

PUCO EXHIBIT FILING

FILE

Date of Hearing: 5-2-13

45

Case No. 12-1685-GA-AIR

PUCO Case Caption: In the Matter of the Application
of Duke Energy Ohio

Volume IV

List of exhibits being filed:

DEO 29

OCC 16

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Reporter's Signature: Karen Sue Gibson
Date Submitted: 5-8-13

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BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO

- - -

In the Matter of the Application :
of Duke Energy Ohio, Inc., for : Case No
an Increase in Gas Rates. : 12-1685-GA-AIR

In the Matter of the Application :
of Duke Energy Ohio, Inc., for : Case No.
Tariff Approval. : 12-1686-GA-ATA

In the Matter of the Application :
of Duke Energy Ohio, Inc., for : Case No.
Approval of an Alternative Rate : 12-1687-GA-ATA
Plan for Gas Distribution :
Service. :

In the Matter of the Application :
of Duke Energy Ohio, Inc., for : Case No.
Approval to Change Accounting : 12-1688-GA-AAM
Methods. :

- - -

PROCEEDINGS

before Ms. Christine M. T. Pirik and Ms. Katie
Stenman, Attorney Examiners, at the Public Utilities
Commission of Ohio, 180 East Broad Street, Room 11-A,
Columbus, Ohio, called at 9:00 a.m. on Thursday, May
2, 2013.

- - -

VOLUME IV

- - -

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Fax - (614) 224-5724

- - -

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Free Product Considerations Under Ohio's Voluntary Action Program (VAP)

John T. Garvey, CP #118
Partners Environmental Consulting, Inc.

and

Mike McKim, CP #229
URS



2012 VAP Certified Professional (CP)
Training

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FENGAD 800-681-6888

EXHIBIT

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DEO

Presentation Overview

- I. Overview of Free Product Occurrence
- II. Overview of Characterization Techniques
- III. Implications of Free Product under the VAP
- IV. Case Studies



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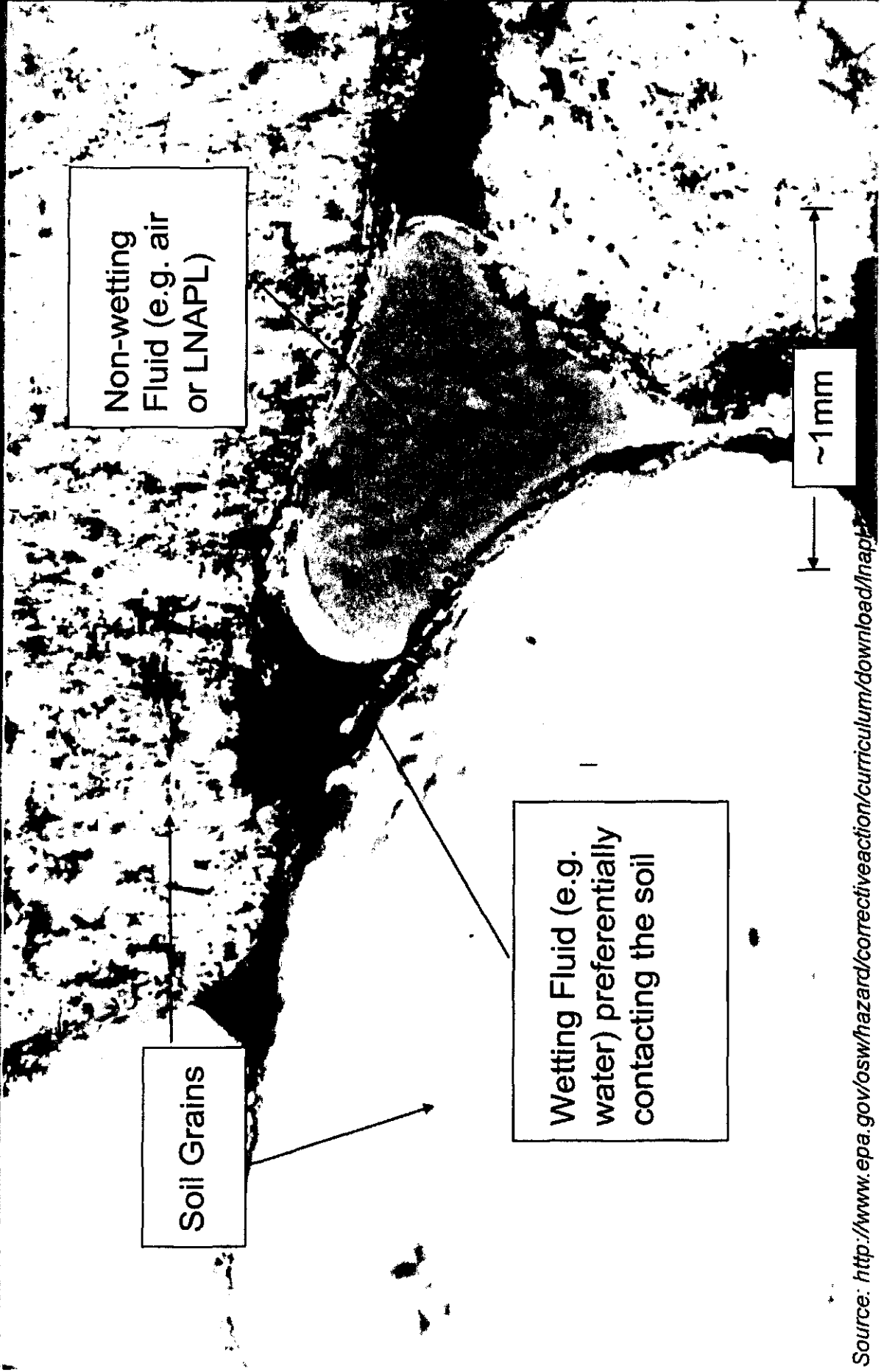
Overview of Product Occurrence Definitions

- Non-Aqueous Phase Liquids (NAPL) = Contaminants (commonly petroleum or solvents) that remain undiluted, essentially as the original bulk liquid form in the subsurface.
- Free Product (VAP) = A separate liquid hydrocarbon phase that has a measurable thickness of greater than one one-hundredth of a foot.
- NAPL = Free Product potential if the concentration exceeds residual saturation values. *(Typically .1% to 10% in the vadose zone; and 3% to 7 % in the saturated zone)*



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Overview of Product Occurrence Phase Diagrams



Overview of Product Occurrence Phase Diagram – Wetting Phase Importance

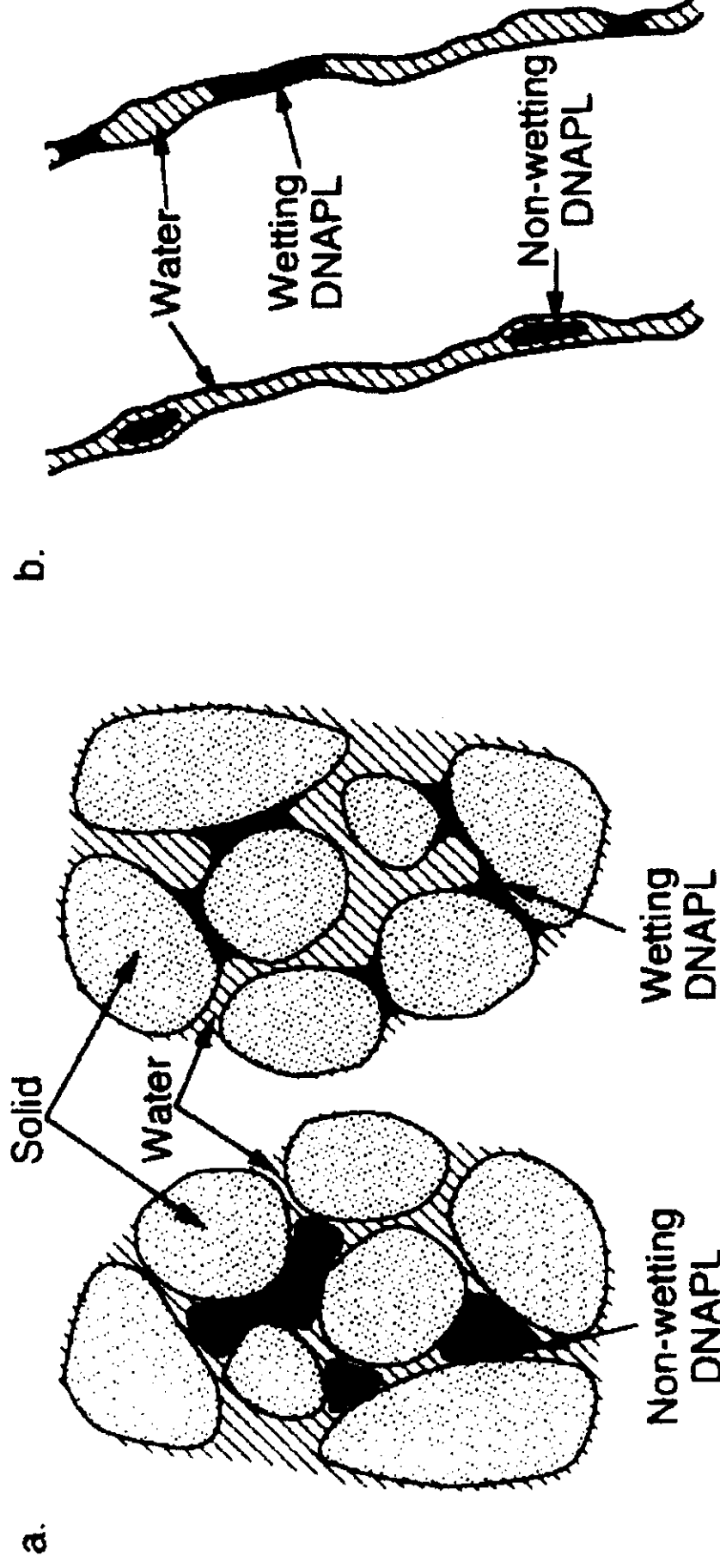
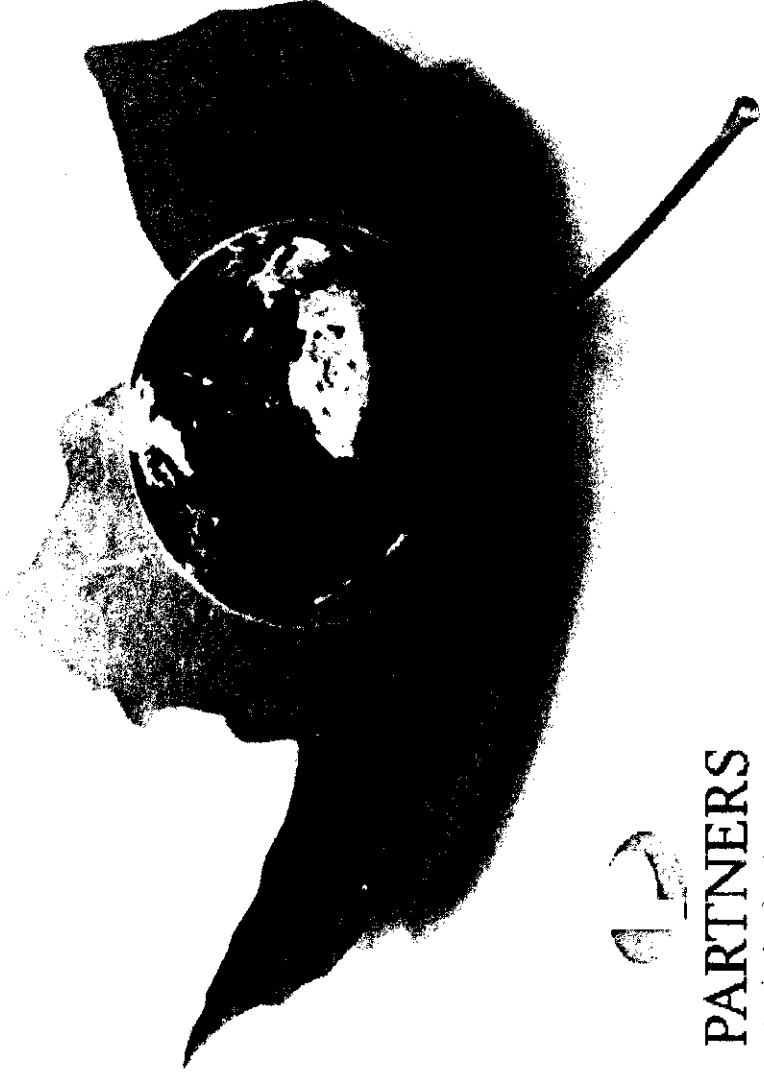


Figure 2.3 Pore-scale representation of non-wetting and wetting DNAPL residual in:
a) water-saturated sand; and b) a fracture.

Source: <http://www.epa.gov/osw/hazard/correctiveaction/curriculum/download/lnapl.pdf>

II. Overview of Characterization Techniques



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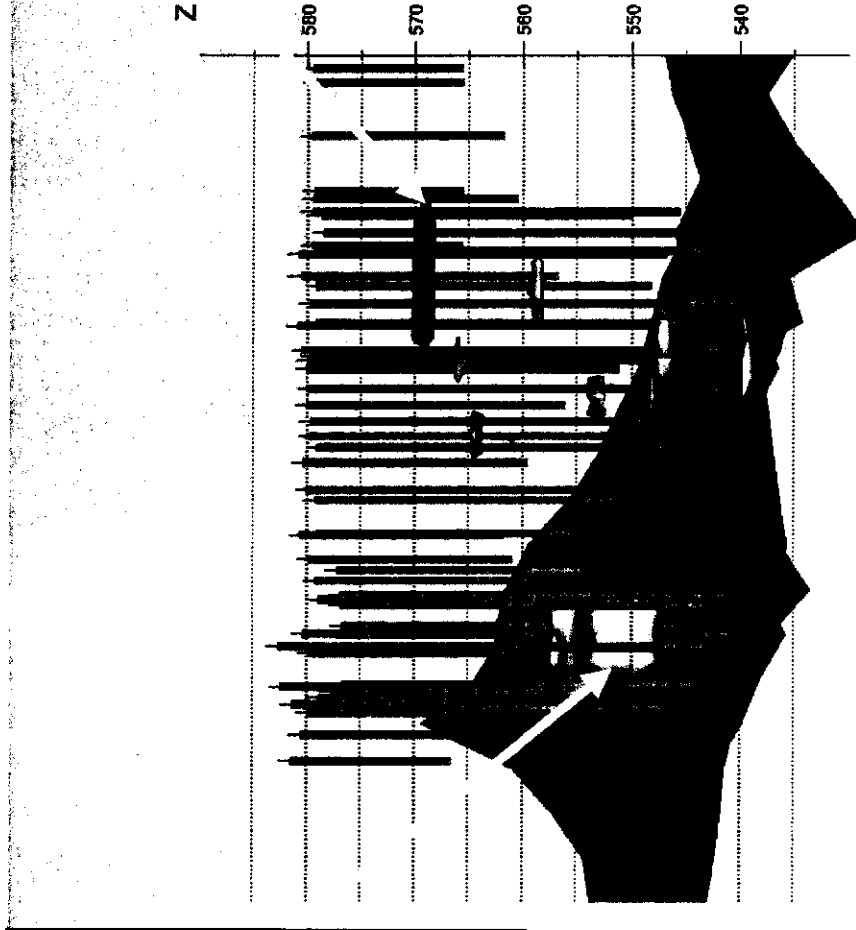
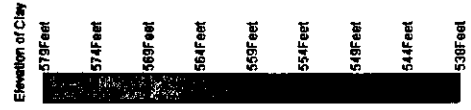
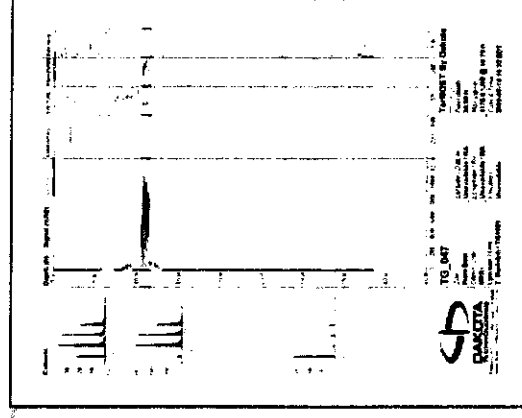
Characterization Techniques

- Monitoring well gauging
 - Presence or absence
- Sample analyses
 - Soil type, density
 - Hydraulic conductivity
 - LNAPL saturation
 - Porosity & effective porosity (mobility)
 - Viscosity



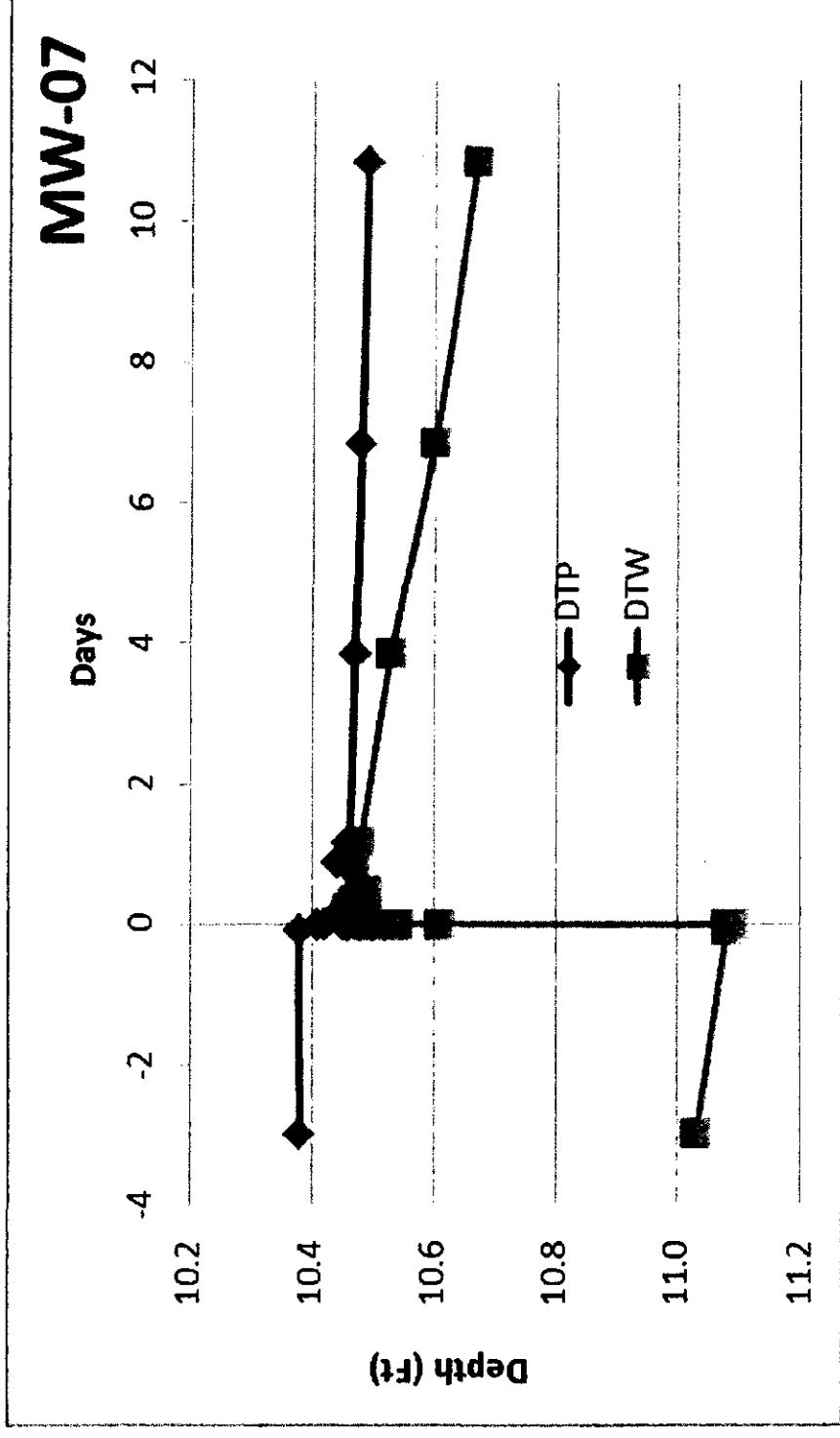
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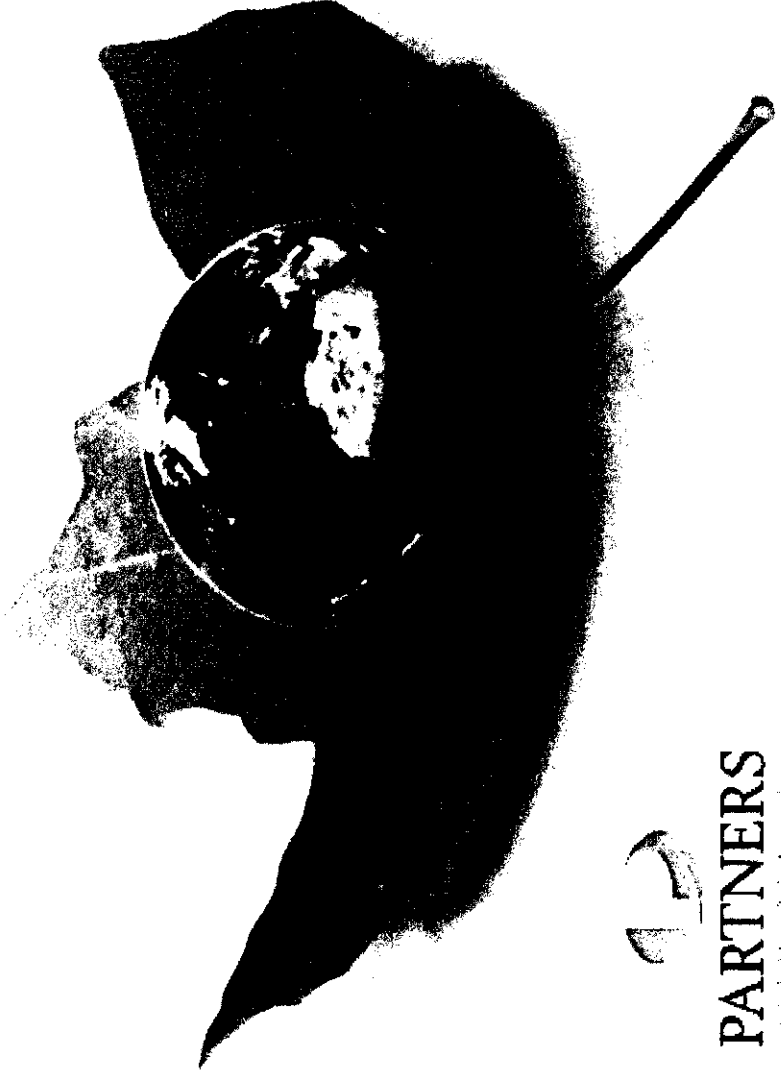


Characterization Techniques

- Baildown testing – recoverability/mobility



III. Implications of Free Product Under the VAP




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Implications of Free Product

- Risk Considerations
 - Depth to product (*direct contact or not*)
 - Vapor migration potential
 - Chemical characteristics
 - Volatile Organic Compounds
 - Semivolatile Organic Compounds
 - Polychlorinated Biphenyls

Implications of Free Product

- Institutional Controls:
 - No groundwater use
 - Risk Mitigation Plan
- Remedial options to address:
 - Developer or owner considerations
 - Other regulatory requirements

IV. Case Studies



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Gear Manufacturing Facility

Two Product Areas

- Former UST Area – BUSTR
 - Remedy needed for NFA determination
- Interior Building Area
 - Mobility evaluation
 - Remedy involved operational changes to eliminate potential ongoing source

Gear Manufacturing Facility



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Former UST Area

BUILDING

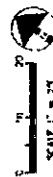
LOADING DOCK
RE-ENTRY WALL

CONCRETE
PAVEMENT

APPROXIMATE LOCATION OF
FORMER 5000 GALLON HEATING
OIL UST

BUILDING

APPROXIMATE LOCATION OF FORMER
9000 GALLON HEATING OIL CUTTING
OIL UST



LEGEND



APPROXIMATE LIMITS OF REMEDIAL TREATMENT

APPROXIMATE LOCATIONS OF FORMER PRODUCT SUPPLY LINES
(INFERRED FROM HISTORICAL INTERVENTION)



PROPOSED POST REMEDIAL SAMPLE LOCATION

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Former UST Area



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Former UST Area



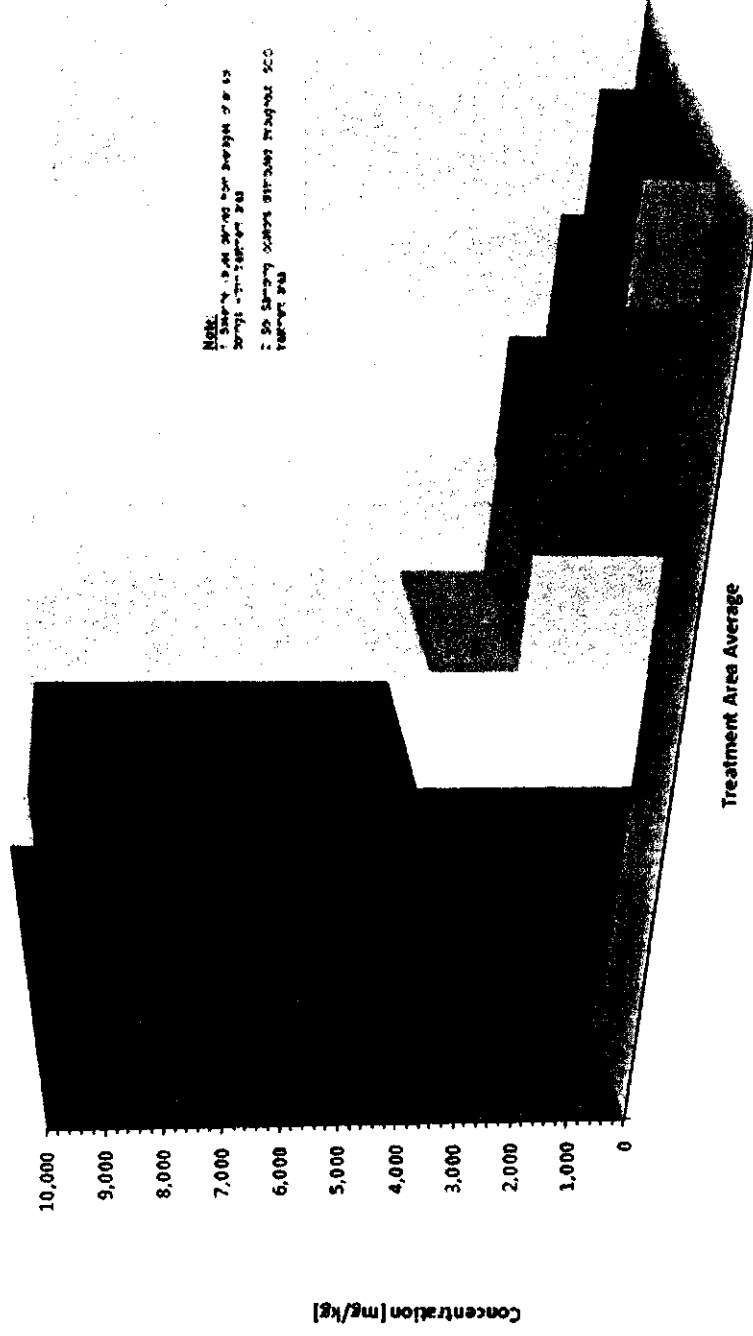
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Former UST Area



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Former UST Area

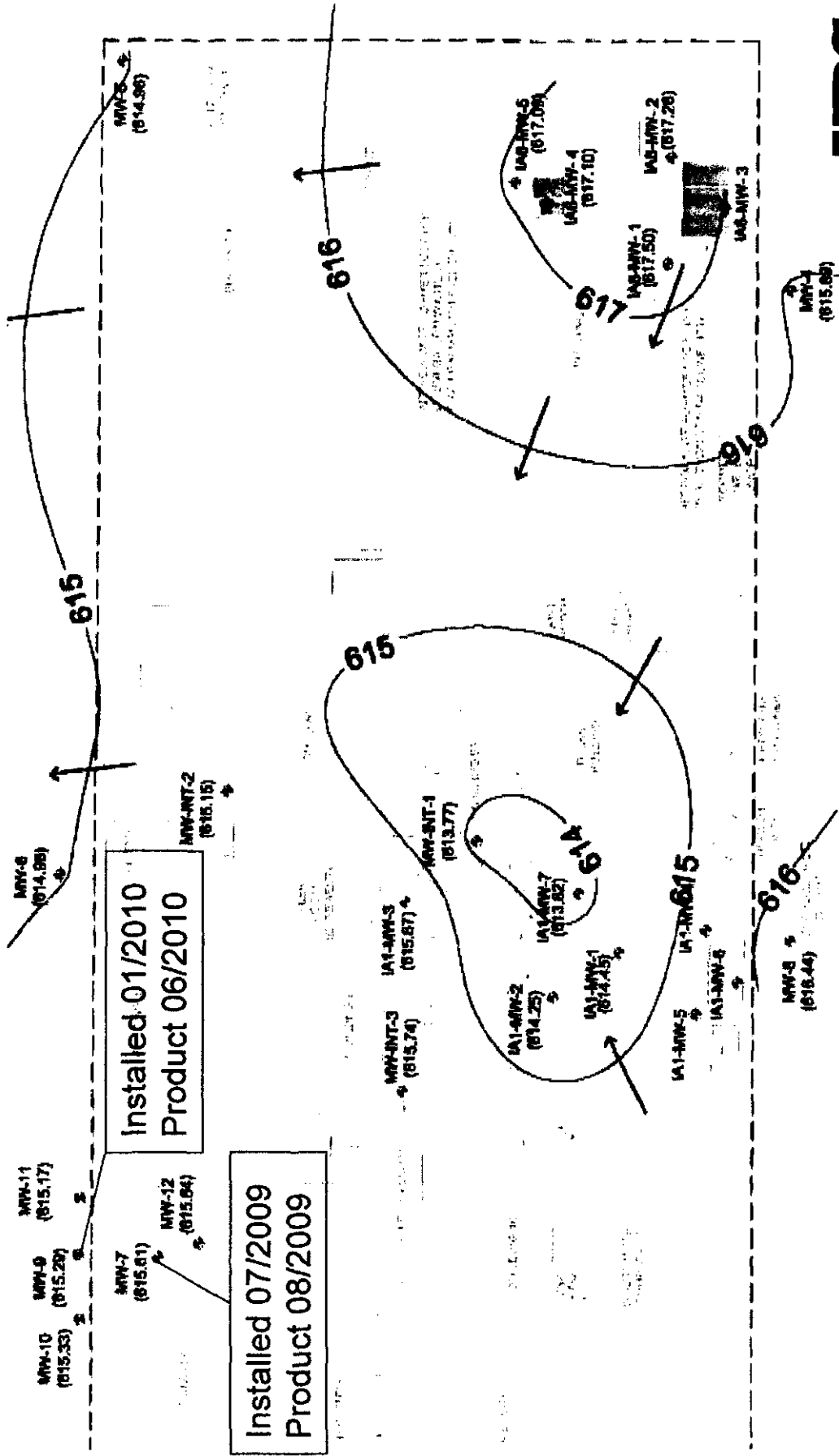


Former UST Area

Observations & Conclusions

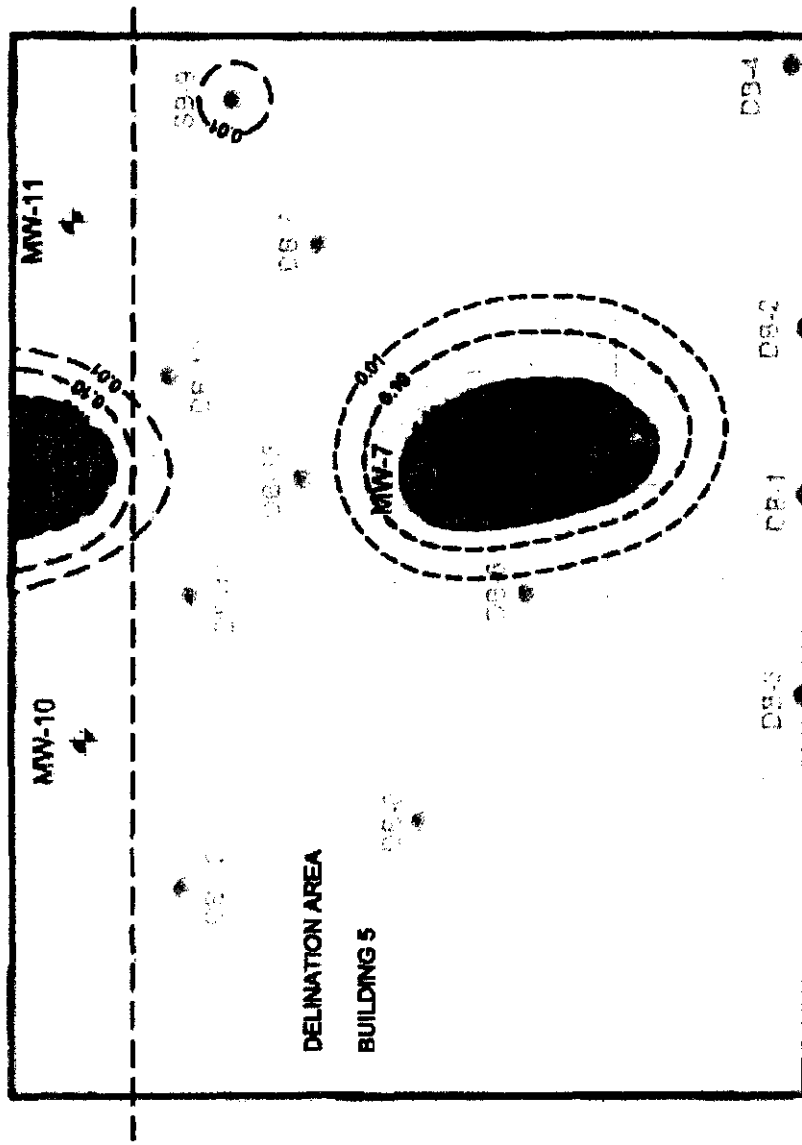
- Innovative Soil Mixing/ISCO
- 5 days to treat 7,500 ft² from 3-18 feet (4,200 yd³)
- No mobilization of chemicals from soil to groundwater
- 2 small areas retreated
- 9 months to attain standards
- Average 90% concentration reduction
- Cost savings of \$450K over excavation

Property-Wide Groundwater



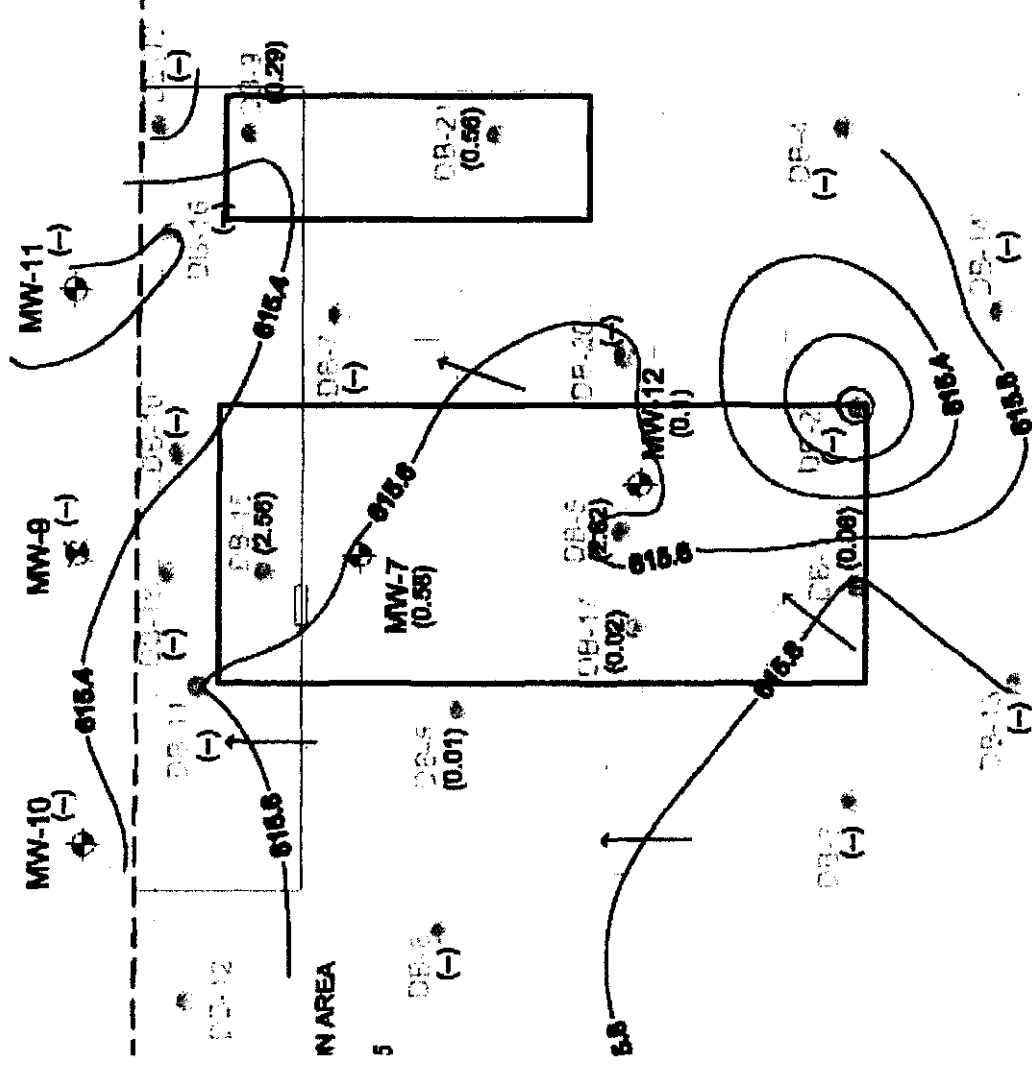
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Building Interior Pre-Remedy



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Building Interior – Post Remedy



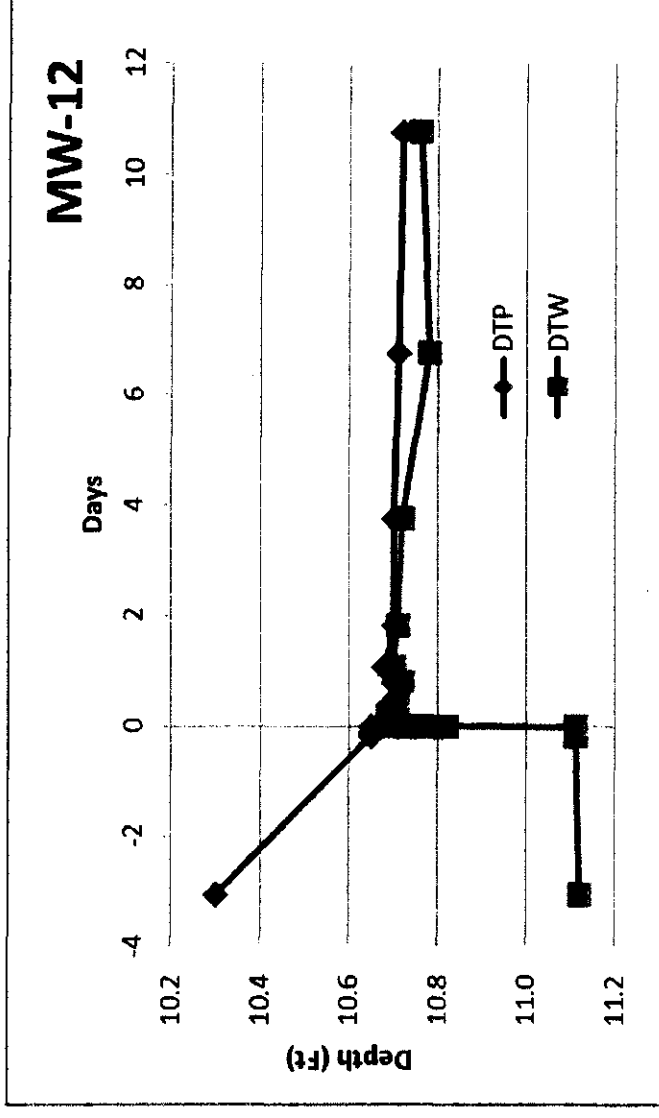
Building Interior



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Building Interior - Status

- Up to 3 feet remains in some wells
- Viscosity 300 times greater than water
- Baildown tests – not mobile



Potential VAP Response

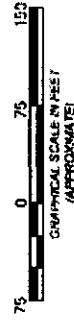
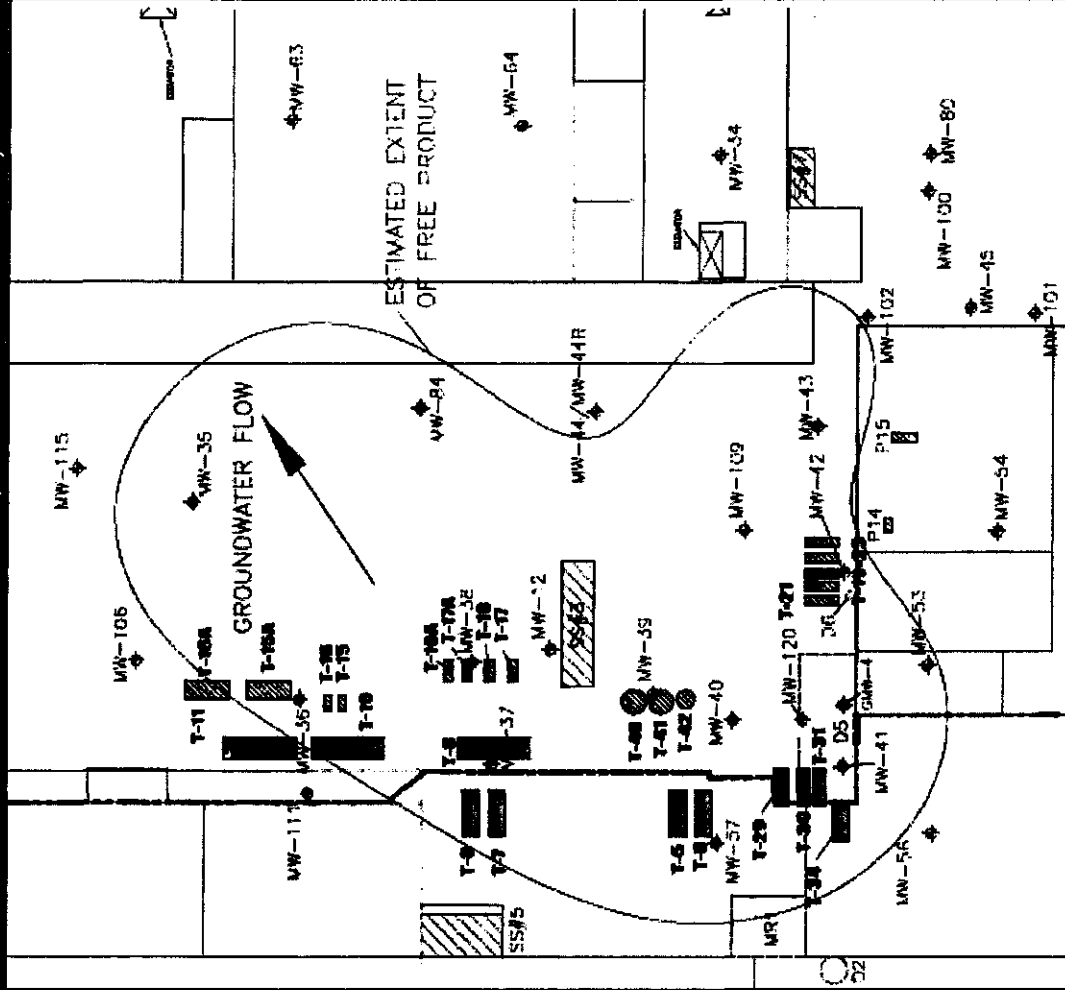
- Weight of evidence demonstrates immobility
 - Thickness monitoring
 - Field & lab test results
- Risk Mitigation Plan
- No Groundwater Use – Urban Setting Designation

Monitoring Well Free Product Gauging Information

Well ID	Date	Depth to Product (ft)	Depth to Groundwater (ft)	Product Thickness (ft)
GMW-4	4/4/2001	12.35	12.42	0.07
	4/5/2001	12.35	12.42	0.07
	10/1/2009	11.96	12.41	0.45
	10/21/2009	12.02	12.53	0.51
MW-35	10/5/2004	14.04	15.04	1.00
	11/11/2004	14.30	15.36	1.06
	6/21/2005	13.65	14.23	0.58
	10/20/2009	13.56	14.32	0.76
MW-36	10/21/2009	13.59	14.40	0.81
	10/5/2004	12.41	12.96	0.55
	11/11/2004	12.65	13.48	0.83
	6/21/2005	11.97	12.63	0.66
MW-38	10/1/2009	11.93	12.47	0.54
	10/21/2009	12.00	12.50	0.50
	11/11/2009	12.16	12.59	0.43
	2/1/2010	12.51	13.03	0.52
MW-39	10/6/2004	NA	12.14	-
	10/27/2004	NA	12.29	-
	1/11/2004	NA	12.40	-
	6/21/2005	NA	11.72	-
MW-40	10/1/2009	NA	12.07	-
	10/21/2009	11.65	11.67	0.02
	10/6/2004	12.92	13.40	0.48
	11/11/2004	12.92	13.56	0.64
MW-41	11/11/2009	12.77	12.92	0.15
	10/6/2004	NA	12.15	-
	10/27/2004	NA	12.31	-
	11/11/2004	NA	12.39	-
MW-43	6/17/2005	11.52	11.60	0.08
	10/1/2009	11.43	11.62	0.19
	10/21/2009	11.46	11.78	0.32
	10/5/2004	NA	13.23	-
MW-57	10/27/2004	NA	13.39	-
	11/11/2004	NA	13.42	-
	6/17/2005	12.96	13.35	0.39
	10/1/2009	12.87	13.33	0.46
MW-54	10/21/2009	12.85	13.45	0.60
	11/3/2004	15.02	16.65	1.63
	11/11/2004	15.03	16.71	1.68
	6/17/2005	13.62	15.89	2.27
MW-84	2/19/2010	15.02	16.51	1.49
	6/16/2005	NA	14.02	-
	6/22/2005	NA	14.00	product observed, not measurable
	10/1/2009	13.77	14.02	0.25
NOTES	10/21/2009	13.79	14.10	0.31

NOTES
NIM = not measured

Monitoring Well Location Map Commerce Park, Cleveland, Ohio

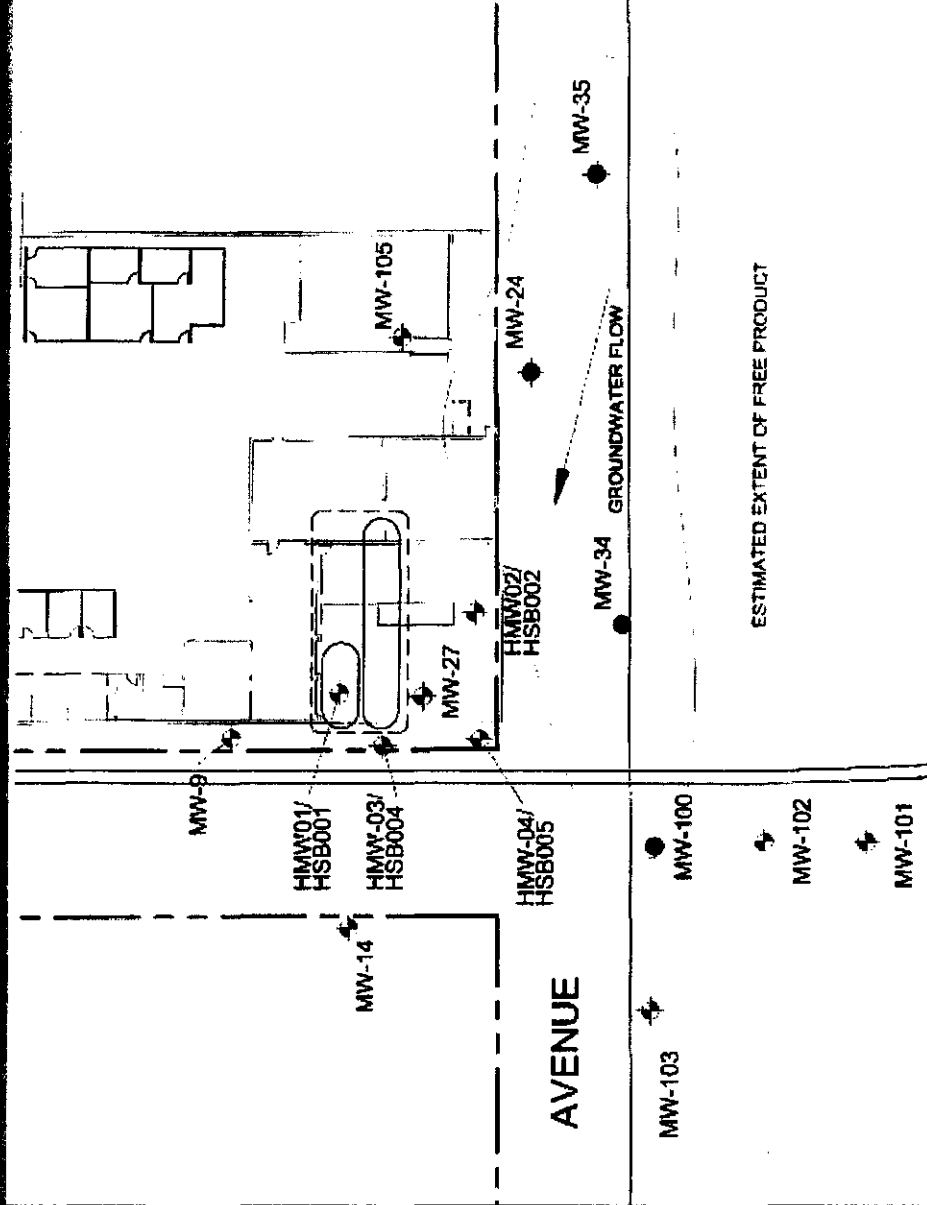


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Groundwater Monitoring Well Location Map Industrial Facility, Cleveland, Ohio

Monitoring Well Free Product Gauging Information				
Well ID	Date	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)
MW-24	10/6/1994	7.83	7.86	0.03
	7/21/1997	NMI	9.20	NMI
	4/15/1998	6.94	7.30	0.36
MW-27	10/6/1994	NMI	5.04	NMI
	7/21/1997	NMI	4.48	NMI
	4/15/1998	3.84	3.86	0.02
	3/6/2007	NMI	7.95	NMI
	7/10/2008	NMI	4.91	NMI
	9/20/2011	NMI	4.69	NMI
	9/27/2011	NMI	4.76	NMI
MW-34	2/27/2012	NMI	4.41	NMI
	3/7/2012	NMI	4.65	NMI
	4/15/1998	2.36	2.38	0.02
	4/3/2007	2.85	5.26	2.41
	7/10/2008	2.71	11.39	8.68
MW-35	12/10/2008	2.79	11.74	8.95
	9/27/2011	2.57	12.72	10.15
	2/27/2012	3.04	12.70	9.66
	4/15/1998	10.65	11.05	0.40
MW-100	7/10/2008	8.32	13.15	4.83
	12/10/2008	11.11	11.88	0.77
	9/27/2011	10.62	11.62	1.00
	2/27/2012	10.72	11.74	1.02
	4/29/2011	4.65	4.66	0.01
	5/5/2011	NMI	3.43	NMI
	5/18/2011	NMI	3.47	NMI
	9/22/2011	NMI	3.55	NMI
	9/27/2011	NMI	2.19	NMI
	2/27/2012	NMI	4.47	NMI

Notes:
NMI - No measurable interface



LEGEND

--- PROPERTY LINE
 --- FENCE
 • MONITORING WELL
 • MW-104

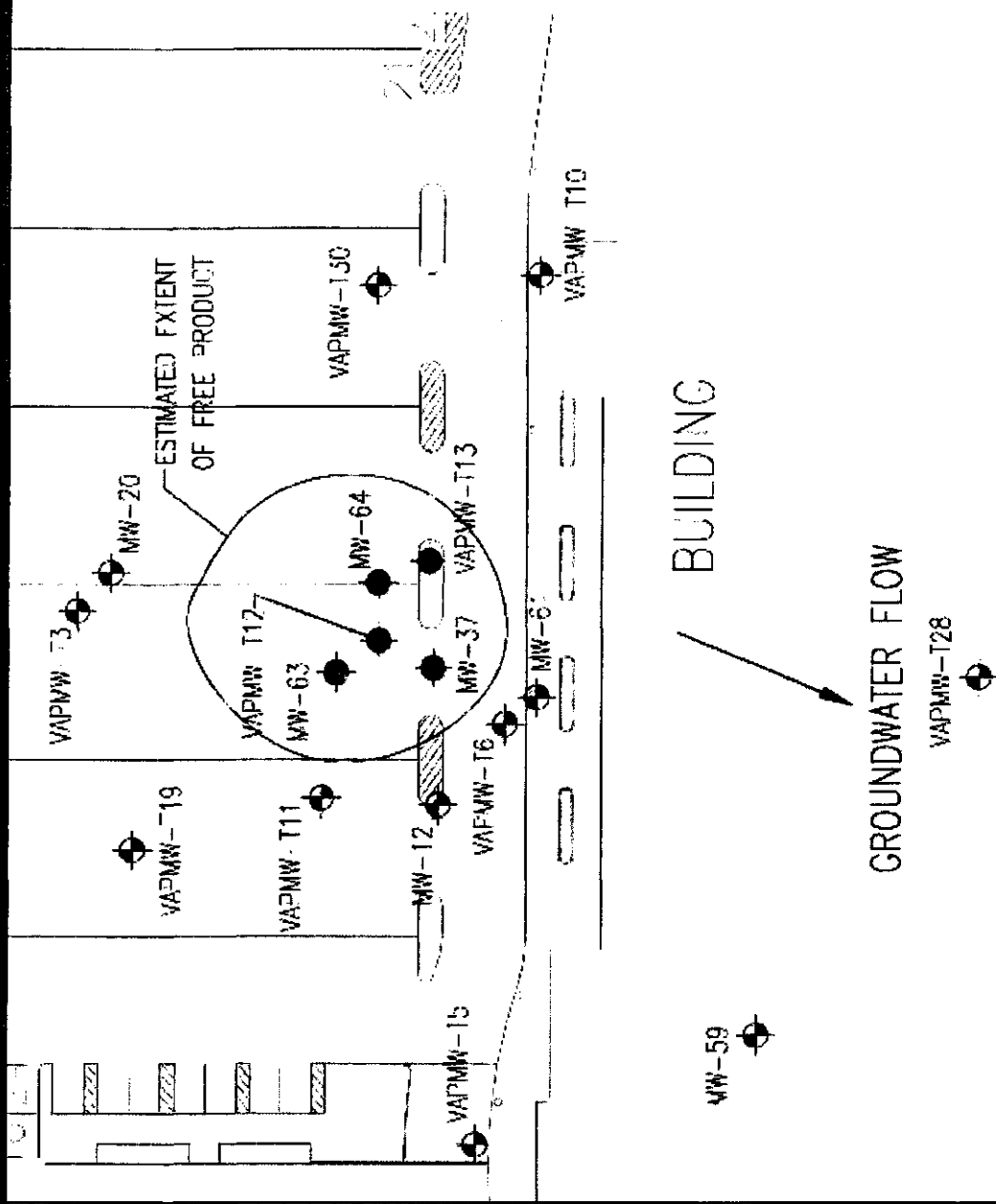


Monitoring Well Location Map Commercial Facility, Cleveland, Ohio

Monitoring Well Free Product Gauging Information			
Well ID	Date	Depth to Product (ft)	Depth to Groundwater (ft)
MW-37	10/12/2004	12.27	15.69
	7/5/2005	11.15	15.20
MW-63	11/15/2004	11.8	12.65
	11/18/2004	N/A	13.81
MW-64	7/5/2005	11.14	11.80
	10/11/2006	5.52	5.53
MW-66	12/29/2006	6.83	6.90
	1/15/2007	6.07	6.08
MW-67	4/2/2007	N/A	6.66
	4/13/2007	N/A	6.55
MW-68	1/4/2006	9.86	10.05
	4/7/2006	11.46	14.41
MW-69	4/17/2006	10.79	11.90
	5/17/2006	11.85	17.27
MW-70	5/19/2006	11.87	11.94
	5/23/2006	12	12.09
MW-71	10/11/2006	5.81	6.15
	12/29/2006	7.21	8.62
MW-72	1/15/2007	6.32	7.91
	4/2/2007	7.11	9.91
MW-73	3/26/2010	7.38	11.14
	6/16/2010	7.37	10.08
MW-74	9/29/2010	7.8	12.05
	11/22/2010	7.55	11.05
MW-75	4/29/2011	6.52	11.35
	10/31/2011	6.28	7.71
MW-76	4/24/2012	6.88	8.44
	1/4/2006	9.12	9.78
MW-77	4/3/2006	11.35	11.71
	4/7/2006	11.41	11.47
MW-78	4/17/2006	10.8	10.89
	5/17/2006	12.13	12.27
MW-79	5/19/2006	12.26	12.47
	5/23/2006	12.3	12.37
MW-80	10/11/2006	6.2	6.50
	12/29/2006	N/A	N/A

NOTES

N/A = No Information Available





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EXHIBIT

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