137436

SITE SCREENING REPORT FOR C & R BATTERY SITE, CHESTERFIELD CO., VA

by

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Sheet A

Information and Regional Request

EPA Region: III Regional Project Manager: Leonard

Site Name: C & R Battery Location/address: Chesterfield Co, VA

Site Protection Level: A B C D E

Time Frame: from 8/29/88 to 9/30/88 .

PRPs: Fund-Lead

EPA on-site Contractors: NUS Corp.

Elements sought: Lead

Description of Work Requested: X-ray fluorescence screening of surface and subsurface soil samples to determine horizontal & vertical extent of contamination. Also to reduce the number of samples to be sent to the lab. Finally to receive a computer generated profile of the contamination at the site. Site area is equal to approximately 4 acres.

Prepared and signed by: Paul Leonard Date: 8/16/88

Sheet B

Site Reconnaissance

Site Name: C & R Battery Region: III

Reconnaissance Team: Bill Cole and Tim Hunt (Safety Officer)

Is Site closed or still in operation? closed (circa 1985)

Limited Access? Site is surrounded by a chain link fence. Obtained key on reconnaissance.

Structures that might be Problems:

Buildings: No permanent structures. A trailer is located on the southwest corner of the property.

Discarded materials:(drums, scrap metal, concrete, rubbish, etc.): A debris pile is located on the southeast corner. The remnant of a concrete loading dock is located just north of the trailer on the west property line. The loading dock depression has been back filled with imported riprap material (gneissic/schistosic rock). Same riprap material is lining the drainage ditch along the eastern property line and is found scattered throughout the property.

Geological/Morphological: Property is flat. Drainage is to the north.

Vegetation: Short (0-4') grassy vegetation on the northeast section of the property.

Weather: Warm (78 - 80^{0}F), patchy clouds, possible rain.
Proximity to Commercial, Residential Areas, Schools, Parks, etc.: Capitol Oil Co. to the east, forested to the north and west, and a road is on the southern border.

Power Available? no Size of Site: approx. 4.5 acre

Availibility of prior reports and data? see Sheet D

History: Site was used for lead reclamation from spent batteries. Acids from batteries were dumped into holding ponds which have since been neutralized. Battery casings were shredded and scraps were distributed throughout the property.

Sheet C

Data Quality Objective Summary Form

1. Site: C & R Battery EPA Region: III

Location: Chesterfield Co, VA

Phase: RI1, RI2, ERA, FS, RD, RA

2. Media: soil, ground water, surface water, sediment, air, biological, other (specify)

3. Use: Site Charact., Risk Assess., Eval. Alts., Eng'g Design, Monitoring Remedial Action, other (specify):

4. Objective: Establish spatial distribution of lead contamination on site.

5. Site Information:
Area: approx. 4.5 acres
Depth to ground water: 26-38 ft.
Ground water use: Up gradient used as potable water supply.
Soil Types: River point bar and overbank deposits.

6. Data types:

A. Analytical Data			B. Physical Data	
pH	Pesticides	TOX	Permeability	Hydraulic head
conductivity	PCB	TOC	Porosity	Penetration test
VOA	Metals	BTX	Grain size	Hardness
ABN	Cyanide	COD	Bulk density	Moisture

7. Sampling Method to be Used: Surface grab samples; surface and subsurface, split tube spoon samples; and in situ specimen analysis

8. Analytical Levels (indicate level and equipment to be used):
Level 1, 2, 3, 4, or 5

9. Sampling procedures: NUS will drill a series of holes throughout the property. At various intervals, split tube spoon sampling will be done. The cores will be homogenized and split as necessary, one split being for on site X-ray screening analysis. Approximately 180 splits will be awaiting the X-ray team.

Contractor: LESC Prime Contractor: NUS
Site manager: Paul Leonard Date: 9/26 - 9/30/88

Sheet D

Sampling Grid

Prior Data on the Site available: Y N; If Y, list references:
1. NUS Corporation, June 1988, Work Plan for RI/FS, C&R Battery

2. NUS Corporation, February 1986, Site Inspection of C&R Battery

3. Sayer & Associates, December 1983, Geotechnical Study of C&R Battery Company

Enough data for semivariograms? Y N; If Y, show variograms, ranges, sills, and proposed sampling grid.
Completed by: Date:
NO GEOSTATISTICS TO BE USED

On-Site:

Does the proposed grid apply to the real-world situation on-site? Y, N; if N then answer questions below:

What affects the proposed sampling grid? Concrete pad (old zone of operation) forced adustment of the 50' x 50' grid pattern.

Comments: The data will be contoured using CPS-PC.

Sheet E

Sampling

Sample size: 40-80 grams Homogenized in situ: Y N

Distance between sample stations: ~ 50 ft

Appearance of soil: Wet or dry

Description of soil:

Paumunkey loam: typical overbank deposits and point bar sequences.

Containers:
glass jars, freezer zip-lock bags, polyethylene bottles, polycarbonate bottles

Sampling device:
Split spoon drive tube
Describe sampling: Samples run in the mobile lab were received (under sample custody) in 8 oz. glass jars which were one of several splits from split spoon core samples. The other splits will go to assigned CLP labs for RAS and SAS analyses.

Do the samples contain organics? Y N.
Are the samples going to be analyzed for organics? Y N.

Sheet F

Chain-of-Custody Check List

Site: C & R Battery, Chesterfield Co, VA Date: 9-26-88

Samplers: NUS crew under supervision of R. Bethel

Were sample bottles decontaminated? Y N

Have labels been filled out and dated? Y N

Have boxes of bottles been secured with Custody Seals? Y N

Who has samples in custody? Sample splits for X-Ray analysis were signed over to Lockheed (Tim Hunt). Sample splits for CLP analysis remained in the custody of NUS.

What analyses are scheduled for the samples? CLP-SAS and RAS analysis for the following parameters: TAL inorganics, alkalinity, acidity, TSS, TDS and sulfate.

Which laboratories are scheduled to receive the samples? CLP

A sample is under custody if:
1. it is in your possession, or
2. it is in your view, after being in your possession
3. it was in your possession and you locked it up, or
4. it is in a designated secure area

Sheet G

Instrument Specifications

The X-Met 840 is a field portable, energy dispersive X-Ray fluorescence spectrometer marketed by Columbia Scientific Industries Corporation, Austin, TX. The unit is self-contained, battery powered, microprocessor based and weighs 8.5 kg. The surface analysis probe is specifically designed for field use. The X-Met 840 is hermetically sealed and can be decontaminated with soap and water. The probe includes a radioisotope source of Curium-244, a proportional counter and the associated electronics. The source is protected by an NRC-approved safety shutter.

The electronic unit has eight calibration memories called 'models'. Each model can be independently calibrated for as many as six elements. These can be used to measure elements from silicon to uranium assuming the proper isotope source is available. The unknown sample intensities are regressed against the calibration curves to yield concentrations.

For the C & R Battery site, only lead was investigated. Two models were calibrated, Model #4 for lead concentrations up to approximately 1.5 percent and Model #1 for concentrations ranging from approximately 1.5 percent to 21.5 percent.

Detection Limits:

The American Chemical Society (ACS) defines a limit of detection as "...the lowest concentration level that can be determined to be statistically different from a blank"(1). This is further defined as three times the standard deviation of a series of blanks (3 sigma).

The ACS defines a quantitation limit as "...the level above which quantitative results may be obtained with a specified degree of confidence"(1). The recommended value for the quantitation limit is 10 sigma. This is said to correspond "...to an uncertainty of +30% in the measured value (10 sigma±3 sigma) at the 99% confidence level"(1).

Using the above definitions and the QCCS 0 sample as the series of blanks, we get the following:

Number of observations	=	n	= 54	
Standard deviation	=	sigma	= 0.004 wt%	
Detection Limit	=	3 sigma	= 0.012 wt%	= 120 mg/kg
Quantitation limit	=	10 sigma	= 0.040 wt%	= 400 mg/kg

A value falling below 3 sigma is considered to be "not detected"; this is not to be interpreted as a zero level of concentration but merely below the sensitivity of the instrument. Values between 3 sigma and 10 sigma are considered to be in the "region of less-

certain quantitation". Values greater than 10 sigma are considered to be in the region of quantitation. The ACS states quite emphatically that "...quantitative interpretation, decision making and regulatory actions should be limited to data at or above the limit of quantitation."

The above discussion is supplied as a source of information. More important, though, is that this program is designed to be a screening technique. In that light, the major emphasis should not be placed on individual samples but rather on the trend of analyte concentration over the area of interest.

(1) ACS Committee on Environmental Quality,"Principles of Environmental Analysis" Anal. Chem. 1983, 55, 2210-2218

Sheet H

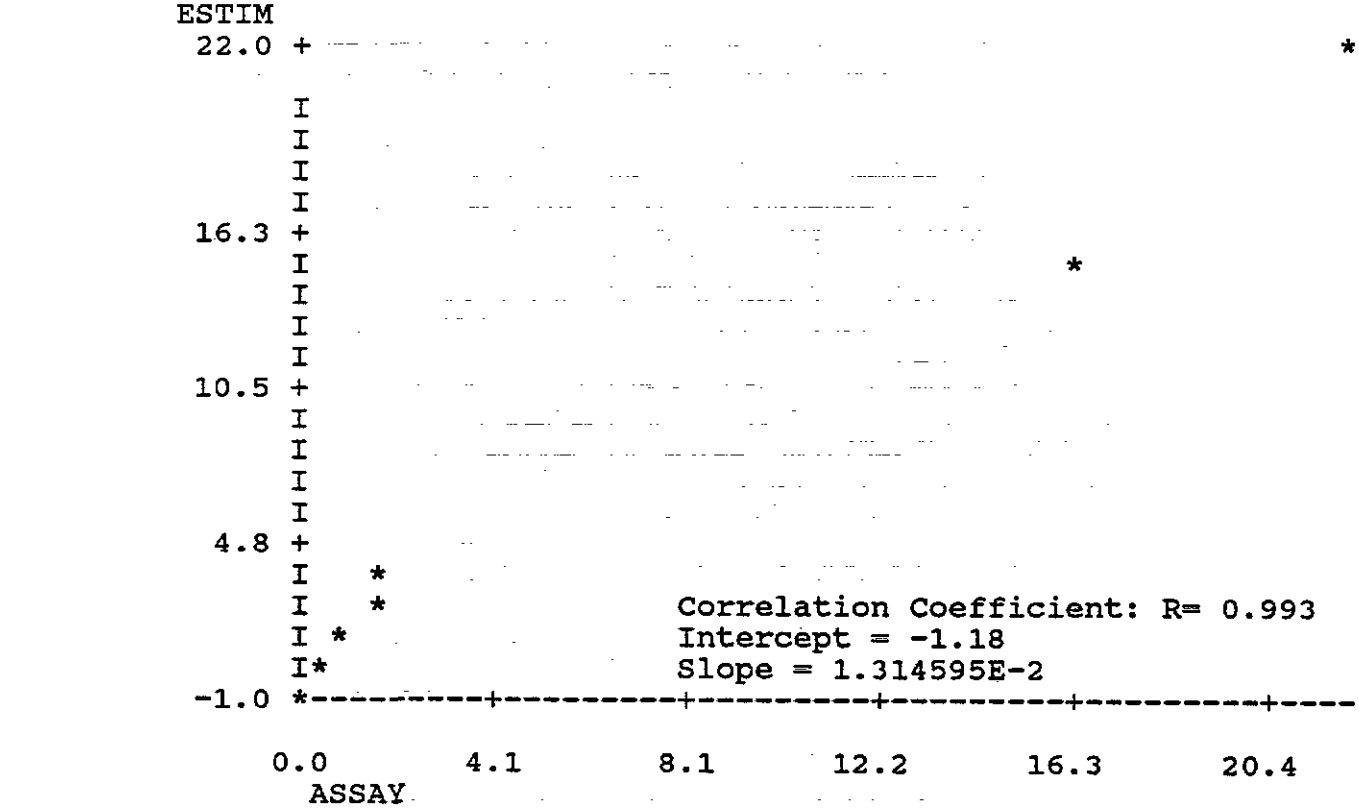
Instrument Calibration

CALIBRATION FOR MODEL #1
(Used for samples exceeding approximately 3.0 wt% Pb)

Standards were site specific samples characterized at EMSL-LV.

Elements:	Pb (all concentrations in wt%)	
1.	16.358	(S3)
2.	21.598	(S4)
3.	0.412	(S5)
4.	0.041	(S6)
5.	0.841	(S10)
6.	2.784	(S11)
7.	1.542	(S12)
8.	1.444	(S16)
9.	0.656	(S17)

CALIBRATION PLOT FOR MODEL #1



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Sheet H (cont.)

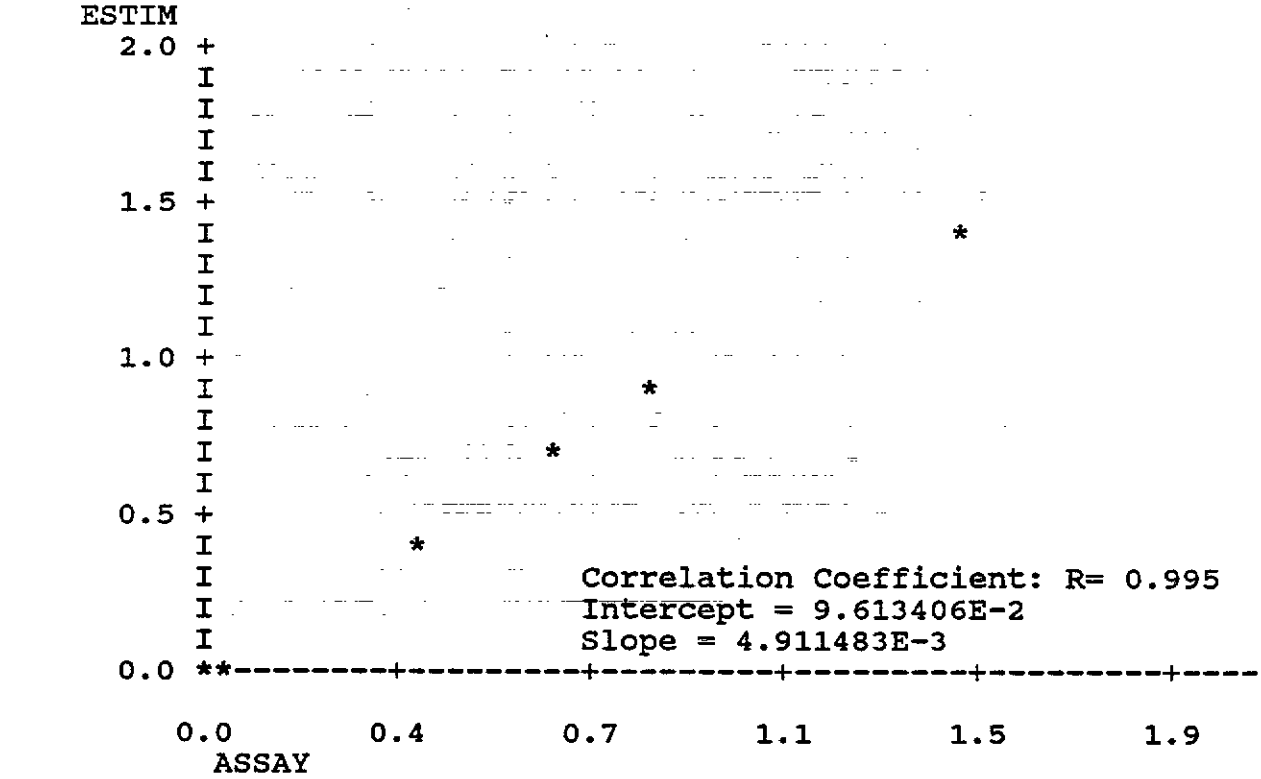
Instrument Calibration

CALIBRATION FOR MODEL #4
(Used for sample range 0.0 - 3.0 wt%; all samples were first shot on this curve.)

Standards were site specific samples characterized at EMSL-LV.

Elements:	Pb (all concentrations in wt%)
1.	0.000 (CSI std.)
2.	0.041 (S6)
3.	0.412 (S5)
4.	0.656 (S17)
5.	0.841 (S10)
6.	1.444 (S16)

CALIBRATION PLOT FOR MODEL #4



Sheet I
Mobile Laboratory Analysis
Blanks and Quality Control Check Samples (QCCS)

note: A blank sample (QCCS 0)and two QCCS (QCCS 5 & 17) were run in triplicate before the first routine sample, after every twelfth routine sample and after the last sample.

QCCS TYPE	TRUE VALUE	TRIPLICATES X1	X2	X3
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.036
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.007
QCCS 0	0.000	0.023	0.000	0.000
QCCS 0	0.000	0.000	0.007	0.004
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.003
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.003	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.003
QCCS 0	0.000	0.005	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.000	0.000
QCCS 0	0.000	0.000	0.015	0.002
QCCS 0	0.000	0.000	0.000	0.017
QCCS S5	0.412	0.299	0.324	0.373
QCCS S5	0.412	0.437	0.390	0.393
QCCS S5	0.412	0.476	0.457	0.386
QCCS S5	0.412	0.404	0.390	0.397
QCCS S5	0.412	0.370	0.318	0.367
QCCS S5	0.412	0.397	0.340	0.396
QCCS S5	0.412	0.371	0.403	0.408
QCCS S5	0.412	0.298	0.400	0.423
QCCS S5	0.412	0.415	0.387	0.395
QCCS S5	0.412	0.364	0.436	0.400
QCCS S5	0.412	0.450	0.406	0.386
QCCS S5	0.412	0.369	0.378	0.396
QCCS S5	0.412	0.405	0.382	0.354
QCCS S5	0.412	0.363	0.321	0.402
QCCS S5	0.412	0.430	0.350	0.434
QCCS S5	0.412	0.383	0.423	0.394
QCCS S5	0.412	0.371	0.376	0.409
QCCS S5	0.412	0.395	0.398	0.397
QCCS S17	0.656	0.830	0.824	0.811
QCCS S17	0.656	0.866	0.881	0.903
QCCS S17	0.656	0.857	0.879	0.979
QCCS S17	0.656	0.877	0.830	0.825
QCCS S17	0.656	0.802	0.866	0.840

Sheet I (cont.)
Mobile Laboratory Analysis
Blanks and Quality Control Check Samples (QCCS)

QCCS TYPE	TRUE VALUE	TRIPLICATES X1	X2	X3
QCCS S17	0.656	0.888	0.902	
QCCS S17	0.656	0.770	0.765	0.733
QCCS S17	0.656	0.706	0.726	0.789
QCCS S17	0.656	0.862	0.835	0.881
QCCS S17	0.656	0.847	0.803	0.839
QCCS S17	0.656	0.872	0.760	0.901
QCCS S17	0.656	0.802	0.746	0.828
QCCS S17	0.656	0.756	0.842	0.854
QCCS S17	0.656	0.827	0.885	0.785
QCCS S17	0.656	0.831	0.791	0.753
QCCS S17	0.656	0.795	0.856	0.832

Sheet J
Mobile Laboratory Analysis
Routine Analysis Data
(all concentrations in wt% Pb)

SAMPNO	X1	X2	X3	X4	$\overline{X}$	SD
S001-00	0.341	0.137	0.211		0.230	0.103
S001-03	0.597	0.805	0.599		0.667	0.120
S001-06	0.000	0.000	0.000		0.000	
S001-09	0.000	0.000	0.000		0.000	
S001-13	0.000	0.000	0.020		0.000	
S002-00	1.049	0.930	1.109		1.029	0.091
S002-03	0.041	0.063	0.000	0.013	0.029	0.028
S002-06	0.016	0.357	0.000	0.013	0.124	0.202
S002-09	0.011	0.000	0.022	0.003	0.009	0.010
S002-13	0.000	0.000	0.000		0.000	
S003-00	0.086	0.026	0.082		0.065	0.034
S003-03	0.000	0.000	0.000		0.000	
S003-06	0.000	0.000	0.000		0.000	
S003-09	0.000	0.000	0.000		0.000	
S003-13	0.000	0.000	0.000		0.000	
S004-00	0.000	0.000	0.000		0.000	
S004-03	0.000	0.013	0.000		0.000	
S004-07	0.000	0.000	0.000		0.000	
S004-09	0.000	0.000	0.000		0.000	
S004-13	0.000	0.000	0.000		0.000	
S005-00	0.000	0.000	0.000		0.000	
S005-03	0.684	0.778	1.075		0.846	0.204
S005-03-D	0.688	0.690	0.357		0.578	0.192
S005-06	0.000	0.030	0.075		0.035	0.038
S005-09	0.000	0.000	0.000		0.000	
S005-13	0.000	0.000	0.000		0.000	
S005-20	0.000	0.000	0.000		0.000	
S005-25	0.000	0.007	0.020		0.009	0.010
S005-30	0.000	0.000	0.000		0.000	
S005-35	0.000	0.000	0.000		0.000	
S005-40	0.000	0.000	0.000		0.000	
S006-00	0.455	0.456	0.621		0.511	0.096
S006-03	0.076	0.042	0.072		0.063	0.019
S006-03-D	0.005	0.039	0.037		0.027	0.019
S006-06	0.000	0.000	0.000		0.000	
S006-09	0.000	0.000	0.000		0.000	
S006-13	0.000	0.000	0.000		0.000	

Sheet J (cont.)
Mobile Laboratory Analysis
Routine Analysis Data
(all concentrations in wt% Pb)

SAMPNO	X1	X2	X3	X4	$\overline{X}$	SD
S007-00	2.188	2.208			2.198	0.014
S007-03	0.098	0.050	0.056		0.068	0.026
S007-03-D	0.016	0.000	0.019		0.012	0.010
S007-06	0.154	0.000	0.000		0.051	0.089
S007-09	0.014	0.000	0.014		0.009	0.008
S007-13	0.000	0.000	0.000		0.000	
S008-00	7.619	7.662			7.641	0.030
S008-03	0.000	0.000	0.000		0.000	
S008-06	0.190	0.240	0.104		0.178	0.069
S008-09	0.015	0.132	0.030		0.059	0.064
S008-13	0.000	0.015	0.007		0.007	0.008
S009-00	0.367	0.170	0.151		0.229	0.120
S009-03	0.000	0.000	0.000		0.000	
S009-06	0.000	0.000	0.000		0.000	
S009-09	0.000	0.000	0.000		0.000	
S009-13	0.000	0.000	0.000		0.000	
S010-00	1.919	2.323	2.024		2.089	0.210
S010-03	1.598	1.908			1.753	0.219
S010-06	0.367	0.338	0.457		0.387	0.062
S010-09	0.040	0.102	0.137	0.052	0.083	0.045
S010-13	0.000	0.000	0.000		0.000	
S011-00	9.143	9.308			9.226	0.117
S011-03	2.391	1.740	2.069		2.067	0.326
S011-03-D	3.760	5.552	3.563		4.292	1.096
S011-06	1.445	1.620	1.591		1.552	0.094
S011-09	0.000	0.000	0.000		0.000	
S011-13	0.000	0.033	0.000	0.010	0.011	0.016
S012-00	0.886	0.482	0.815		0.728	0.216
S012-03	0.532	0.275	0.223		0.065	0.054
S012-06	0.055	0.123	0.017		0.065	0.054
S012-09	0.000	0.059	0.000	0.000	0.015	0.030
S012-13	0.000	0.000	0.000		0.000	

Sheet J (cont.)
Mobile Laboratory Analysis
Routine Analysis Data
(all concentrations in wt% Pb)

SAMPNO	X1	X2	X3	X4	$\bar{X}$	SD
S013-00	12.68	13.76	11.71		12.71	1.025
S013-03	2.247	1.640	2.222		2.036	0.343
S013-06	0.109	0.198	0.100		0.136	0.054
S013-06-D	0.146	0.084	0.054		0.095	0.047
S013-09	0.000	0.000	0.000		0.000	
S013-13	0.000	0.000	0.000		0.000	
S013-20	0.000	0.000	0.000		0.000	
S013-25	0.024	0.000	0.000	0.000	0.000	
S013-30	0.000	0.000	0.000		0.000	
S013-35	0.000	0.000	0.000		0.000	
S013-40	0.000	0.000	0.000		0.000	
S014-00	13.15	13.76	13.44		13.45	0.305
S014-03	2.269	1.023	1.869		1.720	0.636
S014-06	0.095	0.141	0.054		0.097	0.044
S014-09	0.091	0.100	0.081		0.091	0.010
S014-13	0.147	0.071	0.054		0.091	0.050
S015-00	1.857	2.457	2.443		2.252	0.420
S015-03	0.150	0.179	0.144		0.158	0.019
S015-06	0.912	0.565	0.572		0.683	0.198
S015-09	0.000	0.000	0.000		0.000	
S015-13	0.000	0.000	0.000		0.000	
S016-00	13.23	11.69	11.19		12.04	1.03
S016-03	3.328	2.168	1.797	2.145	2.360	0.668
S016-06	1.431	1.191	1.481		1.368	0.155
S016-09	0.055	0.086	0.000		0.047	0.044
S016-13	0.000	0.000	0.000		0.000	
S017-00	0.757	0.383	0.318		0.486	0.237
S017-03	0.000	0.000	0.000		0.000	
S017-06	0.000	0.002	0.000		0.000	
S017-09	0.000	0.000	0.000		0.000	
S017-09-D	0.000	0.000	0.000		0.000	
S017-13	0.000	0.000	0.000		0.000	
S017-20	0.000	0.000	0.000		0.000	
S017-25	0.000	0.008	0.017		0.008	0.008
S017-30	0.000	0.000	0.000		0.000	
S017-35	0.000	0.000	0.000		0.000	
S017-40	0.000	0.000	0.000		0.000	

Sheet J (cont.)
Mobile Laboratory Analysis
Routine Analysis Data
(all concentrations in wt% Pb)

SAMPNO	X1	X2	X3	X4	$\overline{X}$	SD
S018-00	1.430	1.579	1.450		1.486	0.081
S018-03	0.115	0.041	0.066	0.036	0.064	0.036
S018-06	0.062	0.022	0.085		0.056	0.032
S018-09	0.000	0.000	0.000		0.000	
S018-13	0.000	0.000	0.000		0.000	
S019-00	1.849	1.278	1.150		1.426	
S019-00-D	0.932	0.986	1.426		1.115	0.271
S019-03	0.001	0.000	0.031	0.000	0.000	
S019-06	0.000	0.000	0.000		0.000	
S019-09	0.000	0.000	0.000		0.000	
S019-13	0.000	0.000	0.000		0.000	
S020-00	0.114	0.077	0.069		0.087	0.024
S020-03	0.000	0.000	0.000		0.000	
S020-06	0.018	0.000	0.006		0.008	0.009
S020-09	0.000	0.018	0.000		0.006	0.010
S020-13	0.000	0.000	0.000		0.000	
S021-00	0.042	0.050	0.012		0.035	0.020
S021-03	0.000	0.000	0.000		0.000	
S021-06	0.000	0.000	0.000		0.000	
S021-09	0.000	0.000	0.000		0.000	
S021-13	0.000	0.000	0.000		0.000	
S022-00	2.110	1.655	2.539		2.101	0.442
S022-03	0.765	0.851	0.498		0.705	0.184
S022-06	0.000	0.000	0.000		0.000	
S022-09	0.000	0.000	0.000		0.000	
S022-13	0.000	0.000	0.000		0.000	
S022-13-D	0.000	0.000	0.003		0.000	
S022-20	0.000	0.000	0.000		0.000	
S022-30	0.000	0.000	0.000		0.000	
S022-35	0.000	0.000	0.000		0.000	
S022-40	0.000	0.000	0.000		0.000	
S023-00	0.000	0.000	0.000		0.000	
S023-03	0.000	0.000	0.000		0.000	
S023-06	0.000	0.000	0.000		0.000	
S023-09	0.000	0.000	0.000		0.000	
S023-13	0.000	0.000	0.000		0.000	

Sheet J (cont.)
Mobile Laboratory Analysis
Routine Analysis Data
(all concentrations in wt% Pb)

SAMPNO	X1	X2	X3	X4	$\overline{X}$	SD
S024-00	0.000	0.000	0.000		0.000	
S024-00-D	0.000	0.000	0.000		0.000	
S024-03	0.000	0.000	0.000		0.000	
S024-06	0.000	0.000	0.000		0.000	
S024-09	0.000	0.000	0.000		0.000	
S024-13	0.000	0.000	0.000		0.000	
S025-00	0.322	0.380	0.463		0.388	0.071
S025-03	0.288	0.506	0.161		0.318	0.174
S025-06	0.000	0.007	0.000		0.000	
S025-09	0.000	0.000	0.000		0.000	
S025-09	0.000	0.000	0.000		0.000	
S025-13	0.000	0.000	0.000		0.000	
S025-20	0.000	0.021	0.068		0.030	0.035
S025-25	0.000	0.020	0.000		0.000	
S025-30	0.033	0.035	0.030		0.033	0.002
S025-35	0.000	0.000	0.000		0.000	
S025-40	0.000	0.000	0.000		0.000	
S026-00	0.000	0.000	0.000		0.000	
S026-03	0.000	0.000	0.000		0.000	
S026-06	0.000	0.000	0.000		0.000	
S026-09	0.000	0.000	0.000		0.000	
S026-14	0.000	0.000	0.000		0.000	
S026-20	0.000	0.000	0.000		0.000	
S026-25	0.001	0.045	0.006		0.017	0.024
S026-30	0.006	0.000			0.000	
S026-35	0.000	0.026	0.012		0.013	0.013
S026-40	0.000	0.006	0.000		0.000	
S028-00	0.241	0.148	0.136		0.175	0.057
S028-03	0.075	0.140	0.050		0.088	0.046
S028-06	0.000	0.000	0.000		0.000	
S028-09	0.000	0.000	0.000		0.000	
S028-13	0.000	0.000	0.000		0.000	
S028-20	0.000	0.000	0.000		0.000	
S028-26	0.000	0.000	0.025		0.008	0.014
S028-30	0.000	0.000	0.000		0.000	
S028-35	0.000	0.000	0.000		0.000	
S028-40	0.000	0.000	0.000		0.000	
S029-00	0.000	0.000	0.000		0.000	
S030-00	0.000	0.000	0.000		0.000	

Sheet J (cont.)
Mobile Laboratory Analysis
Routine Analysis Data
(all concentrations in wt% Pb)

SAMPNO	X1	X2	X3	X4	$\overline{X}$	SD
SD01-01	0.299	0.275	0.260		0.278	0.020
SD02-01	1.283	1.264	1.241		1.263	0.021
SD03-01	0.003	0.066	0.079		0.049	0.041
SD03-01-D	0.082	0.068	0.033		0.061	0.025
SD04-01	0.000	0.000	0.000		0.000	
SD05-01	0.000	0.000	0.000		0.000	
SD06-01	0.000	0.000	0.000		0.000	
SD07-01	0.000	0.000	0.000		0.000	
SD09-01	0.366	0.297	0.310		0.324	0.037
SD08-01	0.000	0.000	0.000		0.000	

Sheet K

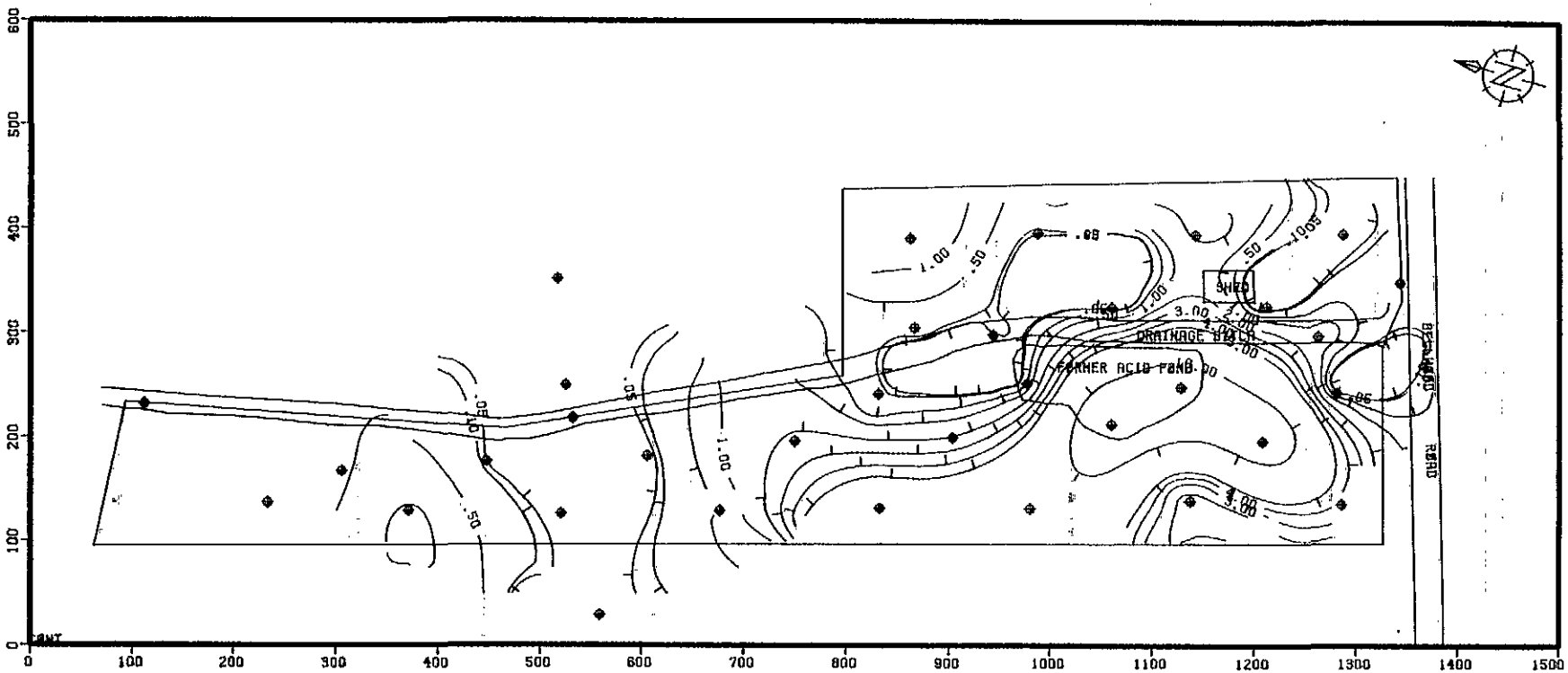
Concentration Isopleth Contouring

Concentration Isopleth Contours - Unkrigged

Software used: CPS-PC, Radian Corp.

List of elements mapped:
Lead

ISOPLETH MAPS FOLLOW THIS SHEET



LEGEND

S SURFACE ØR BØRE HØLE SØIL SAMPLES

SD SEDIMENT SAMPLE

LEAD ISØPLETH MAP - SURFACE ELEVATIØN
C AND R BATTERY SITE, CHESTERFIELD CØ., VA

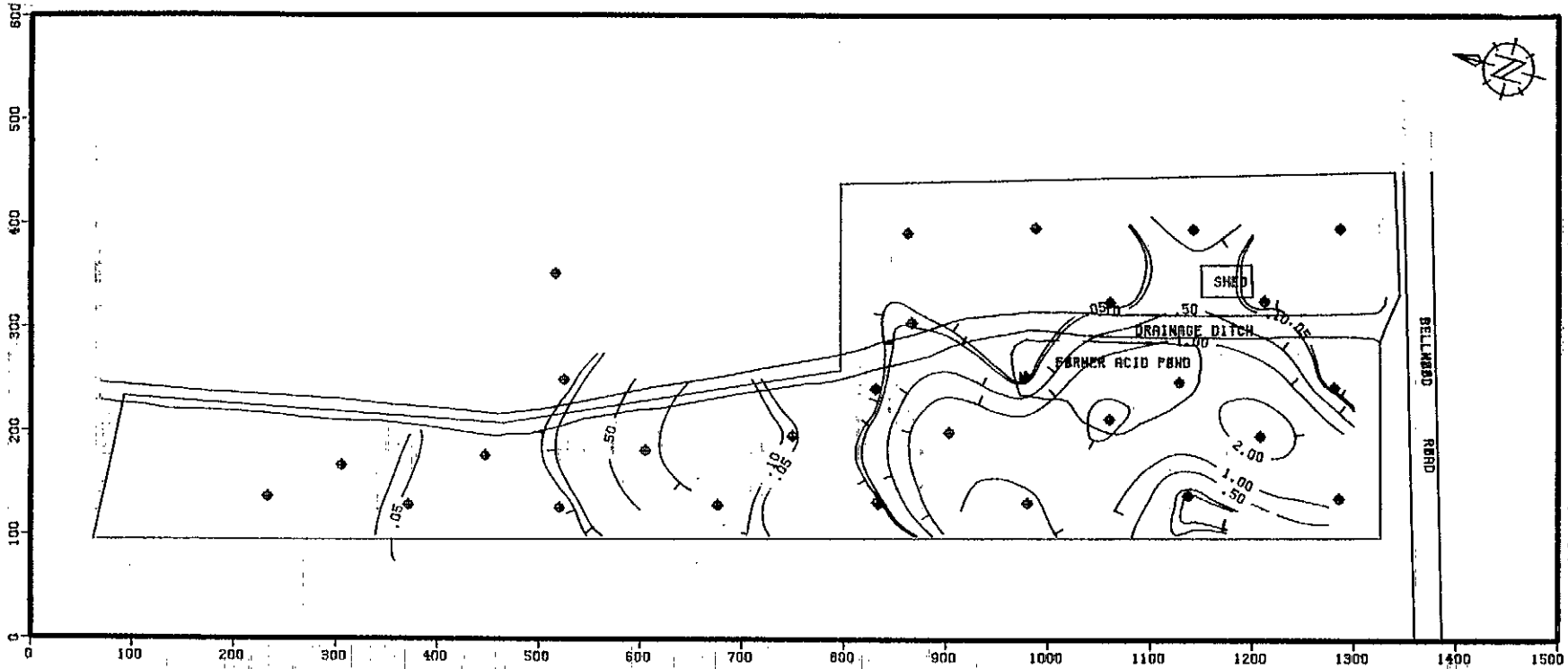
0 100 200

SCALE IN FEET

LØCKHEED ESC
R. ENKALL/B. CØLE

AR301113

*



CONTOUR VALUES IN WEIGHT PERCENT LEAD

LEGEND

S SURFACE OR BORE HOLE SOIL SAMPLES

SD SEDIMENT SAMPLE

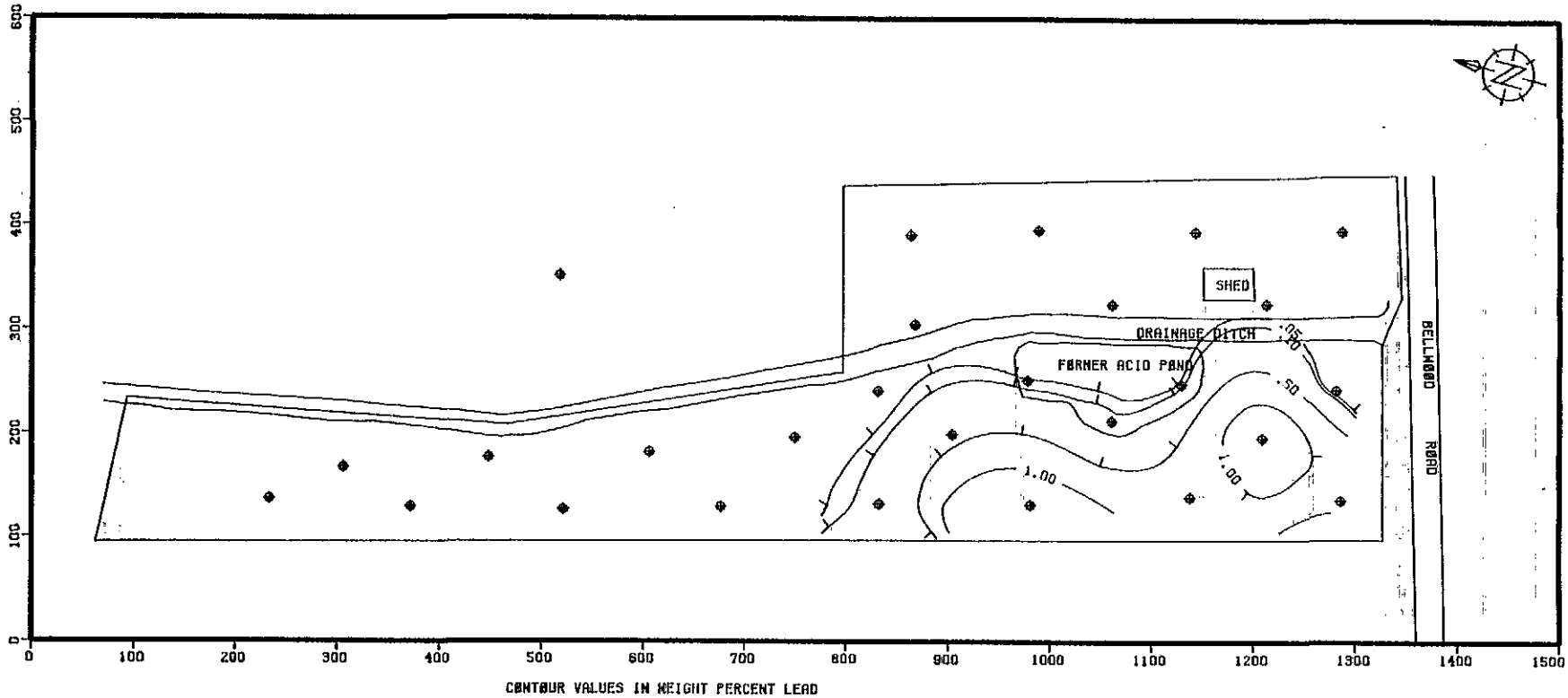
0 100 200

SCALE IN FEET

LEAD ISOPLETH MAP - 3 FOOT DEPTH
C AND R BATTERY SITE, CHESTERFIELD CO., VA

LOCKHEED ESC
R. ENHALL/B. COLE

AR301114



LEGEND

S SURFACE ØR BØRE HØLE SØIL SAMPLES

SD SEDIMENT SAMPLE

LEAD ISØPLETH MAP - 6 FØØT DEPTH
C AND R BATTERY SITE, CHESTERFIELD CØ., VA

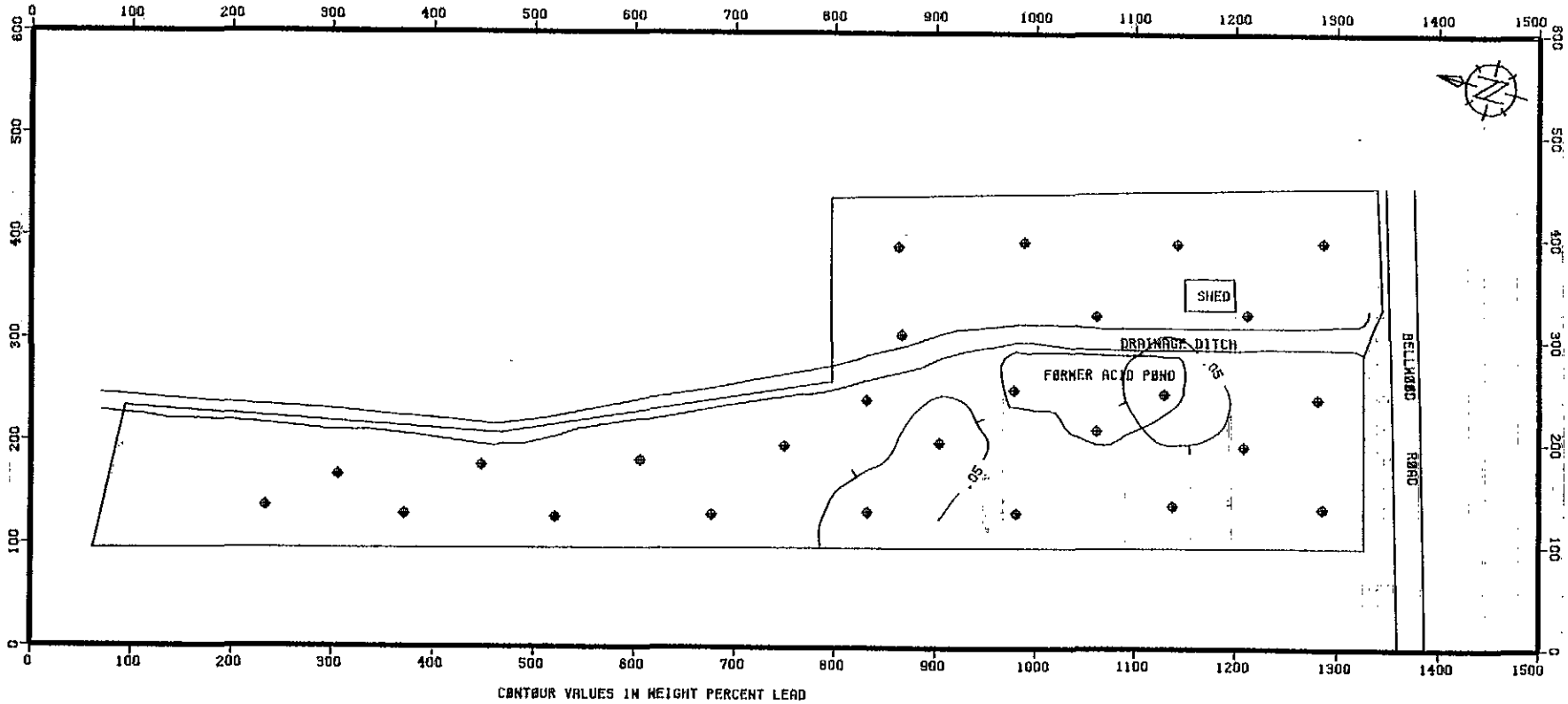
0 100 200

SCALE IN FEET

LØCKHEED ESC
R. ENWALL/B. CØLE

AR301115

*



CONTOUR VALUES IN WEIGHT PERCENT LEAD

LEGEND

S SURFACE OR BORE HOLE SOIL SAMPLES

SD SEDIMENT SAMPLE

LEAD ISOPLETH MAP - 9 FOOT DEPTH
C AND R BATTERY SITE, CHESTERFIELD CO., VA

0 100 200

SCALE IN FEET

LOCKHEED ESC
R. ENWALL/B. LOLE

AR301116