3001 0406160002

CH2M HILL
Mound, Inc.
1 Mound Road
P.O. Box 3030
Miamisburg, OH
45343-3030

CH2MHILL

ER-065/03
April 2, 2003

Mr. Richard B. Provencher, Director
Miamisburg Closure Project
U. S. Department of Energy
P. O. Box 66
Miamisburg, OH 45343-0066

SUBJECT: Contract No. DE-AC24-03OH20152
PRS 269 PACKAGE, PUBLIC REVIEW DRAFT

REFERENCE: Statement of Work Requirement 039 - PRS Documents

Dear Mr. Provencher:

Rob Rothman from your office has approved the release of the following document for public review:

- PRS 269 Package, Public Review Draft

USEPA had no comments on the Draft Addendum 1. OEPA comments were incorporated. The public review period is 2 April 2003 through 2 May 2003. Any public comments will be addressed in the final document. If you have any questions regarding the document, please contact Dave Rakel at Extension 4203.

Sincerely,

Monte A. Williams
Deputy Project Manager, Environmental Restoration

MAW/KMA/jdg

Enclosure

Approved: Paul C. Lucas 4/2/03
For Robert S. Rothman Date
CERCLA Program Manager

cc: David Seely, USEPA, (1) w/attachments
Brian Nickel, OEPA, (4) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Paul Lucas, DOE/MCP, (1) w/attachments
Randy Tormey DOE/OH, (1) w/attachments
Dann Bird, MMCIC, (3) w/attachments
J. D. Bonfiglio, MESH, (1) w/attachments
Monte Williams, CH2M HILL, (1) w/attachments
Dave Rakel, CH2M HILL, (1) w/o attachments
John Fulton, CH2M HILL, (1) w/o attachments
Gene Valett, CH2M HILL, (1) w/o attachments
Public Reading Room, (4) w/attachments
DCC, (1) w/attachments

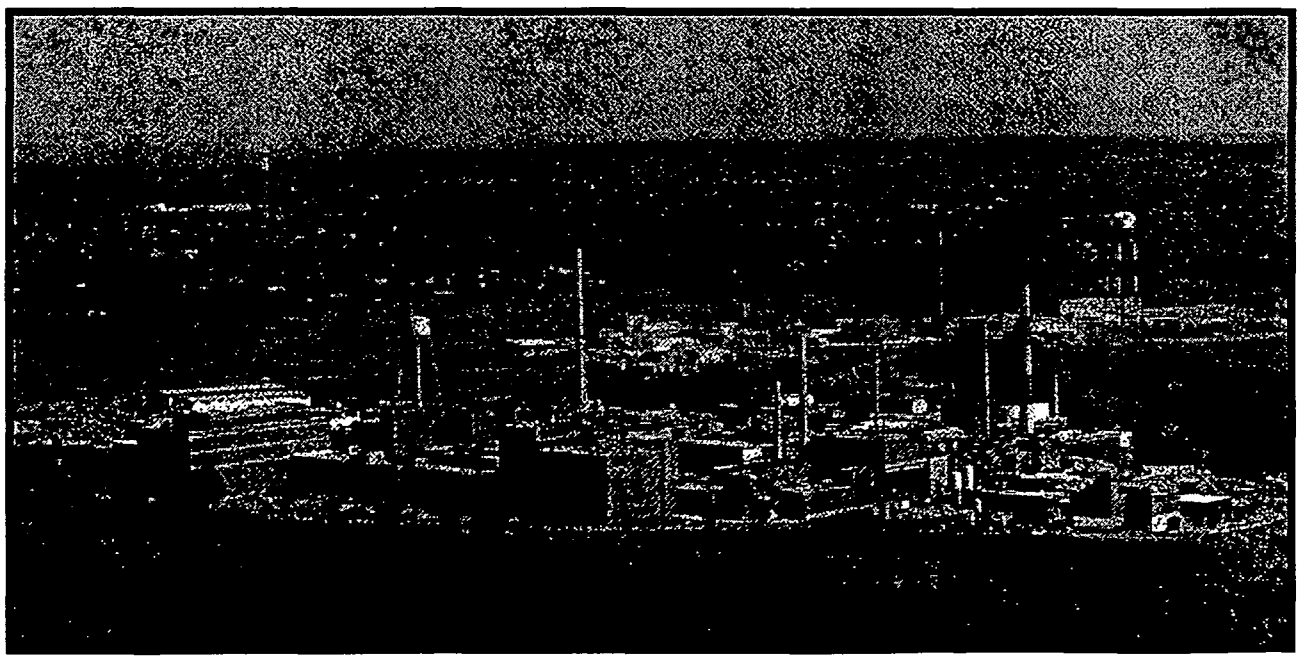
MOUND

Environmental
Restoration
Program

Miamisburg Closure Project
Potential Release Site Package

PRS 269

Public Review Draft
April 2003



Environmental Restoration Program

MIAMISBURG CLOSURE PROJECT
POTENTIAL RELEASE SITE PACKAGE
Notice of Public Review Period

The following Potential Release Site (PRS) package is available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio. Public comment on this document will be accepted 09 April 2003 through 09 May 2003.

PRS 269: Building 36 Historic Gasoline Tanks

Questions can be referred to Paul Lucas at (937) 865-4578

PRS 269 Package Tracking Sheet

REVISION	DESCRIPTION	DATE
Regulator Release A	ADDED: • Narrative modified concerning Rad. Data (placed on hold for soil gas data). • Soil gas confirmation sampling results. CHANGED: • Photograph correction concerning location • Binned Further Assessment, December 18, 1996. • Core team wants a magnetic survey to be conducted to try and locate the tank. If found, then sampling will be required. Sample results distributed and appropriate action in accordance with BUSTR abandon remove regulations will be enacted. If tank not present, the PRS will be revised and rebinned.	**Sept. 23, 1996**
Draft Proposed Final	Addendum 1 submitted to CT. No USEPA comments. OEPA comments resulted in adding GPR explanatory information as Appendix A to Addendum 1. PRS binned NFA on 19 March 2003. Added Addendum 1 to original package and submitted as Public Review Draft.	**February 2003**
Public Review Draft	Public review period: 09 April to 09 May 2003.	**April 2003**
Final		

ADDENDUM 1

SUPPORTING NFA RECOMMENDATION

MOUND

Environmental
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Program

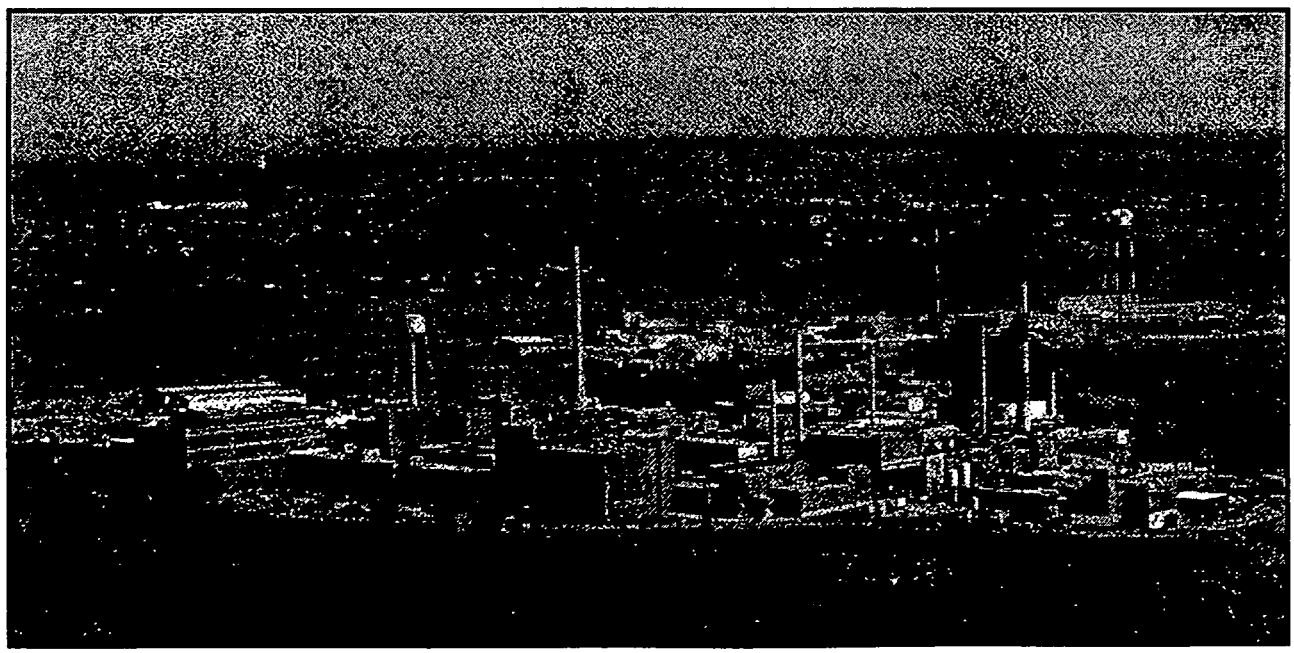
Miamisburg Closure Project

Potential Release Site Package

PRS 269

Addendum 1

Public Review Draft
April 2003



PRS HISTORY:

Potential Release Site (PRS) 269 is an area of land where two underground fuel storage tanks were shown to be located in support of original plant construction in a 1948 construction drawing that indicated a fueling facility existed near the northwest corner of Building 50. [1,2] The drawing shows four pumps supplied by two underground tanks. No documentation of the tanks having been removed has been found, although it is believed that they were removed as part of construction demobilization. Figure 1 shows the location of PRS 269. PRS 269 was binned Further Assessment (FA) by the Core Team in December 1996 based on the suspected presence of the tanks. FA included an assessment to locate the tanks, and if the tanks were found to be present, sampling should be conducted. If the tanks were determined to be no longer present, the PRS would be re-binned.

FURTHER ASSESSMENT ACTIVITY:

FA was successfully completed in July 2000 by means of a ground penetrating radar (GPR) survey [3]. An explanation of GPR technology and its application to detecting underground tanks is included as Appendix A to this document. The GPR survey report is included as Appendix A in the FA Data Report. [4] A magnetic survey of the area was not possible due to interferences from metal fencing and the underground utility duct bank that traverses PRS 269 in the north/south direction. The GPR survey results did not identify any underground tanks at PRS 269.

FIGURES:

Figure 1: Location of PRS 269

APPENDICES:

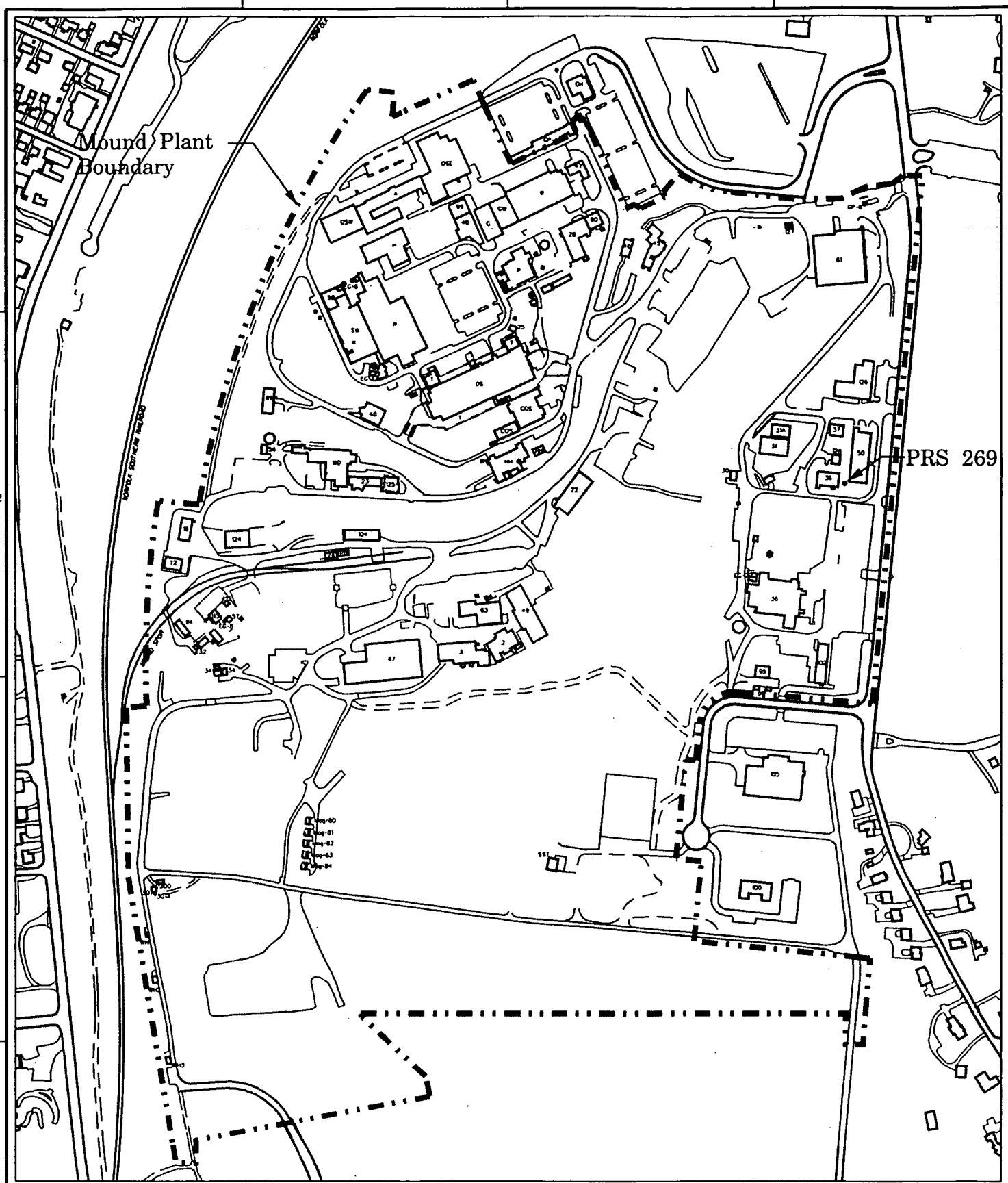
Appendix A: Ground Penetrating Radar Explanatory Information

REFERENCES:

1) Maxon Construction Company, Inc., Drawing No. MCC-11/1, "General Plot Plan – Temporary Electric and Telephone", 1948 (included as p. 29 of PRS 269 original package)
2) Monsanto Research Corporation, Drawing No. FSD-852240, "Control Monuments with Plant Overlay", 1985 (included as p. 30 of PRS 269 original package)
3) Ground Penetrating Radar Survey, PRS 269, Xenon Geosciences, Inc. July 2000
4) PRS 269 FA Data Report, Rev. 0, February 2003

PREPARED BY:

Gary Miller, CH2MHill, ER Technical Staff
Karen M. Arthur, CH2MHill, ER QA



Legend

- Structures
- Paved roadway
- Unpaved roadway
- Mound Plant boundary
- Railroad

0 100 200 400 600 800 1000
Scale in Feet

ISS	DATE	REVISION	BY	CHKR	ENG	UPDEC	APVD
	02/11/03		SSP				

MOUND

Environmental Restoration Geographic Information System

SHEET 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	
ISSUE	
SHEET 1 2 3 4 5 6	Figure 1 Location of PRS 269
ISSUE	
PART CLASSIFICATION	
DRAWING CLASSIFICATION: UNCLASSIFIED	SIZE / DRAWING NUMBER: gen_site_plan.dgn / JOB NUMBER
DOC TYPE: STE / PROJ: ER-GIS	CADD / SCALE / SHEET 1 OF
STATUS: MD-REL-##/##/##	ORIGIN: MSTATION / J

MIAMISBURG CLOSURE PROJECT
PRS 269

RECOMMENDATION:

Potential Release Site (PRS) 269 is an area of land where two underground fuel storage tanks were shown to be located in support of original plant construction in a 1948 construction drawing that indicated a fueling facility existed near the northwest corner of Building 50. No documentation of the tanks having been removed has been found, although it is believed that they were removed as part of construction demobilization. PRS 269 was binned Further Assessment (FA) by the Core Team in December 1996 based on the suspected presence of the tanks. FA included an assessment to locate the tanks, and if the tanks were found to be present, sampling should be conducted. If the tanks were determined to be no longer present, PRS 269 would be re-binned.

FA has been successfully completed by means of a ground penetrating radar (GPR) survey that did not identify any underground tanks at PRS 269.

Therefore, the Core Team recommends **No Further Assessment** for PRS 269.

A PRS Package with an NFA recommendation signed by the Core Team will be placed in the Public Reading Room for a 30-day review period. Upon closure of the public review comments, if any, the PRS Package will be issued as a final document and made available in the Public Reading Room.

CONCURRENCE:

DOE/MCP: _____ 3/19/03
Robert S. Rothman, Remedial Project Manager (date)

USEPA: David P. Seely 3/26/03
David P. Seely, Remedial Project Manager (date)

OEPA: _____ 3/19/03
Brian K. Nickel, Project Manager (date)

APPENDIX A

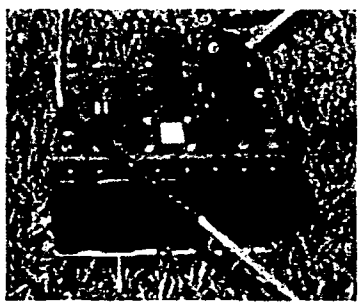
GROUND PENETRATING RADAR EXPLANATORY INFORMATION

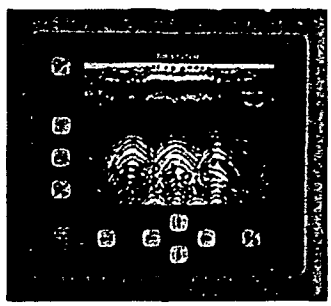
Ground Penetrating Radar

Basic Operating Principles

Ground penetrating radar is a nondestructive geophysical method that produces a continuous cross-sectional profile or record of subsurface features, without drilling, probing, or digging. Ground penetrating radar (GPR) profiles are used for evaluating the location and depth of buried objects and to investigate the presence and continuity of natural subsurface conditions and features.

Ground penetrating radar operates by transmitting pulses of ultra high frequency radio waves (microwave electromagnetic energy) down into the ground through a transducer or antenna. The transmitted energy is reflected from various buried objects or distinct contacts between different earth materials. The antenna then receives the reflected waves and stores them in the digital control unit.

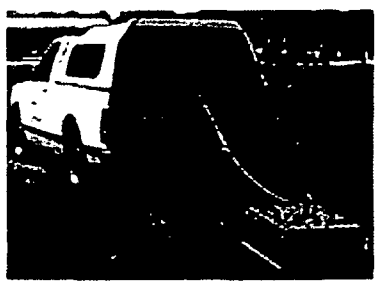




Equipment pictured is not identical to that used for Mound surveys.
GDM
3/27/03

400 MHz Antenna and SIR-2 Digital Control Unit

The ground penetratiing radar antenna (transducer) is pulled along the ground by hand or behind a vehicle.



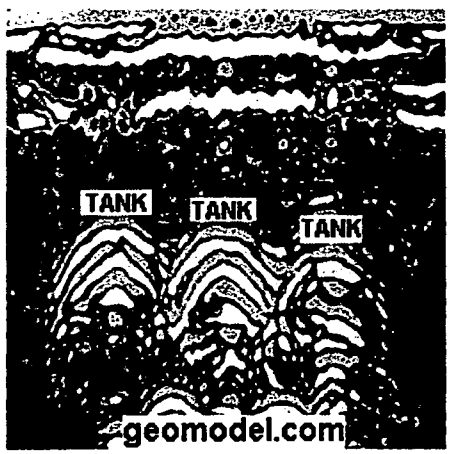
Photos do not depict survey activities on the Mound Site
GDM
3/27/03

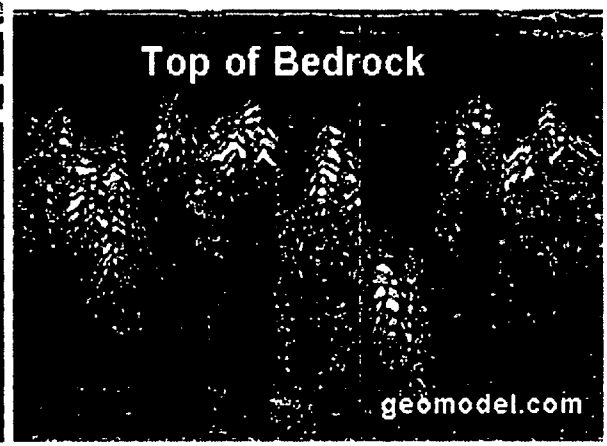
Hand-towed GPR Survey and Vehicle-towed GPR survey

When the transmitted signal enters the ground, it contacts objects or subsurface strata with different electrical conductivities and dielectric constants. Part of the ground penetrating radar waves reflect off of the object or interface; while the rest of the waves pass through to the next interface.

The reflected signals return to the antenna, pass through the antenna, and are received by the digital control unit. The control unit registers the reflections against two-way travel time in nanoseconds and then amplifies the signals. The output signal voltage peaks are plotted on the ground penetrating radar profile as different color bands by the digital control unit.

For each reflected wave, the radar signal changes polarity twice. These polarity changes produce three bands on the radar profile for each interface contacted by the radar wave.





Survey results shown here are not from the Mound PRS 269 survey.
GDM
3/27/03

Three Buried Tanks and Irregular Bedrock Topography

Ground penetrating radar waves can reach depths up to 100 feet (30 meters) in low conductivity materials such as dry sand or granite. Clays, shale, and other high conductivity materials, may attenuate or absorb GPR signals, greatly decreasing the depth of penetration to 3 feet (1 meter) or less.

The depth of penetration is also determined by the GPR antenna used. Antennas with low frequencies of from 25 to 200 MHz obtain subsurface reflections from deeper depths (about 30 to 100 feet or more), but have low resolution. These low frequency antennas are used for investigating the geology of a site, such as for locating sinkholes or fractures, and to locate large, deep buried objects.

Antennas with higher frequencies of from 300 to 1,000 MHz obtain reflections from shallow depths (0 to about 30 feet), and have high resolution. These high frequency antennas are used to investigate surface soils and to locate small or large, shallow buried objects and rebar in

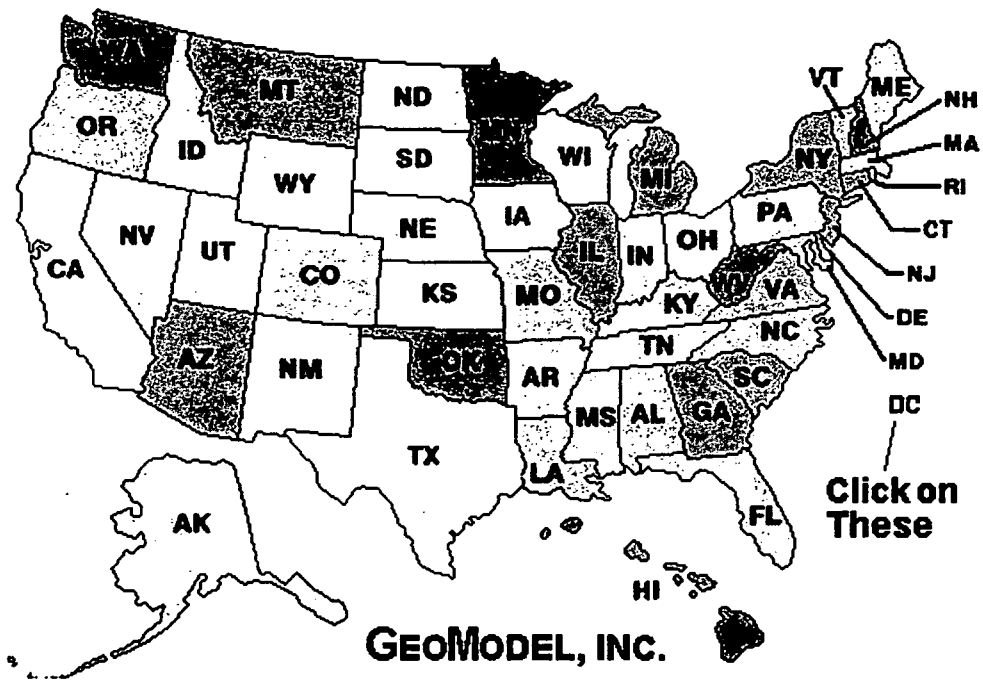
concrete.

GeoModel, Inc. conducts ground penetrating radar surveys using a SIR-2 digital control unit and various antennas with frequencies ranging from 25 to 1,000 MHz. The **GeoModel, Inc.** principals have over 40 years of combined experience and conduct GPR surveys worldwide, at low cost.

GeoModel, Inc. conducts surveys in every state.

Contact us to check the availability of a crew in your state.

Click on your state below:



Click here for worldwide surveys

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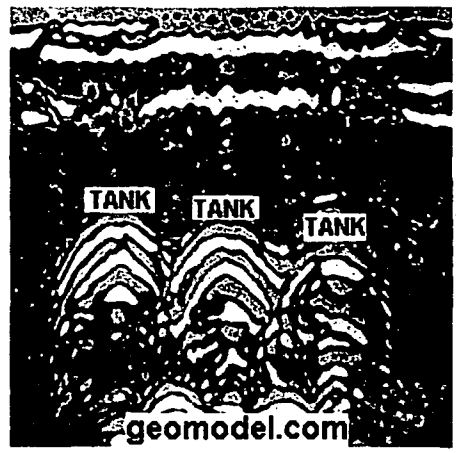
e-mail: geomodel@geomodel.com

Back to GPR page

Underground Storage Tanks

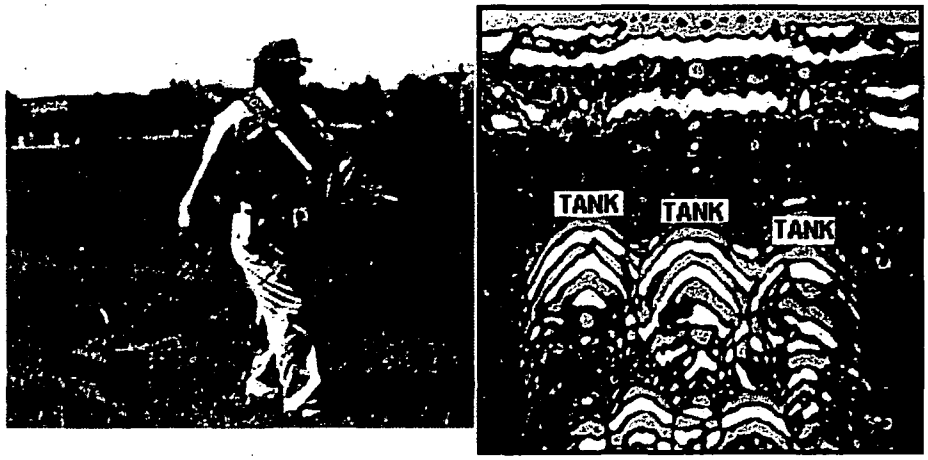


GeoModel, Inc. conducts surveys for locating underground storage tanks (USTs) using various geophysical methods. The most common methods used to locate USTs are ground penetrating radar (GPR) and electromagnetic (terrain) conductivity (EM).

Ground Penetrating Radar Surveys

GeoModel, Inc. has conducted ground penetrating radar (GPR) surveys at numerous sites for locating USTs using a GSSI SIR-2 digital control unit and various transducers (antennas).

The underground storage tank can be made of metal or any other material that has different electrical or conductive properties than the surrounding subsurface soils or rocks.

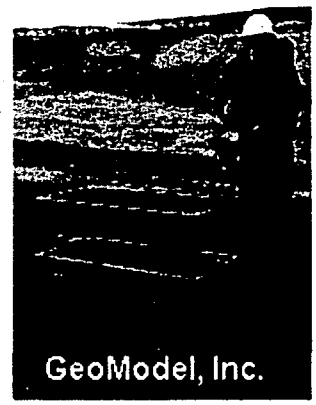


Geophysicist conducting GPR survey with a 400 MHz antenna (above left), GPR image of three USTs (above center, click to enlarge), and UST being removed from ground (above right).

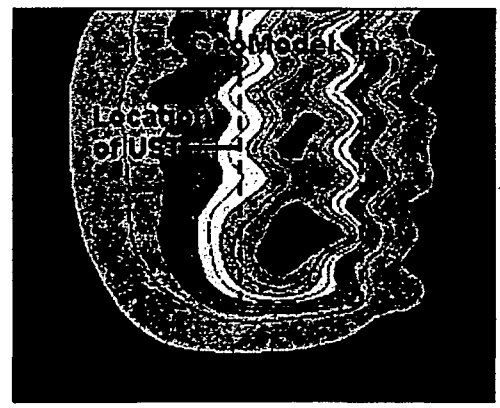
Electromagnetic Conductivity (Metal Detection) Surveys

GeoModel, Inc. has conducted numerous electromagnetic conductivity (EM) and metal detection surveys to locate USTs. Geophysicists operating the Geonics EM-31-DL and EM-61-MK2 instruments and a contour map indicating the location of a UST are shown below:

EM-31-DL



EM-61-MK2



EM-61-MK2 Map Showing UST

GeoModel, Inc. uses the new Geonics EM-61-MK2 which is more accurate than the standard EM-61.

Other buried metal objects, such as buried drums and buried utility lines, can also be easily located with the EM-31 and EM-61 instruments.

Company Background

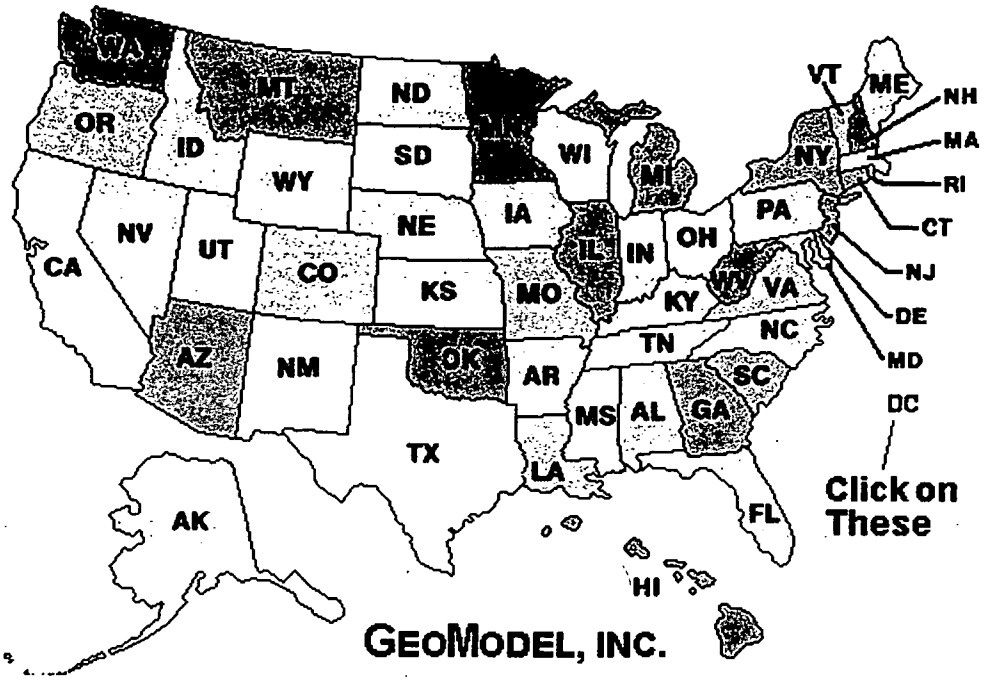
GeoModel, Inc. was founded in 1991 as a geophysical services and environmental consulting firm. The company principals have over 40 years of combined experience and have conducted numerous surveys to locate USTs worldwide. All projects are conducted by registered

professional geologists.

GeoModel, Inc. conducts surveys in every state.

Contact us to check the availability of a crew in your state.

Click on your state below:



Click here for worldwide surveys

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e-mail: geomodel@geomodel.com

HOME [Back to Top of page] [Back to GPR Applications]

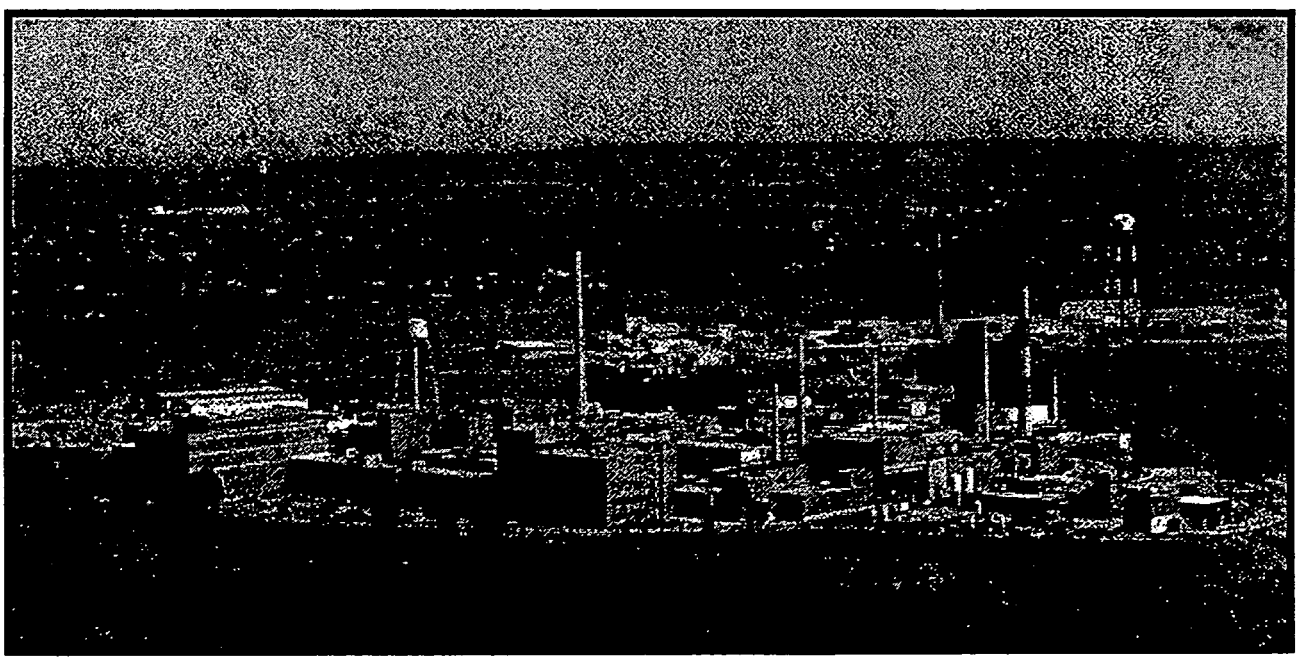
ORIGINAL DOCUMENT

SUPPORTING FA RECOMMENDATION

MOUND

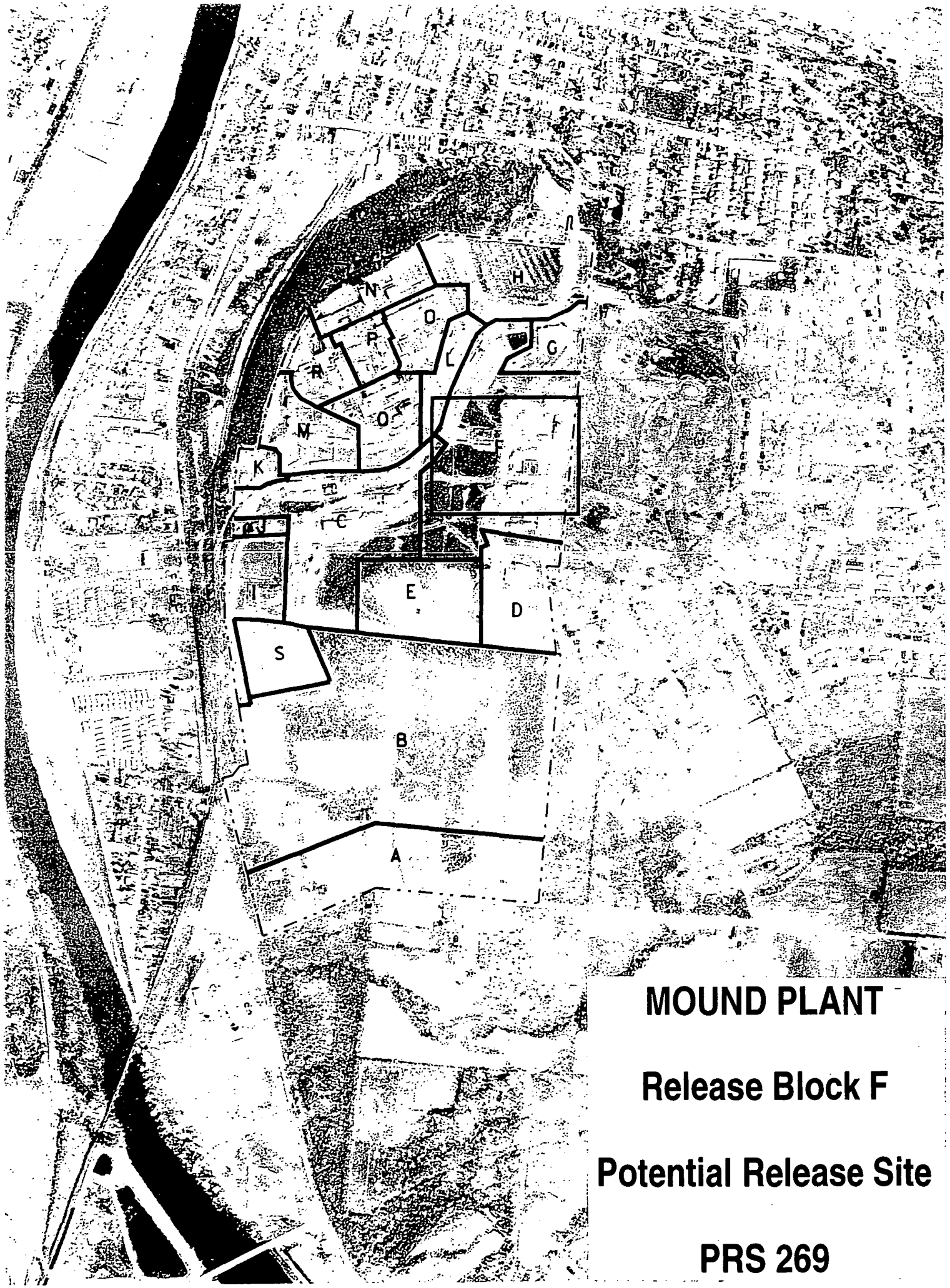
Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS 269



PRS 269 (FILE)

REV	DESCRIPTION	DATE
DRAFT		
REGULATOR RELEASE A	ADDED: - Narrative modified concerning Rad. data (placed on hold for soil gas data). - Soil Gas Confirmation Sampling results. CHANGED: - Photograph correction concerning location. - Binned Further Assessment, Dec. 18, 1996. - CORE team wants a magnetic survey to be conducted to try and locate the tank. If found, then sampling will be required. Sample results distributed and appropriate action in accordance with BSTR abandon/remove regulations will enacted. If tank not present, the PRS will be revised and rebinned.	**Sept. 23, 1996**

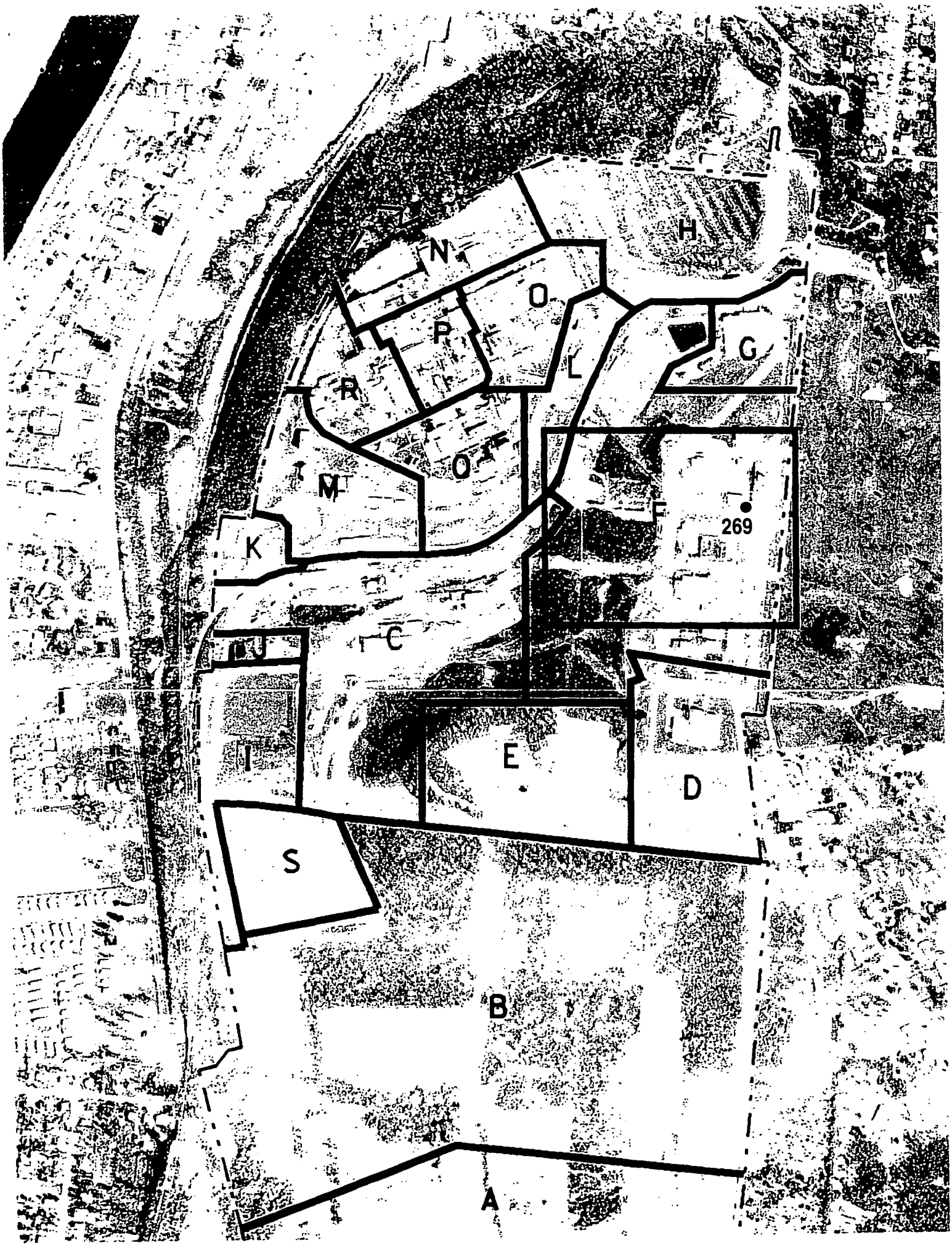


MOUND PLANT

Release Block F

Potential Release Site

PRS 269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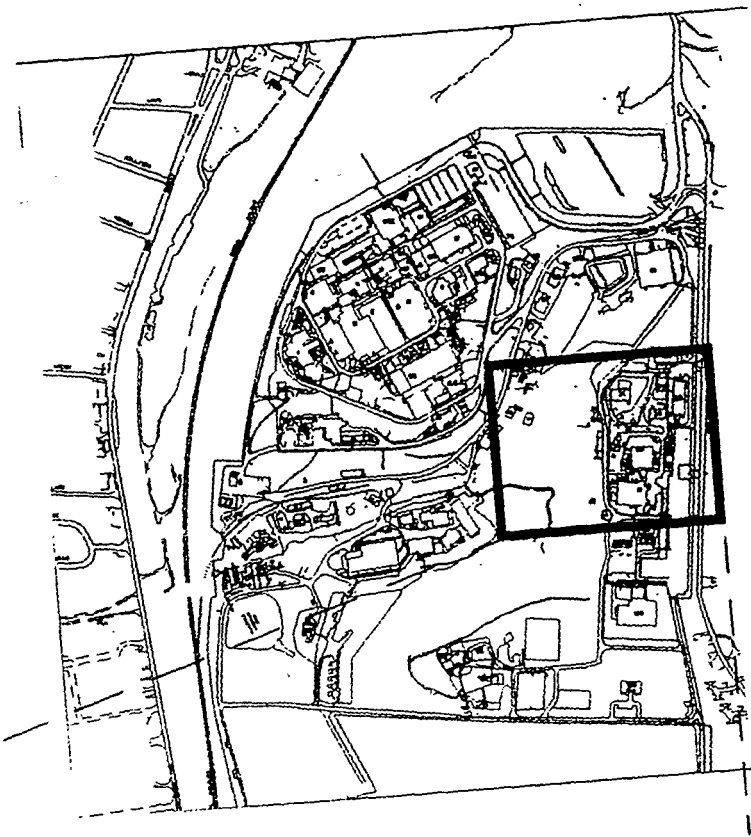
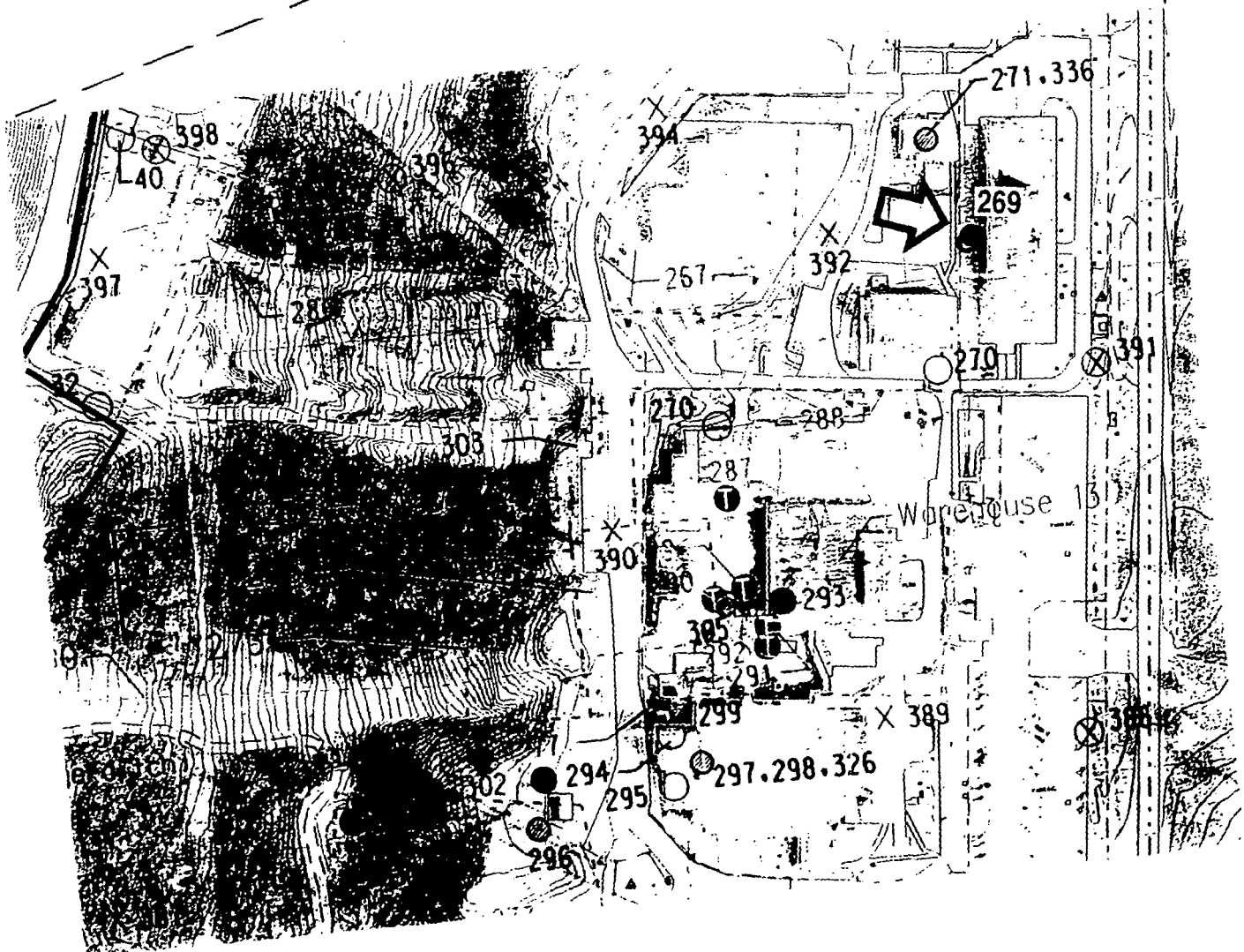
MOUND PLANT

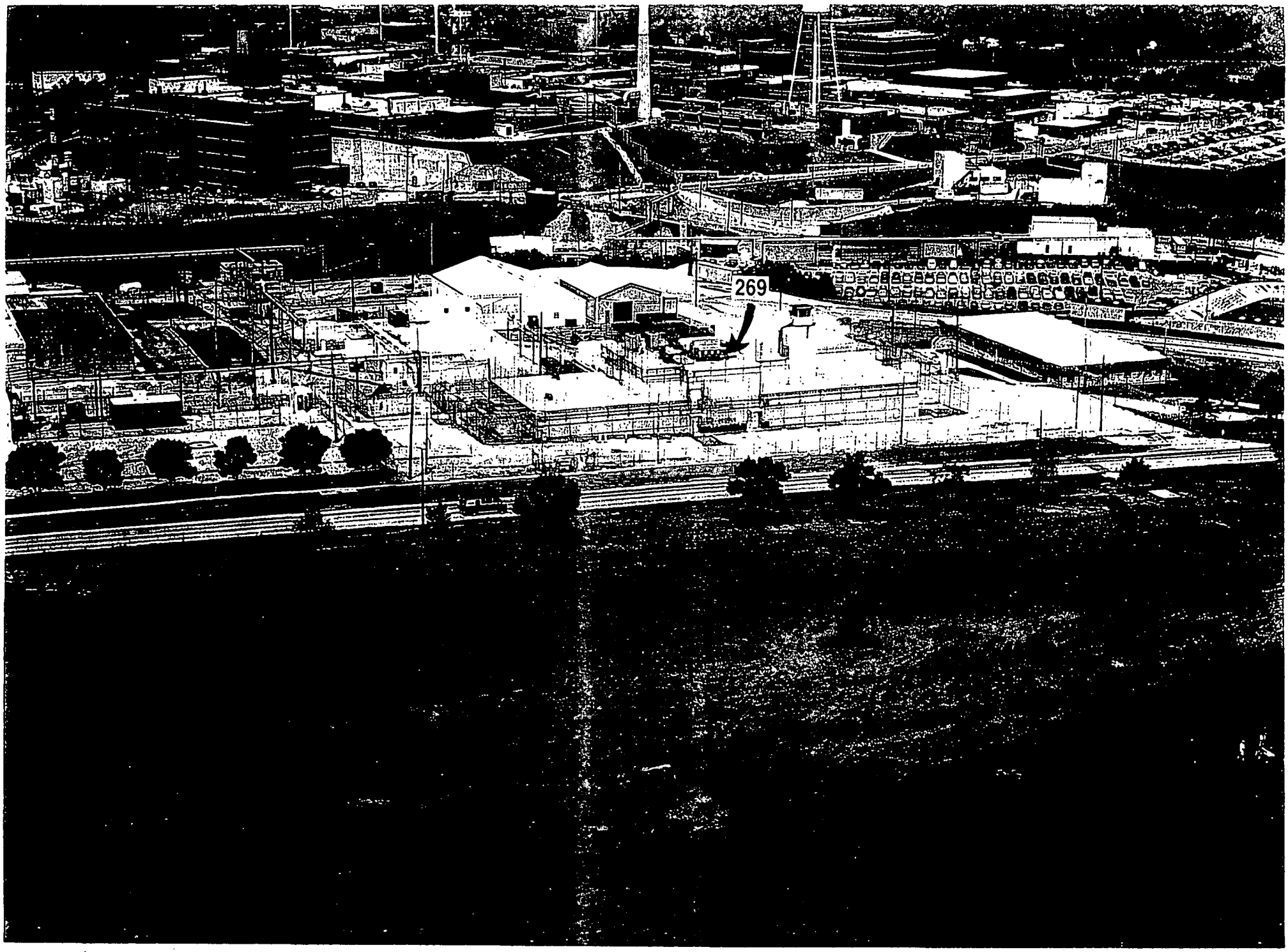
Release Block F

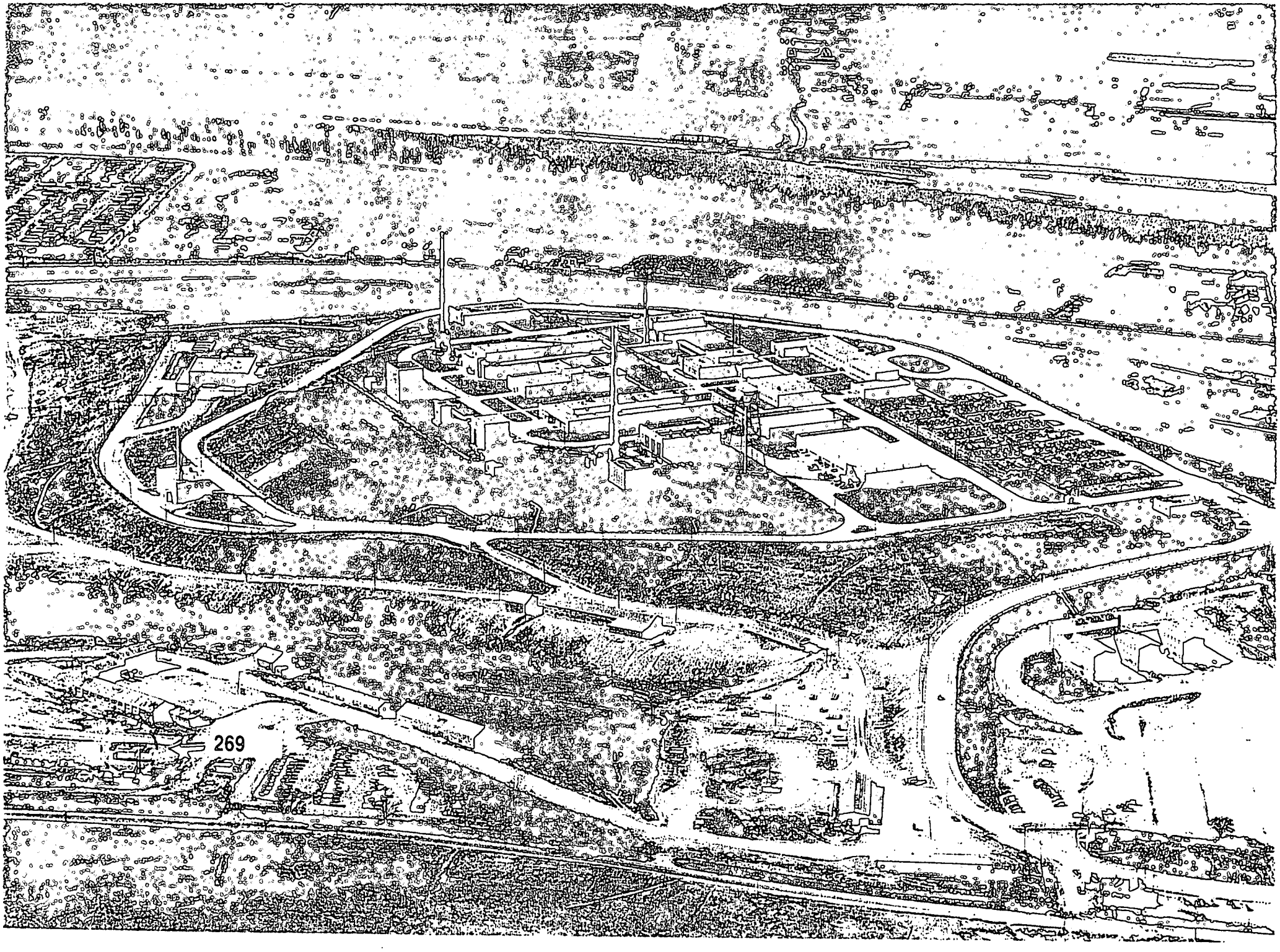
Potential Release Site

PRS 269






269


269

PRS 269

PRS HISTORY:

Potential Release Site (PRS) 269 is an area of land where two underground fuel tanks were shown to be located to support the original plant construction.[1,2] A 1948 construction drawing[5] indicates that a fueling facility existed at a location near the northwest corner of Building 50.[5,6] The drawing shows four pumps supplied by two underground storage tanks.[5] The volume and construction of these tanks have not been determined, nor has documentation concerning closure of the tanks been found, although it is believed that the tanks were probably removed as part of construction demobilization. The site of these tanks is near the northwest corner of Building 50.[5,6] This site was identified during the Mound Plant Underground Storage Tank Program and Regulatory Status Review as a result of a review of historic construction drawings.

CONTAMINATION:

Radiological data from the OU5, Non-AOC Field Report indicated no plutonium or thorium concentrations above Mound action levels in the area.[3]

A passive soil gas survey, in 1994, indicated that PRS 269 is on the margin of an area that exhibits relatively high total aromatic hydrocarbons (1,013,033 ion counts) and total petroluem hydrocarbons (2,927,024 ion counts); low semivolatile hydrocarbons (3942 ion counts). No halogenated hydrocarbons were detected.[3]

In February 1996, the *Soil Gas Confirmation Investigation* sampled the soil at 100 locations on the Mound Plant site. Each sample was collected over a depth of 1 to 3 feet and analyzed for volatiles, semivolatiles, PCBs, pesticides, metals, radionuclides, and explosives. The investigation did not sample the location of PRS 269, however two soil gas confirmation samples were taken in the same area of elevated readings from the passive soil gas survey. Sample 000005 was located about 200 feet southeast and sample 000030 about 300 feet southwest of PRS 269.[4]

Results showed that all samples in the vicinity of PRS 269 contained contaminant concentrations less than the acceptable 10^{-6} risk based regulatory or ALARA guideline criteria.[4,7]

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 5-7)
2) Mound Plant Underground Storage Tank Program Plan and Regulatory Status Review, November 1992. (pages 8-9)
3) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, June 1995. (pages 10-17)
4) Further Assessment: Soil Gas Confirmation Sampling, May 1996. (pages 18-28)
7) Risk Based Guideline Values, December 1995.

REFERENCE MATERIAL
PRS 269

Document Control No. _____

Environmental Restoration Program

OPERABLE UNIT 9 SITE SCOPING REPORT: VOLUME 12 – SITE SUMMARY REPORT

MOUND PLANT
MIAMISBURG, OHIO

December 1994

Final

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

Table A.1. Comprehensive Tabulation of Potential Release Sites

Description of History and Nature of Waste Handling						Hazardous Conditions and Incidents			Environmental Data		
No.	Site Name	Location	Status	Potential Hazardous Substances	Ref	Releases	Media	Ref	Analytes*	Results	Re
264	Explosive Waste Storage Bunker (Magazine 53)	I-7	In service	Classified, non-explosive wastes Explosion residuals (primarily aluminum residuals) Contaminants listed under Explosive Waste Storage Bunker (Magazine 53) Detonators, Detonating cord, Thermite, Pyrotechnic powders, Primary explosives High explosive powder, PETN, PBX, RDX, HMX, HNS, CP HNS (hexanitrostilbene)	4, 5, 18	None Suspected			No Data		
265	Biodegradation Unit	I-7	Inactive	Soapy wastewater containing explosives constituents	4, 5, 18	Suspected	S	7, 18	See Pyrotechnic Waste Shed		4
266	Area 8, Thorium-Contaminated Soils from Areas 1 and 9	F-9	Grounds	Thorium-232, Plutonium-238	1, 4, 5, 18	Thorium	S	4, 6	14, 15, 16	Table B.1 (Table V.3 in Ref. 6)	6
267	Area 9, Thorium Storage and Redrumming Area	F-9 G-9	Grounds	Plutonium-238, Thorium Thorium sludge constituents (c)	1, 4, 5, 18	Thorium	S	4, 6	14	Table B.1 (Table V.4 in Ref. 6)	6
268	Building 31, Contaminated Material Storage Building	F-9	In service	Plutonium-238 Thorium Tritium	4 3	None Suspected			See Area 9	Table B.9	6
269	Building 36 Historic Gasoline Tanks (Tanks 239 and 240) *	G-10	Historical	Gasoline	3	No information on when tanks were removed			No Data		
270	Underground Sanitary Sewer Lines G6 & G7	G-10	In Service	Organic solvents, plating solutions, laboratory chemicals, nitric acid, hydrochloric acid, methylene chloride, strong acids and bases	4	Suspected VOCs	S	4	3, 4, 5, 6, 9, 10, 11, 12, 13, 16	Tables B.6, B.7, B.8, and B.9	7
271	Building 37 Sanitary Waste Tank (Tank 100)	F-10	In service	Sanitary wastes	3, 4	None Suspected			No Data		

* ACTUAL LOCATION IS NEAR BUILDING 50. REFER TO DISCUSSION REFERENCES 3 & 4.

1 - Soil Gas Survey - Freon 11, Freon 113, Trans-1,2-Dichloroethylene, Cis-1,2-Dichloroethylene, 1,1,1-Trichloroethane, Perchloroethylene, Trichloroethylene, Toluene
2 - Gamma Spectroscopy - Thorium-228, -230, Cobalt-60, Cesium-137, Radium-224, -226, -228, Americium-241, Actinium-227, Bismuth-207, Bismuth-210m, Potassium-40
3 - Target Analyte List
4 - Target Compound List (VOC)
5 - Target Compound List (SVOC)
6 - Target Compound List (Pesticides/Polychlorinated Biphenyl)
7 - Dioxins/Furans
8 - Extractable Petroleum Hydrocarbons (EPH)/Total Petroleum Hydrocarbons (TPH)
9 - Lithium
10 - Nitrate/Nitrite
11 - Chloride
12 - Explosives
13 - Plutonium-238
14 - Plutonium-238, Thorium-232
15 - Cobalt-60, Cesium-137, Radium-226, Americium-241
16 - Tritium

Reference List

1. DOE 1986 "Phase I: Installation Assessment Mound (DRAFT)."
2. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
3. DOE 1992c "Mound Plant Underground Storage Tank Program Plan & Regulatory Status Review (Final)."
4. DOE 1993a "Site Scoping Report: Vol. 7 - Waste Management (FINAL)."
5. EPA 1988a "Preliminary Review/Visual Site Inspection for RCRA Facility Assessment of Mound Plant"
6. DOE 1993d "Operable Unit 9, Site Scping Report: Vol. 3 - Radiological Site Survey (FINAL)."
7. DOE 1993c "Operable Unit 3, Misc. Sites Limited Field Investigation Report."
8. DOE 1992d "Reconnaissance Sampling Report Decontamination & Decommissioning Areas, OU6, (FINAL)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scpoing Report: Vol. 9 - Spills and Response Actions (FINAL)."
11. Styron and Meyer 1981"Potable Water Standards Project: Final Report."
12. DOE 1993b "Reconnaissance Sampling Report - Soil Gas Survey & Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (FINAL)."
13. DOE 1993d "Operable Unit 9, Site Scoping Report: Vol. 3 - Radiological Site Survey (FINAL)."
14. DOE 1991b "Main Hill Seeps, Operable Unit 2, On-Scene Coordinator Report for CERCLA Section 104 Remedial Action, West Powerhouse PCB Site."
15. Halford 1990 "Results of South Pond Sampling."
16. DOE 1993e "Operable Unit 4, Special Canal Sampling Report, Miami Erie Canal."
17. DOE 1990 "Preliminary Results of Reconnaissance Magnetic Survey of Mound Plant Areas 2, 6, 7, and C."
18. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (FINAL)."
19. Rogers 1975 "Mound Laboratory Environmental Plutonium Study, 1974."
20. DOE 1992h "Ground Water and Seep Water Quality Data Report Through First Quarter, FY92."
21. Dames and Moore 1976a, b "Potable Water Standards Project Mound Laboratory" and "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory."
22. DOE 1992l "Closure Report, Building 34 - Aviation Fuel Storage Tank."
23. DOE 1992j "Closure Report, Building 51 - Waste Storage Tank."
24. DOE 1994 "Operable Unit 1, Remedial Investigation Report."
25. EG&G 1994 "Active Underground Storage Tank Plan."

Document Control No. _____

Environmental Restoration Program

MOUND PLANT UNDERGROUND STORAGE TANK PROGRAM PLAN AND REGULATORY STATUS REVIEW

MOUND PLANT
MIAMISBURG, OHIO

November 1992

FINAL

(Revision 0)

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

~~2.3.26. Building 19, Historic Gasoline Tank (Tank 238)~~

Built during the initial construction of Mound Plant in the 1940s, Building 19 is reported to have served as a vehicle service and maintenance facility for the Plant construction contractor (Kabot, 1992c). Two gasoline pumps at the facility are visible in a historical drawing, and are believed to have been supplied by a UST. The number, volume, and construction of the tank(s) have not been determined, nor has documentation concerning closure of the tank(s) been found, although it is believed that the tank(s) has been removed.

Because the historic gasoline tank(s) at Building 19 is thought to have been closed by removal, the existence of the tank(s) and any evidence of a release is subject to investigation by the ER Program ~~(FFA) in Operable Unit 5.~~

2.3.27 Building 36,* Historic Gasoline Tanks (Tanks 239 and 240)

A very old construction drawing (circa 1948) indicates that a fueling facility existed at the location of what is now Building 36.* The drawing shows four pumps supplied by two USTs. The volume and construction of these tanks have not been determined, nor has documentation concerning closure of the tanks been found, although it is believed that the tanks have been removed.

Because the historic gasoline tanks at Building 19 are thought to have been closed by removal, the existence of the tanks and any evidence of a release is subject to investigation by the ER Program (FFA) in Operable Unit 5.

~~2.3.28 SM Building, Historic Septic Tank (Tank 241)~~

Historically, a sanitary septic tank located southeast of Building 30 served the SM Building. This tank is believed to have been constructed as a concrete vault, about 15 feet by 8 feet, and of unknown volume, that served the SM leach field downslope of the tank. Discharges to the tank took place from 1960 when it was built to 1964 when it was taken out of service and when the sanitary sewer connected to the sewage disposal facility. Overflow of the alpha wastewater system in room SM-1, may have contributed plutonium contamination to the tank and leach field. The D&D of the SM leach field originally included the removal of the tank, but the tank could not be located when excavation started. The tank may have been removed during an earlier construction project in the area (DOE, ~~1992c).~~

* ACTUAL LOCATION IS NEAR BUILDING 50. REFER TO DISCUSSION REFERENCES 3&4.

Document Control No._____

Environmental Restoration Program

OPERABLE UNIT 5
OPERATIONAL AREA PHASE I INVESTIGATION
NON-AOC FIELD REPORT

MOUND PLANT
MIAMISBURG, OHIO

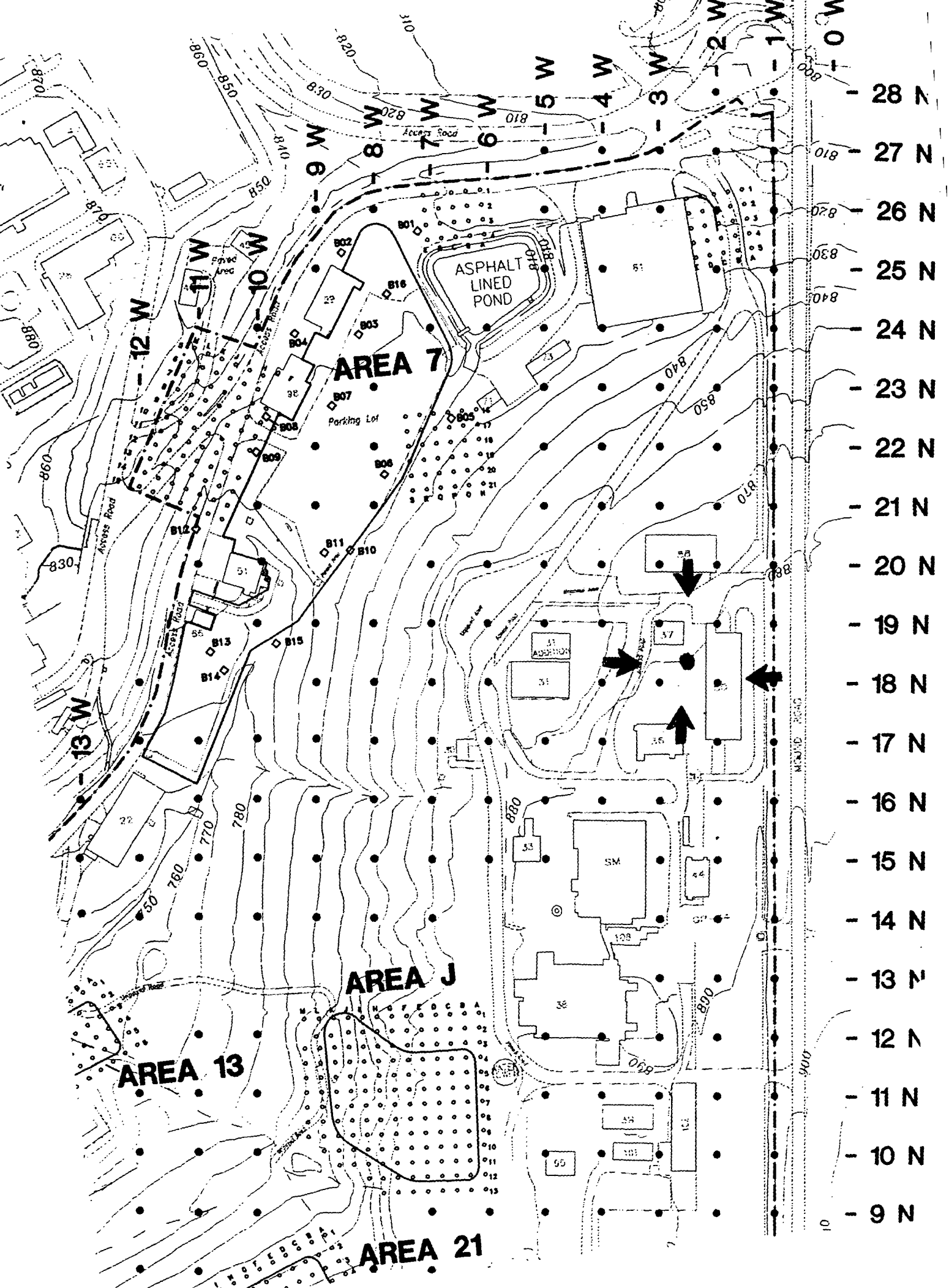
VOLUME II - APPENDICES A-G

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies


ASPHALT LINED POND
AREA 7
AREA J
AREA 13
AREA 21
Parking Lot
Access Road
Paved Area
ADDITION
SM
28 N
27 N
26 N
25 N
24 N
23 N
22 N
21 N
20 N
19 N
18 N
17 N
16 N
15 N
14 N
13 N
12 N
11 N
10 N
9 N
0 W
1 W
2 W
3 W
4 W
5 W
6 W
7 W
8 W
9 W
10 W
11 W
12 W
13 W

FIDLER Data

Mound Soil Screen Data

APPENDIX D
RADIOLOGICAL DATA (FIDLER SURVEY MOUND SOIL SCREENING FACILITY DATA) FOR NON-AOC POINTS

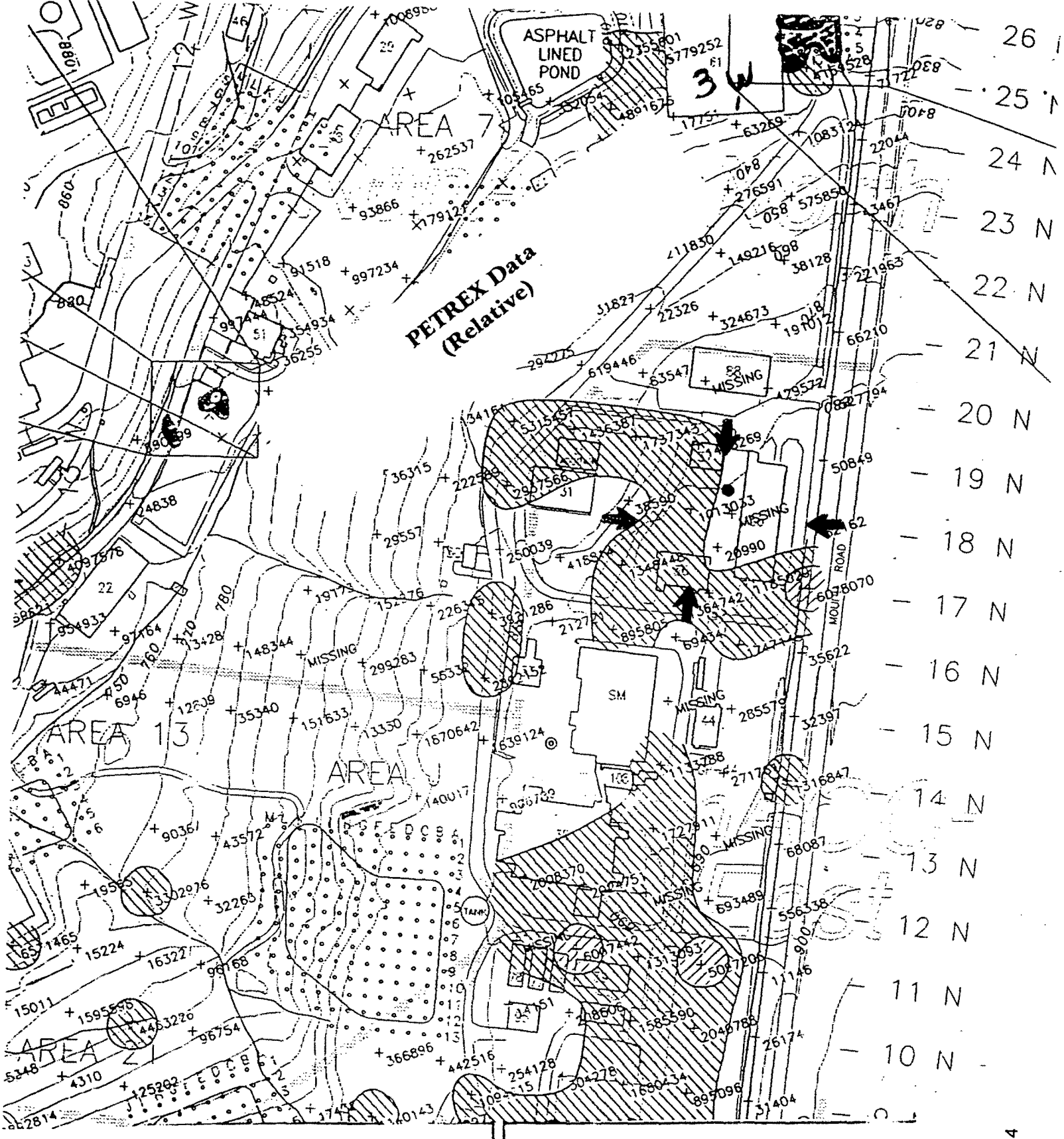
	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
17N06	130	100	6.5	5.0	NC	0	a	0.9	a
17N07	170.3	130	9.72	6.5	NC	21	a	1.2	a
17N08	170.3	130	9.72	8.0	NC	19	a	1.2	a
17N09	170.3	80	9.72	5.5	NC	NC		NC	
17N10	170.3	100	9.72	6.0	NC	NC		NC	
17N11	170.3	90	9.72	7.0	NC	NC		NC	
17N12	152.1	40	8.45	4.5	NC	6	a	0.6	a
18N01	253.5	185	12.48	9.0	NC	16	a	1.1	a
18N02	130	80	6.5	4.0	NC	WIPE	c	WIPE	c
18N03	130	75	6.5	5.0	NC	WIPE	c	WIPE	c
18N04	130	60	6.5	4.5	NC	6	a	0.8	a
18N06	130	90	6.5	6.5	NC	WIPE	c	WIPE	c
18N07	170.3	100	9.72	7.0	NC	13	a	0.7	a
18N08	170.3	170	9.72	11.0	NC	22	a	1.1	a
18N09	170.3	150	9.72	10.5	NC	NR		NR	
[illegible]	152.1	100	8.45	6.5	NC	0	a	0.3	a
	253.5	155	12.48	9.5	NC	3	a	0.6	a
	130	85	6.5	4.0	NC	NC		NC	
	130	70	6.5	5.0	NC	4	a	0.8	a
	130	60	6.5	4.0	NC	WIPE	c	WIPE	c
	130	65	6.5	4.0	NC	WIPE	c	WIPE	c
	130	60	6.5	5.0	NC	WIPE	c	WIPE	c
	176.8	325	8.97	20.0	45	56	b	15.9	b
	176.8	125	8.97	7	NC	25	b	2.4	b
						39	b	0.9	a
	176.8	170	8.97	9.5	NC	10	a	1.1	a
19N10	176.8	70	8.97	3.5	NC	3	a	0.2	a
20N01	253.5	95	12.48	5.0	NC	16	a	0.6	a
20N02	130	105	6.5	6.5	NC	8	a	0.7	a

APPENDIX D

RADIOLOGICAL DATA (FIDLER SURVEY MOUND SOIL SCREENING FACILITY DATA) FOR NON-AOC POINTS

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:

NR - Not recorded
NC - No sample/reading taken
NA - Reading not taken; contamination criteria not exceeded.
a - Mound Soil Screening Facility detection level not exceeded.
b - Concentration at or above the Mound Soil Screening Facility detection level.
c - Results of the wipe sample were less than 20 disintegrations per minute.
CPM - Counts per minute
KCPM - Counts per minute x 1000
pCi/g - Picocuires per gram



Features:

+ PETREX Sample Location

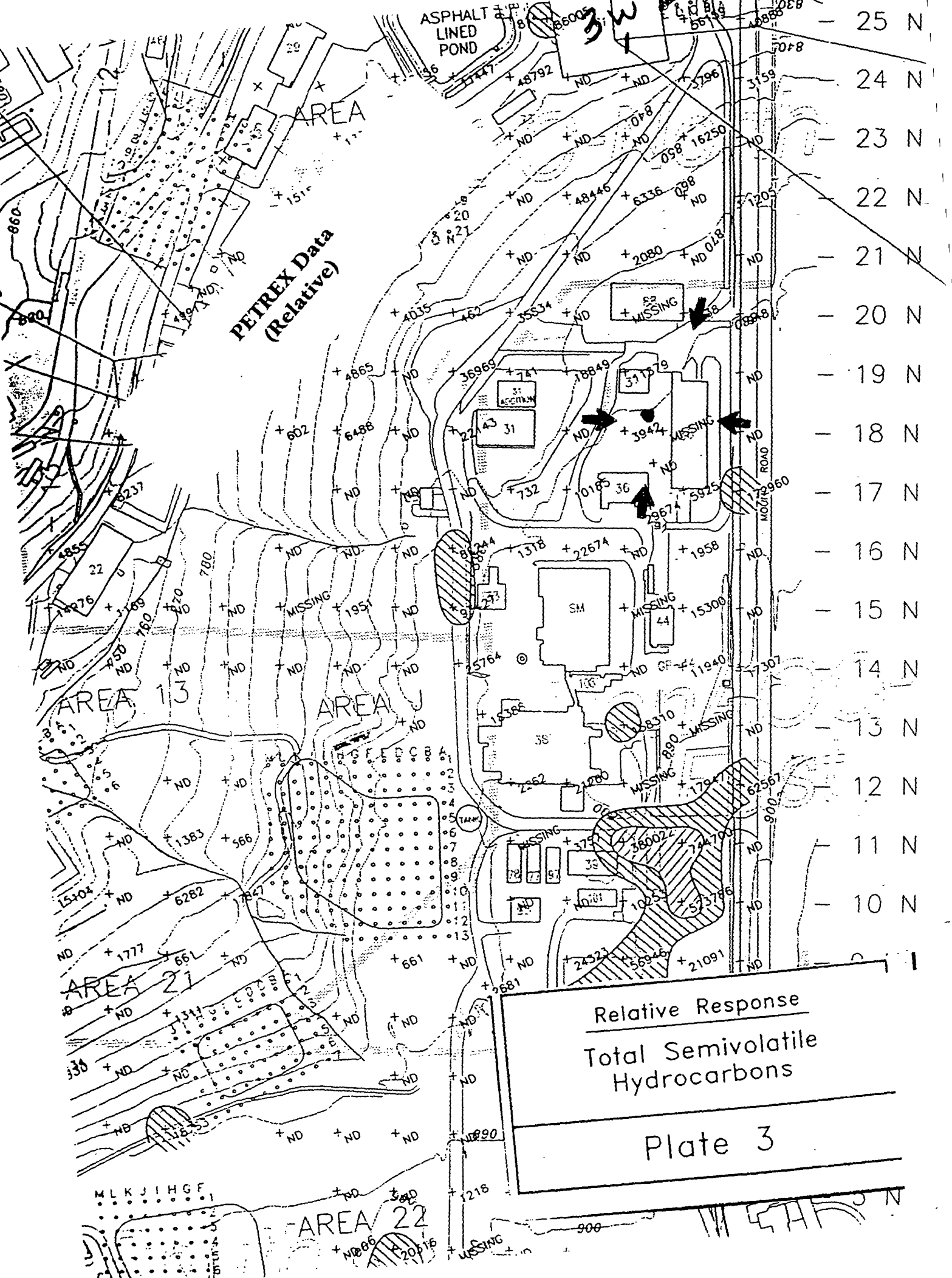
ND Not Detected

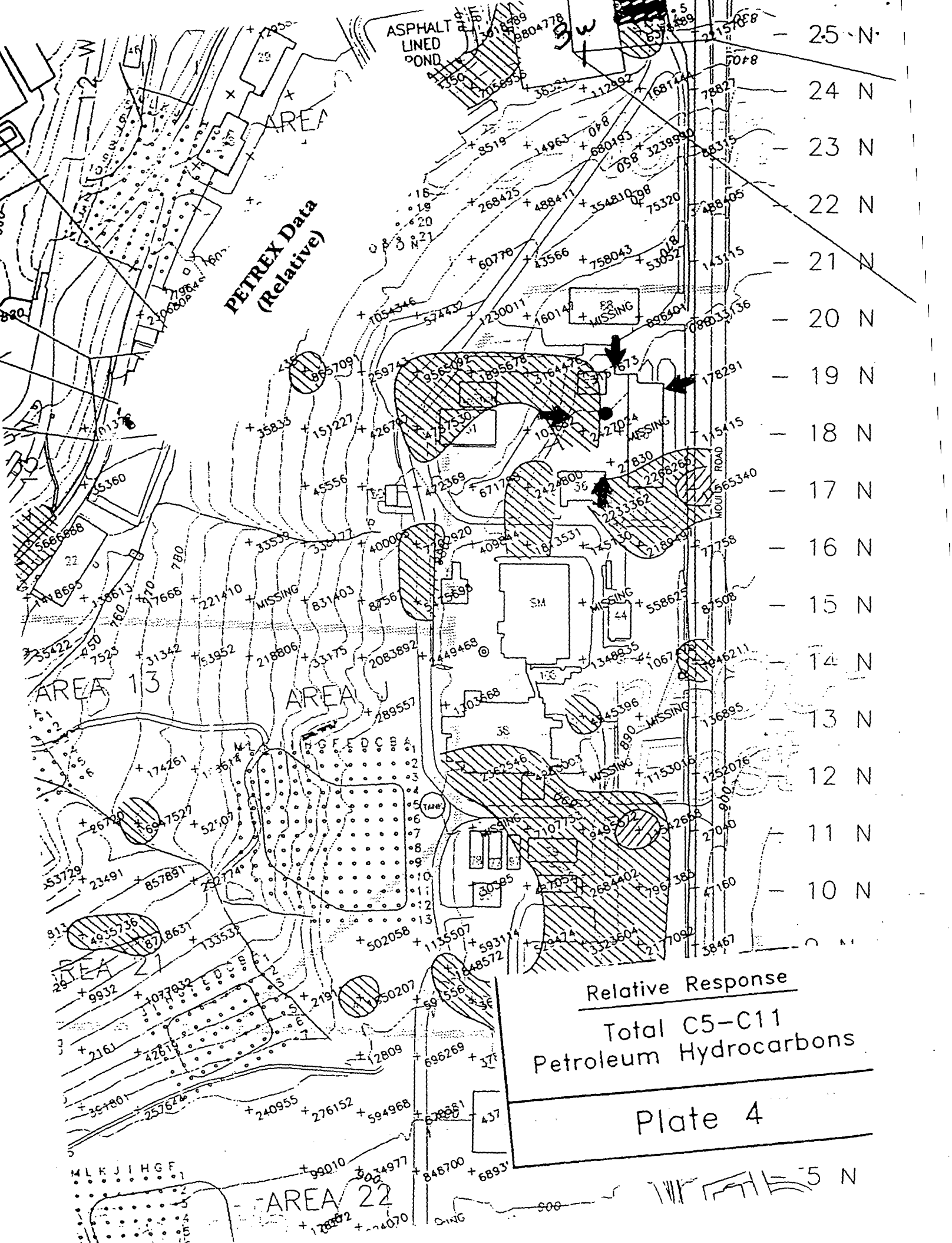
T Denotes interference by terpenes; see text.

Relative Response

Total Aromatic Hydrocarbons

Plate 2

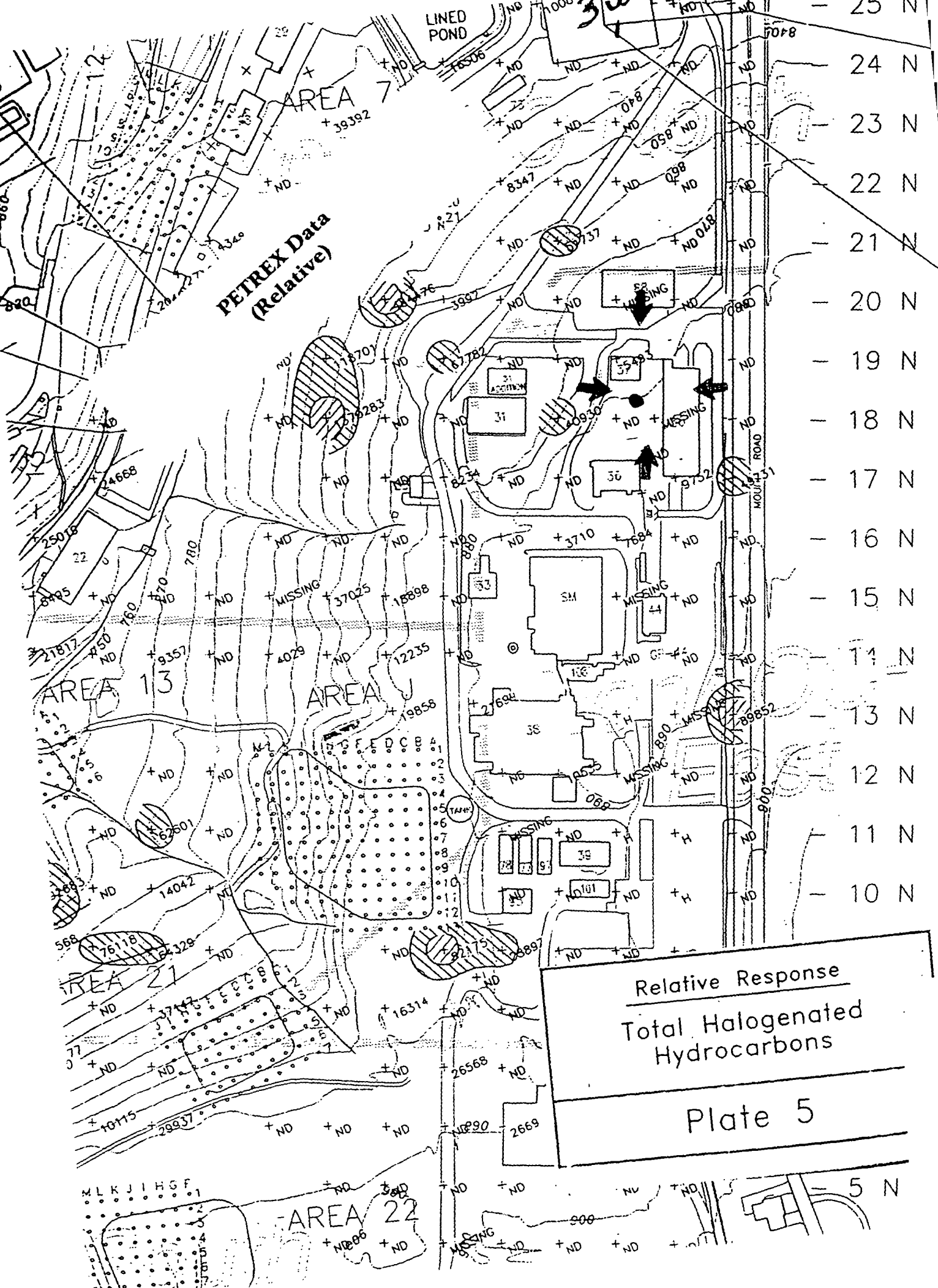

ASPHALT LINED POND
PETREX Data (Relative)
AREA
AREA 13
AREA J
AREA 21
AREA 22
MOUNTAIN ROAD
25 N
24 N
23 N
22 N
21 N
20 N
19 N
18 N
17 N
16 N
15 N
14 N
13 N
12 N
11 N
10 N
Relative Response
Total Semivolatile Hydrocarbons
Plate 3



Relative Response

Total C5–C11
Petroleum Hydrocarbons

Plate 4



Relative Response

Total Halogenated Hydrocarbons

Plate 5

MOUND

Environmental
Restoration
Program

Further Assessment

Soil Gas Confirmation Sampling

Mound Plant
Miamisburg, Ohio

May 1996

Revision 0

Department of Energy

EG&G Mound Applied Technologies

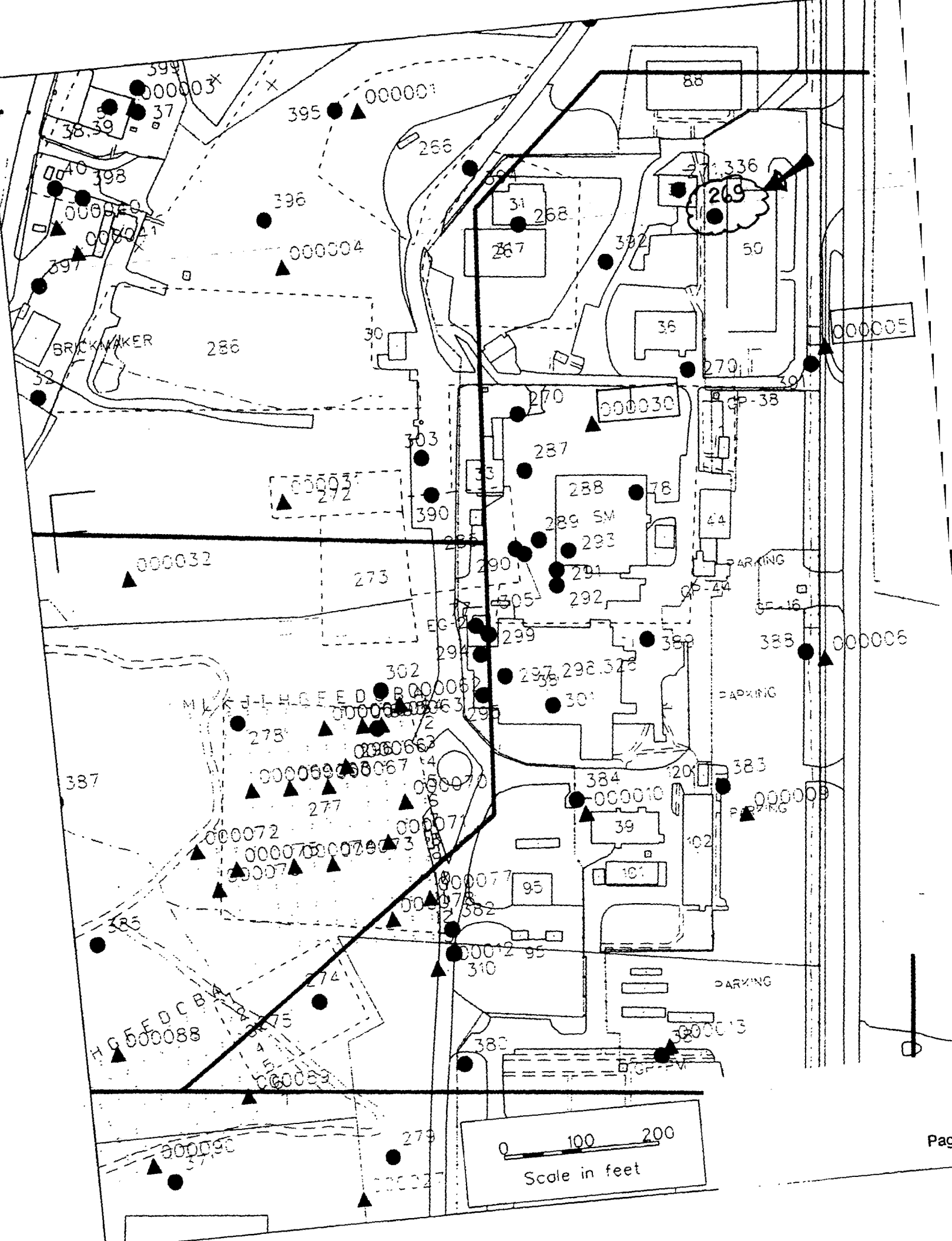

BRICKMAKER
PARKING
PARKING
PARKING
PARKING
0 100 200
Scale in feet

Table A.1. Soil Gas Confirmation Detected Volatile Organic Compounds

ANALYTE	SGC NAC 000002	SGC NAC 000003	SGC NAC 000004	SGC NAC 000005	SGC NAC 000006	SGC NAC 000007	Background	10^{-6} Construction Worker Guidelines
VOLATILES (µg/Kg)								
Acetone	36						NA	105000000
1,2-Dichloroethene (total)							NA	21500000
2-Butanone	12						NA	46500000
Benzene	1 J						NA	8900
Carbon Disulfide							NA	1400000
Chloroform			67				NA	NA
Chloromethane							NA	NA
Ethylbenzene							NA	480
Methylene Chloride	6			7	8		NA	NA
Tetrachloroethene							NA	10500000
Toluene	1 J	1 J					NA	1250000
Trichloroethene						7	NA	41000
Xylene (total)							NA	2150000000

Table A.1. Soil Gas Confirmation Detected Volatile Organic Compounds (cont.)

ANALYTE	SGC NAC 000023	SGC NAC 000025	SGC NAC 000030	SGC NAC 000031	SGC NAC 000032	SGC NAC 000034	Background	10^{-6} Construction Worker Guidelines
VOLATILES (µg/Kg)								
Acetone			39		29		NA	105000000
1,2-Dichloroethene (total)							NA	21500000
2-Butanone			9 J		6 J		NA	46500000
Benzene							NA	8900
Carbon Disulfide							NA	1400000
Chloroform							NA	NA
Chloromethane							NA	NA
Ethylbenzene							NA	480
Methylene Chloride			12	14	10		NA	NA
Tetrachloroethene							NA	10500000
Toluene	4 J	2 J		2 J	1 J	2 J	NA	1250000
Trichloroethene							NA	41000
Xylene (total)				2 J			NA	2150000000

Table A.2. Soil Gas Confirmation Detected Semivolatile Organic Compounds

ANALYTE	SGC NAC 000001	SGC NAC 000002	SGC NAC 000003	SGC NAC 000004	SGC NAC 000005	SGC NAC 000006	Background	10^{-6} Construction Worker Guidelines
SEMIVOLATILES (μg/Kg)								
Acenaphthene		190 J	63 J				NA	NA
Acenaphthylene		730				42 J	NA	NA
Anthracene		1300	66 J		25 J	55 J	NA	320000000
Benzo(a)anthracene		1500	180 J		160 J	350 J	NA	4100
Benzo(a)pyrene		1300	180 J		200 J	450	NA	410
Benzo(b)fluoranthene		1000	180 J		190 J	460	NA	4100
Benzo(g,h,i)perylene		550	110 J		100 J	260 J	NA	NA
Benzo(k)fluoranthene		1000	160 J		190 J	440	NA	41000
Bis(2-ethylhexyl)phthalate							NA	215000
Butylbenzylphthalate							NA	215000000
Carbazole		600	62 J			34 J	NA	NA
Chrysene		1500	220 J		240 J	490	NA	410000
Di-n-butyl phthalate	120 J			280 J			NA	105000000
Di-n-octyl phthalate							NA	21500000
Dibenz(a,h)anthracene		180 J	40 J		37 J	87 J	NA	410
Dibenzofuran		1100	23 J				NA	NA
Diethyl phthalate							NA	NA
Fluoranthene		3400 D	480		400 J	800	NA	42500000
Fluorene		1500	42 J				NA	NA
Indeno(1,2,3-cd)pyrene		690	120 J		130 J	320 J	NA	4100
2-Methylnaphthalene		970					NA	NA
Naphthalene		4000 D	24 J				NA	NA
Phenanthrene		4700 D	380		150 J	280 J	NA	NA
Phenol							NA	650000000
Pyrene	24 J	2700 D	440		340 J	730	NA	32000000

Table A.4. Soil Gas Confirmation Detected TAL Inorganics

ANALYTE	SGC NAC 000001		SGC NAC 000002		SGC NAC 000003		SGC NAC 000004		SGC NAC 000005		SGC NAC 000006		Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)														
Aluminum	11000		4190		1910		11400		7970		7780		19000	NA
Antimony			0.23	B			0.24	B	0.41	B			NA	425
Arsenic	1.5	B	2.1	B	2.9	B	1.4	B	7		7.2		8.6	320
Barium	48.6		20.7	B	23.7	B	47.1	B	73.6		86.4		180	75000
Beryllium	0.56				0.12	B	0.65		0.38		0.28		1.3	0.7
Bismuth													NA	NA
Cadmium			0.25	B	0.19	B			0.36	B	0.5	B	2.1	1050
Calcium	162000		159000		95500		152000		13600		86200		310000	NA
Chromium	13.2		6.7		3.8		15.2		13		11.6		20	1050000
Cobalt	9.8	B	4.5	B	2.3	B	10.1	B	7.6	B	7.6	B	19	NA
Copper	16.2		11.9		9.9		17.1		14.5		15.2		26	NA
Cyanide													ND	21400
Iron	21300		10600		5680		21800		17200		17700		35000	NA
Lead	6.7		5.2		11.2		8.6		30.9		25.1		48	NA
Lithium	21	B	12.5	B	6.2	B	23	B	7.7	B	10.3	B	26	NA
Magnesium	6160		57800		27900		5670		5210		35600		40000	NA
Manganese	695		384		270		612		383		589		1400	135000
Mercury					0.13								NC	320
Molybdenum	0.43	B	1.2	B	0.77	B			1.7	B	1.5	B	27	NA
Nickel	18.4		9.9		6.4	B	20.6		11.1		16.1		32	21500
Potassium	1780		742	B	346	B	2080		574	B	744	B	1900	NA
Selenium													NA	NA
Silver					0.24	B							1700	5500000
Sodium	228	B	888	B	150	B	137	B	411	B	348	B	240	NA
Thallium													460	NA
Tin	1.1	B					1.4	B	1	B			20	NA
Vanadium	14.9		8.3		4.7		16.3		23.1		18.9		25	7500
Zinc	53.3		29.5				67		59		69.2		140	320000

Table A.4. Soil Gas Confirmation Detected TAL Inorganics (cont.)

ANALYTE	SGC NAC 000025		SGC NAC 000026		SGC NAC 000027		SGC NAC 000028		SGC NAC 000029		SGC NAC 000030		Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)														
Aluminum	6830		7120		11500		15300		10700		5550		19000	NA
Antimony									0.61	B			NA	425
Arsenic	1.9	BJ	0.61	BJ	3.6	J	2.0	BJ	1.8	BJ	5.6		8.6	320
Barium	49.2		34.1	B	87.6		111		59.1		47.8		180	75000
Beryllium	0.40		0.11	B	0.81		0.96		0.64		0.27		1.3	0.7
Bismuth													NA	NA
Cadmium			2.9										2.1	1050
Calcium	162000	J	315000		68800	J	48400	J	87300	J	158000		310000	NA
Chromium	18.1		8.1		16.2		20.6		14.8		9.7		20	1050000
Cobalt	8.7	B	5.4	B	11.6	B	11.8	B	12.0		5.6	B	19	NA
Copper	30.5		8.7		19.2		16.1		15.3		11.9		26	NA
Cyanide													ND	21400
Iron	24200		16300		30800		35200		25400		13500		35000	NA
Lead	6.9	J	4.9		14.3	J	5.6	J	6.2	J	8.4		48	NA
Lithium	16.3	B	16.7	B	17.0	B	21.4	B	22.5	B	13.4	B	26	NA
Magnesium	14900		4380		9760		5190		5910		52600		40000	NA
Manganese	429	J	417		659	J	593	J	637	J	307		1400	135000
Mercury					0.13	J							NC	320
Molybdenum	2.3	B	0.88	B	1.9	B	0.80	B	0.77	B	1.3	B	27	NA
Nickel	22.2		12.2		25.9		28.2		24.6		14		32	21500
Potassium	443	B	1200		757	B	1400		800	B	873	B	1900	NA
Selenium													NA	NA
Silver													1700	5500000
Sodium	157	BJ	228	B	126	BJ	119	BJ	125	BJ	626	B	240	NA
Thallium													460	NA
Tin	0.89	B	1.3	B	1.1	B	0.67	B					20	NA
Vanadium	10.5		8.1		21.3		22.4		15.4		12.2		25	7500
Zinc	64.6		32.7		109		80.8		58.4		37.4		140	320000

Table A.5. Soil Gas Confirmation Detected Nitrate-Nitrite

ANALYTE	SGC NAC 000001	SGC NAC 000002	SGC NAC 000003	SGC NAC 000004	SGC NAC 000005	SGC NAC 000006	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	83.9	93.8	88.5	83.3	78.4	75.0	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.0	1.8	1.2	2.1	7.2	4.8	26	NA

ANALYTE	SGC NAC 000007	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	83.9	95.0	78.9	83.9	90.1	84.7	NA	NA
Nitrate/Nitrite (MG-N/KG)	1.6	26.5	2.2	5.9	5.3	1.8	26	NA

ANALYTE	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	SGC SAN 000018	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	81.7	80.9	74.0	85.3	72.8	84.2	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.1	4.9	3.0	2.4	6.4	13.7	26	NA

ANALYTE	SGC NAC 000019	SGC NAC 000020	SGC NAC 000021	SGC NAC 000022	SGC NAC 000023	SGC NAC 000024	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	85.3	87.6	77.4	78.3	77.5	89.5	NA	NA
Nitrate/Nitrite (MG-N/KG)	6.5	2.1	6.1	2.2	11.6	2.2	26	NA

Table A.5. Soil Gas Confirmation Detected Nitrate-Nitrite (cont.)

ANALYTE	SGC NAC 000025	SGC NAC 000026	SGC NAC 000027	SGC NAC 000028	SGC NAC 000029	SGC NAC 000030	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	89.3	85.7	85.3	82.0	84.8	89.8	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.0	3.4	2.6	3.6	3.5	3.7	26	NA

ANALYTE	SGC NAC 000031	SGC NAC 000032	SGC NAC 000033	SGC NAC 000034	SGC NAC 000035	SGC NAC 000036	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	87.0	81.2	84.4	88.1	84.6	81.2	NA	NA
Nitrate/Nitrite (MG-N/KG)	4.8	4.2	1.1	3.7	3.5	2.2	26	NA

ANALYTE	SGC NAC 000037	SGC NAC 000038	SGC NAC 000039	SGC A66 000040	SGC A66 000041	SGC A61 000042	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	75.3	84.6	81.8	84.4	89.4	83.6	NA	NA
Nitrate/Nitrite (MG-N/KG)	1.7	2.4	1.4	3.9	2.0	1.4	26	NA

ANALYTE	SGC A61 000043	SGC A61 000044	SGC A61 000045	SGC A61 000046	SGC A61 000047	SGC A61 000048	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	94.8	96.2	93.0	81.8	85.6	94.8	NA	NA
Nitrate/Nitrite (MG-N/KG)	0.84	0.58	2.1	1.6	7.9	1.6	26	NA

Table A.6. Soil Gas Confirmation Detected Radionuclides

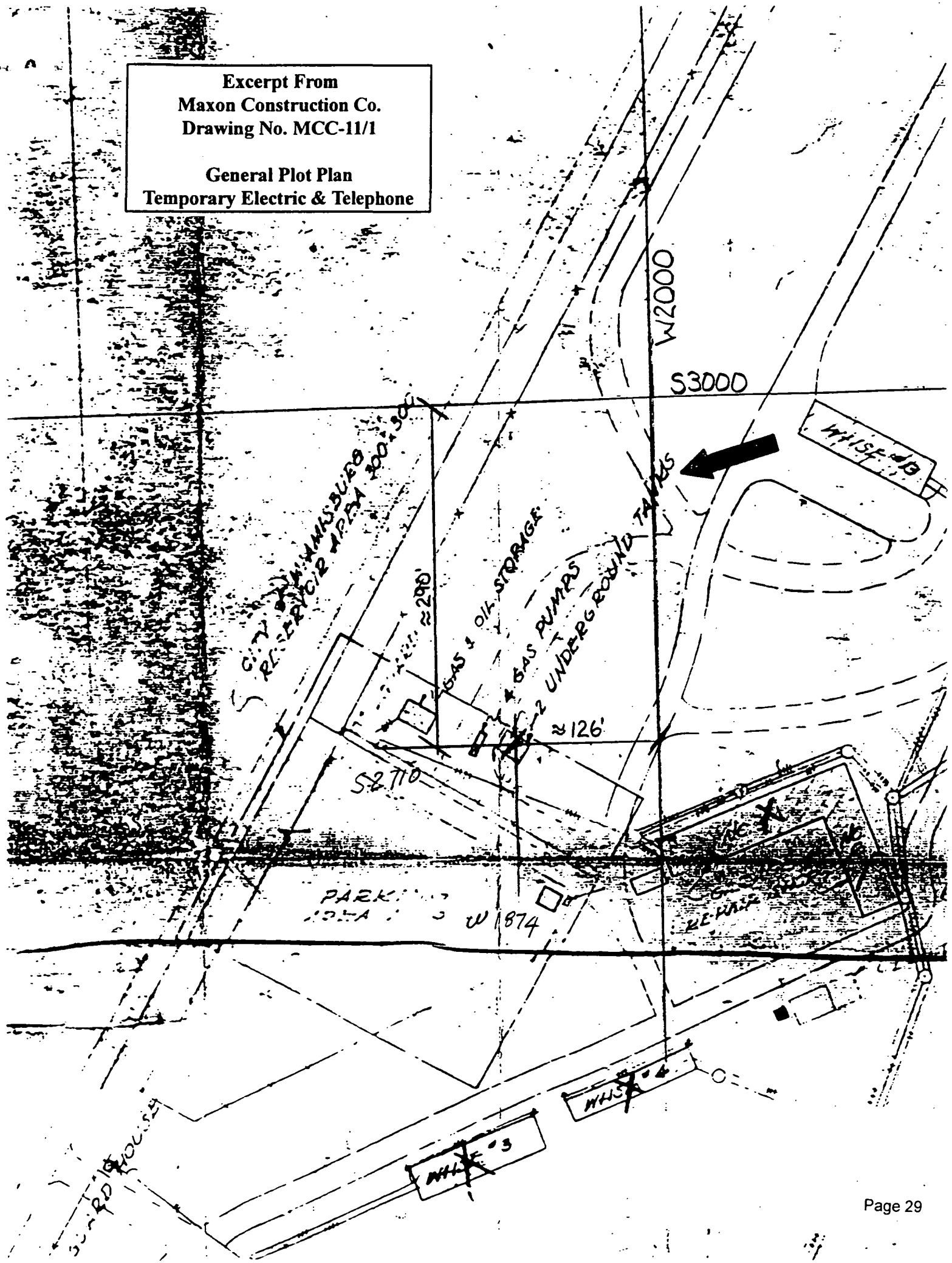
ANALYTE	SGC NAC 000001	SGC NAC 000002	SGC NAC 000003	SGC NAC 000004	SGC NAC 000005	SGC NAC 000006	SGC NAC 000007	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)									
Americium-241								ND	4.95
Bismuth-207								ND	0.175
Bismuth-210								ND	NA
Cesium-137						0.861		0.42	0.46
Cobalt-60								NC	0.1
Plutonium-238	1.42	0.0690	0.833	0.0870	0.543	4.32	0.537	0.13	5.5
Plutonium-239/240			0.0252					0.18	5.5
Potassium-40	21.7	2.95	6.53	27.4	15.1	14.3	10.8	37	NA
Radium-226	1.03	0.478	0.508	1.16	1.22	0.870	0.537	2	0.14
Thorium-228	1.52	0.277	0.370	1.24	1.05	1.06	0.431	1.5	0.85
Thorium-230	0.814	0.374	0.621	0.980	1.19	1.18	0.582	1.9	44
Thorium-232	1.30	0.184	0.315	1.17	0.950	1.18	0.328	1.4	50
Uranium-234	2.19	0.401	0.419	0.934	0.874	0.761	0.551	1.1	37.5
Uranium-235	0.0974		0.0400	0.0349	0.0328			0.11	3.35
Uranium-238	2.35	0.392	0.512	0.918	0.913	0.815	0.574	1.2	11

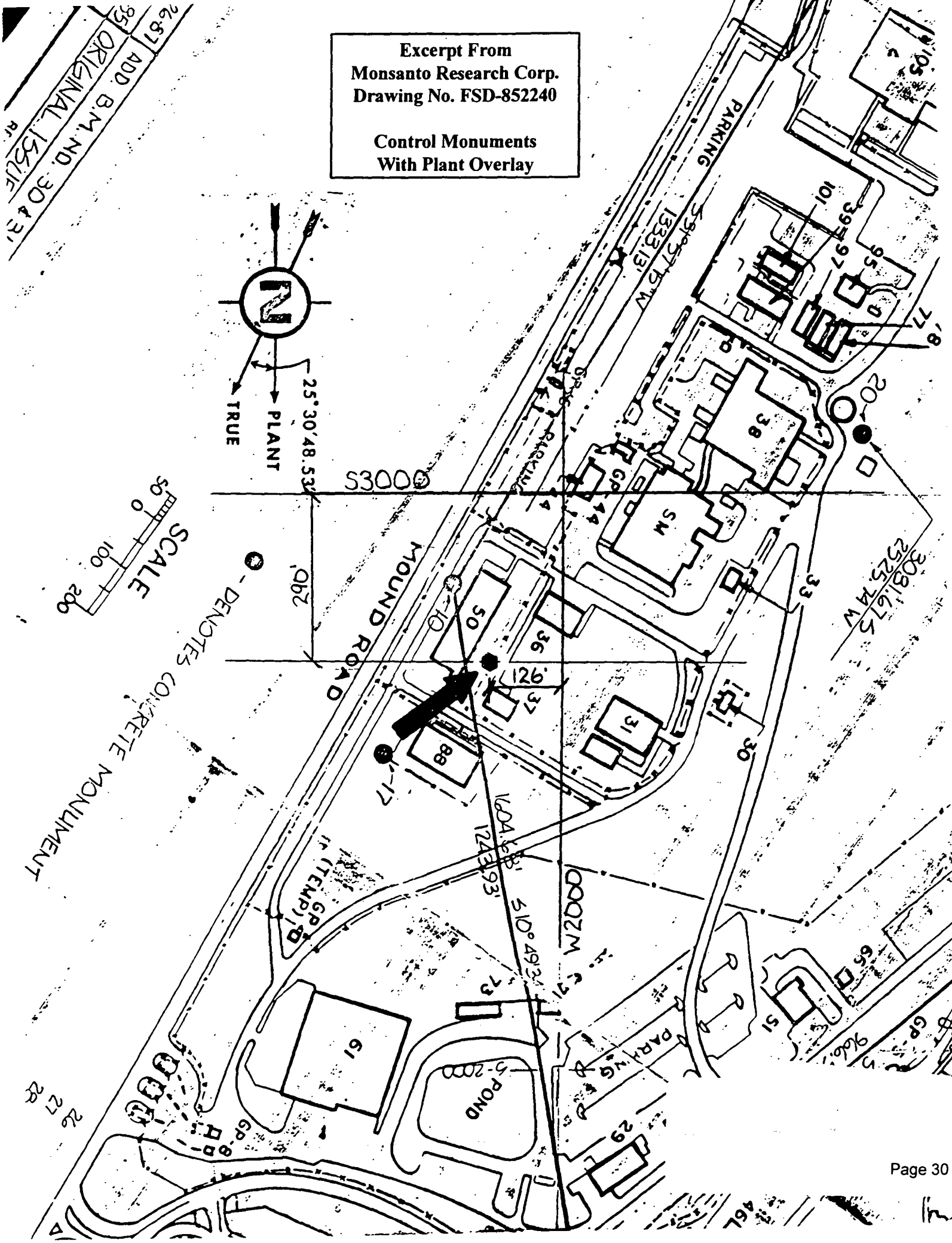
Table A.6. Soil Gas Confirmation Detected Radionuclides (cont.)

ANALYTE	SGC NAC 000029	SGC NAC 000030	SGC NAC 000031	SGC NAC 000032	SGC NAC 000033	SGC NAC 000034	SGC NAC 000035	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)									
Americium-241						0.00933		ND	4.95
Bismuth-207						0.0191		ND	0.175
Bismuth-210						0.0168		ND	NA
Cesium-137	0.493		0.393		0.602	-0.00785		0.42	0.46
Cobalt-60						-0.0628		NC	0.1
Plutonium-238	0.151	1.38	0.586	29.1	0.109	0.574	0.0569	0.13	5.5
Plutonium-239/240	0.0107		0.00822	0.0744	0.0143	0.00369		0.18	5.5
Potassium-40	29.1	3.23	12.2	21.3	31.4	16.5	24.8	37	NA
Radium-226	0.932		1.35	0.901	1.30	0.872	0.800	2	0.14
Thorium-228	1.31	0.0928	0.792	0.977	1.11	0.884	1.07	1.5	0.85
Thorium-230	0.843	0.140	1.48	0.848	0.907	1.34	0.881	1.9	44
Thorium-232	1.11	0.110	0.823	1.08	0.963	0.963	1.03	1.4	50
Uranium-234	0.774	0.171	0.811	0.738	0.796	0.977	0.827	1.1	37.5
Uranium-235	0.0418		0.0340		0.0550	0.0563	0.0267	0.11	3.35
Uranium-238	0.968	0.0922	0.936	0.851	0.938	0.978	0.768	1.2	11

Excerpt From
Maxon Construction Co.
Drawing No. MCC-11/1

General Plot Plan
Temporary Electric & Telephone



Excerpt From
Monsanto Research Corp.
Drawing No. FSD-852240

Control Monuments
With Plant Overlay