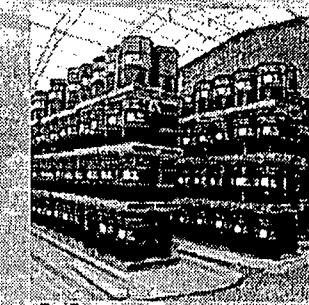
FERNALD CLEANUP PROGRESS BRIEFING
DECEMBER 1998

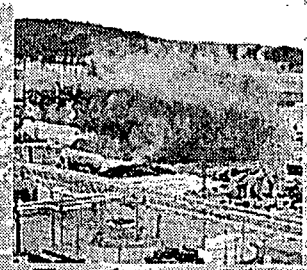
OU4 - Silos Project

OU1 - Waste Pits Remedial Action Project

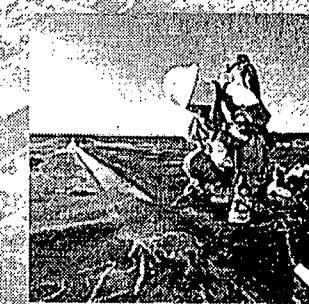


Waste Management Project

OU5 - Aquifer Restoration/ Wastewater Project



OU3 - Facilities Closure & Demolition Project



OU2 - On-Site Disposal Facility Project

Project Management

OU5 - Soil Characterization & Excavation Project

Graphics #5401.0A 12/98

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FERNALD CLEANUP PROGRESS BRIEFING
DECEMBER 1998

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6:30 p.m.	Opening Remarks	Gary Stegner
6:35 p.m.	Project Updates	
	OU1 - Waste Pits Remedial Action Project	Dave Lojek
	OU2 - On-Site Disposal Facility Project	Jay Jalovec
	OU3 - Facilities Closure & Demolition Project	Art Murphy
	OU4 - Silos Project	Nina Akgunduz
	OU5 - Aquifer Restoration/Wastewater Project	Rob Janke
	OU5 - Soil Characterization & Excavation Project	Chris Sutton
	Waste Management	John Sattler
	Question and Answer Session	
8:30 p.m.	Adjourn	

Graphics # 5401.0B 12/98

PROJECT NEWS
OU1 - WASTE PITS REMEDIAL ACTION PROJECT

- IT Corp. construction update
- Dryers to arrive in December/January
- Training for rail operations
- Rail progress
- Draft Remedial Action Package

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Graphics # 5401.1A 12/98

IT CORP. CONSTRUCTION SITE

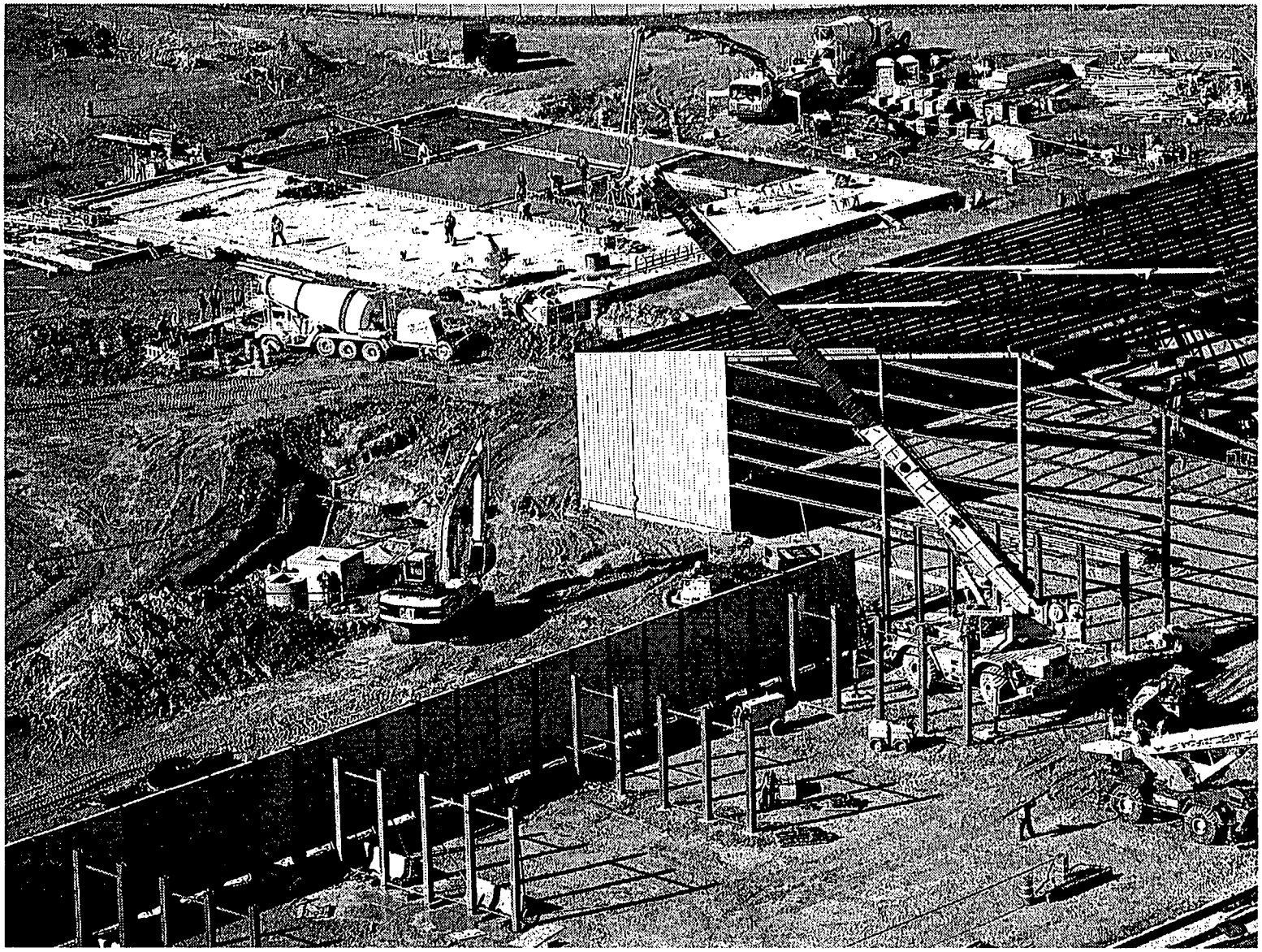

Photo taken November 1998

Graphics # 5401.1B 12/98 Photo # 7019-56

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MATERIAL HANDLING BUILDING

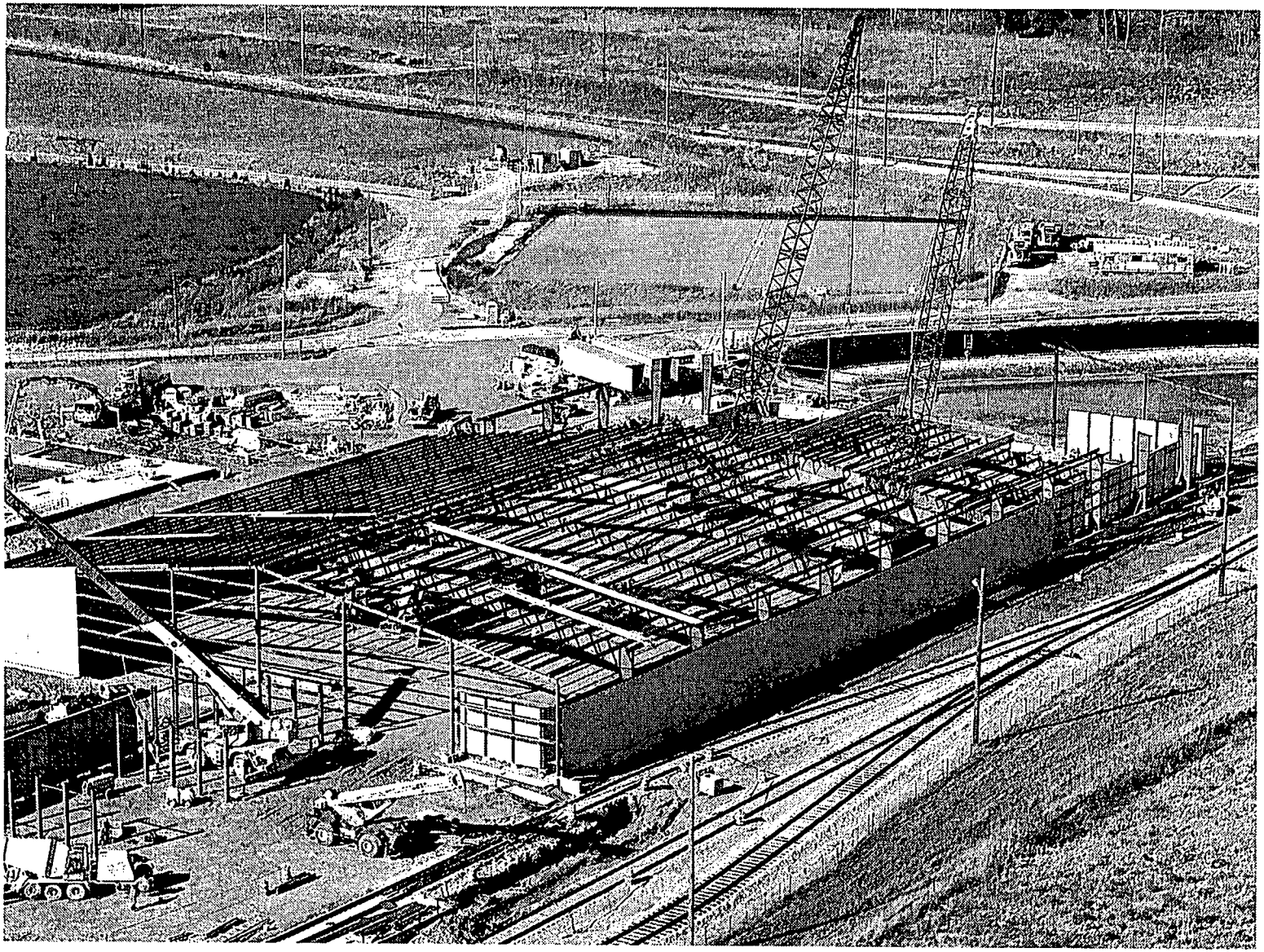

Photo taken November 1998

Graphics # 5401.1C 12/98 Photo # 7019-40

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GAS CONTROL SYSTEM

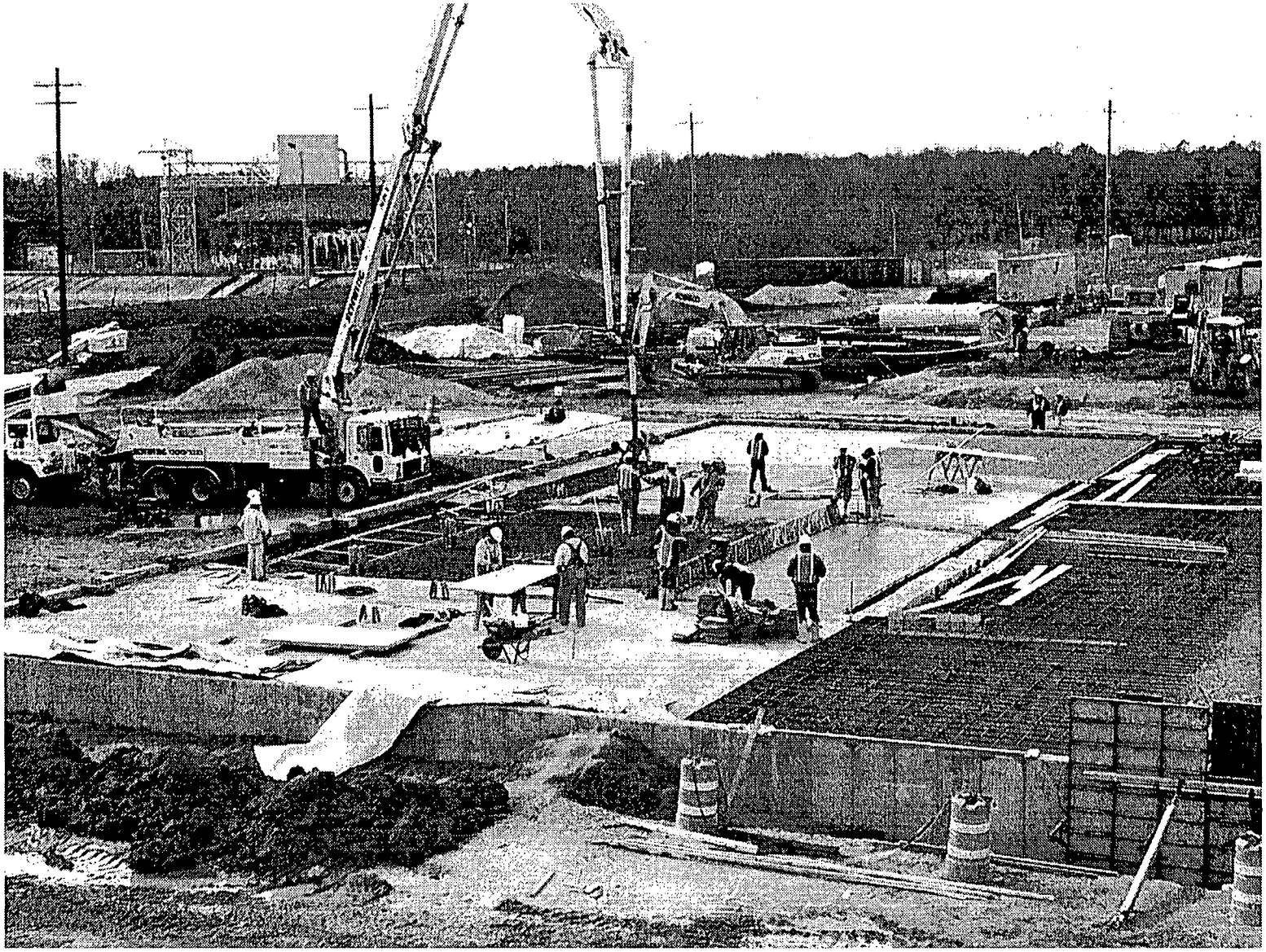

Photo taken November 1998

Graphics # 5401.1D 12/98 Photo # 6944-D337

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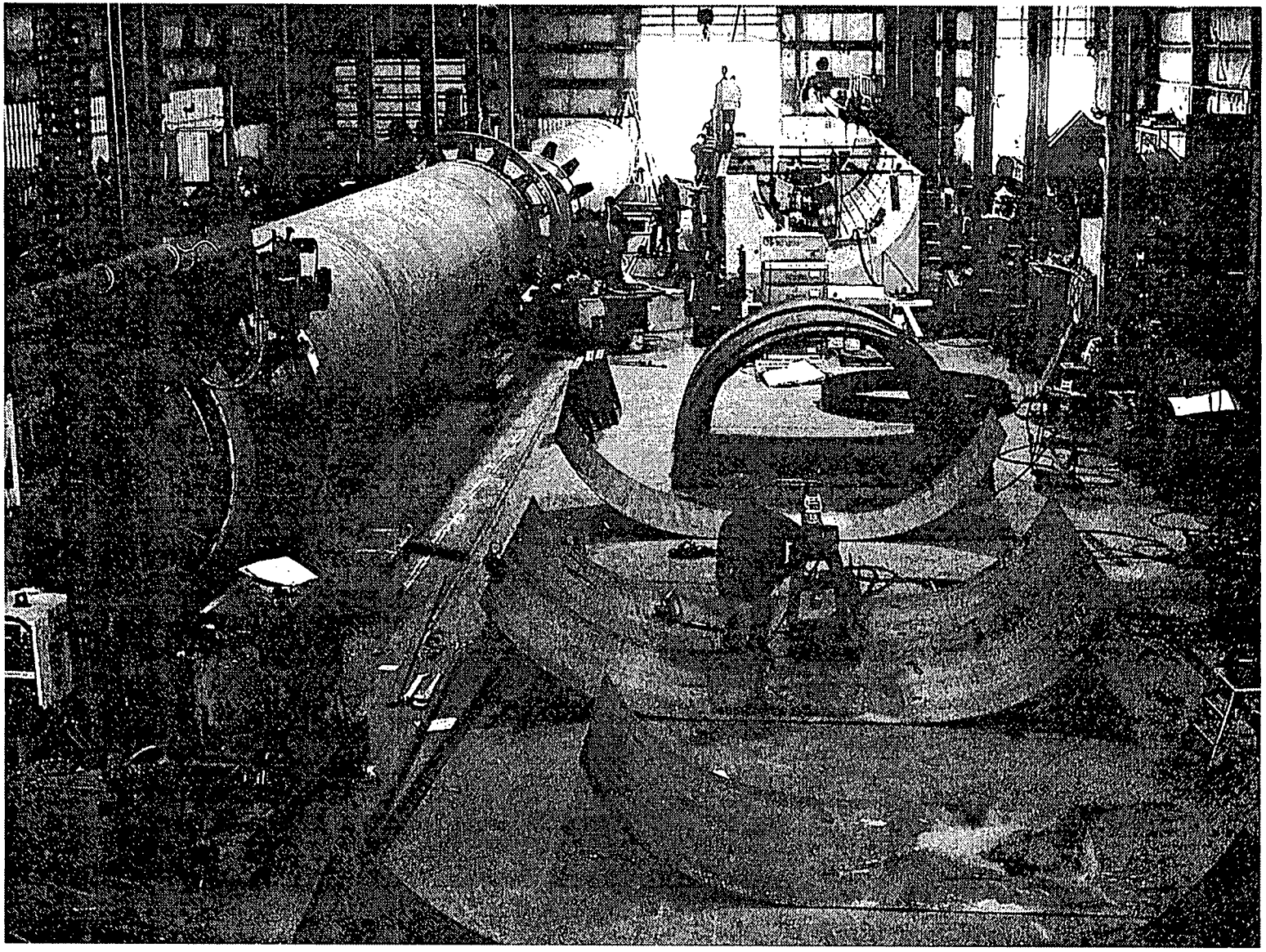
IT CORP. ROTARY DRYER



Graphics # 5401.1E 12/98 Photo #7022-1

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PROJECT NEWS
OU2 - ON-SITE DISPOSAL FACILITY

- Cell 1 Activities:
  - 232,214 loose cubic yards of soil and at/below grade debris placement
  - 15,107 loose cubic yards of demolition debris placement
- Cell 2 Activities:
  - First waste placement – 11/12/98
  - One foot protective layer – 11/20/98
- Vehicle Safety Incident

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CELL 2

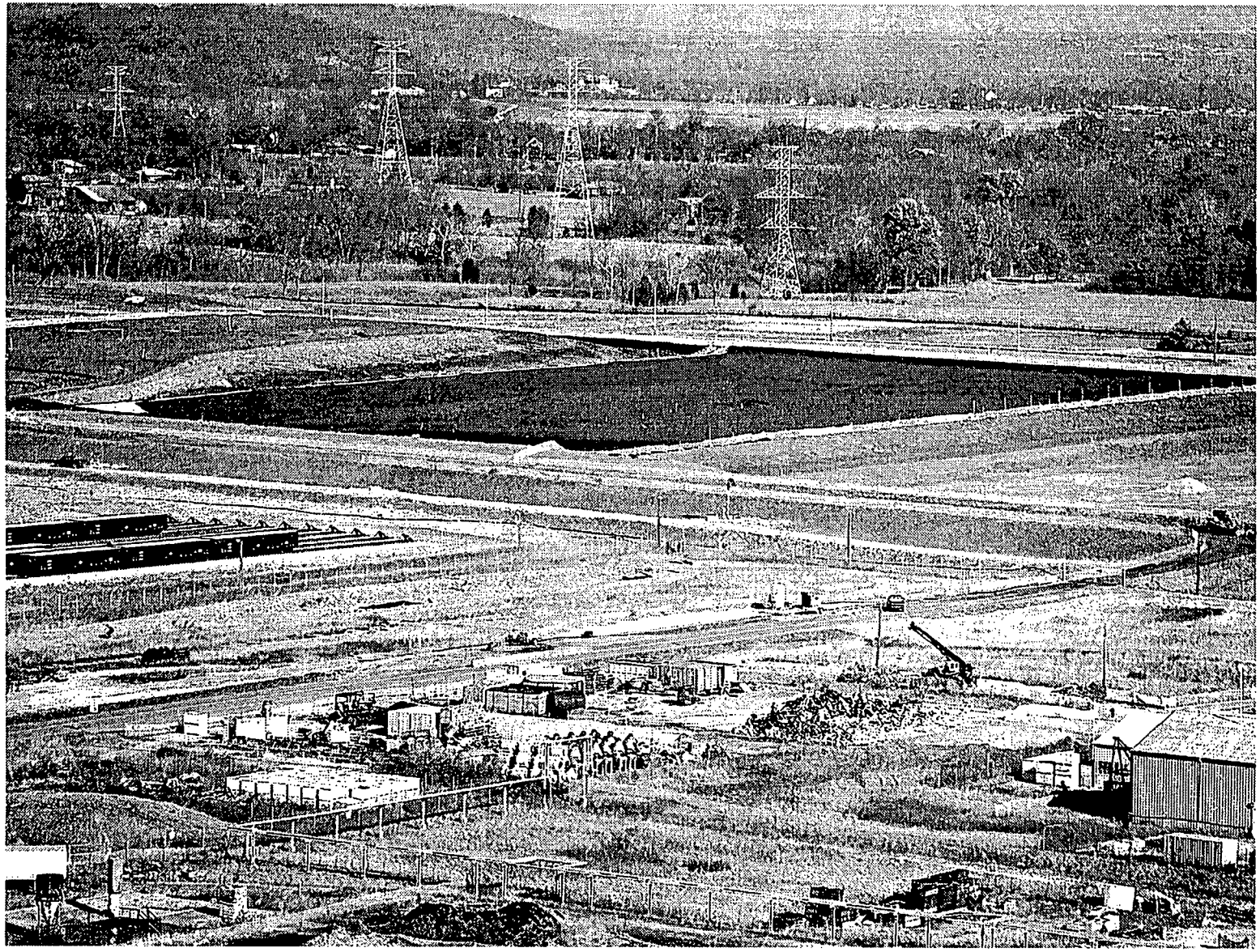

Photo taken November 1998

Graphics # 5401.2B 12/98 Photo #7019-60

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BORROW AREA

Photo taken November 1998

Graphics # 5401.2C 12/98 Photo #7019-19

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PROJECT NEWS
OU3 - FACILITIES CLOSURE & DEMOLITION PROJECTS

- Recent decontamination and dismantlement progress
- Plant 9
- Safe Shutdown status

Graphics # 5401.3A 12/98

BOILER PLANT BEFORE

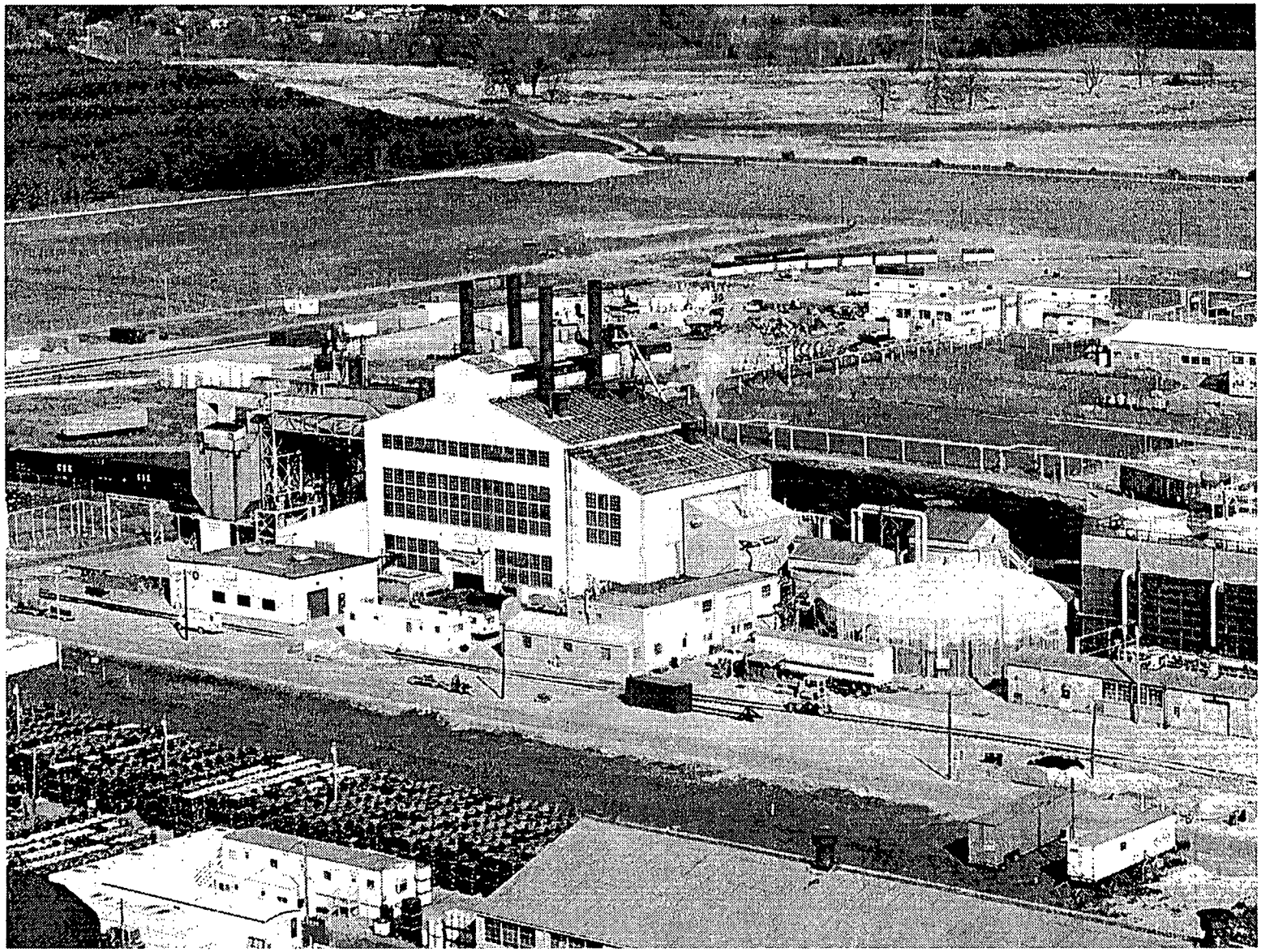

Photo taken November 1993

Graphics # 5401.3B 12/98 Photo #5560-28

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BOILER PLANT AFTER

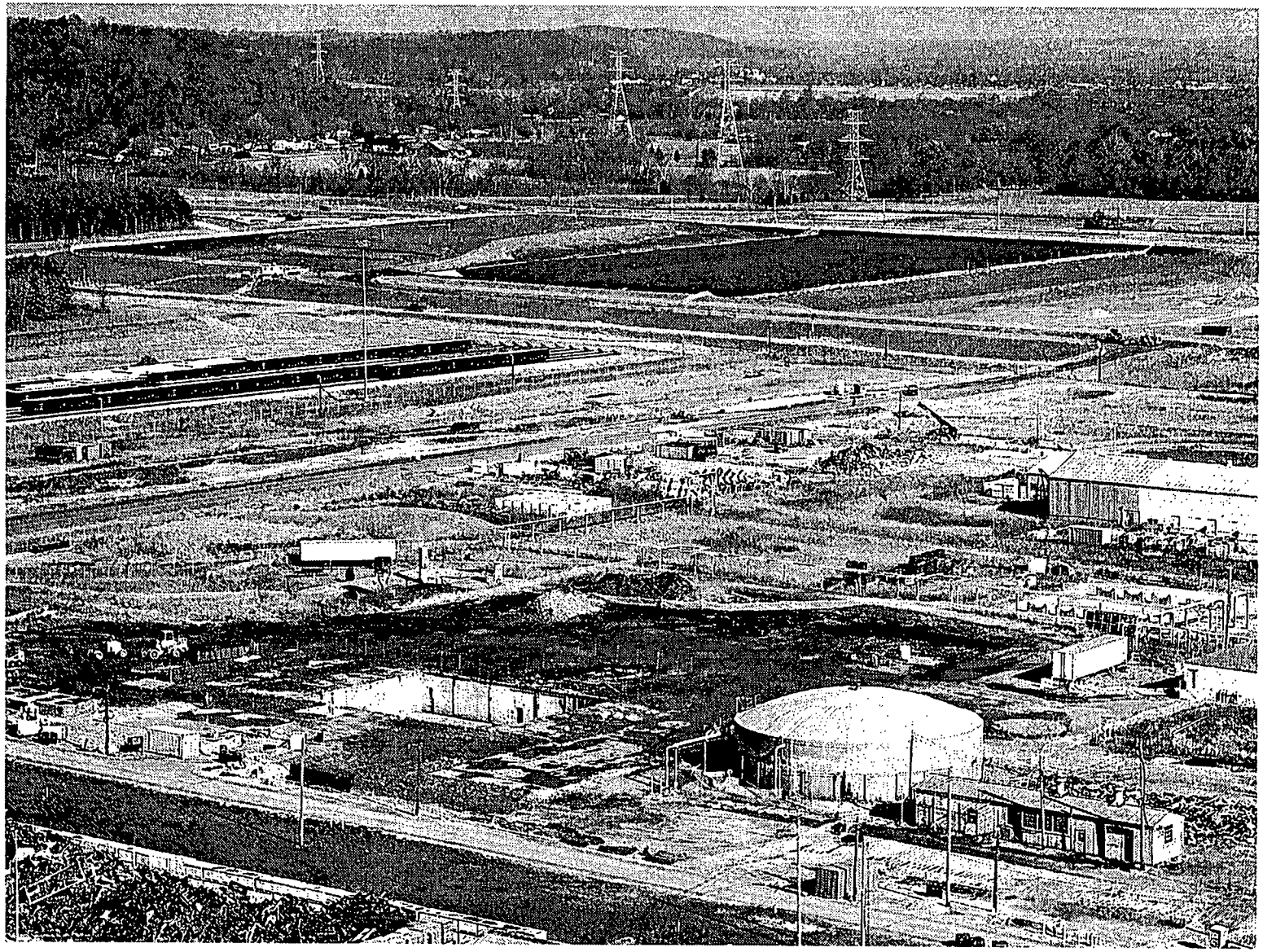

Photo taken November 1998

Graphics # 5401.3C 12/98 Photo #7019-49

PLANT 9

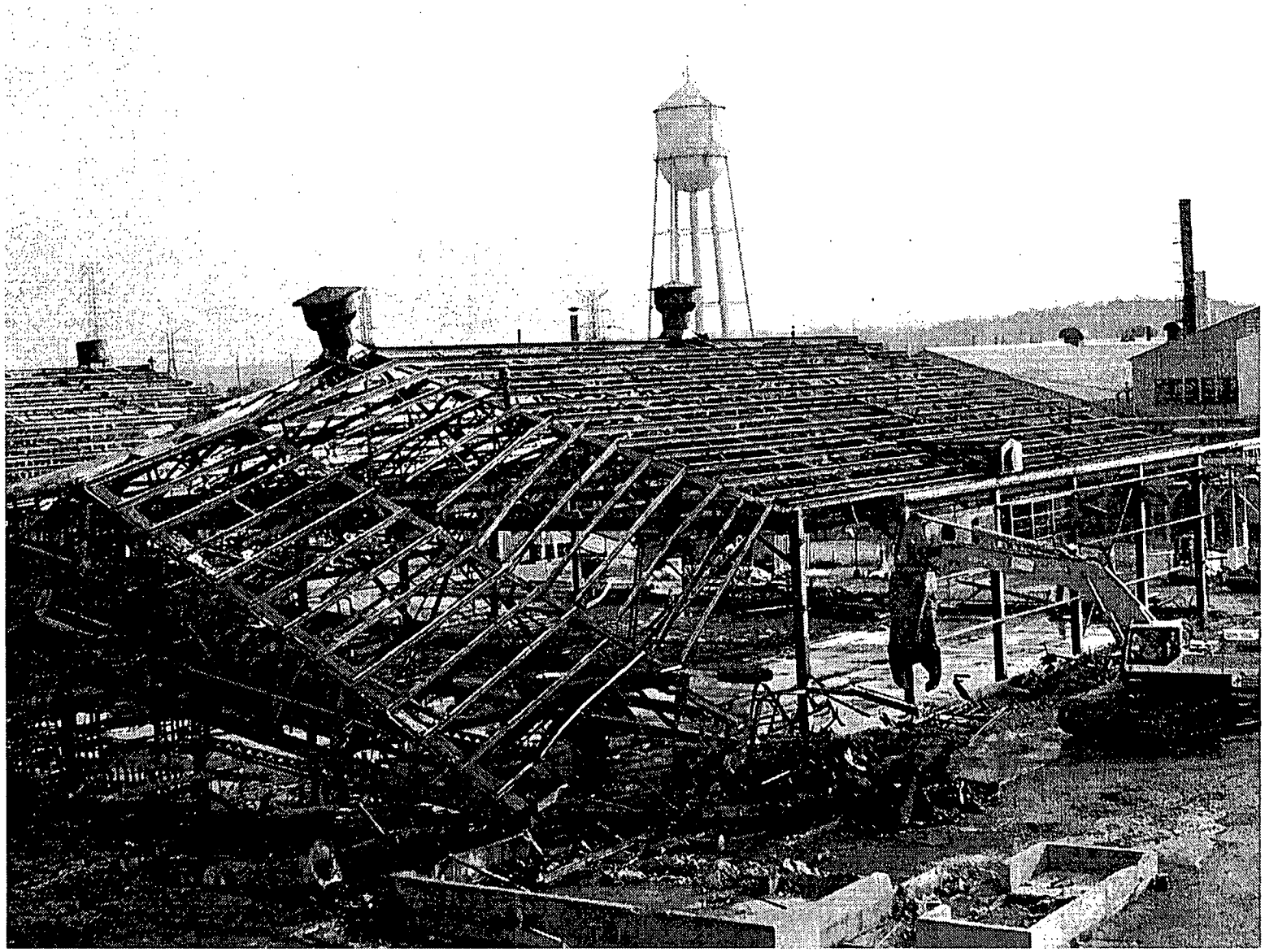

Photo taken November 1998

Graphics # 5401.3E 12/98 Photo #6494D-582

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PLANT 9

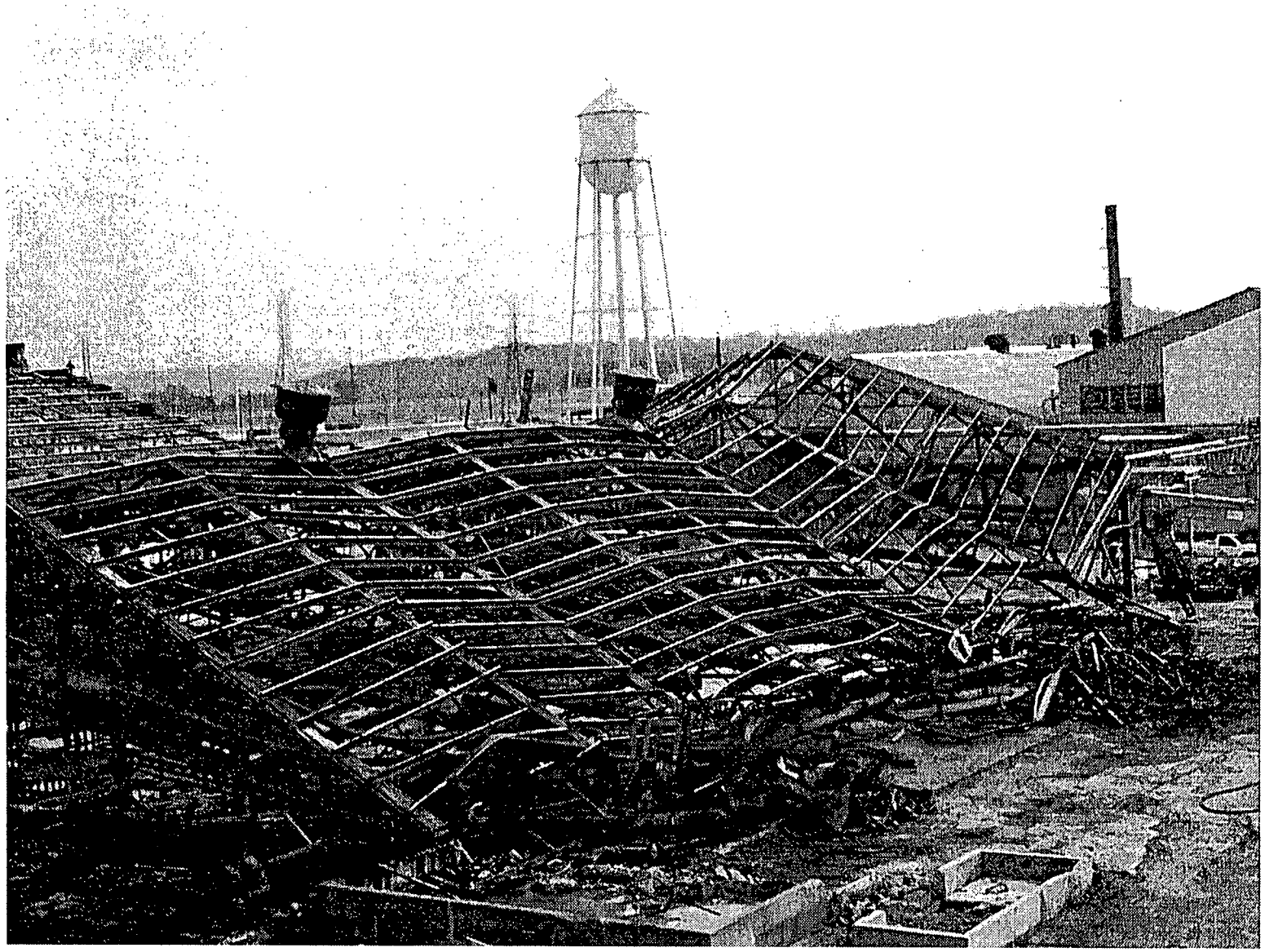


Photo taken November 1998

Graphics # 5401.3D 12/98 Photo #6494D-593

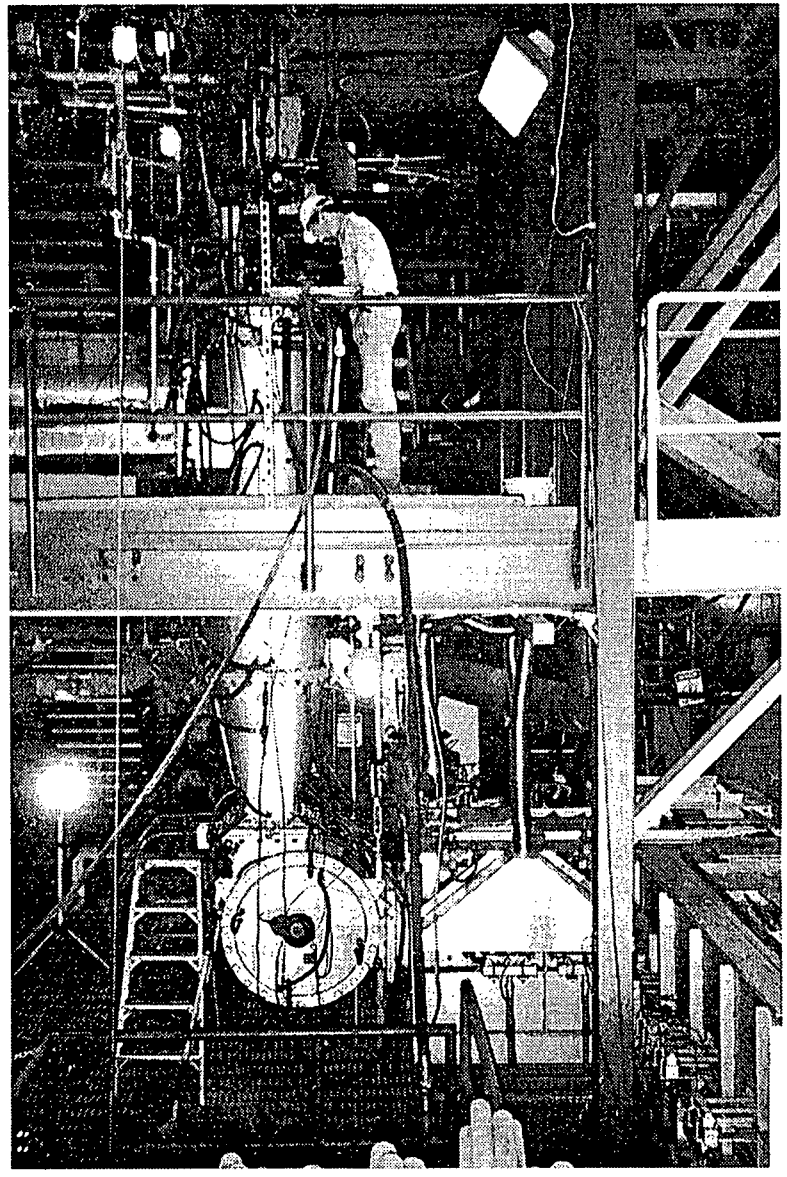
PROJECT NEWS
OU4 - SILOS PROJECT

Silos 1 & 2:

- Finalizing review process for Accelerated Waste Retrieval Proposals
- Proof-of-Principle demonstration runs started this month
- Draft feasibility study will be submitted to DOE in January

Graphics # 5401.4A 12/98

VORTEC CYCLONE VITRIFICATION UNIT



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Graphics # 5401.4B 12/98

PROJECT NEWS
OU4 - SILOS PROJECT

Silo 3:

- Consent Package will be submitted to DOE this month
- Contract expected to be awarded in January

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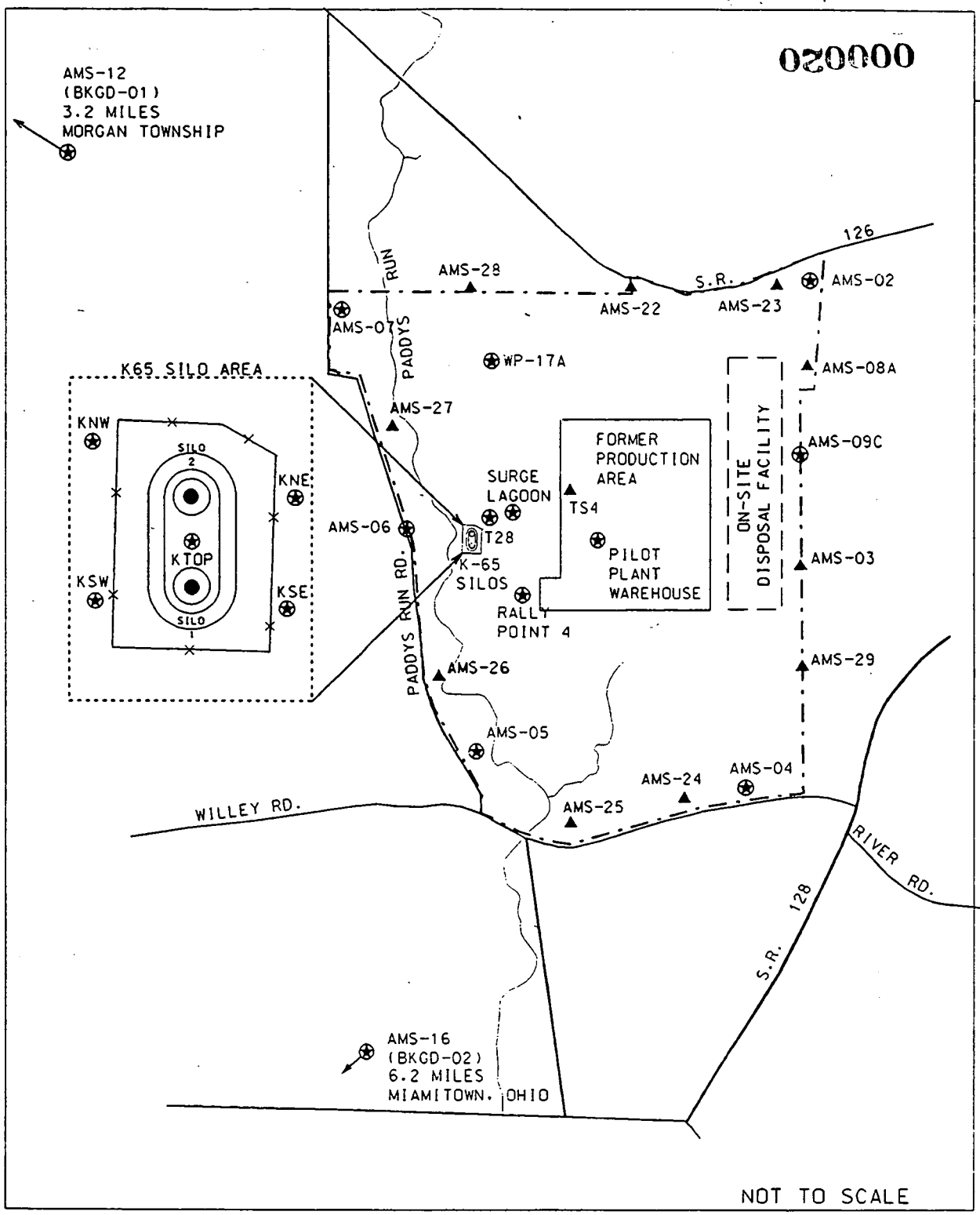

LEGEND:

- FEMP BOUNDARY
- ENVIRONMENTAL RADON MONITORING - CONTINUOUS ALPHA SCINTILLATION LOCATION
- PROPOSED CONTINUOUS MONITORING LOCATION FOR 1999
- DISTANCE FROM CENTER OF FORMER PRODUCTION AREA TO LOCATION OFF MAP
- SILO HEAD SPACE RADON MONITORING - CONTINUOUS ALPHA SCINTILLATION LOCATION

PROPOSED CONTINUOUS RADON MONITORING LOCATIONS

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07-DEC-1998

PROJECT NEWS
OU 5 - AQUIFER RESTORATION/ WASTEWATER PROJECT

Extraction/Injection Well Update for November

- South Field Extraction System
  - Consists of ten wells in the South Field Area
  - Extracted a total of 58,218,000 gallons of water
  - Average extraction rate was 1,348 gallons per minute
- South Plume Extraction System
  - Consists of six wells located south of Fernald's property boundary
  - Extracted a total of 86,136,000 gallons of water
  - Average extraction rate was 1,994 gallons per minute

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Graphics # 5401.5B 12/98

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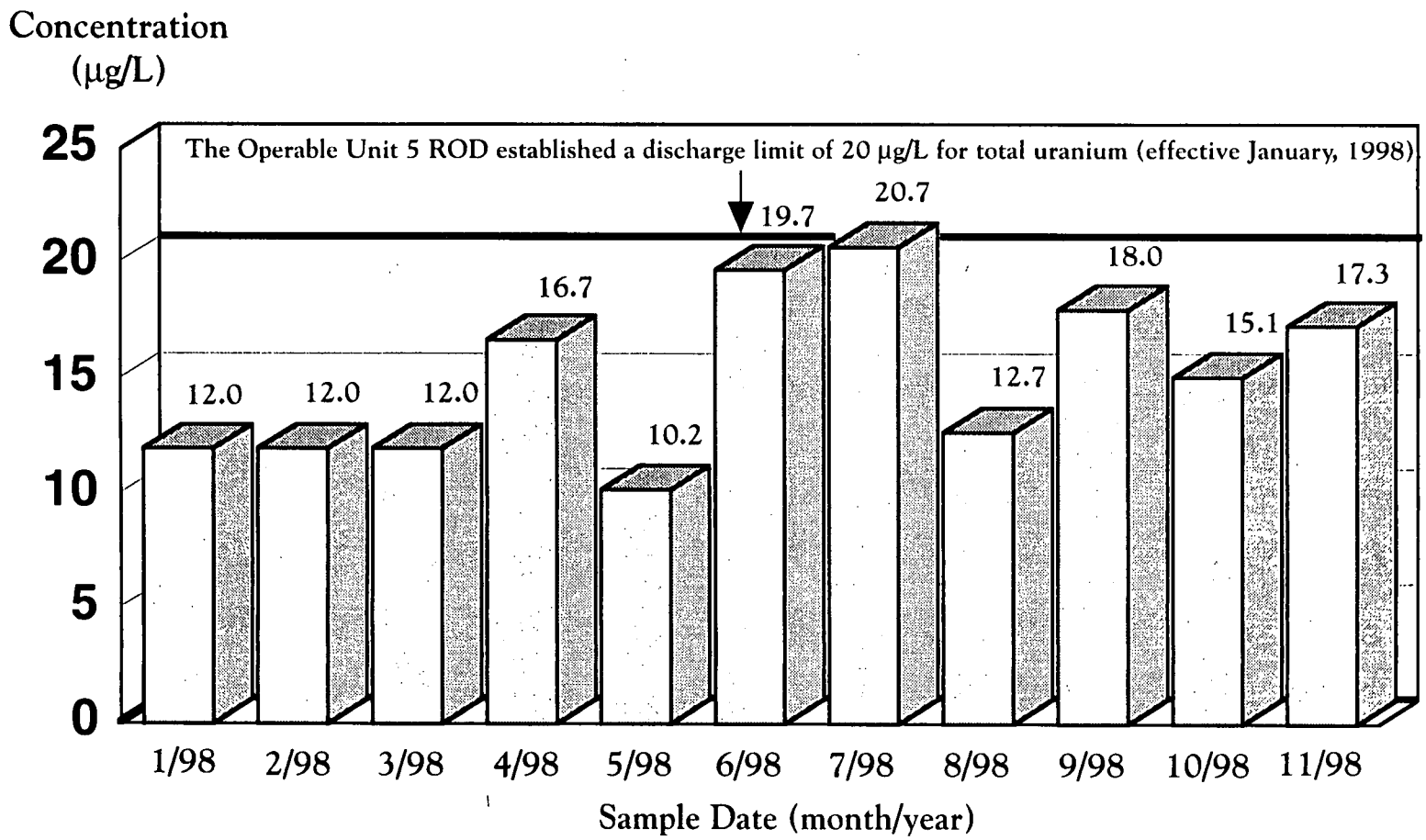
PROJECT NEWS
OU 5 - AQUIFER RESTORATION/ WASTEWATER PROJECT

Extraction/Injection Well Update for November

- Injection Demonstration
  - Consists of five wells located along Fernald's southern property boundary
  - Injected a total of 42,523,490 gallons of water
  - Average injection rate was 984 gallons per minute
- Water Treatment
  - In November, a total of 104,838,000 gallons of water were treated
  - Average treatment rate was 2,427 gallons per minute

AVERAGE MONTHLY TOTAL URANIUM CONCENTRATION DISCHARGED TO THE GREAT MIAMI RIVER IN 1998



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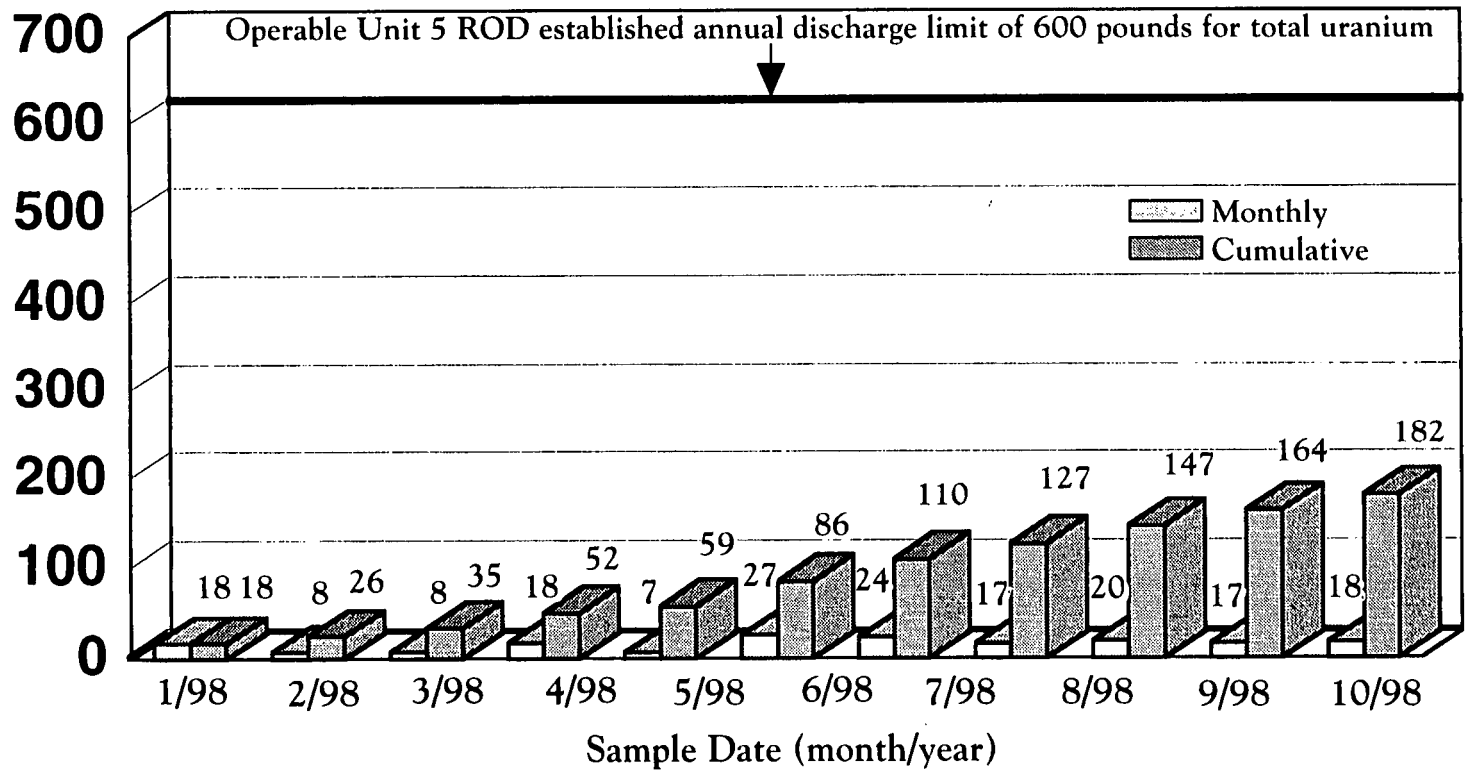
Graphics # 5401.5D 12/98

POUNDS OF URANIUM DISCHARGED TO THE GREAT MIAMI RIVER IN 1998



Note: Sum of monthly discharges may not always agree with cumulative total because of rounding differences.

Graphics # 5401.5E 12/98

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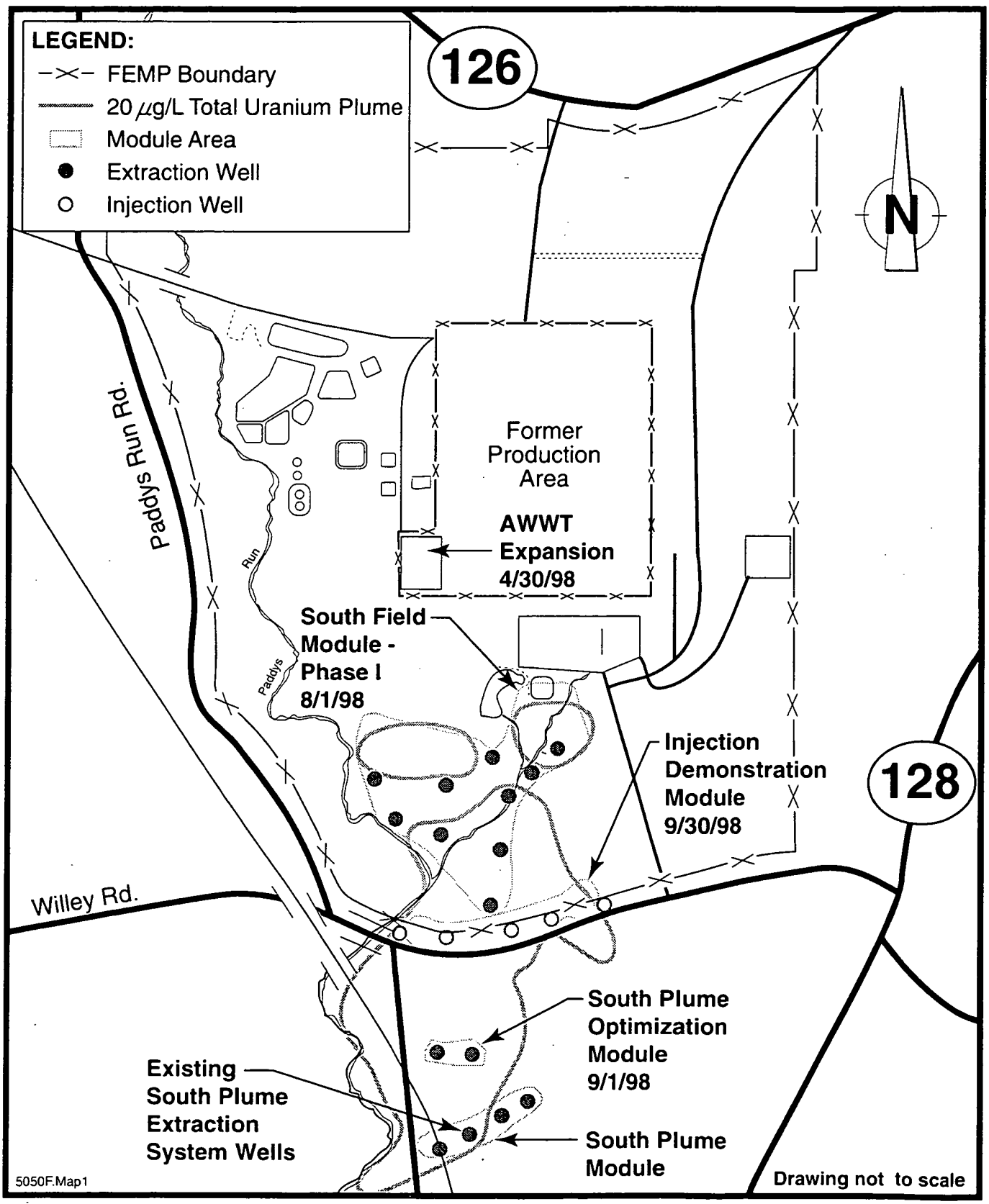
CURRENT AQUIFER RESTORATION MODULES & WELL LOCATIONS



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PROJECT NEWS
OU 5 - SOIL CHARACTERIZATION & EXCAVATION PROJECT

- Radiochemical Measurements
- In Situ Gamma Spectrometry
- Status of Real Time Program

Graphics # 5401.6A 12/98

HIGH PURITY GERMANIUM DETECTOR (HPGe)

Photo taken March 1998

Graphics # 5401.6B 12/98 Photo #6846-D26

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MOBILE RADIATION TRACKING SYSTEM (RTRAK)

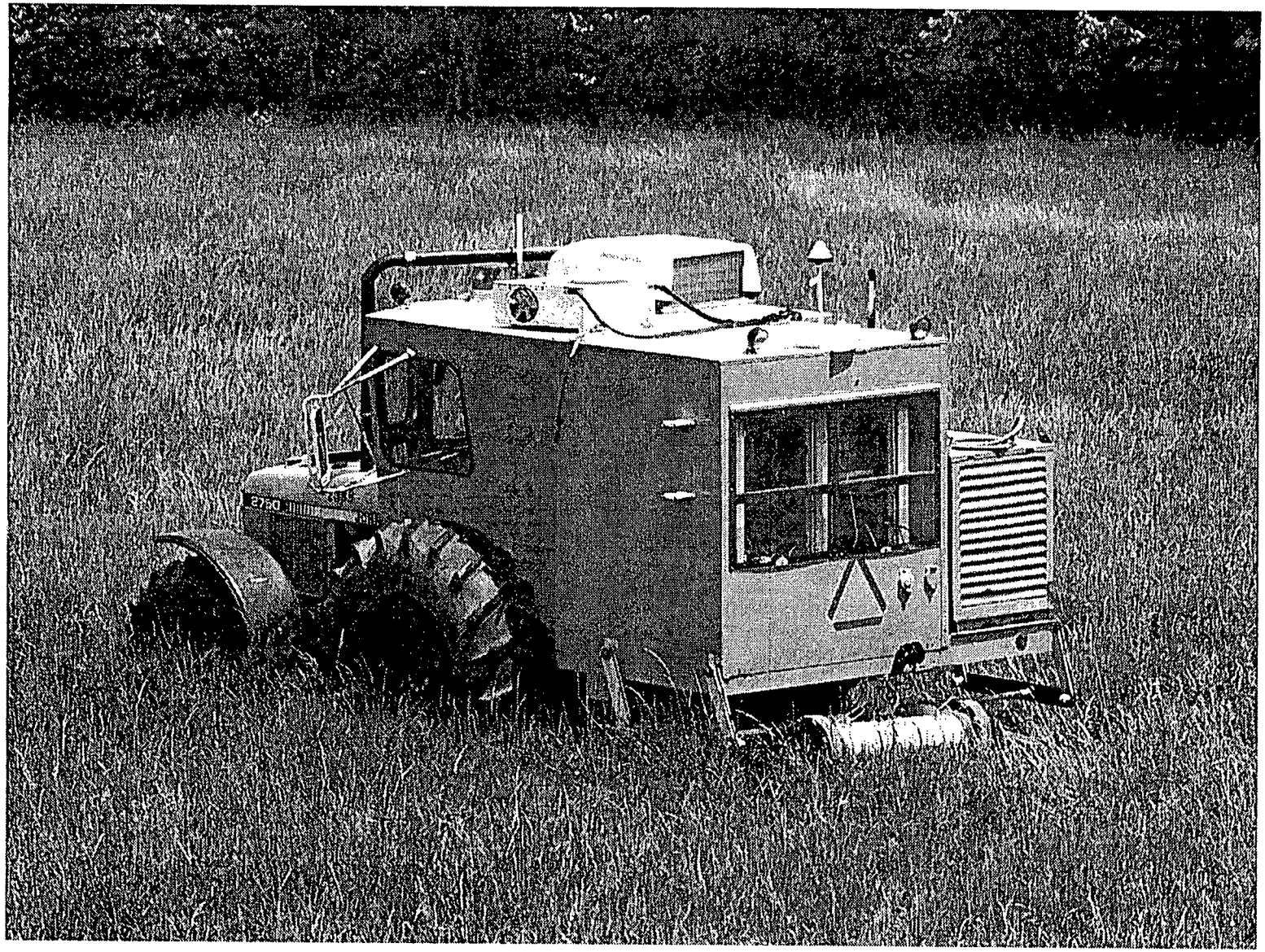

Photo taken May 1998

Graphics # 5401.6C 12/98 Photo #6846-D87

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RADIATION SCANNING SYSTEM (RSS)

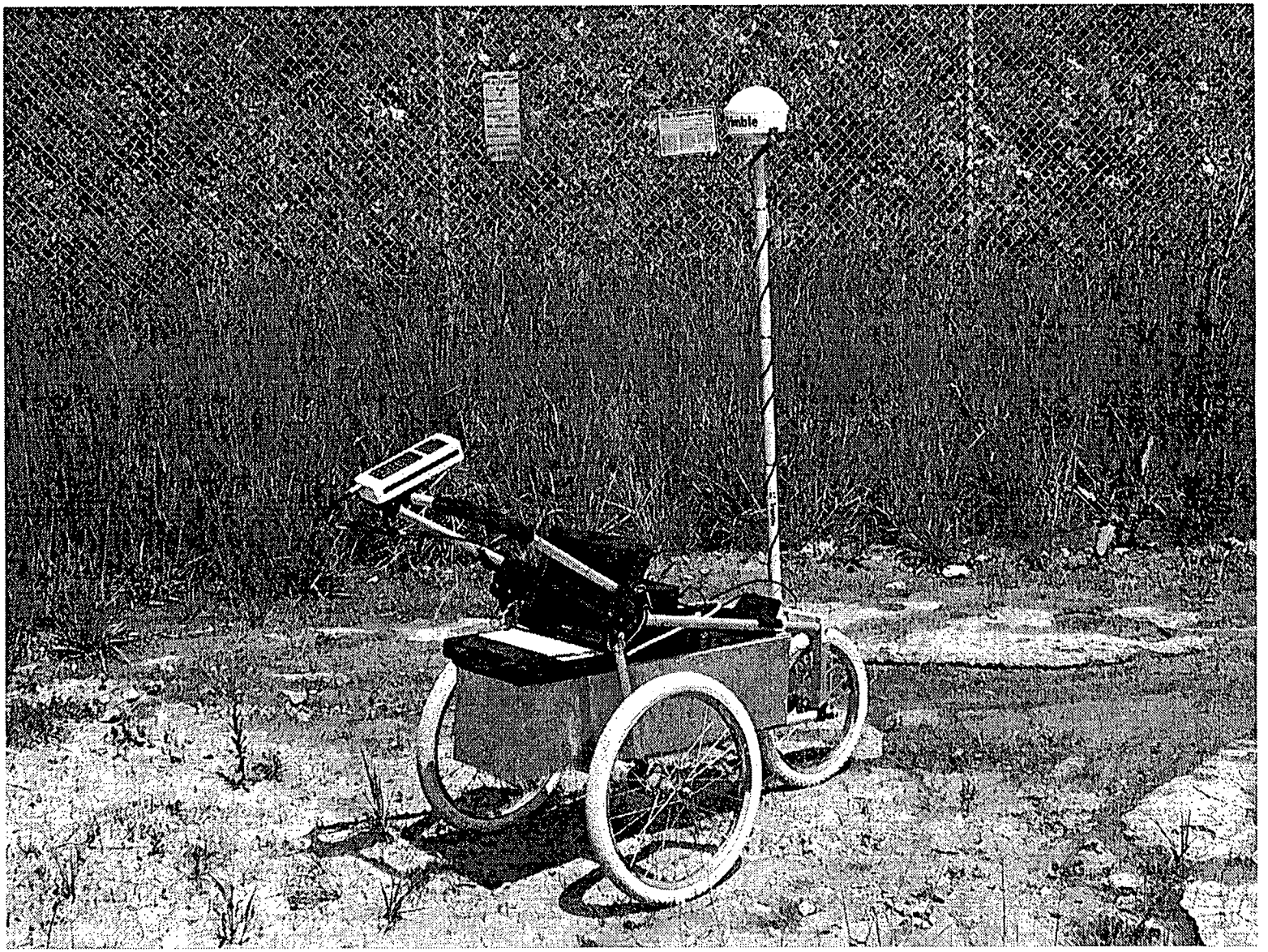

Photo taken May 1998

Graphics # 5401.6D 12/98 Photo #6846-D77

RTRAK DETECTS ABOVE WAC AREA DURING INACTIVE FLYASH PILE EXCAVATION

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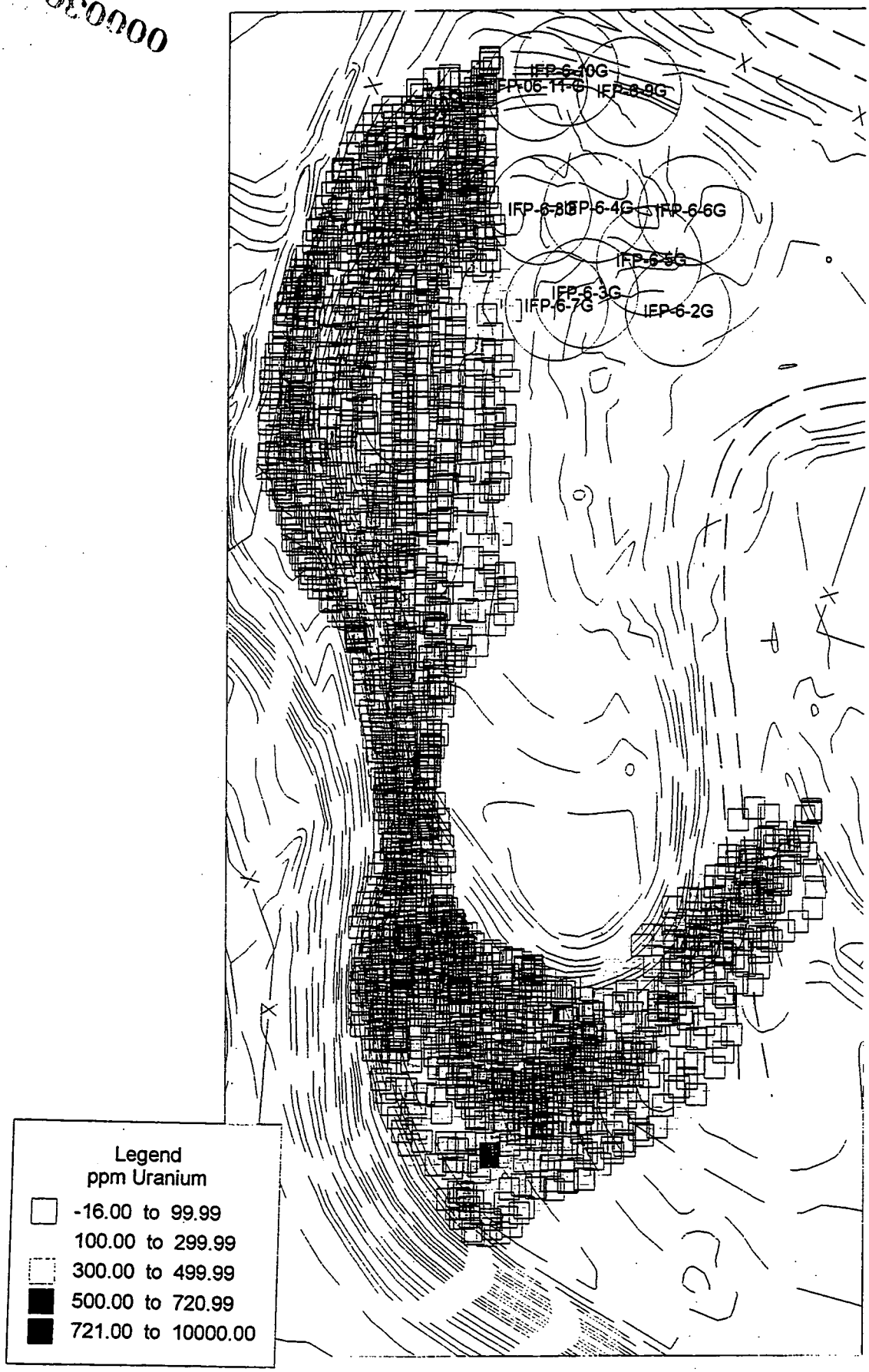

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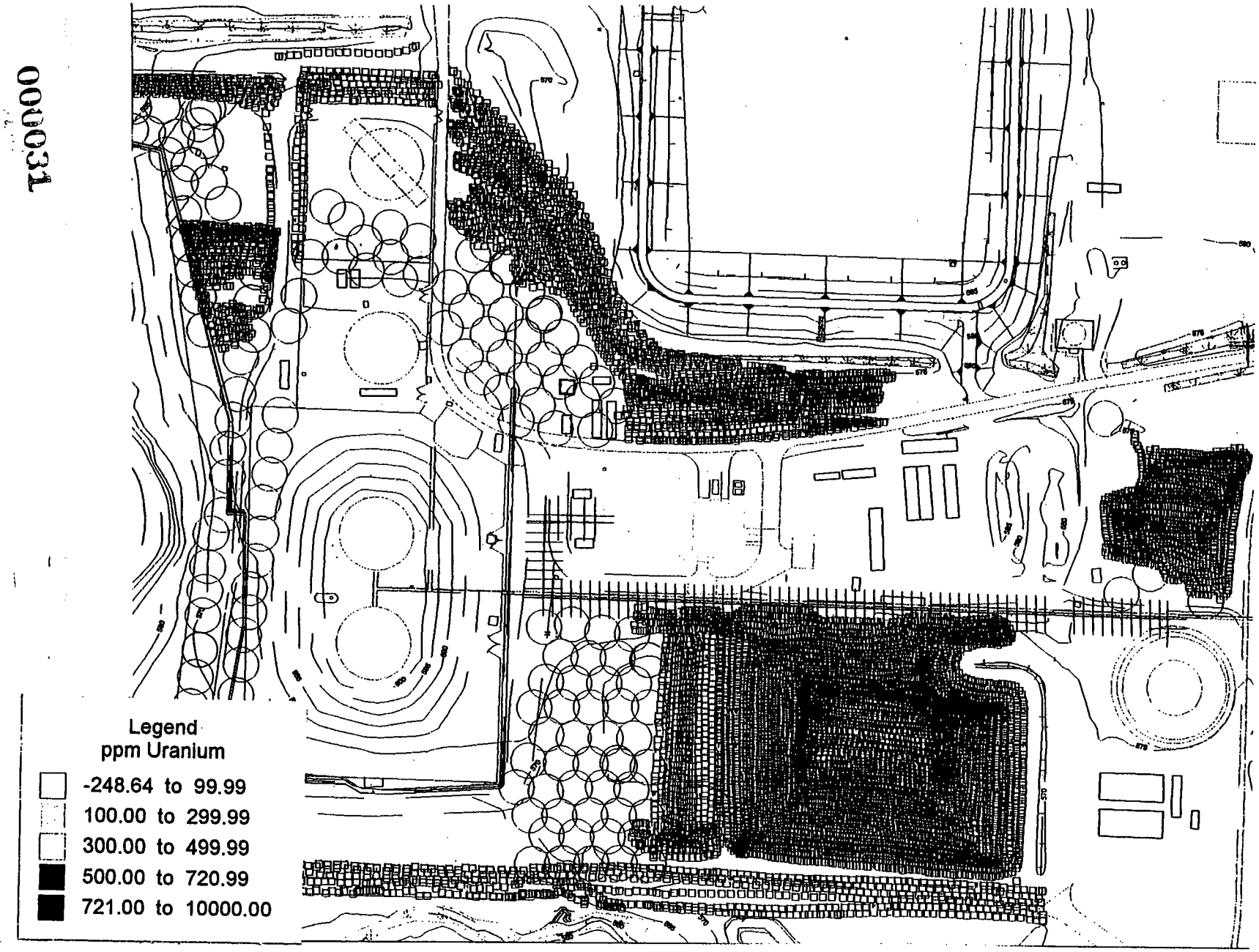
HPGe AND RTRAK MEASUREMENTS IN AREA 7 (SILOS)



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PROJECT NEWS
WASTE MANAGEMENT

- NTS surveillance team conducted assessment
- Nuclear materials continue to be shipped off site
- Batch 7 material will soon be transported to the TSCA Incinerator
- Scheduled to start shipping Batch 8 in January
- Initiated Thorium Legacy Waste Project

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LIQUID MIXED WASTE BULKING

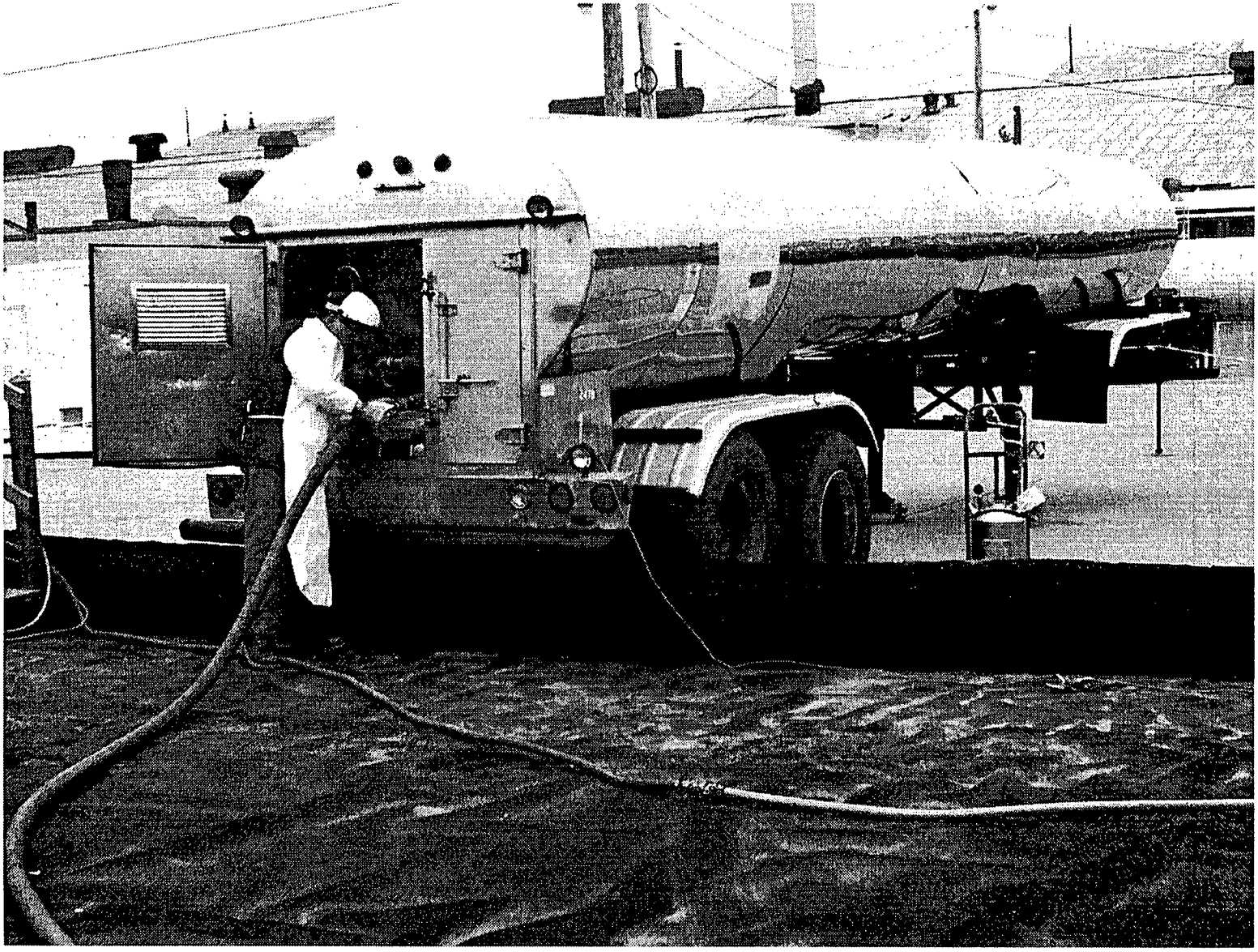

Photo taken November 1998

Graphics # 5401.7B 12/98 Photo # 6898-D9

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LOFT FUEL RODS

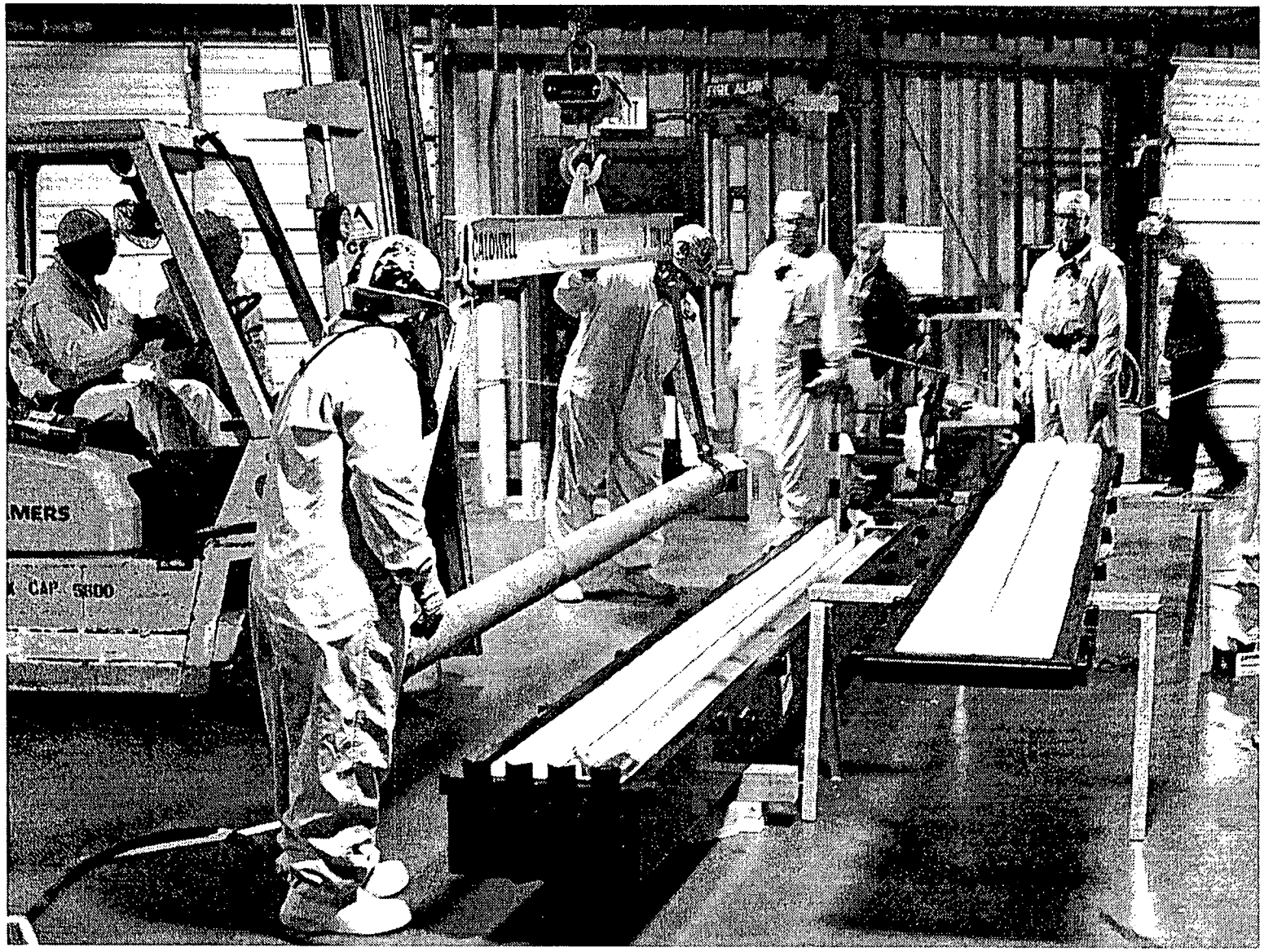

Photo taken November 1998

Graphics # 5401.7C 12/98 Photo # 6855-D79

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PROJECT NEWS
PROJECT MANAGEMENT

- "Accelerated Cleanup Plan" Paths to Closure
  - Draft guidance for FY 1999 Paths to Closure update has been issued and the final "integrated" guidance is expected to be issued by 12-18-98
  - Draft versions of the Site Paths to Closure Reports will be due in May 1999 so that the final reports can be issued in June 1999
- FY99 Replan Change Proposal
  - DOE-HQ approved the FY99 Replan Change Proposal with comments and exceptions
  - DOE-HQ has requested additional information

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WASTE PITS REMEDIAL ACTION PROJECT

NOVEMBER 1998	
Major Work Activities	**Enforceable Milestones**
International Technology (IT) Corporation Subcontract • Continued construction of treatment and railcar loadout facilities • Continued developing/finalizing pre-operations deliverables • U.S. EPA disapproved the Draft Remedial Action (RA) Package; Ohio EPA currently reviewing the package	None
Planning, Training & Contracts • Completed rail operations training • Received draft rail transportation tender from Union Pacific Rail Road & CSXT; continued tender negotiations	

60-DAY LOOK AHEAD	
Anticipated Work Activities	**Enforceable Milestones**
IT Corporation Subcontract • Continue construction of treatment and railcar loadout facilities • Receive two rotary dryers from manufacturer • Finalize pre-operations deliverables • Await Ohio EPA's comments on Draft RA Package; submit Final Draft RA Package to agencies, contingent on comment resolution	None
Planning, Training & Contracts • Initiate treatment facility operations training for on-site personnel • Continue rail transportation tender negotiations	

DOE Project Manager --- Dave Lojek/513-648-3127

FDF Division Manager --- Bob Fellman/513-648-4755

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ON-SITE DISPOSAL FACILITY PROJECT

NOVEMBER 1998	
Major Work Activities	**Enforceable Milestones**
• Completed installation of leachate collection system drainage layer for Cell 2 • Placed 1-foot protective cover on Cell 2 • Continued placement of impacted material into Cell 1	Met milestone for protective cover on Cell 2 on 11/20/98, **in advance of actual milestone date of 12/31/98**

60-DAY LOOK AHEAD	
Anticipated Work Activities	**Enforceable Milestones**
• Complete placement of 2 feet of select impacted material into Cell 2 • Continue placement of impacted material into Cell 1 • Continue impacted material placement as long as weather conditions permit	Place protective cover on Cell 2 by 12/31/98 **(as noted above, this milestone was met on 11/12/98, over 45 days in advance of actual milestone date)**

DOE Project Manager --- Jay Jalovec/513-648-3122

FDF Project Manager --- Mike Hickey/513-648-5971

FACILITIES CLOSURE & DEMOLITION PROJECTS

NOVEMBER 1998

Major Work Activities		Enforceable Milestones
Safe Shutdown Project		Submitted Project Closeout Report for Sewage Treatment Plant Complex to regulatory agencies 10/28/98, **in advance of actual milestone date of 11/04/98**
• Plant 2 – Completed isolation of electrical utilities • Plant 6 – Continued holdup removal in selected areas – Completed isolation/draining of condensate systems	• Non-Nuclear Facilities/Miscellaneous – Completed holdup removal in various areas of Tank Farm Complex	
Decontamination & Dismantlement (D&D) Projects		
• Maintenance/Tank Farm & Water Storage Tank Project – Mobilized subcontractor & began field activities • Thorium/Plant 9 Complex – Completed removal of all wall & roof transite; 99.9% of all transite has now been wrapped & transferred – Demolished East and West Bays of Plant 9 – Removed, contained & transferred all lead • Plant 5 Complex – Issued Request for Proposal (RFP); conducted pre-bid meeting & site tour for pre-qualified bidders	• Miscellaneous Small Structures – Dismantled Buildings 3G, 22A, 39C and 45B • Recycling Supplemental Environmental Projects – Finalized plans with DOE-Ashtabula to ship 436 tons of track rail, tie plates, spike plates & spikes for decontamination & unrestricted release – Finalized plans to ship 1,350 tons of copper motor windings to DOE in Oak Ridge, Tennessee, as a site-to-site property transfer for recycling **NOTE: See Waste Management Projects reference material for status of other waste minimization efforts.**	

60-DAY LOOK AHEAD

Anticipated Work Activities		Enforceable Milestones
Safe Shutdown Project		Submit Plant 3 Complex Draft Implementation Plan to regulatory agencies by 12/02/98
• Plant 6 – Complete holdup removal in selected areas	• Non-Nuclear Facilities – Continue line draining & holdup material removal at Tank Farm	
D&D Projects		Complete Boiler Plant/Water Plant Field Activities by 12/15/98
• Maintenance/Tank Farm & Water Storage Tank Project – Construct new water storage tank • Thorium/Plant 9 Complex – Complete structural steel shearing operations on 9A – Complete demobilization activities • Boiler Plant/Water Plant – Demobilize subcontractor – Complete project close-out report	• Plant 5 Project – Continue procurement activities; target due date for bids is 01/14/99 • Recycling Supplemental Environmental Projects – Begin shipment of containers of copper motor windings to DOE-Oak Ridge for recycling – Begin shipments of rail, splice plates & spikes to DOE-Ashtabula	

DOE Project Manager --- John Trygier/513-648-3154

FDF Division Manager --- Jamie Jameson/513-648-5308

SILOS PROJECT

NOVEMBER 1998	
Major Work Activities	**Enforceable Milestones**
Silos 1 & 2 • Continued review of Accelerated Waste Retrieval (AWR) Project bid proposals • Approved contractor Proof-of-Principle Testing Work Plans from International Technology Group (for cement-based chemical stabilization) & Chem-Nuclear Systems Inc. (for non-cement-based chemical stabilization) • Scheduled 72-hour demonstration testing runs for all four Proof-of-Principle vendors	None
Silo 3 • Briefed Critical Analysis Team (CAT) on final technical & price proposals for Silo 3 remediation • Began preparation of Silo 3 Consent Package for DOE review • Completed closeout of Small Scale Waste Retrieval Project	

60-DAY LOOK AHEAD	
Anticipated Work Activities	**Enforceable Milestones**
Silo 1 & 2 • Observe 72-hour demonstration runs by all four Proof-of-Principle Testing vendors (regulatory agency representatives & CAT members will also observe these tests) • Brief CAT members on review of proposals for AWR contract • Submit AWR Consent Package to DOE for review prior to contract award • Complete Trailer Upgrade portion of Silos Infrastructure Project	None
Silo 3 • Submit Consent Package to DOE for review prior to contract award • Award Silo 3 Stabilization contract	

DOE Project Manager --- Nina Akgündüz/513-648-3110

FDF Project Manager --- Dennis Nixon/513-648-4800

AQUIFER RESTORATION/WASTEWATER PROJECT

NOVEMBER 1998	
Major Work Activities	**Enforceable Milestones**
Mobilized site construction contractor for General Sump Phaseout activities	Submitted monthly National Pollutant Discharge Elimination System (NPDES) Discharge Monitoring Report (DMR) to OEPA 11/12/98 (covering 10/98)
Continued discussing design changes to Stormwater Retention Basin with Ohio EPA	
Held initial design review for Advanced Wastewater Treatment (AWWT) Facility Laboratory Expansion with design subcontractor, Lockwood Greene Technologies, on 11/10/98	
Submitted Injection Demonstration Operations Report for September 1998 to DOE for further transmittal to regulatory agencies	

60-DAY LOOK AHEAD	
Anticipated Work Activities	**Enforceable Milestones**
Hold 60% design review 12/02/98 with Lockwood Greene on AWWT Laboratory Expansion Project	Submit monthly NPDES DMR to OEPA
Site construction subcontractor to install Biosurge Lagoon Ozone Injection System; potential construction completion date of 12/30/98	Submit IEMP Quarterly Update Report to regulatory agencies by 12/28/98
Continue operation of Injection Demonstration, South Plume Optimization & South Field Extraction modules	
Continue operation of Advanced Wastewater Treatment Facility	

DOE Project Manager --- Rob Janke/513-648-3124

FDF Division Manager --- Dennis Carr/513-648-3799

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SOIL CHARACTERIZATION & EXCAVATION PROJECT

NOVEMBER 1998	
Major Work Activities	**Enforceable Milestones**
Area 1 Phase II (Southern Portion of East Field) • Issued Request for Proposal to procure subcontractor for Trap Range Stabilization Package & held pre-proposal meeting for potential bidders • Began Site Preparation activities with removal of trees at South Access Road & construction of outfall sediment trap/ditch • Requested proposal from existing On-Site Disposal Facility (OSDF) contractor to perform Sewage Treatment Plant excavation	None
Area 2 Phase I (Southern Waste Units) • Initiated excavation of Active Flyash Pile 11/12/98 • Continued hauling of impacted material to OSDF for placement • Performed near real-time monitoring (with R-TRAK/High Purity Germanium monitoring equipment) to determine if additional excavation is needed in Inactive Flyash Pile area	
Area 9 , Phases I & II (Area East of Eastern FEMP Property Line) • Sent Revised Precertification Project-Specific Plans for both phases to regulatory agencies 11/12/98 • U.S. Army Corps of Engineers began work on property access	
Natural Resource Restoration • Completed planting of trees for Aesthetic Barrier Project • Completed construction of On-Property Public Access Habitat Area • Began work on Finding & Responsiveness Summary to public comments regarding final land use at Fernald site	

60-DAY LOOK AHEAD	
Anticipated Work Activities	**Enforceable Milestones**
Area 1 Phase II (Southern Portion of East Field) • Construct culverts & ditches as required in Site Preparation Package • Finalize negotiations with OSDF subcontractor to potentially perform Sewage Treatment Plant excavation • Receive responses to Trap Range Area Stabilization Request for Proposal; due date extended to 12/14/98	None
Area 2 Phase I (Southern Waste Units) • Continue Active Flyash Pile excavation, as weather conditions permit • Perform additional excavation in the Inactive Flyash Pile	
Natural Resource Restoration • Issue Responsiveness Summary and Finding regarding final land use at Fernald • Submit Phase I Wetland Mitigation Design to regulatory agencies • Initiate discussions with Natural Resource Trustees regarding settlement of State of Ohio's natural resource damages claim against DOE • Receive/review final proposals for *Ecological Restoration Case Study* subproject	

DOE Project Manager --- Rob Janke/513-648-3124

FDF Division Manager --- Dennis Carr/513-648-3799

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WASTE MANAGEMENT PROJECTS

NOVEMBER 1998		
Major Work Activities		**Enforceable Milestones**
Waste Shipping Activities		None
• Low Level Waste Shipping – Shipments to Nevada Test Site (NTS) still suspended pending Surveillance Closeout and final DOE-HQ approval	• Nuclear Materials Disposition – Shipped 14 more International Shipping Organization (ISO) containers of uranium trioxide (UO_3) in support of contract for sale of low enriched uranium – Made three shipments of Loss of Fluid Test (LOFT) Fuel Rods, beginning 11/01/98	
Mixed Waste Projects		
• Liquid Mixed Waste Project – Completed bulking of liquid wastes from former Solvent Extraction Project into Batch #9 – Bulked 500 gallons of oil from Plant 6 Safe Shutdown in Batch #9	• Thorium Legacy Waste Project (TLWP) – Successfully completed Standard Startup Review • Organic Treatment Project (OTP) – Continued discussions with Materials & Energy Corporation (M&EC) in Oak Ridge regarding potential mobilization of M&EC to Fernald to treat OTP inventory	
Nuclear Materials Projects		
• Nuclear Materials Disposition (NMD) – Continued discussions & planning for shipment of Fernald's uranium to the Uranium Management Center at Oak Ridge	• NMD Operations – Continued repackaging of <1.0% enriched uranium tetrafluoride (UF_4) in support of contract for sale of low enriched materials; 22 boxes packaged in 11/98 for project total of 120 boxes	
Waste Minimization/Pollution Prevention Project		
• Began efforts to inspect 145 drums of material of shredded copper; could potentially be shipped to an approved vendor for recycling **NOTE: See Facilities Closure & Demolition Projects reference material for additional recycling activity status.**		

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WASTE MANAGEMENT PROJECTS (CONTINUED)

60-DAY LOOK AHEAD		
Anticipated Work Activities		**Enforceable Milestones**
Waste Shipping Activities		Submit Fernald Site Treatment Plan Annual Report to Ohio EPA by 12/31/98
• Low Level Waste Shipping – Continue readiness activities and initiate resumption of shipments to NTS • Nuclear Materials Disposition – Continue shipping ISOs of UO_3 – Finish shipping LOFT fuel rods	• Mixed Waste Shipping – Ship Batch #7 (19,000+ gallons mixed waste) to Toxic Substance Control Act (TSCA) Incinerator – Ship Batch #8 (18,100 gallons newly generated & recharacterized low level waste) to TSCA	
Mixed Waste Projects		
• Neutralization/Precipitation/Deactivation/ Stabilization Project – Decontaminate/package dismantled equipment & complete demobilization by 12/15/98 • Liquid Mixed Waste Project – Continue bulking oils from Plant 6 Safe Shutdown into Batch #9	• TLWP – Issue "Readiness to Operate" memorandum – Initiate repackaging/shipping pending resumption of low level waste shipping • OTP – Continue investigating both on-site and off-site treatment options	
Nuclear Materials Projects		
• NMD – Continue discussions with Oak Ridge regarding transfer of selected Fernald nuclear materials		
Waste Minimization/Pollution Prevention Project		
NOTE: See Facilities Closure & Demolition Projects reference material for anticipated steel recycling activities.		

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FERNALD
Environmental Management Project

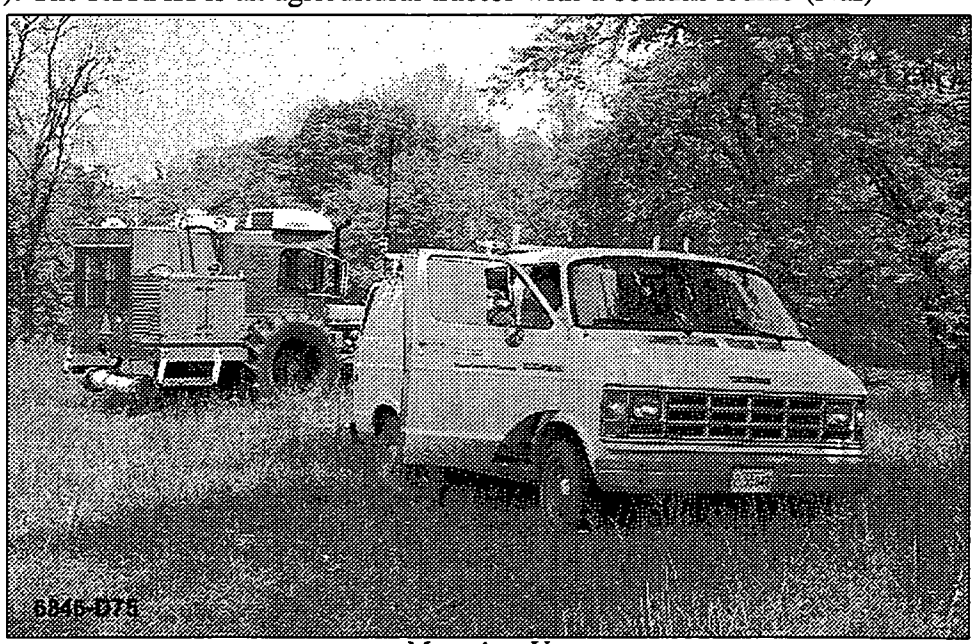
Deployment of Real-Time *In Situ* Gamma Spectrometry Technologies at Fernald

RTRAK (mobile radiation tracking system)

A Department of Energy (DOE) site entering the soil remediation phase is presented with a challenge. This challenge is to find a work process that will 1.) accurately characterize soil for its radiological constituents, 2.) quickly identify areas as above or below remediation criteria, and 3.) present the information in a manner that clearly communicates excavation directions to contractors. Conventional methods using discrete sampling and laboratory analysis require time lags of several days to several months as sample analyses are completed. This approach cannot provide soil analysis results in time to support excavation subcontractors removing soil in lifts. Excavation "down time" costs quickly accumulate and lead to increased remediation costs. At Fernald, an approach is being deployed that is able not only to match or better the conventional method in its accuracy, but also to provide the results in "real time."

The new approach, now being deployed at Fernald, utilizes traditional gamma spectrometry, vendor available field deployable gamma detection devices, and commercially available software, communication, and location devices in an innovative fashion. It provides real-time data analysis, display, and mapping of the results. To help refine and deploy the approach, Fernald applied for and received support from the DOE Office of Science and Technology Accelerated Site Technology Deployment Program (ASTD).

The new approach relies on the successful field integration of data from three main pieces of real-time radiation detection equipment: the mobile radiation tracking system (RTRAK), the radiation scanning system (RSS), and high purity germanium detectors (HPGe). The RTRAK is an agricultural tractor with a sodium iodide (NaI) detector mounted on the back at a height of one foot. A computer on-board the RTRAK outfitted with gamma spectrometry processing software processes and displays the data received from the NaI detector in real time. A Global Positioning System (GPS) hook up allows spatial areas of radiological contamination to be plotted on the on-board computer screen. The RTRAK operator in real-time knows the concentration of radionuclides in any previously scanned vicinity, the precise location of any past analysis, and the location of his vehicle. The operator can also monitor the gamma ray spectrum being acquired, perform



Mapping Van

HPGe (high purity germanium detector)

preliminary quality control checks on the data, and monitor the GPS signal for satellite linkage. The data is transferred by radio wave transmission to a mapping van in a nearby location. The data then receives an in-depth quality control check. Finally, a field map is printed and excavation decisions can be made, allowing excavation personnel to immediately resume excavation activities. The RSS employs the same technology as the RTRAK. The difference is the equipment is mounted on a small jogging stroller. The RSS is used to analyze those areas that are inaccessible to the RTRAK.

The HPGe employs some of the same software and hardware as the RTRAK and RSS with the exception of the detector crystal. The HPGe is manually located for each measurement until the soil area being measured is completely characterized. The HPGe detector has the resolution to differentiate between multiple gamma-emitting radionuclides. Therefore, if necessary, it is used in support of and to refine decisions made with the RTRAK or RSS. In addition, the HPGe is used to confirm that soils above the action level have been removed, as well that the soil remaining in place meets final soil remediation criteria.

These technologies are currently being deployed in support of excavations at Fernald. Customer satisfaction has been high, excavation decision making has been accelerated, and excavation contractor "down time" has been avoided. The improvements funded by the ASTD program to date have been a success, with a projected return on investment of approximately 11:1. As with any DOE site, there are many special soil remediation situations, such as soils adjacent to pipes and process lines, and soils adjacent to high radioactivity areas. These are soil remediation needs still to be met.

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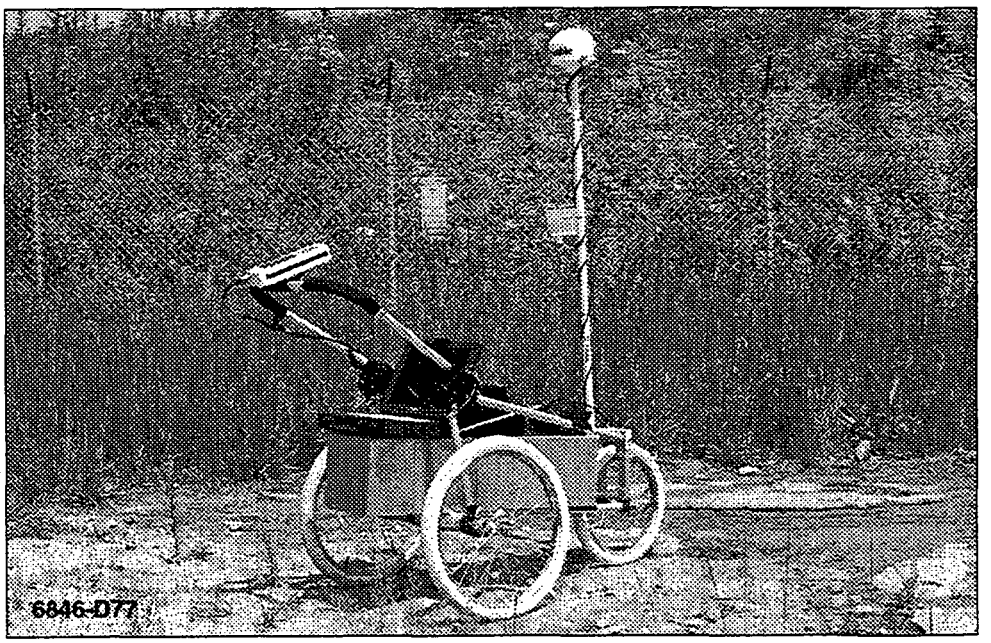

RSS (radiation scanning system)