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DuPont Washington Works



RCRA Facility Investigation Results Review

March 14, 2001

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Proposed Agenda

- Introductions
- Site Background
- Site Hydrogeology
- RFI Scope of Work
- RFI Results
- Conclusions and Recommendations
- Wrap-Up

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Desired Meeting Outcomes

- To familiarize the EPA/WVDEP project team with the Washington Works site physical setting
- To share the results obtained from the recently completed RCRA Facility Investigation
- To provide perspective on the RFI results
- To propose a path forward that will ensure continued protection of human health and the environment

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Main Messages for Today:

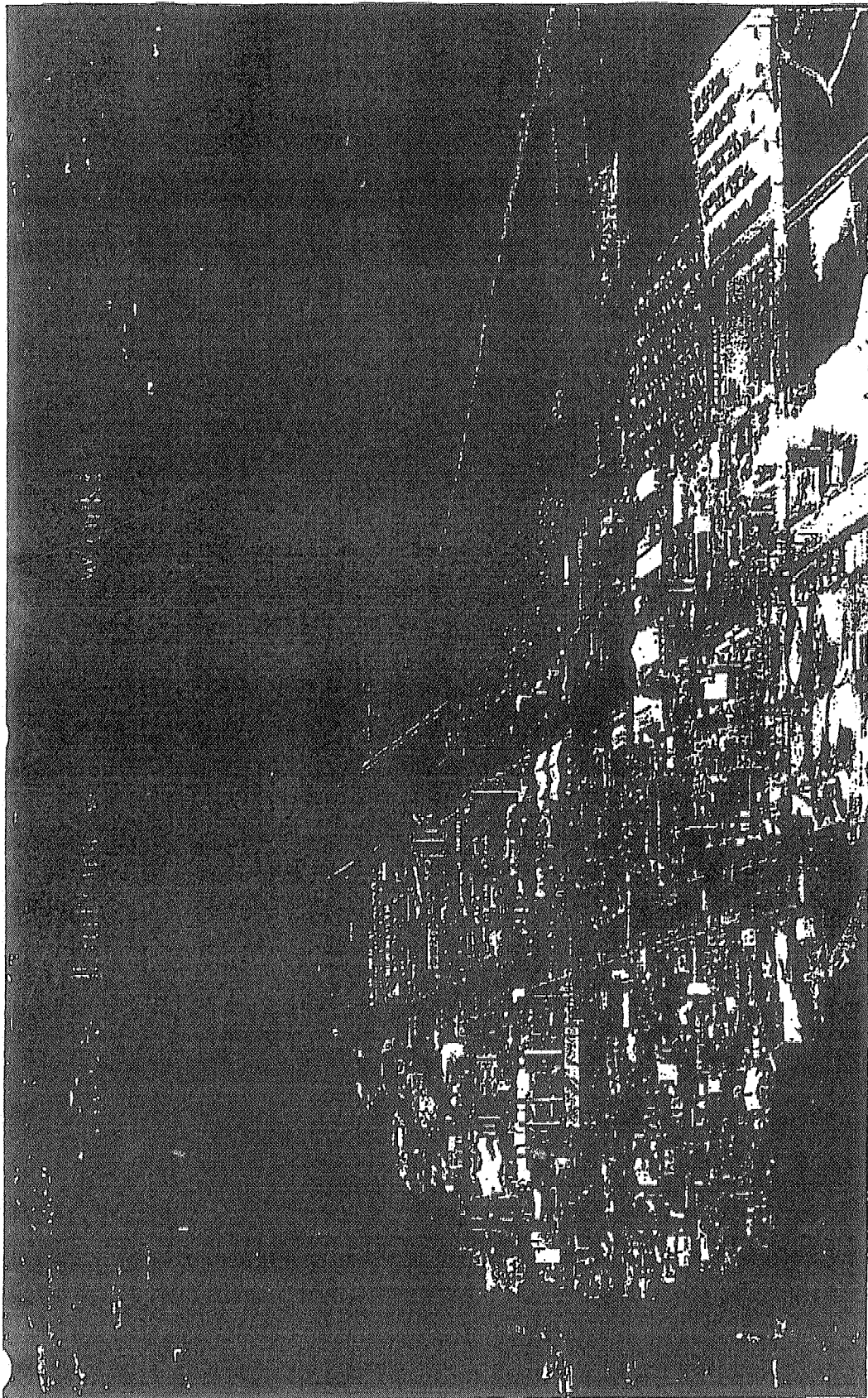
- The DuPont Washington Works site is well characterized and well understood, as a result of over 10 years of investigation and monitoring.
- The combination of IRMs and the active site hydraulic control program ensure protection of human health and the environment from site SWMUs.
- DuPont intends to continue to actively operate the site hydraulic control program and monitor its effectiveness going forward.

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Washington Works Background

- 1,200 acres on Ohio River in western WV
- Manufacturing began in 1948
- Engineering Polymers, Fluoroproducts, and P&IP
 - Engineering plastics (Delrin®)
 - Nylon pellets and filaments (Zytel®)
 - Acrylic resins and molding compounds
 - Polyvinyl butyral (Butacite®)
 - Teflon® & Tefzel®
- Approx. 2,400 employees (DuPont's 2nd largest)

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Regulatory History

- 1989 - Corrective Action or "HSWA" permit issued by EPA Region III requiring Verification Investigation (VI) of 6 SWMUs
- 1991 and 1992 - Conducted VI
- March 1997 - EPA commented on VI and required RFI work plan for four SWMUs (Local LF & Injection Wells removed from consideration)
- 1998 and 1999 - Conducted RFI

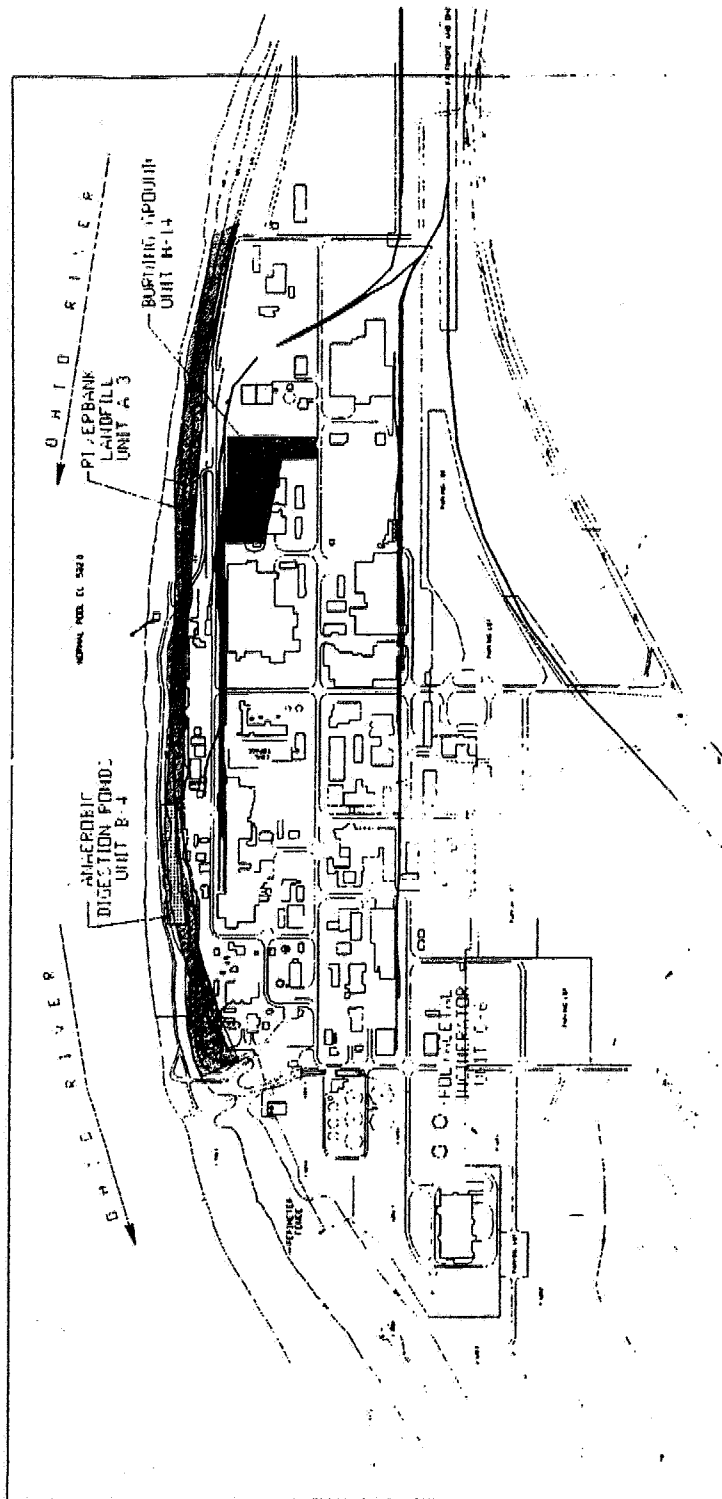
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RFI SWMUs

- Riverbank Landfill
- Anaerobic Digestion Ponds
- Burning Grounds
- Polyacetal Waste Incinerator

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SWMU LOCATIONS



SWMU LOCATIONS

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Riverbank Landfill

- Operated from 1948 to mid-1960s
- Measured 4,500 feet long by 150 feet wide
- Filled steep slope separating main plant terrace from river floodplain
- Filled with general plant solid waste
- Closed by covering with soil, vegetation, and rip-rap
- Today the RBL is densely vegetated
- Methylene chloride seep was the main area of concern - now controlled by collection and treatment system

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Anaerobic Digestion Ponds

- Operated from the mid-1950s to 1988 (three ponds)
- Used for wastewater treatment
- Constructed with bentonite clay liners (i.e., ponds # 2 & # 3) and polyethylene sheet walls
- Closed by removing liquid, sludge, clay, and some underlying soils (5,400 cubic yards) and covering with soil and vegetation.

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• • • Polyacetal Waste Incinerator

- Operated from 1959 to 1990
- Consisted to two, ten-foot deep concrete and fire brick-lined pits
- Used for the burning of off-spec polyacetal polymer
- Area was closed by excavating and backfilling with clean soil and gravel

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Burning Ground

- Operated from 1948 to 1965
- Used for the open burning of miscellaneous wastes (e.g. plant trash, off-spec plastic, and organic liquids)
- Soils were excavated in 1974, 1989, and 1990 (approximately 250 cubic yards)
- In 1990, the BG was leveled with clean fill to allow for plant expansion, and a perimeter drainage ditch was installed.
- Mostly covered with buildings, concrete, and asphalt

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Washington Works - Geology

- Simple stratigraphy - Ohio River Terrace Deposits
- Fine grained soils near surface and along riverbank
- Thick sand and gravel unit:
 - Primary geologic unit
 - Overlies Permian age shale/sandstone bedrock
 - Contains site aquifer

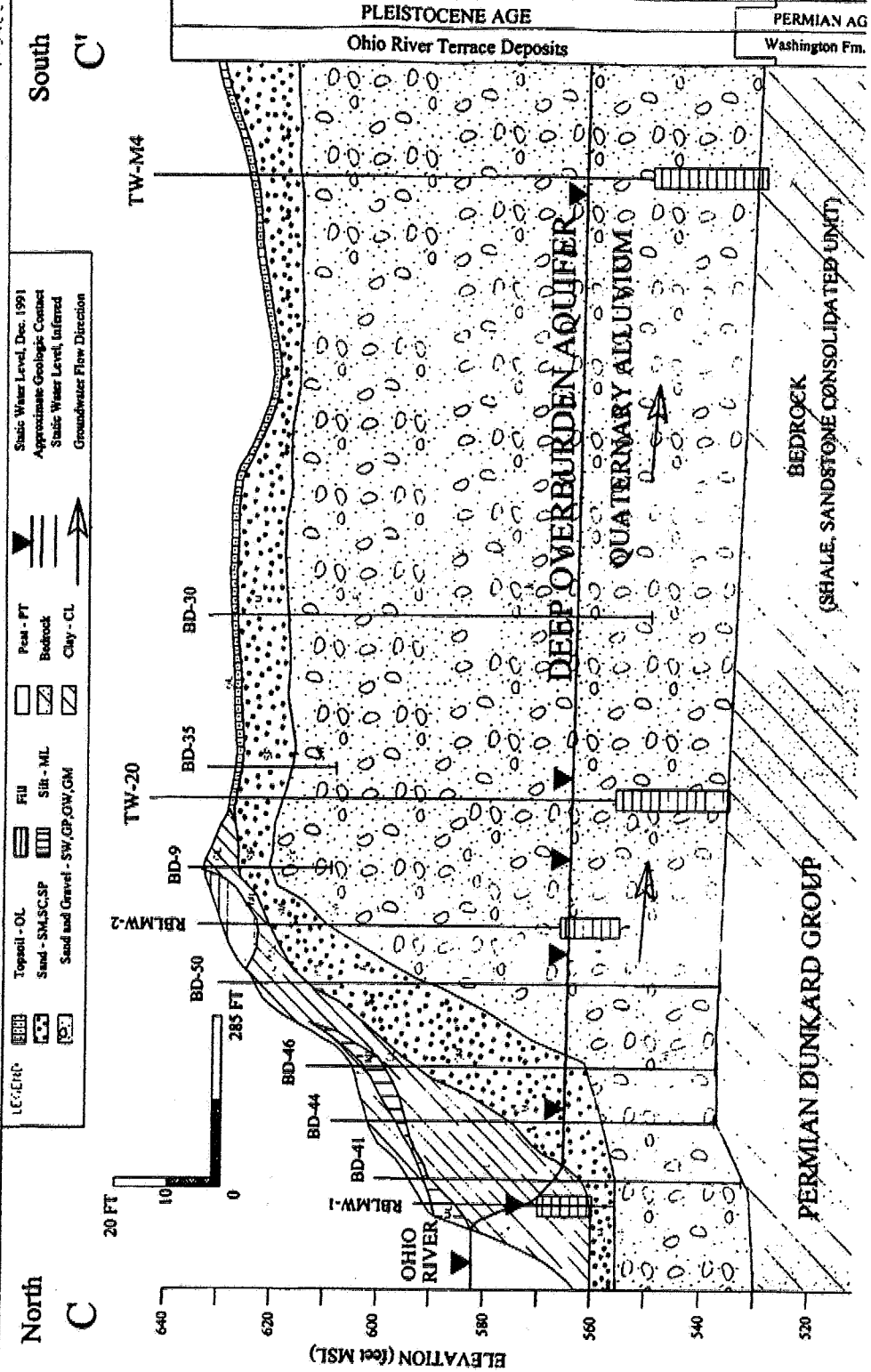
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FIGURE 2-50

CROSS SECTION C - C' E. I. du Pont de Nemours & Company, Inc. WASHINGTON WORKS PLANT, WEST VIRGINIA

1991

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Site Hydrogeology

- Site aquifer in sand and gravel formation
- Depth to groundwater is approximately 60 feet
- Groundwater flow direction is controlled by on-site production well system
 - East Well Field (seven wells-2000 gpm)
 - Ranney Well (800-1000 gpm)
 - Lubeck Well Field (five wells-700 gpm)
- Pumping induces river recharge to aquifer, results in high well yields

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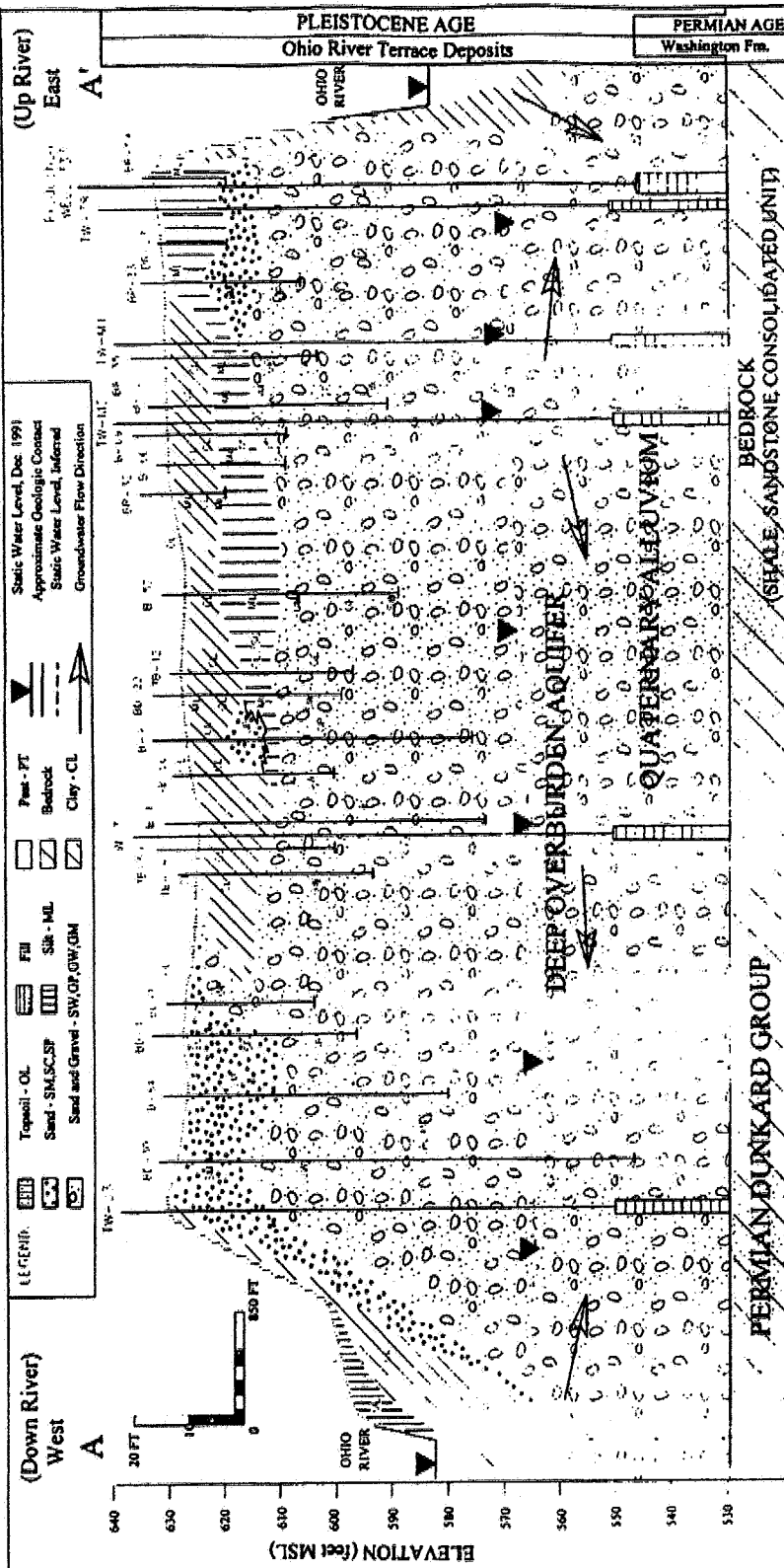
CROSS SECTION A - A'

E. I. du Pont de Nemours & Company, Inc.
WASHINGTON WORKS PLANT, WEST VIRGINIA

1991

FIGURE 2-2A

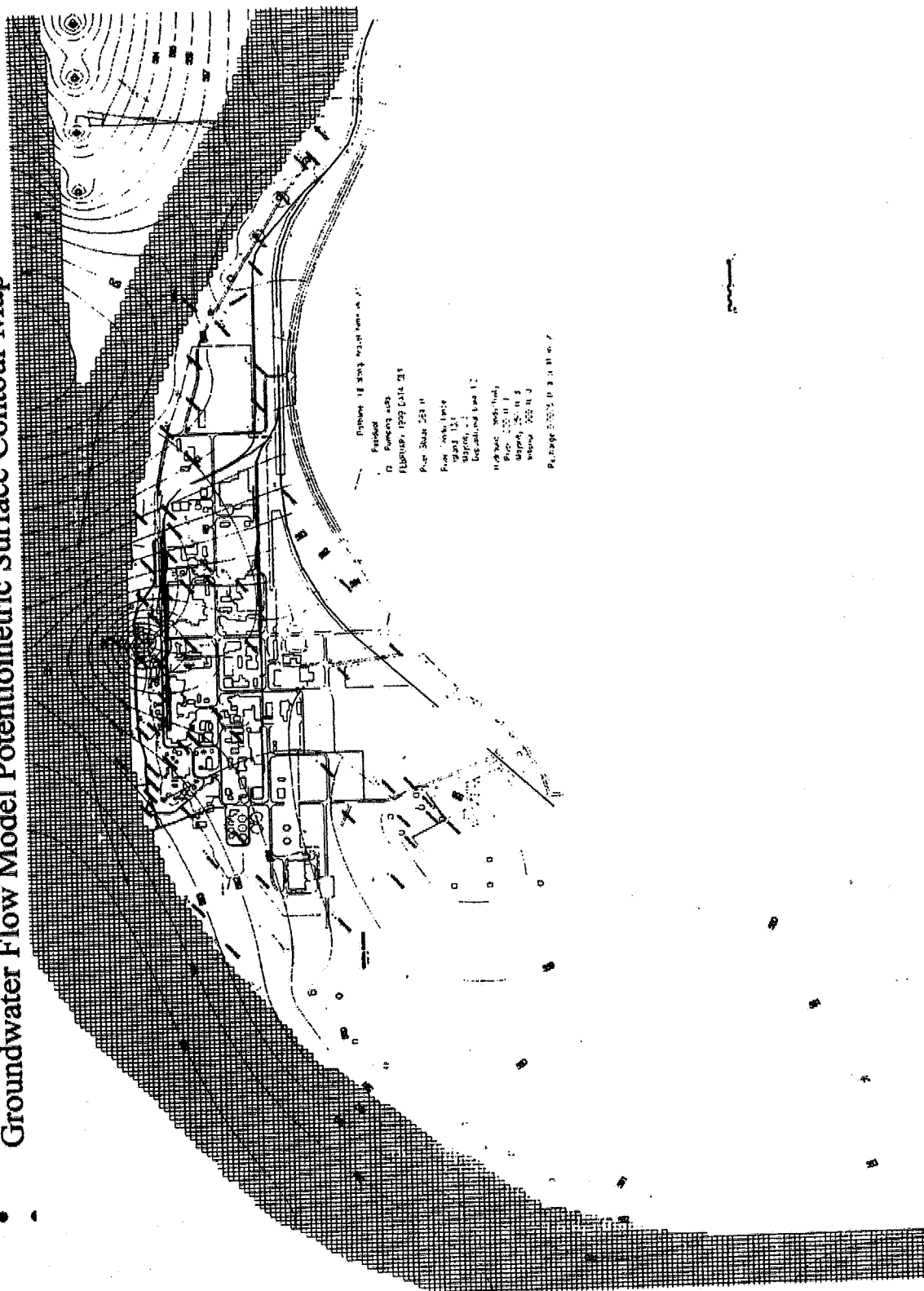
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Groundwater Flow Model Potentiometric Surface Contour Map



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RFI Technical Approach

- Screened VI data against Region III residential RBCs to define applicable analyte list
- Constructed groundwater flow model to provide an initial characterization of the site hydrogeologic system, and to identify additional data needs
- Refined site conceptual model to develop a comprehensive list of data needs
- Implemented a thorough investigation and monitoring of site SWMU soils and site groundwater conditions

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RFI Report Contents

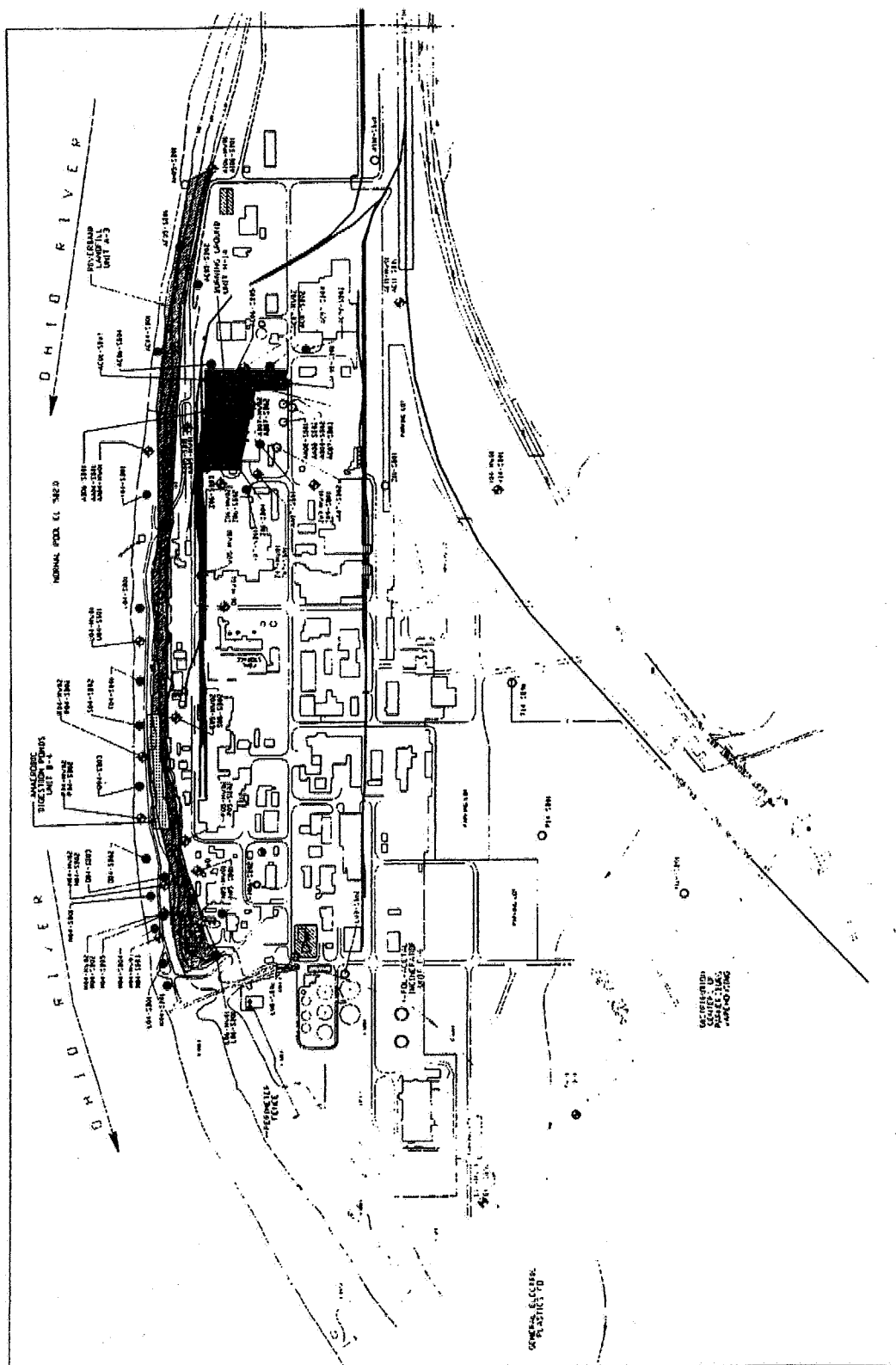
- Describes the comprehensive field program
- Presents and discusses all site data
- Presents groundwater flow modeling results
- Presents screening-level human health risk evaluation by comparing maximum constituent concentrations in exposure media to RBCs for industrial soils and drinking water
- Presents screening-level ecological risk evaluation by characterizing site habitat within the RFI study area
- Provides conclusions and recommendations for further action

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RFI Field Program Overview

- Installed 24 new monitoring wells
- Sampled 40 monitoring wells and 5 production wells (two rounds)
- Drilled 35 soil borings, and collected 15 hand auger samples
- Collected approximately 150 soil samples to a maximum depth of 70 ft
- Compiled all results in a manner that enabled interpretation in the context of the site conceptual model

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RFI Results



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RFI Findings

Analyte	PWI	BG	RBL/ADP	Potable Well	Process Wells
Carbon Tet		*		ND	ND
MeCl			*	ND	
PCE			*	ND	*
TCE			*	ND	**
Freon 113			*	ND	*
FC-143			*	*	**
Arsenic		*	*	*	*
Barium		*	*	*	*
Cadmium		*	*	ND	*
Lead		*	*	ND	ND
Nickel		*	*	ND	ND
Chromium	*				

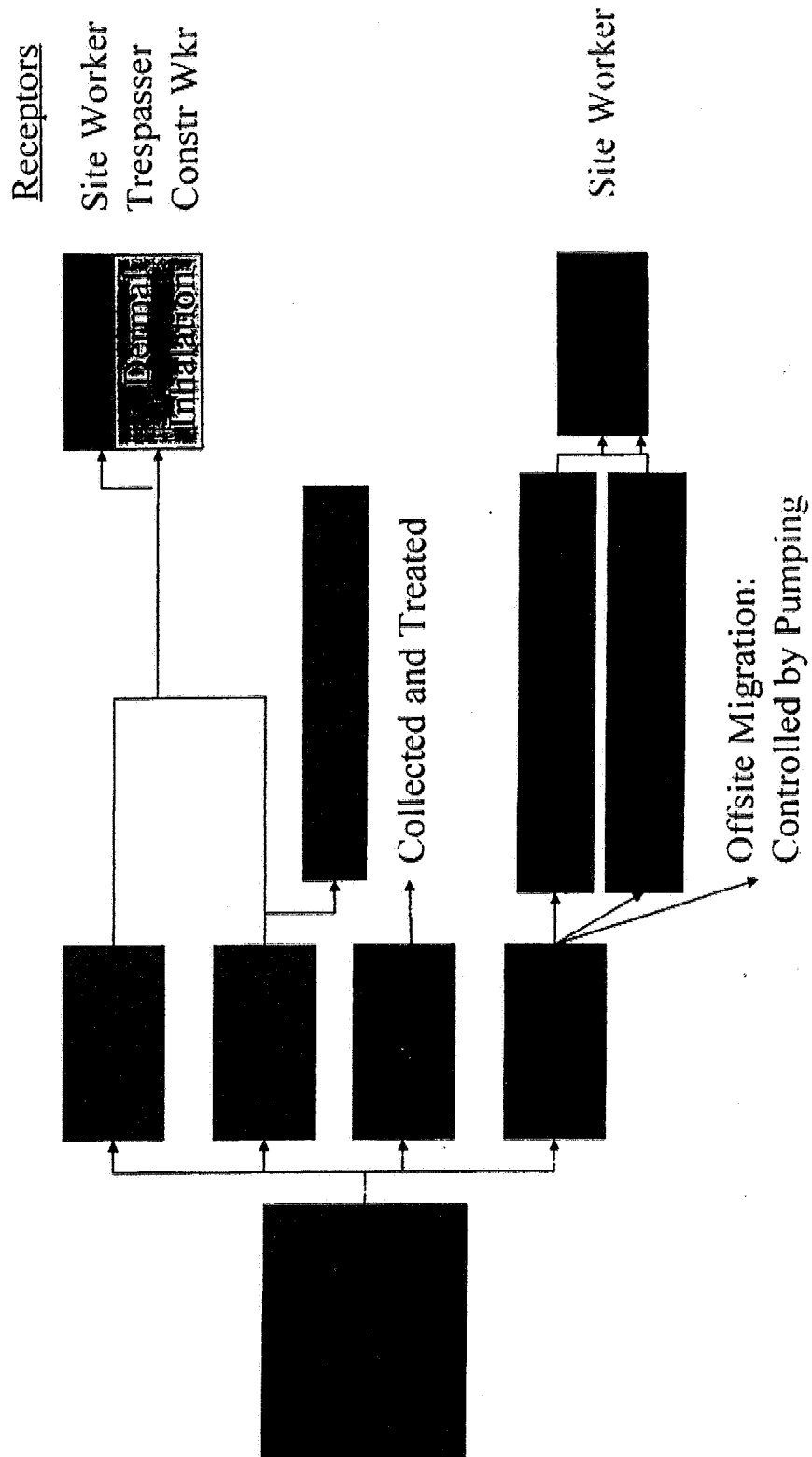
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Site Land Use Characterization

- Land Use:
 - Onsite land use is industrial (current and future)
 - Offsite land use is mixed industrial, commercial, open space, residential
- Groundwater Use:
 - Onsite process and potable water
 - Off-site Well Survey:
 - Public water supply 2 miles downriver
 - GE Plastics' wells west of Washington Works
 - Site under hydraulic control; groundwater does not migrate off-site

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Exposure Pathway Evaluation



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Ecological Evaluation

- Study area included terrestrial and riverbank habitat along the RBL/ADP
- No significant ecological resources were present
 - No critical or sensitive habitats
 - No habitat reflective of public concerns (e.g., game habitat)
 - No listed threatened or endangered species
- The absence of significant ecological resources leads to a lack of ecological exposures, and hence no significant ecological risks

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Preliminary Risk Evaluation - Soil

*Observed Arsenic values were comparable to site background levels.

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Preliminary Risk Evaluation - Production Wells

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PSL is the preliminary screening level for FC-143; AL is the action level for lead.
The groundwater screening value was exceed in process wells only.

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Risk Results Summary

- Soil concentrations of all constituents are well below their respective RBCs for industrial soils
- Potable well water concentrations are below screening levels for drinking water
- Process well water concentrations of two constituents (TCE, FC-143) somewhat exceed drinking-water based screening levels, but this water is not used for drinking
- No unacceptable human health risks occur as a result of site SWMUs
- No significant ecological receptors or pathways occur at any SWMU

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Recommendations for Future Action

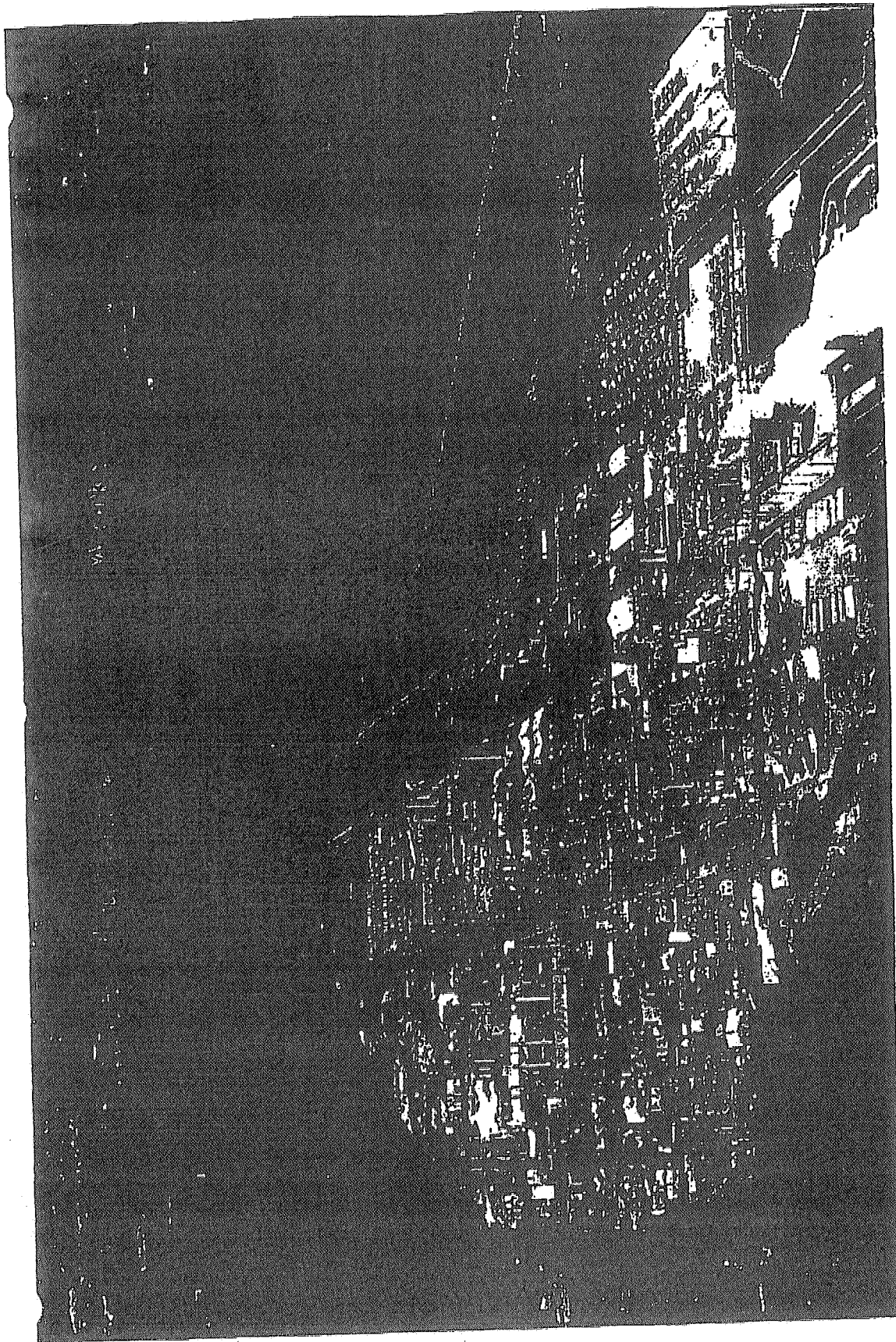
- Continue production well pumping to maintain site hydraulic containment
- Conduct long-term groundwater level monitoring to ensure continued capture of site groundwater
- Conduct long-term groundwater quality monitoring of on-site potable well to ensure protection of human health
- Continue operation of MeCl seep collection and treatment system

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Overall Summary

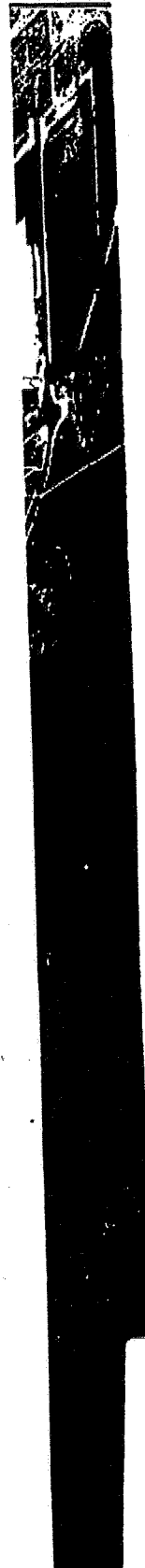
- With the completion of the RFI, the DuPont Washington Works site SWMUs are well characterized and well understood.
- Existing containment and treatment programs provide protection of human health and the environment from site SWMUs.
- DuPont intends to continue to actively manage the site in a way that ensures the protection of human health and the environment into the future.

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