Molycorp, Inc.
Washington Remediation Project
1217 West Wayne Street
Washington, PA 15301
Telephone (724) 222-5605
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Molycorp

September 26, 2005

Dr. Thomas G. McLaughlin
Project Manager
Nuclear Regulatory Commission
Mail Stop T-7E18
Washington, DC 20555-0001

Re: Molycorp, Inc. (Washington, PA Remediation Project)
License No.: SMB-1399
Transmittal of September 20, 2005 Presentation and
Disposition of the Site's radiological materials

Dear Dr. McLaughlin:

At our Meeting of September 20, 2005, you requested both an electronic (CD format) and paper copy of the PowerPoint presentation given by myself and Dr. Al Shuckrow of Malcolm Pirnie, Inc. Both are attached hereto. I am also providing Bob Maiers and Dwight Shearer of the Pennsylvania Department of Environment Protection (PADEP) with electronic copies of the presentation.

During our meeting, I stated Molycorp has entered into discussions with firms for the transportation and disposal of the radiological waste material from our Washington, PA facility. Those firms are as follows:

- USEcology Idaho for the combined transportation and disposal of our Washington, PA facility exempt thorium, uranium, and radium containing slag/soil.

- International Uranium Corporation (IUC) for the disposition of our Washington, PA facility low level uranium containing material.

- MHF Logistical Solutions for the off-site transportation of our Washington, PA facility low level uranium containing material to IUC.

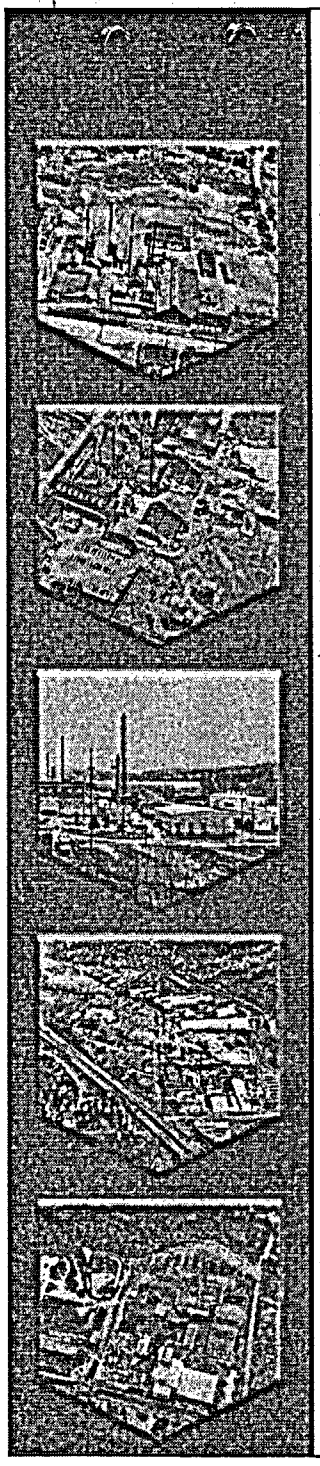
If you have any questions, or would like any additional materials or information, please let me know.

Very truly yours,

MOLYCORP, INC.

John C. Wright, Jr.
Project Manager

cc. Bob Maiers, PADEP w/ CD attachment
Dwight Shearer, PADEP w/ CD attachment



Washington Decommissioning Public Meeting

September 20, 2005

Molycorp

Agenda

- Background
- Plant History
- Remediation Management
- Planned Remediation
- Responses to NRC Questions

Molycorp Washington, PA Site

Site Characteristics

- Approximately 73 acres located in Canton Township, Washington County, PA
- Radiological:
  - 20 acres were used for manufacturing operations, including placement of slag/fill in low-lying areas
  - Some slag contains naturally occurring radioisotopes above local background concentrations
- Non-radiological:
  - Non-radioactive slag
  - Manufactured Gas Plant (MGP) tar waste disposed by prior owners and PennDOT

Manufacturing History

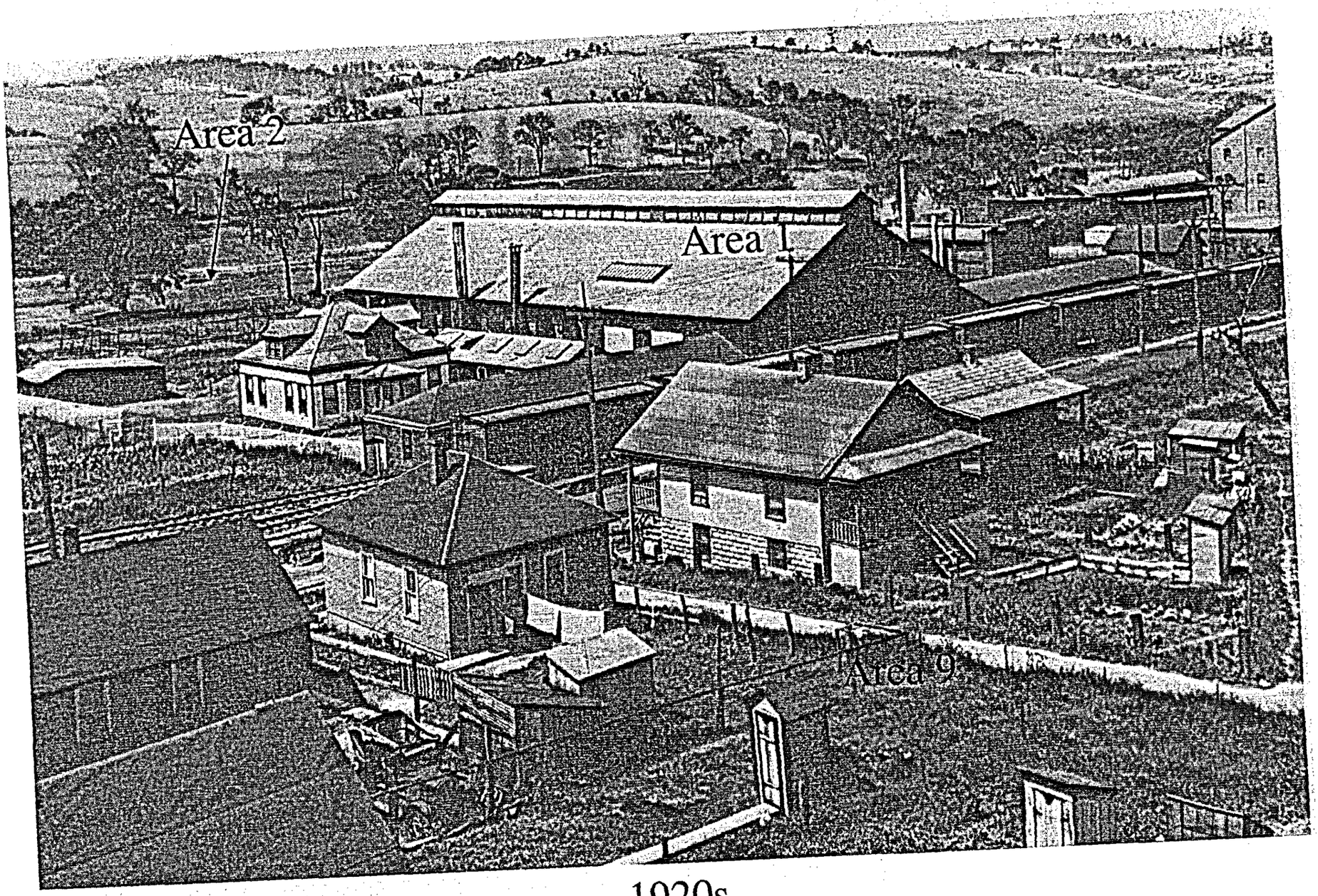
- Products
  - Molybdenum Trioxide
  - Ferromolybdenum
  - Ferrotungsten
  - Ferrocolumbium
  - Calcium Boride
  - Lanthanides

Manufacturing History

- Ferrotungsten production – 1920s-1970s
  - Low levels of uranium associated with some of the ore
- Ferrocolumbium – 1964-1970
  - NRC Source Materials License – 1963
  - Thorium present in ore concentrates
  - Source of thorium slags
- Ferromolybdenum slags not radioactive
- Slags associated with production of all ferroalloys are glass-like in nature

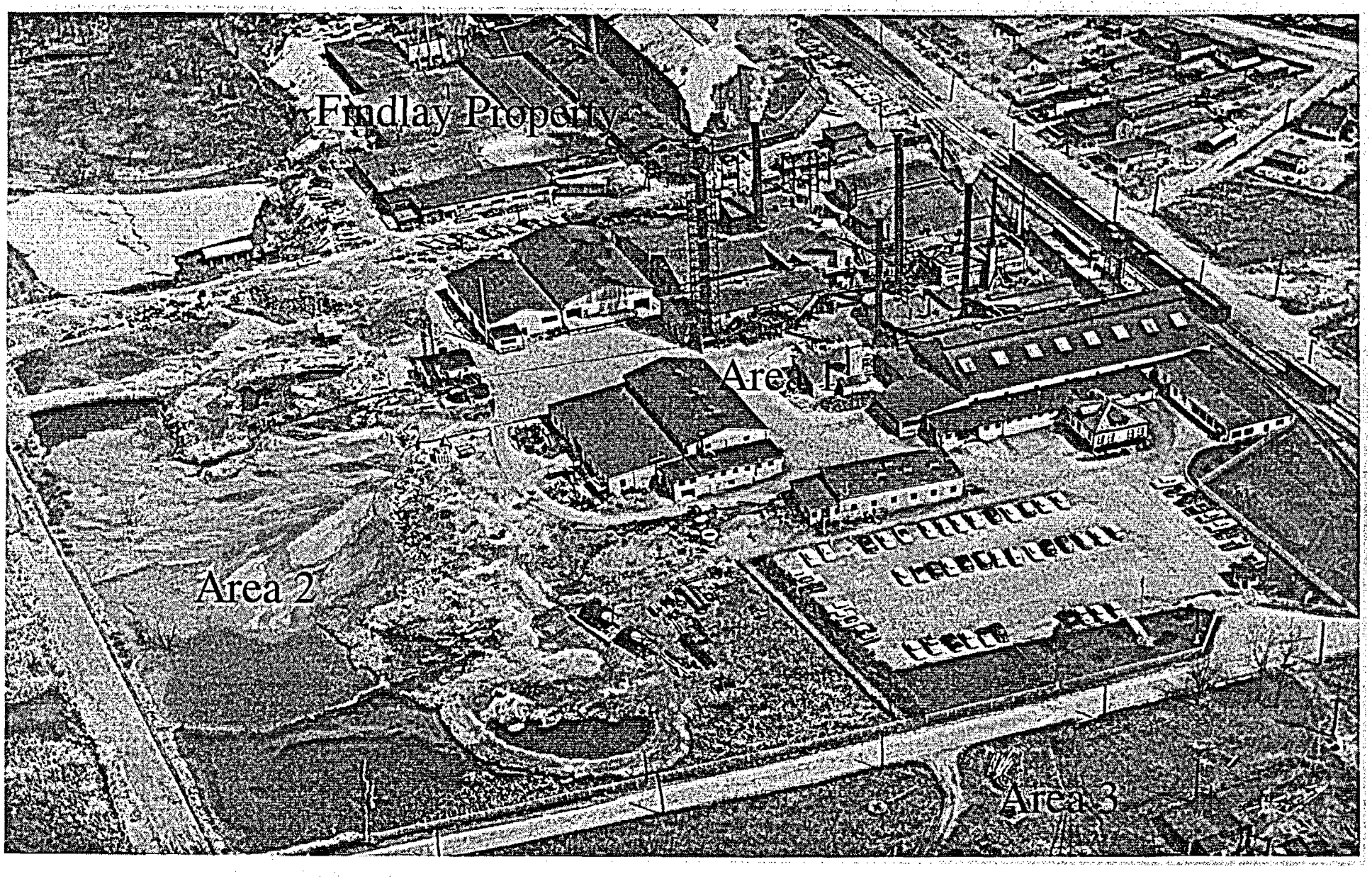
Significant Events

- **1902** — **Main Plant Area purchased by the Railway Spring and Manufacturing Company**
- **1916** — **Electric Reduction Company purchased the site**
- **1920** — **Molybdenum Corporation of America formed from the Electric Reduction Company** (changed name to Molycorp, Incorporated in 1974)
- **1963** — **NRC License obtained to produce ferrocolumbium**
- **1980** — **Building demolition and reconstruction completed**
- **1991** — **Facility placed on stand-by; limited production thereafter**
- **1992** — **NRC requests decomissioning**
- **1999** — **NRC approves Decomissioning Plan**
- **2001** — **Plant shutdown announced**
- **2002** — **Building demolition completed**

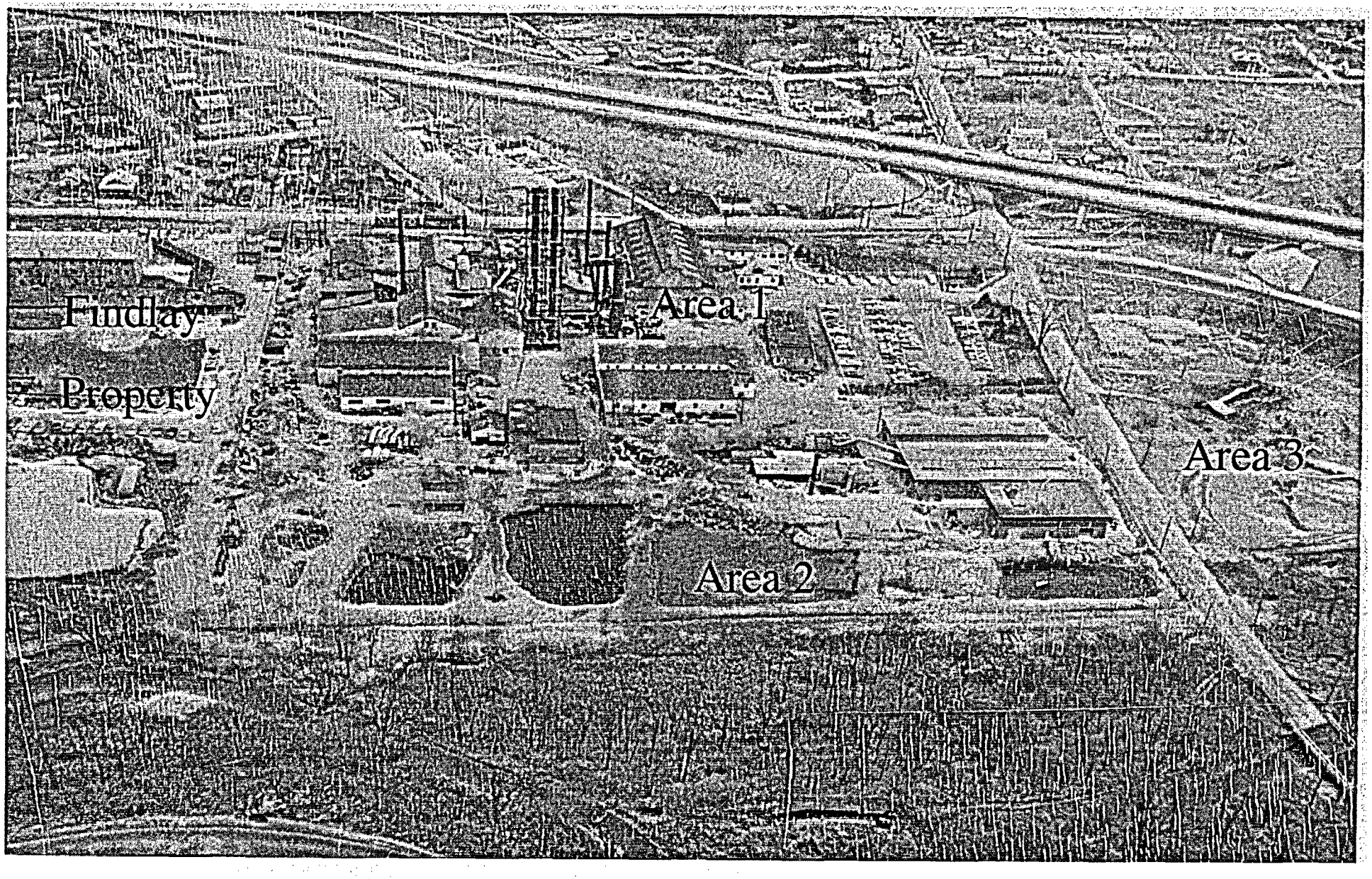


1920s

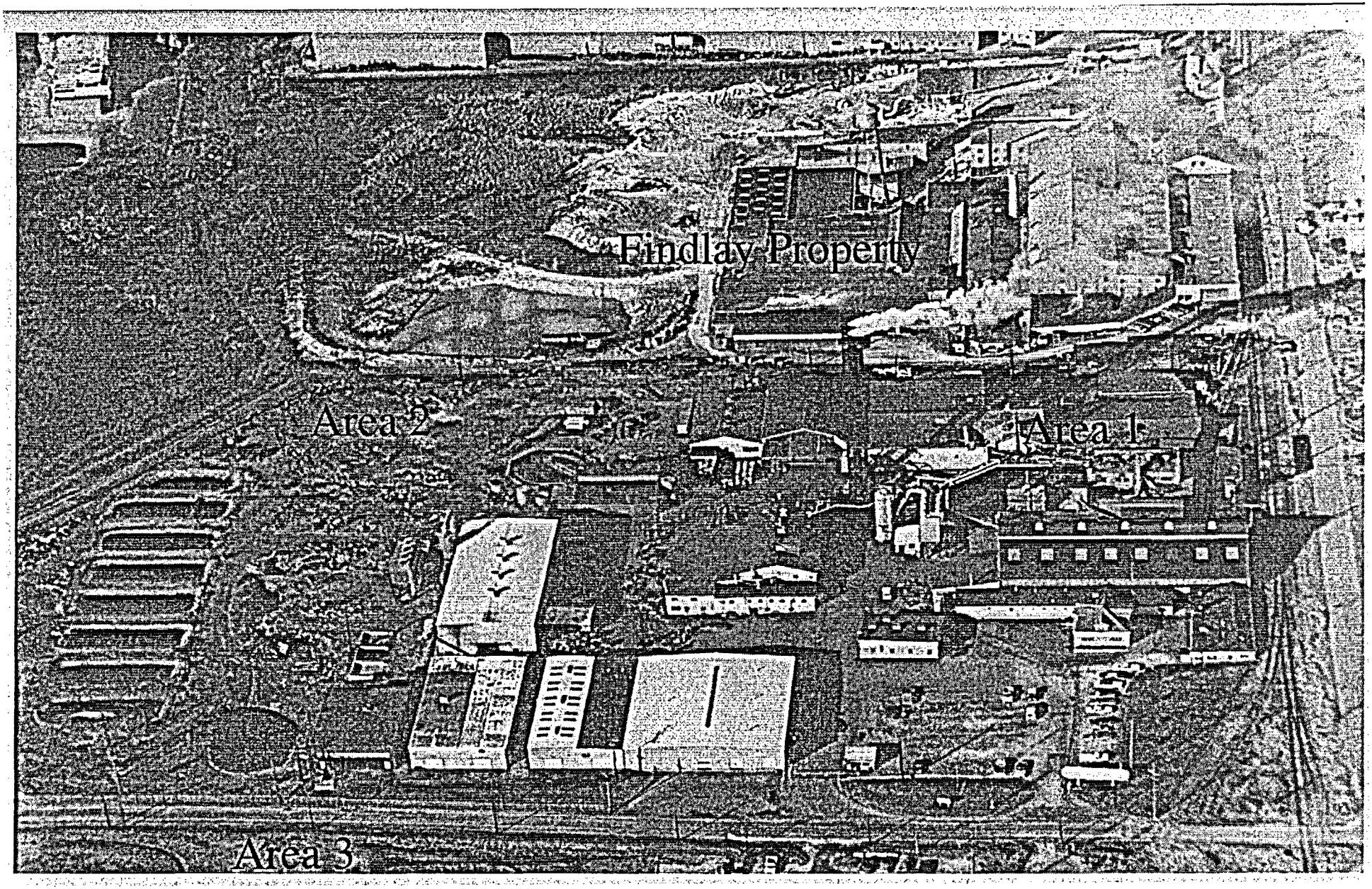
1940s



1952

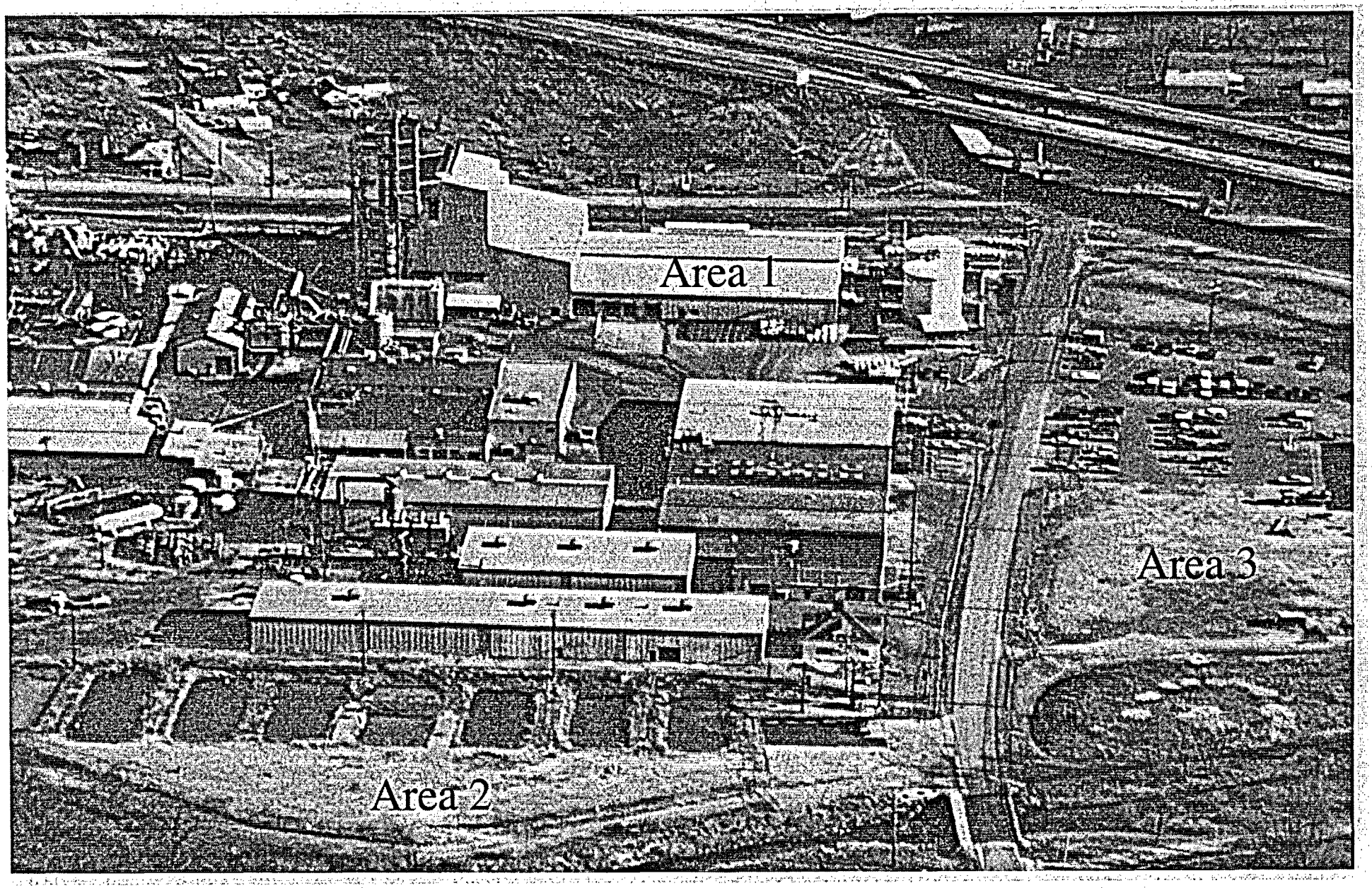


1960s



1978

Late 1980s



1991

Previous Investigations

- ORAU: Radiological Survey, 1985
- RSA: Radiological Survey, 1990
- REMCOR: Groundwater Investigation, 1991
- FWENC: Radiological Characterization, 1994
- FWENC: FSS Northern Boundary, 1996
- RSI: Uranium Equilibrium Evaluation, 2001
- MFG: Overburden Investigation, 2001
- Harding ESE: Groundwater Monitoring, 2002
- MACTEC: FSS Building Footprints, 2002

Prior Remediation Activities

- Ferrocolumbium Slag Excavation (1978)
- Northern Boundary Remediation (1996)
- Slag Pile Removal/Disposal (2001)
- Building Demolition (2002)

Integrated Closure Approach

- Molycorp adopted an approach to address both radiological and non-radiological conditions in an integrated fashion
- Objectives of integrated plan:
  - Unrestricted release by NRC for radiological issues
  - Termination of NRC Source Materials License
  - Remediation to PA Act 2 standards
  - Brownfield redevelopment to return to beneficial use

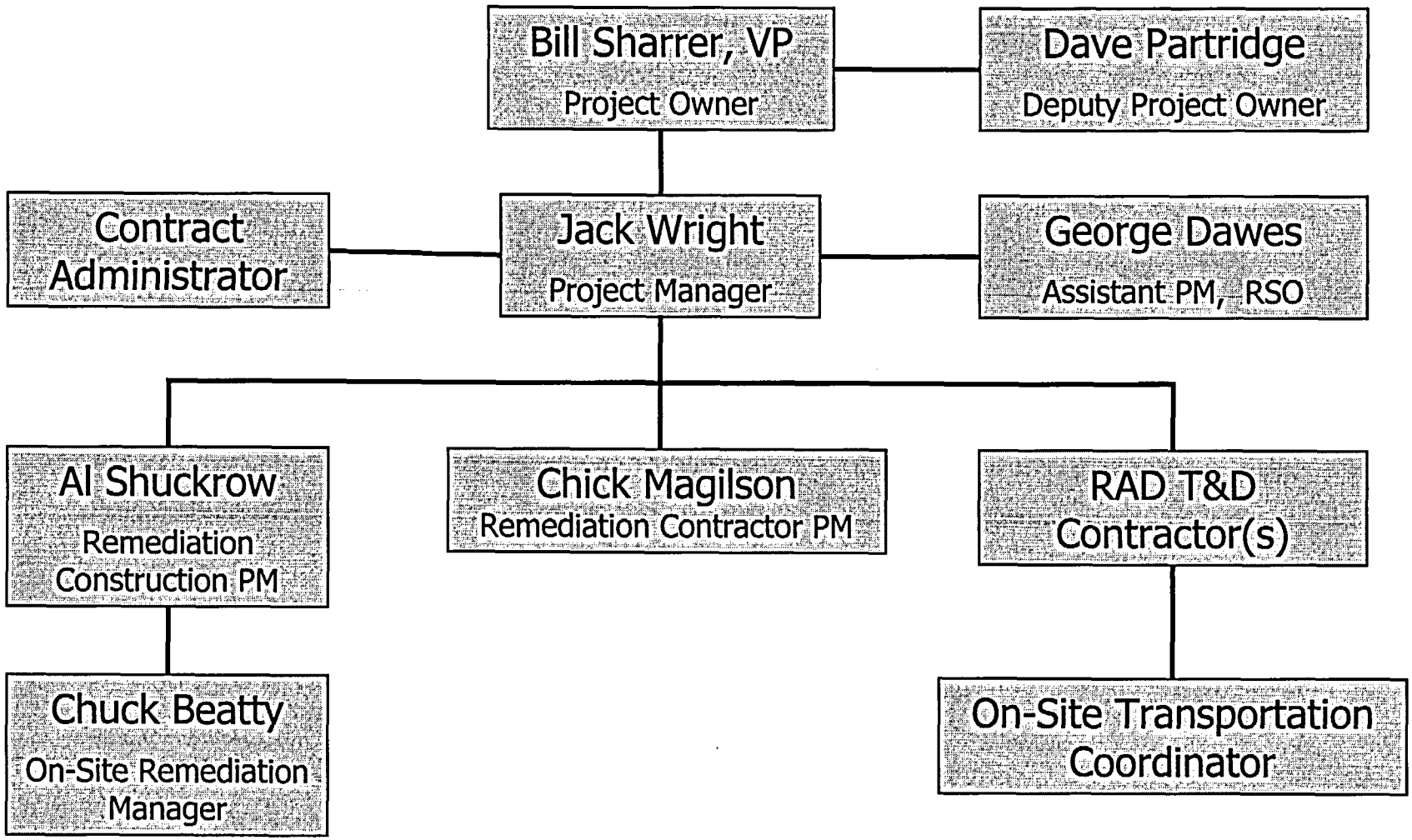
Integrated Closure Plan Schedule

- Supplemental Characterization
  - June 2003 – April 2004
- Remedial Alternatives Analysis/Recommendations
  - July 2004
- Design Phase and Permitting
  - September 2004 – November 2005
- Construction Mobilization
  - January 2006
- Remediation Completion
  - December 2007
- Site Restoration Complete
  - Spring 2008

Project Team

- Owner
  - Molycorp, Inc.
- Remediation Construction Manager
  - Malcolm Pirnie, Inc.
    - **Environmental Restoration Group**
    - **Pace-Waltz Mill Laboratory**
- Remediation Contractor
  - Shaw Environmental, Inc.
- Transportation and Disposal Contractors
  - US Ecology
  - International Uranium
  - MHF Logistics

Project Organization



Project Site Sign

Molycorp

Site Cleanup Office

Project regulated by the Pennsylvania Department of Environmental Protection and the U.S. Nuclear Regulatory Commission

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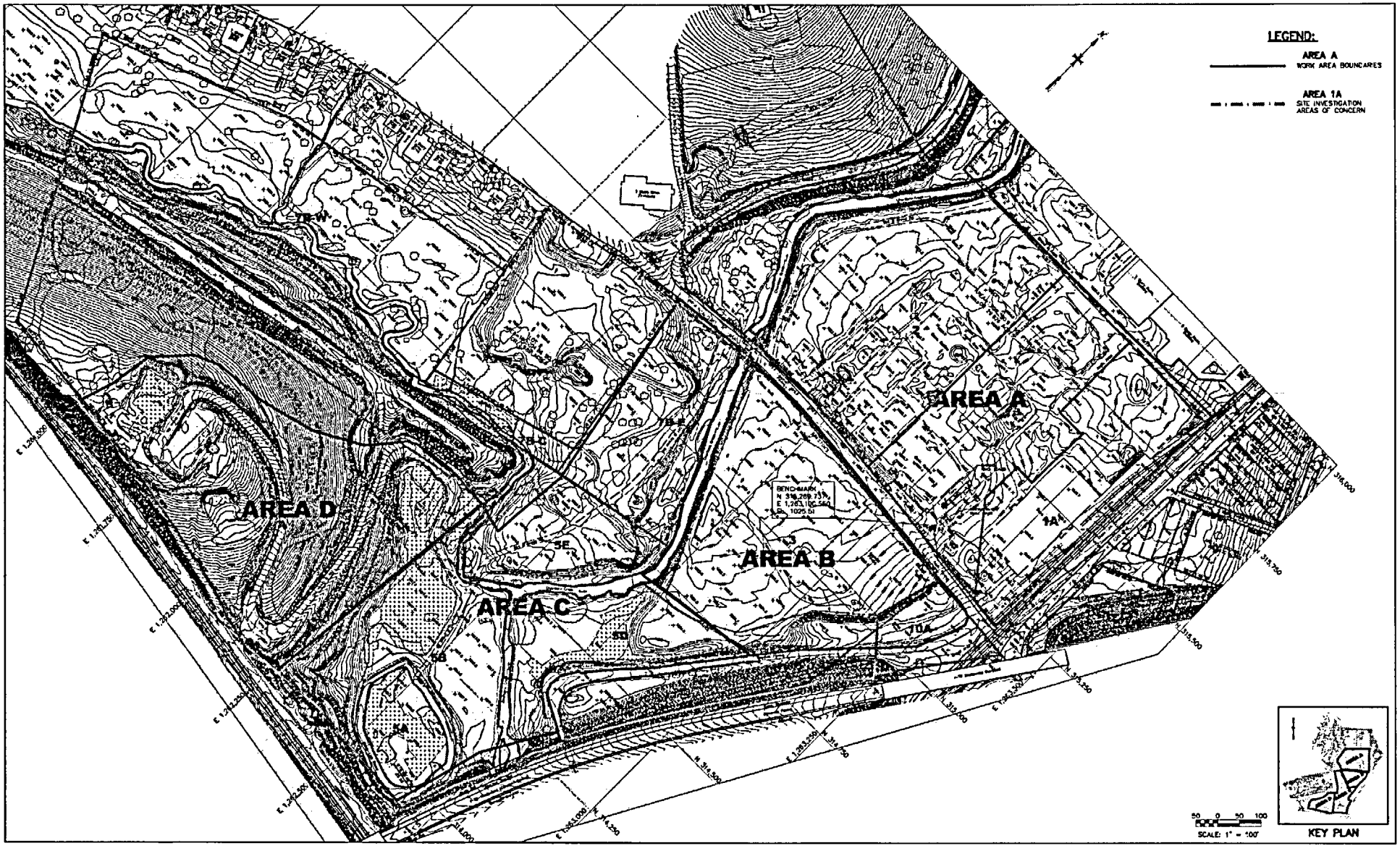
Community Outreach

- Public meeting with Chartiers Creek Watershed Association and The Redevelopment Authority of The County of Washington: January 26, 2005
- Continuing meetings with Elected Officials, Washington County Planning Commission, Canton Township Supervisors, and Fire Department
- Public Involvement Plan submitted to PADEP: June 20, 2005
- PADEP and NRC Public Meeting: September 20, 2005
- Future Public Meetings and Community Mailings

Radiological Remediation

- Primarily low level Thorium and Uranium
  - On average exempt material
- One area of non-exempt Uranium material


LEGEND:
AREA A
WORK AREA BOUNDARIES
AREA 1A
SITE INVESTIGATION AREAS OF CONCERN
AREA A
AREA B
AREA C
AREA D
BENCHMARK
N 316,269.13
E 1,263,105.561
EL. 1025.51
SCALE: 1" = 100'
KEY PLAN

Technical Basis Document

- Area Classification
- Release Criteria
- Final Status Survey

Area Classifications

- Affected
- Unaffected
- Affected Below Guidelines

- Classifications Based On
  - Historical Information
  - Survey Data

Release Criteria

- Based on AAR
- Depth dependent
- Accepted at Molycorp York Site
- Approved for Molycorp Washington Site

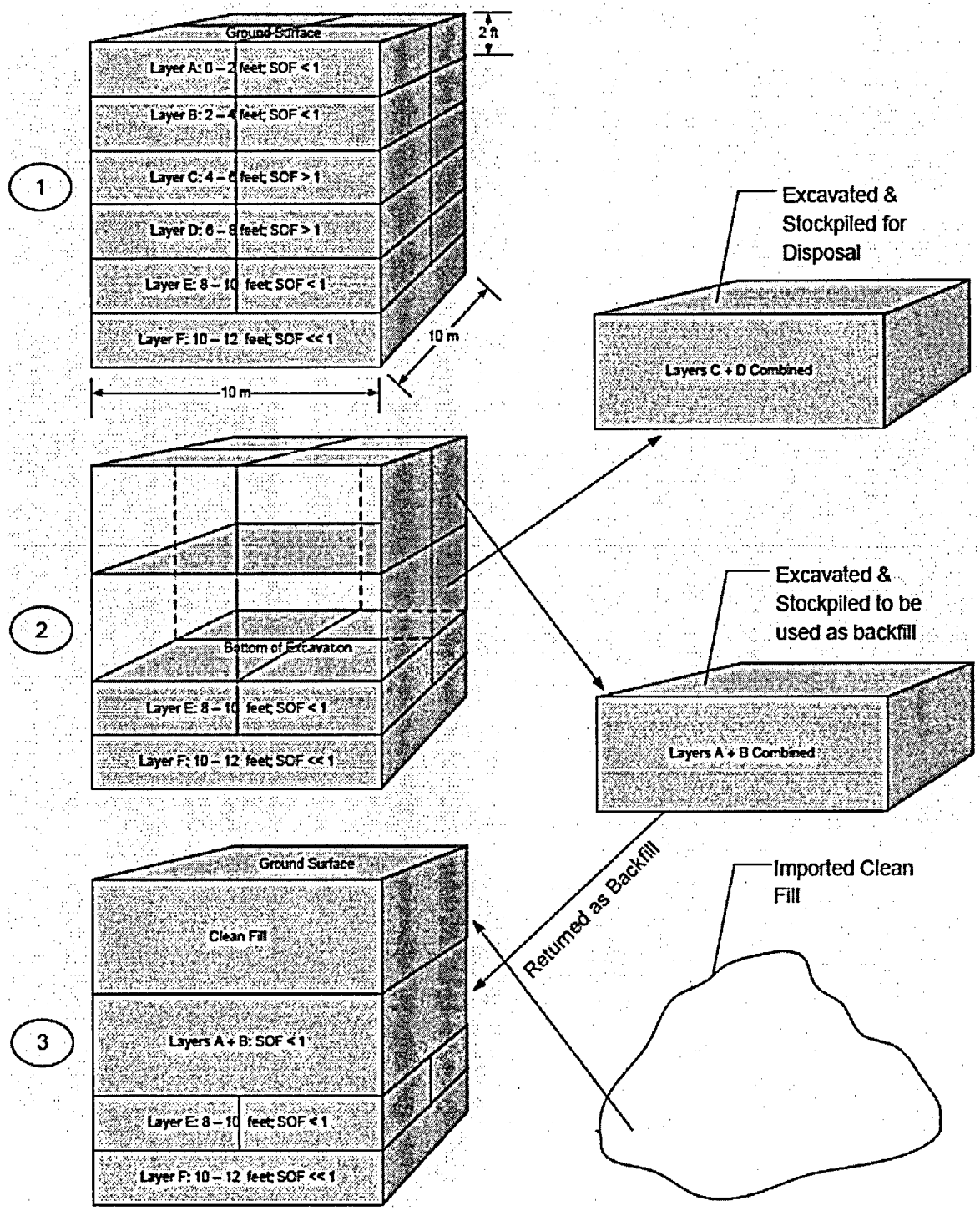
Washington Soil Averaging Criteria

- Refer to hand-out

Site-Specific Subsurface Soil Averaging Limits - Molycorp's Washington, PA Site

Layer #	Layer	# of Quadrants	Volume (ft3)	Uranium (238 + 234)	Average, pCi/g Thorium (232 + 228)	Ra (226)
1	**0 to 2 feet Layer**				Average	
	4 Samples from Layer Area	4	2153	18.7	14.2	7.4
	Maximum in Layer	1	538	25.4	17.8	9.4
2	**0 to 4 feet Layer**					
	2 Vertical Quadrants	2	1076	21.8	15.7	8.2
	4 Samples from Layer Area	4	2153	30.9	25.7	13.2
	8 Samples from Surface to this Layer	8	4306	15.5	12.9	6.6
	Maximum in Layer	1	538	43.6	31.5	16.5
3	**0 to 6 feet Layer**					
	3 Vertical Quadrants	3	1615	20.1	14.9	7.8
	4 Samples from Layer Area	4	2153	40.0	35.7	18.1
	12 Samples from Surface to this Layer	12	6458	13.3	11.9	6.0
	Maximum in Layer	1	538	60.2	44.7	23.3
4	**0 to 8 feet Layer**					
	4 Vertical Quadrants	4	2153	18.7	14.2	7.4
	4 Samples from Layer Area	4	2153	47.2	44.8	22.5
	16 Samples from Surface to this Layer	16	8611	11.8	11.2	5.6
	Maximum in Layer	1	538	74.8	56.9	29.6
5	**0 to 10 feet Layer**					
	5 Vertical Quadrants	5	2691	17.8	13.8	7.2
	4 Samples from Layer Area	4	2153	53.3	53.0	26.4
	20 Samples from Surface to this Layer	20	10764	10.7	10.6	5.3
	Maximum in Layer	1	538	88.8	69.2	35.9
6	**0 to 12 feet Layer**					
	6 Vertical Quadrants	6	3229	16.9	13.5	7.0
	4 Samples from Layer Area	4	2153	63.8	63.4	31.6
	24 Samples from Surface to this Layer	24	12917	10.6	10.6	5.3
	Maximum in Layer	1	538	101.5	80.9	41.8
7	**0 to 14 feet Layer**					
	7 Vertical Quadrants	7	3767	16.2	13.2	6.8
	4 Samples from Layer Area	4	2153	74.2	73.8	36.8
	28 Samples from Surface to this Layer	28	15069	10.6	10.5	5.3
	Maximum in Layer	1	538	113.1	92.1	47.7
8	**Each Layer deeper than 14 feet**					
	Maximum in Layer	1	538	129.2	105.2	54.6

Assumptions				
Area:	100	m2	1076	ft2
Quadrants:	25	m2	269	ft2
Thickness:	NA		2	ft
Area Volume:	NA		2153	ft3
Quadrant Volume:	NA		538	ft3


1
Ground Surface
2 ft
Layer A: 0 – 2 feet; SOF < 1
Layer B: 2 – 4 feet; SOF < 1
Layer C: 4 – 6 feet; SOF > 1
Layer D: 6 – 8 feet; SOF > 1
Layer E: 8 – 10 feet; SOF < 1
Layer F: 10 – 12 feet; SOF << 1
10 m
10 m
Excavated & Stockpiled for Disposal
Layers C + D Combined
2
Bottom of Excavation
Layer E: 8 – 10 feet; SOF < 1
Layer F: 10 – 12 feet; SOF << 1
Excavated & Stockpiled to be used as backfill
Layers A + B Combined
Returned as Backfill
Imported Clean Fill
3
Ground Surface
Clean Fill
Layers A + B: SOF < 1
Layer E: 8 – 10 feet; SOF < 1
Layer F: 10 – 12 feet; SOF << 1

Final Status Survey

- 5849 Grid System
- Stockpile Characterization
- Sample Bottom of Excavation
- Return Stockpile Material to Excavation
- Place Clean Fill
- Calculate Final Status
- Perform Surface Surveys

Sample Analysis

- Off-Site Laboratory
  - High-Resolution Gamma Spectrometry
- On-Site
  - Alpha Counters
  - NaI Spectrometry

Radiological Remediation

- Excavation in 6 inch lifts
- Off-site disposal of above-criteria material
  - ~130,000 tons of soil/slag shipped off-site
- Below-criteria material returned to excavation
- Covered with 2 feet or more of imported clean fill
- Returned to existing grade

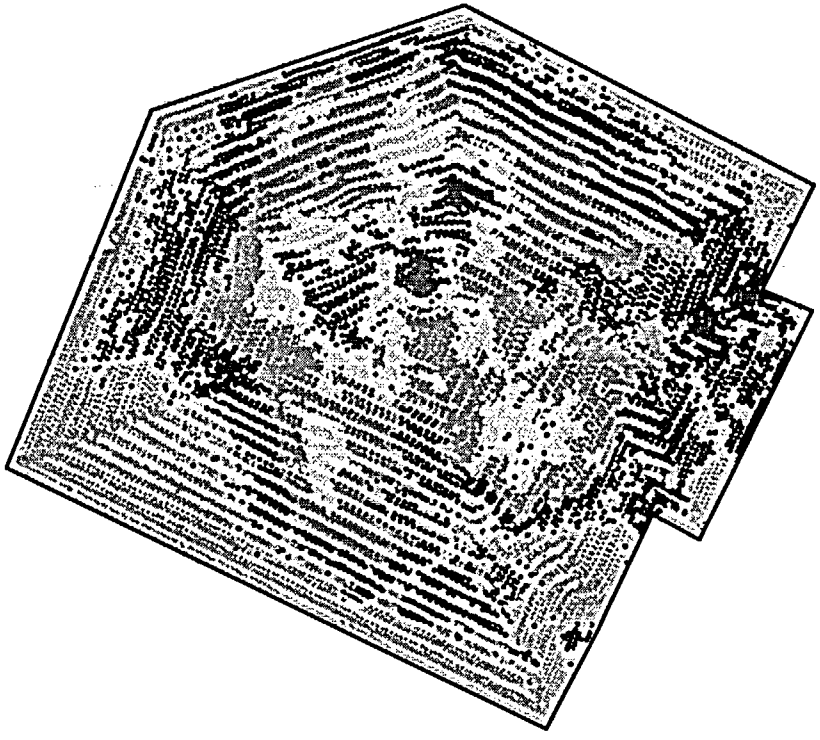
Excavation Monitoring

- Excavation area screened and field delineated using NaI/GPS/GIS system
- Compared to AAR criteria
- Material within 6-inch lift will be
  - Stockpiled for potential re-use as backfill
  - Hauled to the transshipment area for disposal, or
  - Left in place
- Procedure continues until material above AAR criteria is removed

Precision Excavation Control Method (PECM)

- Calibration between gamma scan and radionuclide concentration
- Gamma scans across the area
- Analyzing data using ArcView GIS
- Defining boundaries (field stakeout)
- Excavating and sorting

Precision Excavation Control Method (PECM)



Stockpile Management

- Overburden
  - Removed, stockpiled, characterized and re-used as backfill
- Material above release criteria
  - Removed and transported to transshipment area
- Intermediate Material
  - Removed, stockpiled, characterized and potentially re-used as backfill

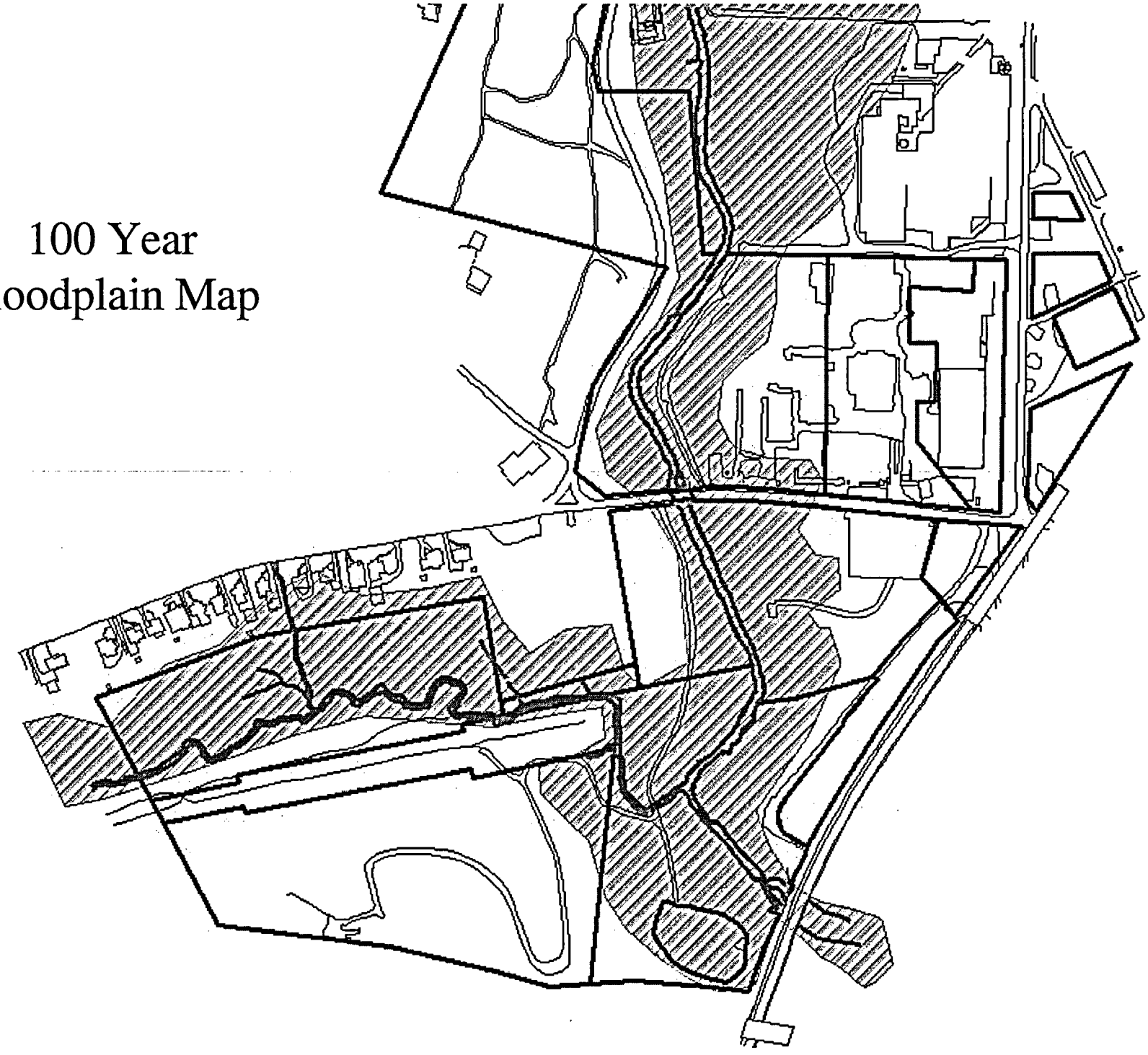
AAR Model

- Developed a Model to Simulate Excavation, Backfill, and Disposal Based on Application of AAR Method
- Determined that Exempt Criteria for Disposed Material can be Achieved
- Model Confirmed by Independent Review
- Used to Manage Backfill

Radiological Remediation

- Radiologically contaminated material shipped off-site
  - Non-exempt Uranium Material by Intermodal
  - Exempt Material by Gondola Cars
- Close Caldwell Avenue during remediation
- Sheet pile and earthen berms to temporarily remove areas from floodplain
- Sheet pile to demarcate excavation boundaries and reduce potential impacts to Chartiers Creek

100 Year Floodplain Map



Water Management

- Dewatering of Excavations
- Contact stormwater/groundwater/decon water treated in on-site plant before discharge to Chartiers Creek
- Non-contact stormwater collected in sedimentation ponds before discharge to Chartiers Creek

Debris Release

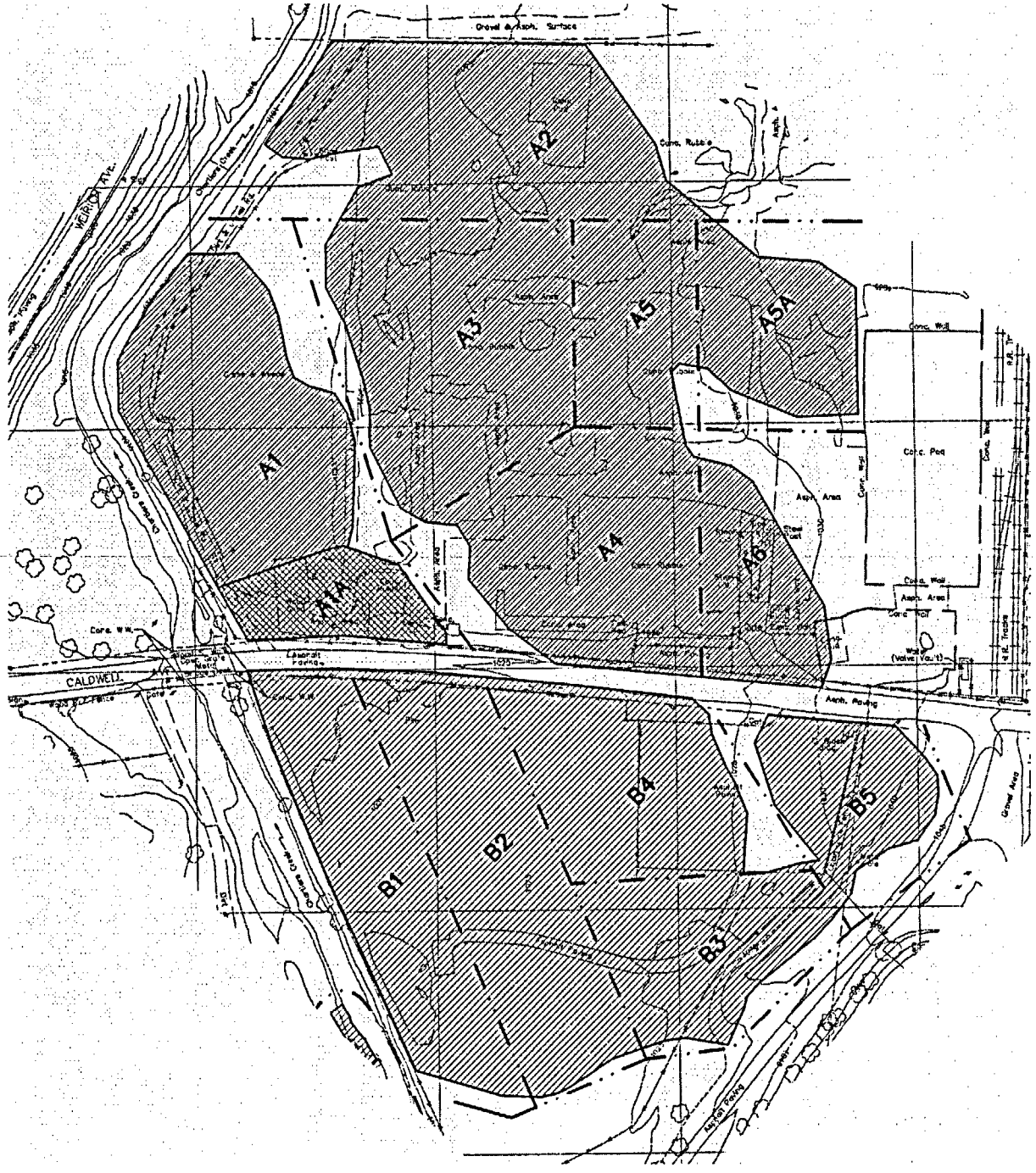
- Mill, Stockpile and Characterize Asphalt
- Scan and Scabble/Wash Concrete in Affected Areas and Concrete Pads in Unaffected Areas
- Demolish Subsurface Concrete in Unaffected Areas for Off-Site Recycling or On-Site Reuse

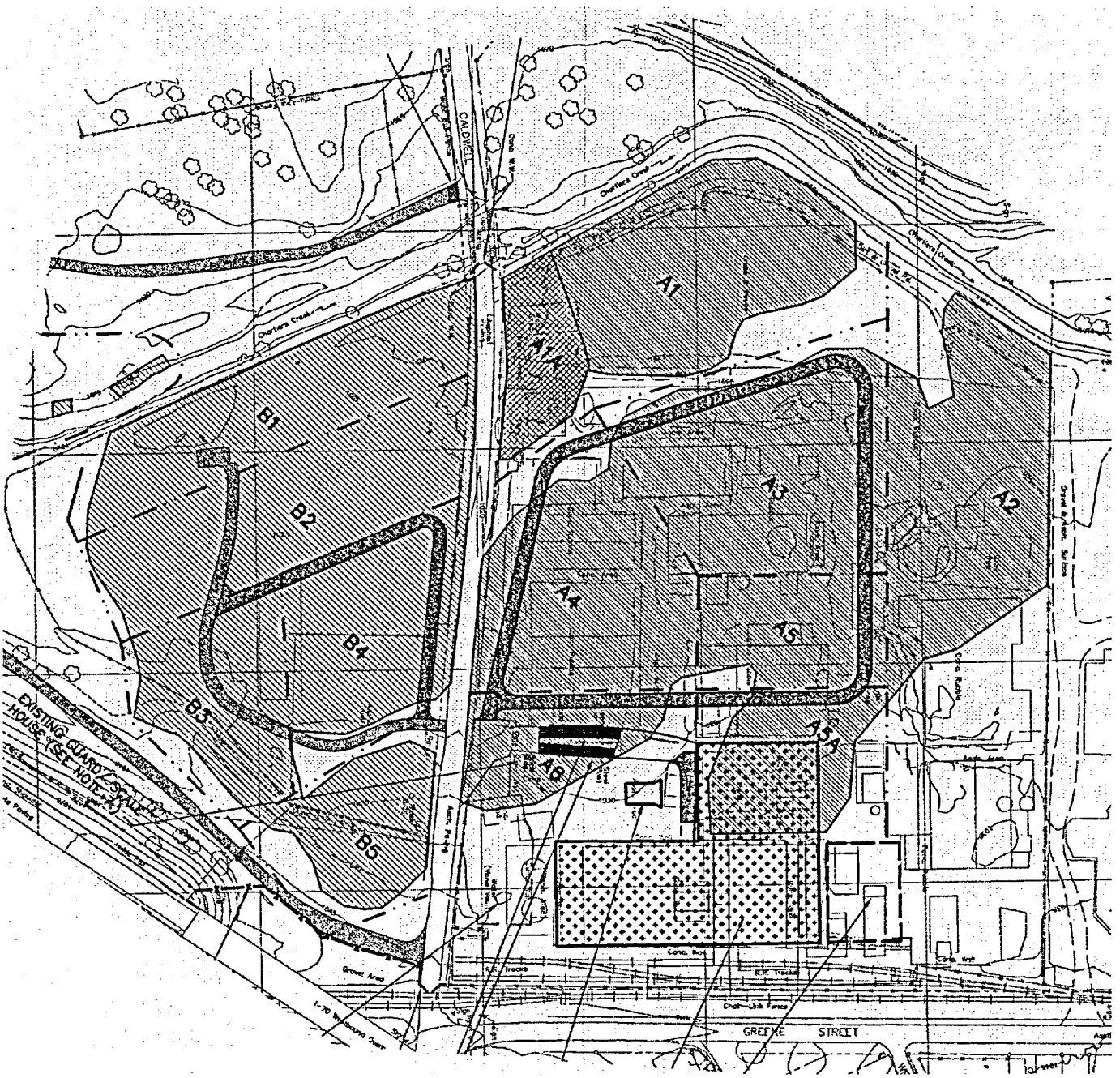
Closure of Excavations

- Minimize time
- Acceptance of FSS data
- Limited confirmatory sampling
- PADEP on-site representative
  - MOU in place

Remediation Sequence

- Site Preparation
- Sewer Relocation in Areas A/B
- Uranium Remediation
- Transshipment Area Construction
- Sewer Force Main Relocation
- Closing of Caldwell Avenue
- Radiological Remediation


A1
A1A
A2
A3
A4
A5
A5A
A6
B1
B2
B3
B4
B5
CALDWELL
Gravel & Asph. Surface
Conc. Pad
Asph. Area
Asph. Paving
Conc. Wall
Gravel Area


CALDWELL
Charles Creek
A1
A2
A3
A4
A5
A5A
A6
B1
B2
B3
B4
B5
EXISTING GUARD SHACK
HOUSE (SEE NOTE 4)
GREENE STREET

Response to NRC's Questions

1a. How are you going to keep track of the boundaries of excavated areas?

- *The boundaries of excavated areas will be delineated by GPS equipment. In addition, the Remediation Contractor will utilize a Registered Surveyor to track excavation areas and depths.*

1b. How large will the "typical" areas be?

- *Typical excavation areas will be approximately one acre or smaller.*

Response to NRC's Questions

2. How are you going to keep "released" areas from being recontaminated?

- *Excavations will occur from the west (along Chartiers Creek) toward the east (the Transshipment Area). Upon completion of backfill in a Survey Unit, the area will be clearly delineated with temporary fencing (or other barrier) that will prevent entry of equipment or trucks.*

Response to NRC's Questions

3. Are samples going to be sent to a lab for high-resolution gamma spec or analyzed on site?

- *Final Status Survey samples will be sent to an off-site laboratory for high-resolution gamma spec analysis. In addition, NaI spectrometry will be conducted on-site to assist in excavation control and manifesting.*

Response to NRC's Questions

4. To what extent are you going to try to use scan data to correlate to radionuclide concentration?

- *Scan data correlations will be used primarily to guide excavations. High resolution gamma spectrometry will be used for FSS sampling.*

Response to NRC's Questions

5. How is the depth from the surface going to be measured?

- *A combination of GPS and traditional survey methods will be used to determine depth.*

Response to NRC's Questions

6. What safety features (for confirmatory samples/scanning) will be in place for deep excavations?

- *The Remediation Contractor will utilize excavation protection systems to slope and bench, shield, or shore and brace as required.*
- *The Remediation Contractor is responsible to maintain dry conditions in each excavation.*
- *All personnel will comply with the H&S Plan*

Response to NRC's Questions

7a. When will the released areas be backfilled with soil?

- *It is our plan that backfilling of survey unit areas will commence approximately two weeks after completion of excavation.*

7b. Where will the "clean" soil come from and will it be tested?

- *Clean soil will come from a yet to be determined off-site source. The Remediation Contractor is required to demonstrate compliance with the Pennsylvania Department of Environmental Protection's Clean Fill Policy.*

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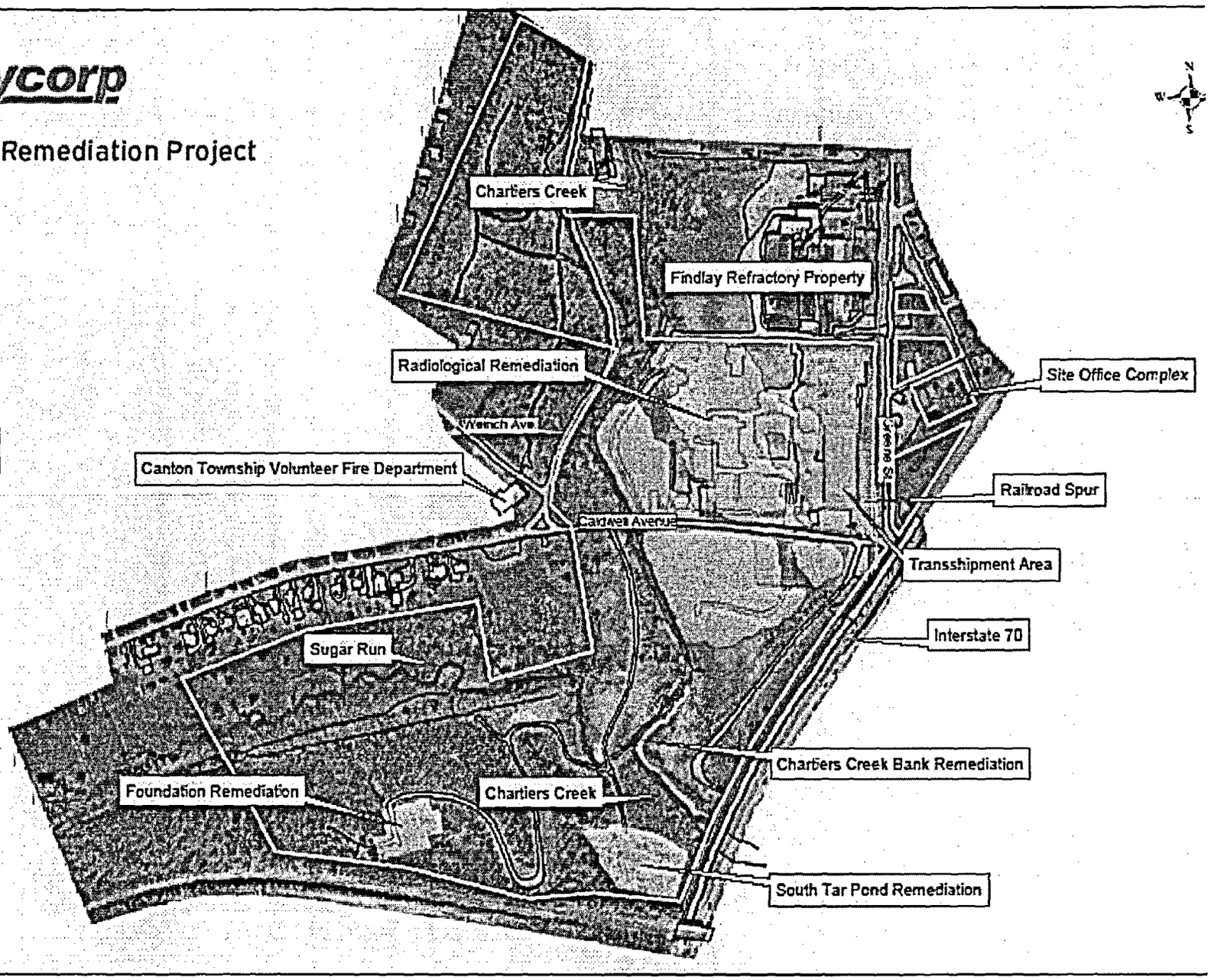
Washington, PA Remediation Project



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Discussion