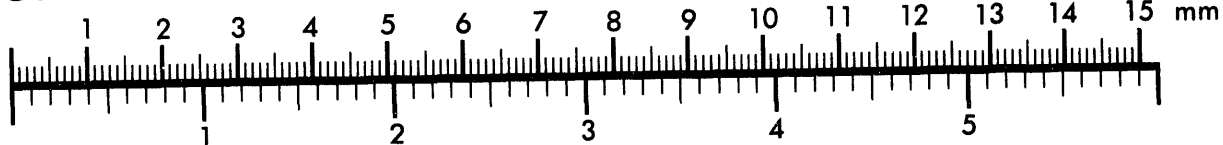
AIM

Association for Information and Image Management

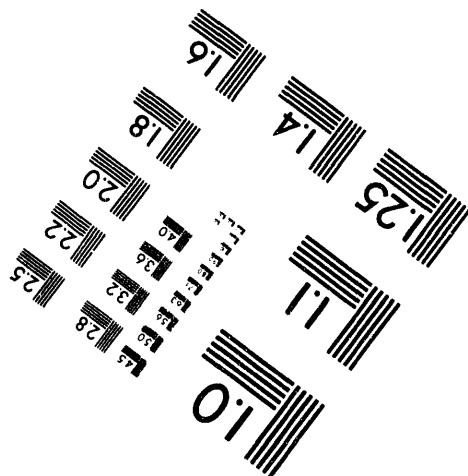
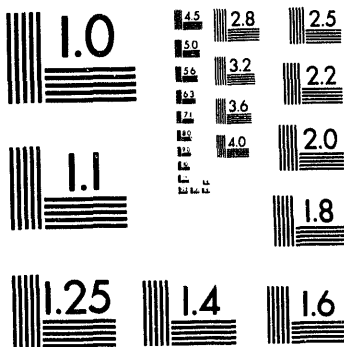
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202



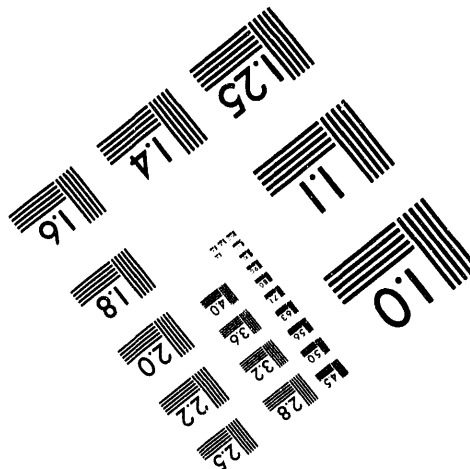
Centimeter



Inches



MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.



1 of 1

JUL 08 1994

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

600587

| | | |
|---|---|---|
| 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: Release | | 9. Equip./Component No.: N/A |
| 11. Receiver Remarks: RECEIVED JUL 29 1994 OSTI | | 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 Trans- mittal | Origina- tor Dispo- sition | Receiv- er Dispo- sition |
| 1 | WHC-SD-EN-TI-228 | | 0 | Geophysical survey for proposed borehole 199-K-108A, 100 K Area | N/A | 1/2 | 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) | | | | | | | | | | | |
|--|-------|--|--|--|--|--|--|--|--|--------|-------|
| (G) | (H) | (J) Name (K) Signature (L) Date (M) MSIN | | | | (J) Name (K) Signature (L) Date (M) MSIN | | | | (G) | (H) |
| Reason | Disp. | | | | | | | | | Reason | Disp. |
| 1/2 | 2 | Cog. Eng. K. A. Bergstrom <i>K.A. Bergstrom</i> 1-19-94 H6-06 | | | | EPIC (2) H6-08 | | | | 3 | |
| 1/2 | 2 | Cog. Mgr. J. W. Fassett <i>J.W. Fassett</i> H6-06 | | | | B. A. Williams H6-06 | | | | 3 | |
| | | QA | | | | J. F. Keller L4-93 | | | | 3 | |
| | | Safety | | | | IRA (2) H4-17 | | | | 3 | |
| | | Env. | | | | | | | | | |
| 3 | | Geophysical Files (2) H6-06 | | | | | | | | | |
| 3 | | Central Files (2) L8-04 | | | | | | | | | |

| | | | |
|--|--|--|--|
| 18. K. A. Bergstrom <i>K.A. Bergstrom</i> Signature of EDT Originator Date 1-19-94 | 19. Authorized Representative for Receiving Organization Date | 20. J. W. Fassett <i>J.W. Fassett</i> 1-28-94 Cognizant/Project Engineer's Manager Date | 21. DOE APPROVAL (if required) Ltr. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments |
|--|--|--|--|

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

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

BD-7400-172-1 (07/91)




| | | | | |
|---|--|---|--|---|
| Date Received: 7-1-94/DS | | INFORMATION RELEASE REQUEST | | Reference: WHC-CM-3-4 |
| Complete for all Types of Release | | | | |
| Purpose | | Reference | | ID Number (include revision, volume, etc.) WHC-SD-EN-TI-228, Rev. 0 |
| <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"/> 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 | | List attachments. |
| | | | | Date Release Required 02-15-94 |

| | | | |
|--|--|---|----------------------------|
| Title: Geophysical Survey for Proposed Borehole 199-K-108A, 100-K Area | | Unclassified Category UC- 630 | Impact Level N/A |
| 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 checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Identify) | |
| Complete for Speech or Presentation | | | |
| Title of Conference or Meeting N/A | | Group or Society Sponsoring | |

| | | | |
|----------------------------------|------------|---|---|
| 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/Unclassified Controlled Nuclear Information | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Patent - General Counsel | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Legal - General Counsel | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| Applied Technology/Export Controlled Information or International Program | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 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"/> | E. D. Goller <i>E. D. Goller</i> 6/30/94 |
| Publication Services | <input checked="" type="checkbox"/> | <input type="checkbox"/> | L. S. Hermann <i>L. S. Hermann</i> 7/1/94 |
| 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 border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: center;">Yes</th> <th style="text-align: center;">No</th> </tr> <tr> <td>References Available to Intended Audience</td> <td style="text-align: center;"><input checked="" type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td>Transmit to DOE-HQ/Office of Scientific and Technical Information</td> <td style="text-align: center;"><input checked="" type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td>Author/Requestor (Printed/Signature)</td> <td>Date</td> </tr> <tr> <td>K. A. Bergstrom <i>J.W. Fassett</i></td> <td>6/30/94</td> </tr> </table> | | Yes | No | References Available to Intended Audience | <input checked="" type="checkbox"/> <input type="checkbox"/> | Transmit to DOE-HQ/Office of Scientific and Technical Information | <input checked="" type="checkbox"/> <input type="checkbox"/> | Author/Requestor (Printed/Signature) | Date | K. A. Bergstrom <i>J.W. Fassett</i> | 6/30/94 | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP</th> </tr> <tr> <td colspan="2">Stamp is required before release. Release is contingent upon resolution of mandatory comments.</td> </tr> <tr> <td colspan="2" style="text-align: center;">  </td> </tr> <tr> <td>Date Cancelled</td> <td>Date Disapproved</td> </tr> <tr> <td></td> <td></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 | | |
| Yes | No | | | | | | | | | | | | | | | | | | | | | | |
| References Available to Intended Audience | <input checked="" type="checkbox"/> <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| Transmit to DOE-HQ/Office of Scientific and Technical Information | <input checked="" type="checkbox"/> <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| Author/Requestor (Printed/Signature) | Date | | | | | | | | | | | | | | | | | | | | | | |
| K. A. Bergstrom <i>J.W. Fassett</i> | 6/30/94 | | | | | | | | | | | | | | | | | | | | | | |
| INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP | | | | | | | | | | | | | | | | | | | | | | | |
| Stamp is required before release. Release is contingent upon resolution of mandatory comments. | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | |
| Date Cancelled | Date Disapproved | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Intended Audience <input type="checkbox"/> Internal <input type="checkbox"/> Sponsor <input checked="" type="checkbox"/> External Responsible Manager (Printed/Signature) Date J. W. Fassett <i>J.W. Fassett</i> 6/30/94 | | | | | | | | | | | | | | | | | | | | | | | |

| SUPPORTING DOCUMENT | | 1. Total Pages 6 |
|---|--|--|
| 2. Title Geophysical Survey for Proposed 199-K-108A, 100-K Area | 3. Number WHC-SD-EN-TI-228 | 4. Rev No. 0 |
| 5. Key Words Ground-penetrating radar, geophysics | 6. Author Name: <u>K. A. Bergstrom</u> <u>J.W. Fessett</u> Signature Organization/Charge Code 8C540/KK481 | |
| <p align="center">APPROVED FOR PUBLIC RELEASE</p> <p align="center">7-1-94 <u>D. Solis</u></p> | | |
| 7. Abstract WHC, 1994, Bergstrom, K. A. and T. H. Mitchell, <i>Geophysical Survey for Proposed Borehole 199-K-108A, 100-K Area</i> , WHC-SD-EN-TI-228, Rev. 0, Westinghouse Hanford Company, Richland, Washington." | | |
| <p>8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use with 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 submitted 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, expressed 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; margin-top: 10px;"> <p align="center">OFFICIAL RELEASE</p> <p align="center">BY WHC</p> <p align="center">DATE JUL 08 1994</p> <p align="center"><u>Station # 12</u></p> </div> |
| 9. Impact Level N/A | | |

Jo

1.0 OBJECTIVE

The objective of the survey was to locate subsurface obstructions that may affect the drilling of proposed borehole, 199-K-108A, about 75 ft southeast of the 105 KW Building, 100-K Area, (Figure 1). Based upon the results of the survey, possible drill sites within the zone, with the least likelihood of encountering identified obstructions, were identified.

2.0 GROUND-PENETRATING RADAR METHODOLOGY

The ground-penetrating radar (GPR) system used for this work utilized a 300-megahertz antenna to transmit the electromagnetic 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.

The method is limited in depth by transmit power, receiver sensitivity, frequency, and attenuation of the transmitted energy which can be strongly affected by geology. 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. Maximum depth of penetration for this survey was about 12 ft.

Display and interpretation of the data are similar to seismic reflection data. In some areas, interpretations can be straightforward, 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) [a trademark of Geophysical Survey Systems Inc. (GSSI)] 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.

3.0 GRID LOCATION

The survey boundary is a square, measuring 50 ft by 50 ft (Figure 2). Painted stakes mark the corners of the grid. The survey strikes approximately N28W. 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 ft "east" and 20 ft "north" of grid point E100/N100.

Data were collected along two sets of profiles perpendicular to each other. Spacing between profiles was 5 ft.

4.0 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.

5.0 RESULTS

Two linear features are evident in this data set. The first correlates with a fire hydrant located at N97/E93 (Figure 2). This linear, pipe-like feature, is 5 ft below the surface and trends toward the 105 KW Building along the E93 grid line. The second linear anomaly trends along the N145 grid line. It is about 5 ft below the surface and cannot be traced to the southwest beyond about E113.

Much of the survey area contains scattered debris and the entire site appears to have been disturbed and is not intact geologically. A horizon about 20 ft by 35 ft is buried 3 ft below the surface. It has distinct edges and is similar in character to buried concrete slabs observed in other surveys. This slab-like feature extends from N114 to N135 and from E109 to E146.

Initially, the proposed borehole site was staked at N124/E124, in the center of the slab-like anomaly. An alternate borehole site at N129/E106 is recommended in order to minimize the likelihood of drilling into significant debris or anomalies.

Figure 1. Location Map.

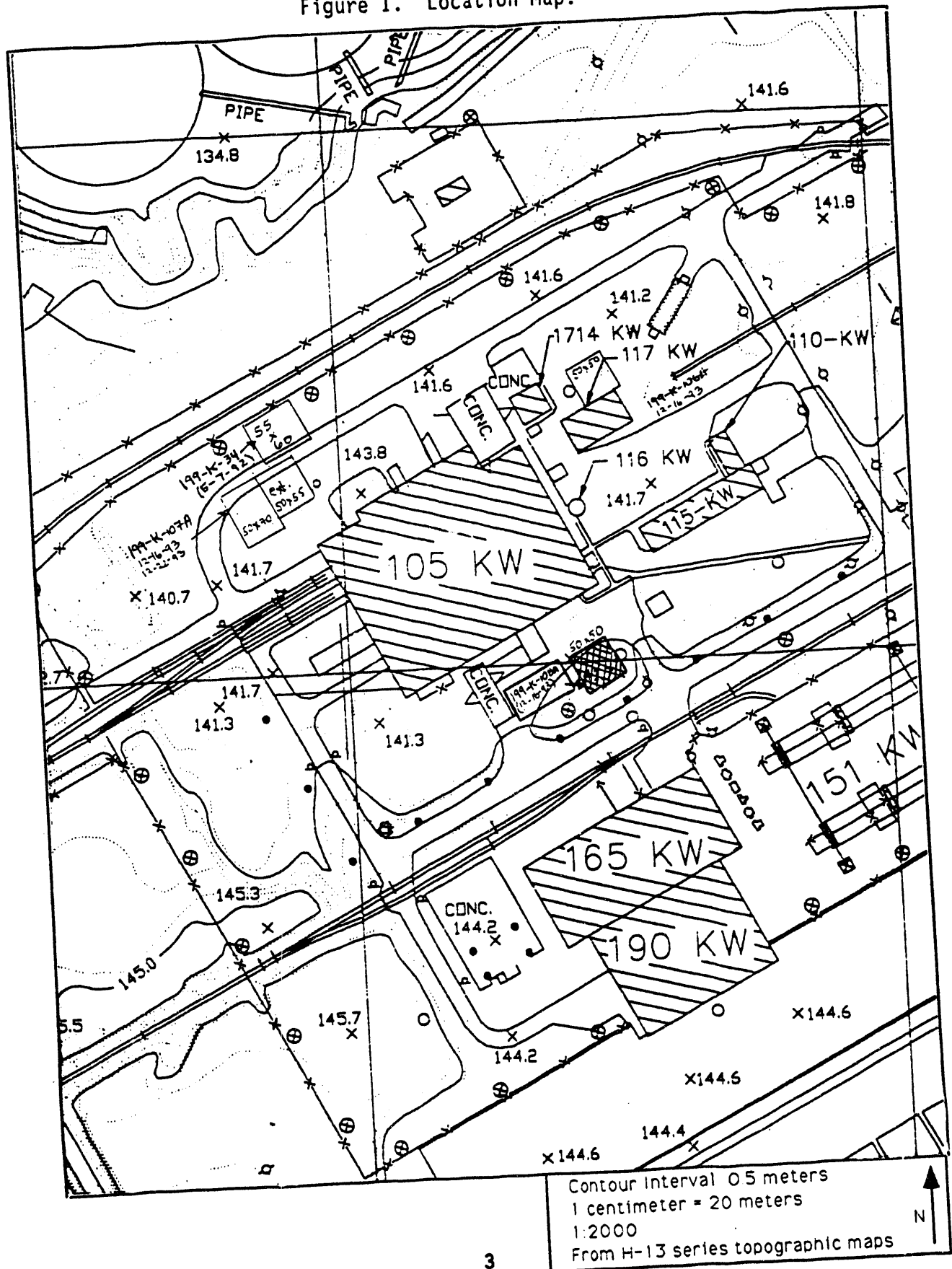


Figure 2. Interpretation Summary.

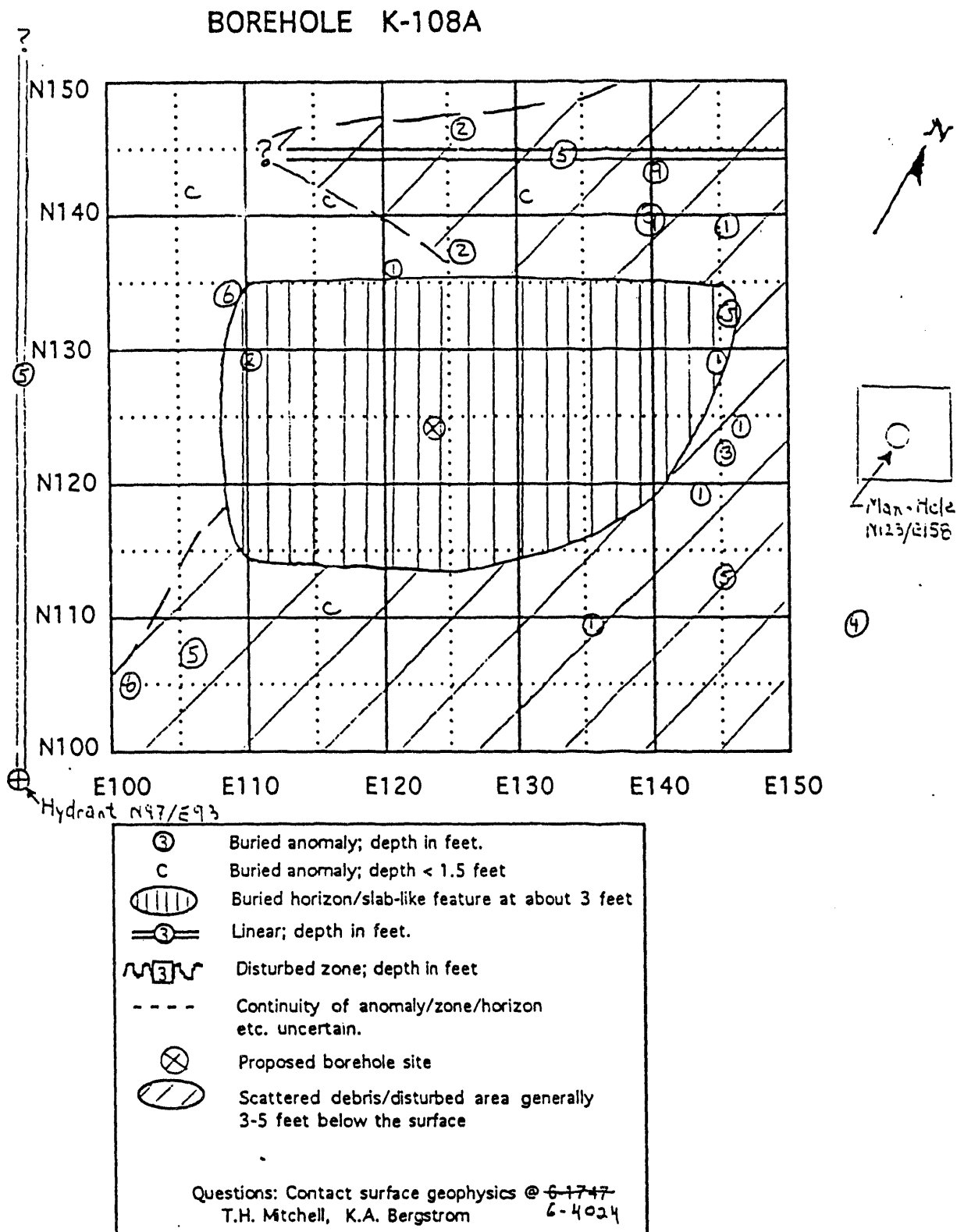


Figure 3. GPR Parameters of the 199-K-108A Well Site Survey.

GROUND PENETRATING RADAR (GPR) SURVEY

Team Geophysics, Westinghouse Hanford Operations

| | | |
|---|--|----------------|
| TITLE: Borehole 199-K-108A | | DATE: 12/16/93 |
| LOCATION: 100 K Area | | |
| CLIENT: | DATA COLLECTED BY G.J. Schwartz & 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: EFL1109 | |
| | TIME WINDOW (NS): 100 | |
| PROCEDURES FOLLOWED: WHC-CM-7-7 EII 11.2, REV. 3 | | |
| GRID : 50 X 50 NO. OF PROFILES: <u>20</u> TOTAL FOOTAGE COLLECTED: <u>1000</u> | | |
| PARAMETERS: Two sets of perpendicular profiles; five feet between profiles. | | |
| DATA TAPE NO.: <u>945</u> RECORDS LOCATION: <u>Geophysical field files</u> | | |
| TAPE ADDRESS : <u>0-15149</u> CALIBRATION ADDRESS: <u>14657-15149</u> | | |
| INTERPRETED BY : <u>K.A. Bergstrom</u> REVIEWED BY : <u>T.H. Mitchell</u> | | |
| INTERPRETATION DELIVERED TO _____ DATE : <u>12/22/93</u> | | |
| OBJECTIVE(S): To locate subsurface obstructions that may adversely affect the borehole. | | |
| NOTES: Antenna pulled by hand at 1-2 mph on the south and east side of the survey marks. | | |

**DATE
FILMED**

8/25/94

END
