B-46

July 30, 1996

SDMS DocID **137561**

Mr. David A. Slowick
Section Chief, Emergency Response
Department of Environmental Protection
436 Dwight Street
Springfield, MA 01103

Re: Appendix B (Magnetometer Survey) of
OP-3 Immediate Response Action Plan Completion Statement

Dear Mr. Slowick:

A copy machine problem resulted in the omission of pages from Appendix B of the IRAP
Completion Statement which was transmitted on July 26, 1996. Please replace Appendix B
in your copy of the Completion Statement with the enclosed copy.

Our apologies for this inconvenience.

Yours truly,

Mark C Phillips

Mark C. Phillips
Environmental Quality Engineer

cc: R. Bell, DEP
G.A. Bibler, Goodwin, Procter & Hoar
J.R. Bieke, Esquire, Shea & Gardner
J.D. Ciampa, GE
J.L. Cutler, DEP
M. Hoagland, EPA
Pittsfield Health Department
B. Olson, EPA
A.J. Thomas, Esquire, GE
A. Weinberg, DEP
S.P. Winslow, Esquire, DEP
Public Information Repositories ECL I-P-IV(A)(1) & (2)

APPENDIX B

MAGNETOMETER SURVEY

BBL

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Transmitted Via Fax/ U.S. Postal Service

February 23, 1996

Mr. Mark Phillips, P.E.
Environmental and Facility Programs
General Electric Corporation
100 Woodlawn Avenue
Building 11-250
Pittsfield, MA 01201

Re: General Electric Company
        Pittsfield, Massachusetts
        Magnetometer Survey - OP-3 Area
        Project #: 0201 201.71 #2

Dear Mark:

This letter provides the results of the magnetometer survey that was performed for General Electric (GE) at the OP-3 Area in Pittsfield, Massachusetts. The survey was conducted by Blasland, Bouck & Lee, Inc., (BBL) on February 8, 1996 to further characterize three anomalies located on the adjacent Conrail property that were identified during a ground penetrating radar (GPR) survey on November 15, 1994. The magnetometer survey data were used to determine if these three GPR anomalies had a magnetic susceptibility (response) of adequate strength to represent a ferrometallic object (i.e., steel drum).

The locations of the three GPR anomalies were identified and staked using the grid coordinates from the GPR survey. These locations are shown on the enclosed Site Map of the OP-3 Area (Figure 1) and are identified as Anomaly Numbers 1, 2, and 3. A Geometrics (Model 856) proton precession magnetometer was used for the survey and was tuned prior to beginning the survey to achieve the optimum signal strength. A value of 55.0 Kilogammas was used to tune the instrument, yielding a signal strength of 8.8 after tuning. A background measurement was taken at a location away from the anomalies, before and after data collection, to determine any changes in the total magnetic field value during the survey.

Magnetic data at the three anomalies were collected using a 5-foot radius (spacing) around the anomalies. Readings were taken at four locations around the anomaly and over the center of the anomaly (as identified by the GPR survey). The field notes for the survey are provided as Attachment 1. The results of the survey are

provided in the table below.

Reading Location	Anomaly 1	Anomaly 2	Anomaly 3
North	53,122.0	53,988.3	58,826.0
South	53,793.1	54,313.2	54,822.0
East	53,460.0	54,215.8	54,389.0
West	53,581.0	54,079.5	56,505.0
Center	53,502.0	54,165.2	55,432.0
N-S gradient (gamma/ft) calculated	53,793.1 - 53,122.0 = 671.1/10 = 67.1	54,313.2 - 53,988.3 = 324.9/10 = 32.5	58,826.0 - 54,822.0 = 4,004.0/10 = 400.4
E-W gradient (gamma/ft) calculated	53,581.0 - 53,460.0 = 121.0/10 = 12.1	54,215.8 - 54,079.5 = 136.3/10 = 13.6	56,505.0 - 54,389.0 = 2,116.0/10 = 211.6
N-S gradient - modeled (gamma/ft)	257.9	257.9	257.9
E-W gradient - modeled (gammas/ft)	57.4	57.4	57.4

To evaluate the three anomaly locations based on the observed magnetic gradient (north - south and east - west), magnetic modeling was performed to calculate the response of a buried steel drum at a depth of 5 feet (target depth identified by the GPR survey for the three anomalies).

A magnetic modeling algorithm was used to calculate the magnetic response (anomaly) caused by a single steel drum, based on a method by Shuey and Pasquale (Geophysics, June 1973). The algorithm computes a data profile over the center of the magnetic target. A model data profile was completed for both north-south and east-west orientations, to compare the modeled gradient to the field gradient data at each of the anomaly locations. The modeled results are listed in the above table, and the worksheet and input parameters are provided as Attachment 2. The model illustrates that the calculated response of a single 55-gallon drum on its side and at a depth of 5 feet is about 258 gamma/foot for the north-south orientation, and about 57 gamma/foot for the east-west orientation. The field gradient data for Anomaly Numbers 1 and 2 are well below the modeled values, indicating that these two anomalies do not have sufficient magnetic susceptibility to represent a buried drum.

At Anomaly Number 3, interference from the nearby railroad tracks (located 15 feet west of this location) has severely affected the field data causing a high magnetic gradient (400 gamma/ft) toward the location of the railroad tracks. Due to the interference at this location, an interpretation of the magnetic response for this anomaly cannot be made.

If you have any questions regarding the information provided in this letter, please feel free to contact me.

Very truly yours,

BLASLAND, BOUCK & LEE, INC.

Raymond A. Wagner
Senior Project Geologist

RAW/gap
2396840.C
Enclosures

cc: Mr. Scott T. Saroff, C.P.G., Blasland, Bouck & Lee, Inc.
        Mr. Bruce Eulian, Blasland, Bouck & Lee, Inc.

ATTACHMENT 1

Magnetometer Survey Field Notes

GENERAL ELECTRIC CO.
PITTSFIELD, MA.

MAGNETOMETER SURVEY	R. Wagner
2-8-96	B. Ealiau
OVERCAST - 40°F	

OD-3 AREA - 3 ANOMALIES LOCATED
          ON CONRAIL PROPERTY
GEOMETRICS G-856 PROTON MAG.
TUNED MAG. TO 55,000 GAMMAS
SIGNAL STRENGTH AFTER TUNING = 8.8

BACKGROUND READING - 54,732.3 (START)
    "   "   - 54,731.7 (END)

READINGS

Anomaly #1

1) 53,793.1
2) 53,502.0
3) 53,122.0
4) 53,460.0
5) 53,581.0

SKETCH
← MERRILL ROAD →
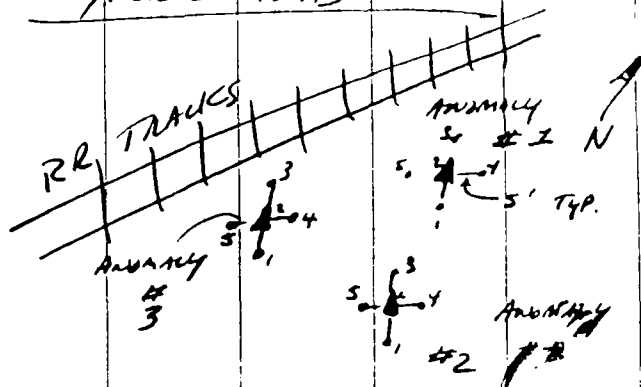
BACKGROUND LOC.

Maybe Rubic
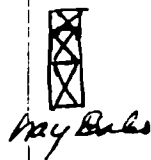
▲ ANOMALY LOC.
: READING LOC.

READINGS

ANOMALY #2	ANOMALY #3
1) 54,313.2	54,822.0
2) 54,165.2	55,432.0 } high gradient
3) 53,988.3	58,826.0
4) 54,215.8	54,389.0
5) 54,079.5	56,505.0

* Anomaly #3 appears to be affected by RR

ATTACHMENT 2

Magnetic Model Worksheet and Input Parameters

2 1/2 dimension Magnetic Mo   lling
Number of points along profile 10
Sample increment 1.5
Number of sources 1
Magnetic field value 54732.0
   ld inclination (dip) 60.0
A   e (deg) between profile & mag N 0.0

Parameters for source #1
Susceptibility 0.55000
Strike half-length 0.8 5.3
Number of edges 4
Edges are located at following positions:
    Y coordinate is unity (along strike of the source).
Coordinates for corner #1 are X = 14.60, and Z = 1.50
Coordinates for corner #2 are X = 15.40, and Z = 1.50
Coordinates for corner #3 are X = 15.40, and Z = 2.00
Coordinates for corner #4 are X = 14.60, and Z = 2.00

Sample	Gammas	Min...Max
1	0.38	*
2	0.80	*
3	1.63	*
4	3.36	*
5	7.22	*
6	16.81	*
7	44.13	| *
8	138.74	*
9	561.45	*
10	2717.79	

Min...Max

Total change in gammas from sample 8 to 10 = 2579.0
Distance between sample 8 and 10 = 10 feet (3.0 m)
Gradient = 257.9 gamm/ft. (N - S)

Reference: Shuey and Pasquale, Geophysics, Vol. 38, No. 3
        June 1973, pp. 507-512

2 1/2 dimension Magnetic Modelling
Number of points along profile 10
Sample increment 1.5
Number of sources 1
Magnetic field value 54732.0
Field inclination (dip) 60.0
Angle (deg) between profile & mag N 90.0

Parameters for source #1
Susceptibility 0.55000
Strike half-length 0.8
Number of edges 4
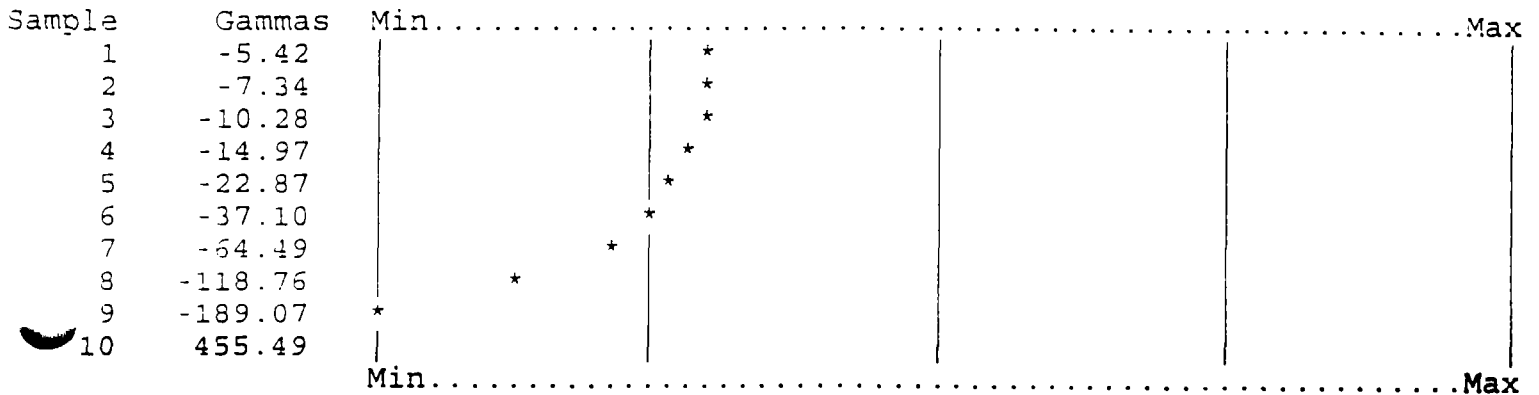Edges are located at following positions:
    Y coordinate is unity (along strike of the source).
Coordinates for corner #1 are X = 14.60, and Z = 1.50
Coordinates for corner #2 are X = 15.40, and Z = 1.50
Coordinates for corner #3 are X = 15.40, and Z = 2.00
Coordinates for corner #4 are X = 14.60, and Z = 2.00


```
Sample      Gammas   Min.......................................................Max
   1         -5.42   |                   *            |              |              |
   2         -7.34   |                   *            |              |              |
   3        -10.28   |                  *             |              |              |
   4        -14.97   |                 *              |              |              |
   5        -22.87   |               *|               |              |              |
   6        -37.10   |             *  |               |              |              |
   7        -64.49   |          *     |               |              |              |
   8       -118.76   |      *         |               |              |              |
   9       -189.07   | *              |               |              |              |
  10        455.49   |                |               |              |              |
                     Min.......................................................Max
```


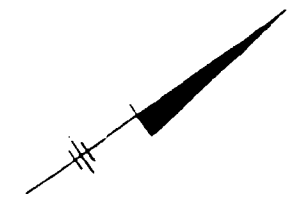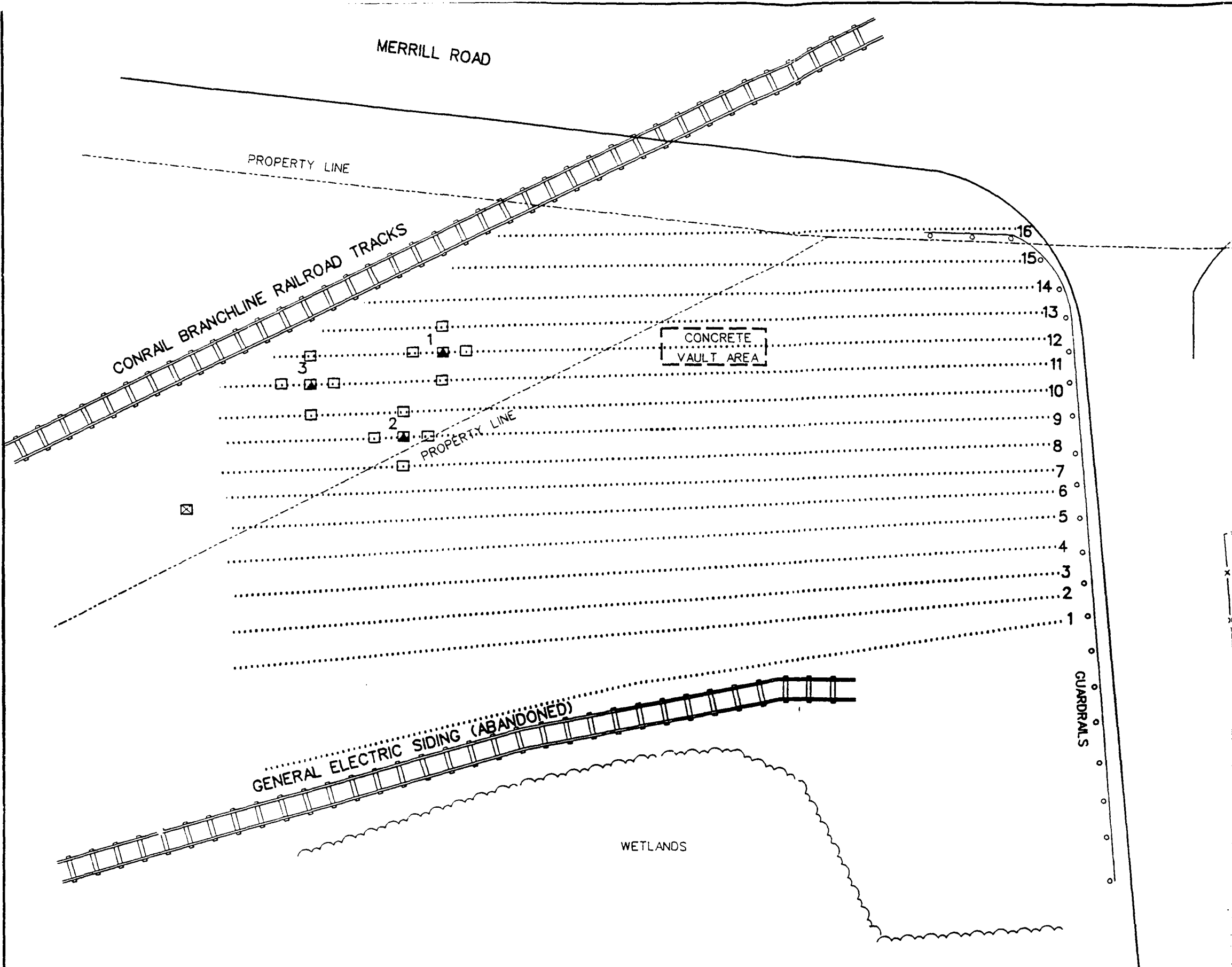   Total change in gammas from sample 8 to 10 = 574.3
        Distance between sample 8 and 10 = 10 ft. (3.0 m)
        Gradient = 57.4 gamma/ft. (E - W)
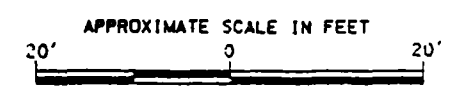

        Reference: Shuey and Pasquale, Geophysics, Vol. 38, No. 3
              June 1973, pp. 507-512

MERRILL ROAD

PROPERTY LINE

CONRAIL BRANCHLINE RAILROAD TRACKS

PROPERTY LINE

CONCRETE
VAULT AREA

GENERAL ELECTRIC SIDING (ABANDONED)

GUARDRAILS

WETLANDS

16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

LEGEND

.... GPR SURVEY LINE

2 ▲ ANOMALY LOCATION
IDENTIFIED ON GPR PROFILE.

☐ MAGNETOMETER READING
LOCATION

⊠ BACKGROUND LOCATION

NOTE: BASE MAP PROVIDED BY GENERAL ELECTRIC COMPANY
ALL LOCATIONS SHOULD BE ASSUMED APPROXIMATE.

APPROXIMATE SCALE IN FEET

20'   0   20'

LAYERS: ALL ON
2/23/96 54-RCB
20117002/20117GP1