

Remedial Action Plan

Public Comment Meeting

July 8, 2026

Agenda

- Welcome/ Meeting Overview/ Investigation & Remediation Update
- Remedial Action Plan Summary
 - Purpose & Objectives (Section 1)
 - Site Background (Section 2)
 - Remediation Objectives (Section 3)
 - Remedial Technologies (Section 4)
 - Evaluation of Remedial Alternatives (Section 5)
 - Remedial Pilot Testing (Section 6)
- Public Comment
- Conclusion

Meeting Overview

- Written public comments will be accepted through **Aug. 3 2026** and can be sent via email or in writing:
 - *Email:* uppermakefieldact2@energytransfer.com
 - *Mail:* SPLP, 525 Fritztown Road, Sinking Spring, PA 19608
- Please direct written comments to **Attention: RAP Public Comment**

Investigation & Remediation Update

Completed and Ongoing

- Ongoing water testing (1,839 samples from 365 private wells)
- Supplying bottled water
- Installation of 203 POET systems
- Daily reporting to DEP
- Performing site characterization activities (e.g., surface and downhole geophysics; soil sampling; indoor air sampling; sub-slab soil gas sampling; well installation (currently 44 wells); and groundwater sampling)
- Performing interim remedial activities (e.g., soil excavation and LNAPL removal)
- Submitted and implemented Public Involvement Plan
- Submitted Interim Remedial Action Plan
- Submitted five (5) Remedial Action Progress Reports
- Submitted Vapor Intrusion Investigation Progress Report
- Submitted Site Characterization Work Plan
- Submitted Interim Site Characterization Report
- Submitted Remedial Action Plan

Future

- Finalize site characterization activity
- Submit additional Remedial Action Progress Reports
- Submit Act 2 Final Report(s)

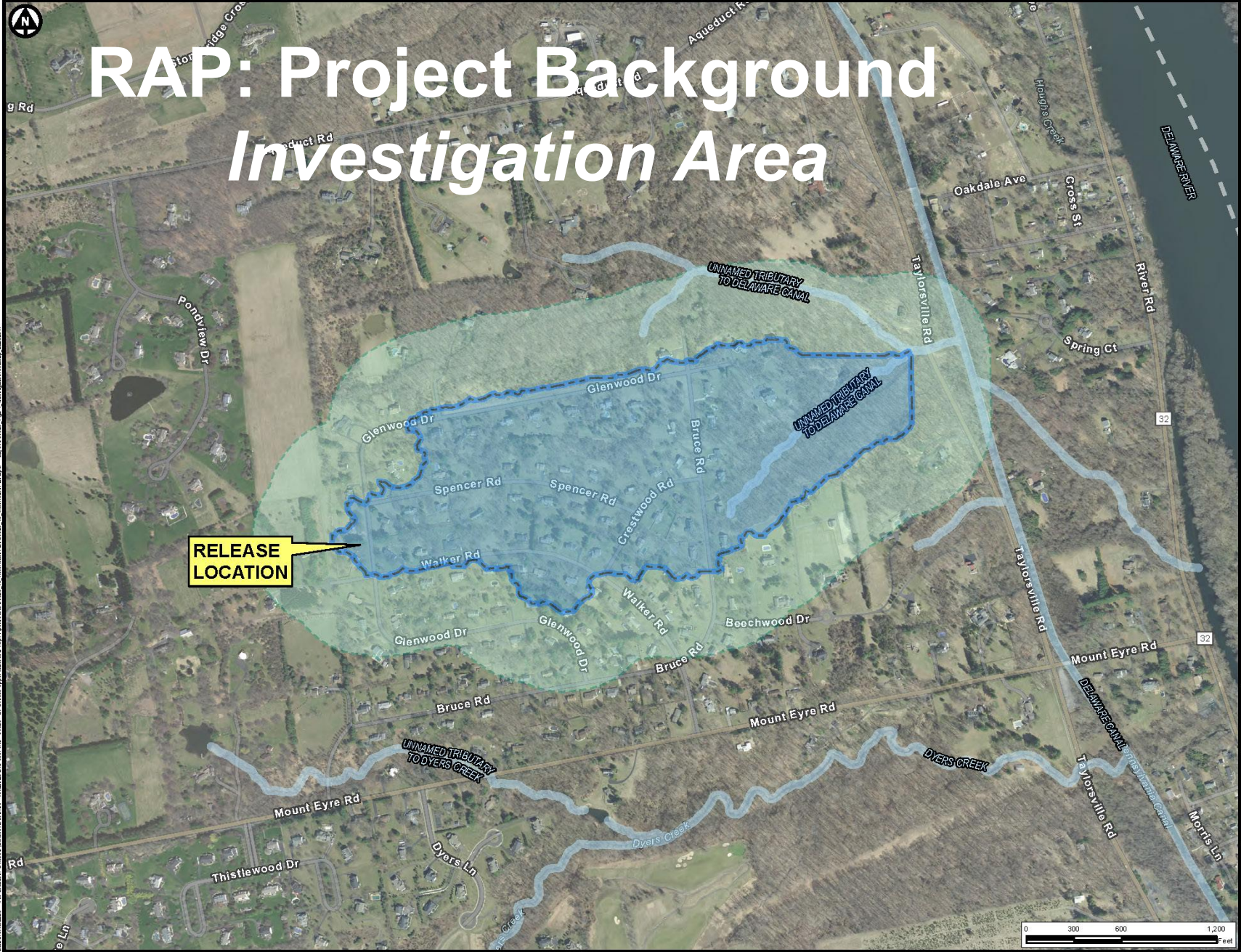
Verdantas Introduction



- Integrated environmental science, engineering, and consulting firm with professionals specializing in environmental assessment & remediation
- Neil Ketchum: 25+ years of broad technical and management experience in environmental site assessments, soil and groundwater contamination investigations, soil and groundwater remediation, and post-remediation/post-closure maintenance and monitoring
- Appointed to PADEP Cleanup Standards Scientific Advisory Board
 - Involved on subcommittees and working groups for the development of guidance for Act 2 regulations and Land Recycling Program Technical Guidance Manual

RAP: Purpose & Objectives

- Summarizes the current site characterization and presents the current plan to remediate impacts resulting from the pipeline release
- This Plan accounts for site knowledge at this time and it may be subject to revision as additional characterization, monitoring, and pathway investigation are performed
- Additional report required by DEP Administrative Order
 - Not required by Act 2
 - Submission date was 60-days following DEP approval of the ISCR



RAP: Project Background Investigation Area

LEGEND

- Catchment/Drainage Area
- Catchment/Drainage 500' Buffer

NOTE: The aerial photo was acquired from the Pennsylvania Spatial Data Access (PASDA) web service. Aerial photography dated 2018.

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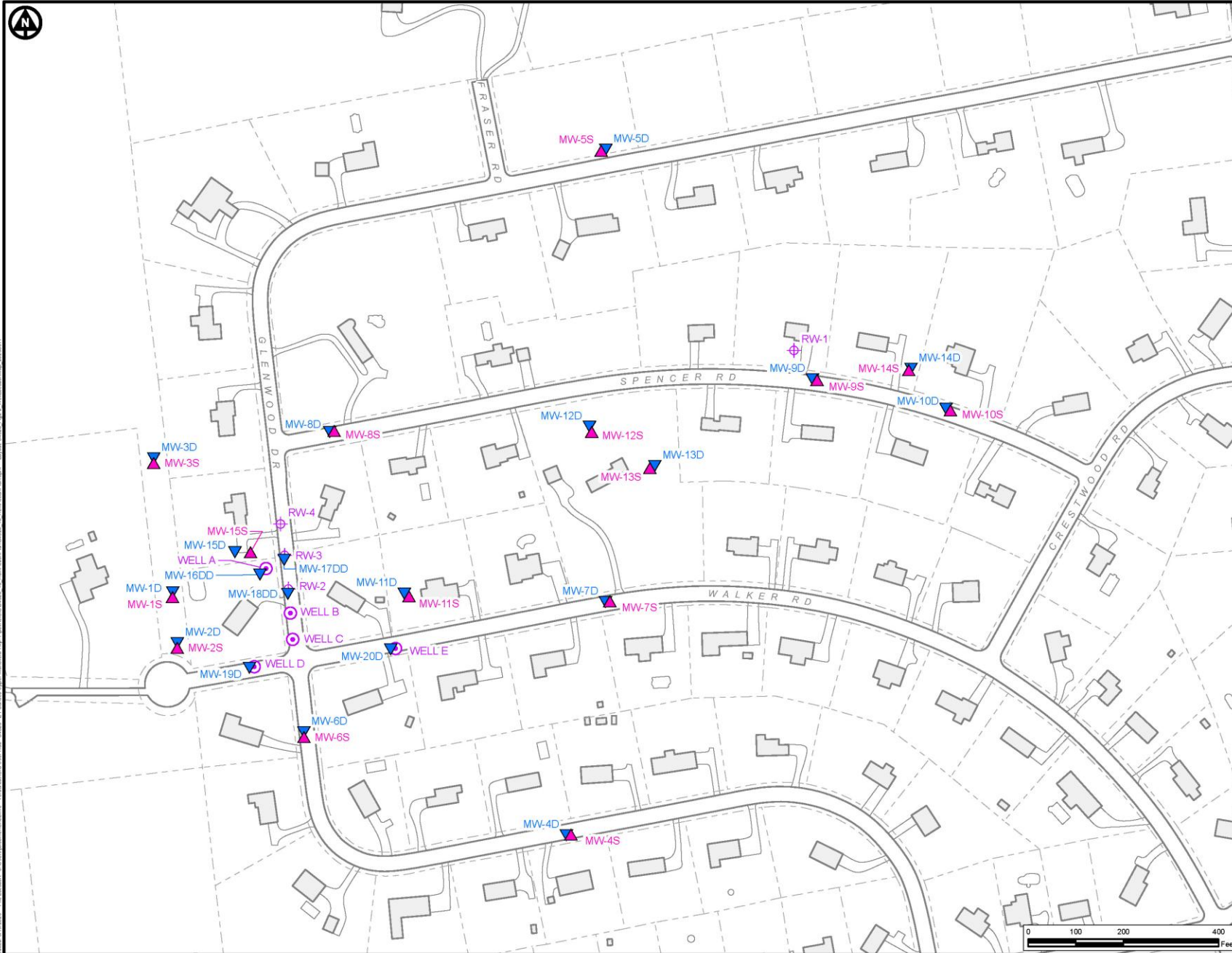


Twin Oaks - Newark 14" Diameter Pipeline LNAPL Incident: Remedial Action Plan

Investigation Area Map

Upper Makefield Township
Bucks County, Pennsylvania

Project Number	006.0000034328
Date	06/20/20
Author	Bloomer
Scale	1 in = 800 ft
Figure	2-1



 Shallow Monitoring Well
 Deep Monitoring Well
 Multipurpose Well
 Recovery Well
 Parcel Boundary (approx.)
 Existing Building
 Edge of Roadway (approx.)

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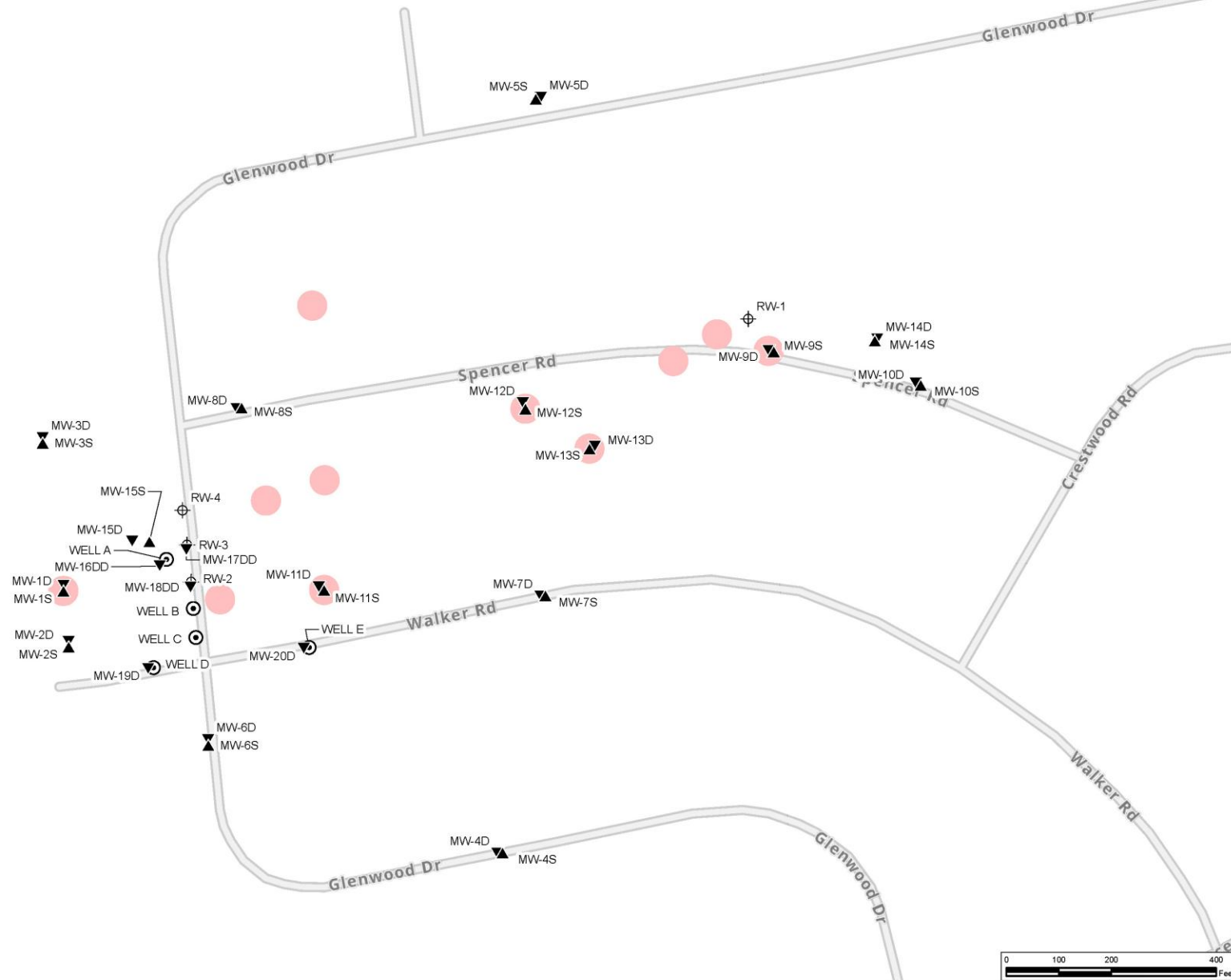
Twin Oaks - Newark 14" Diameter Pipeline
LNAPL Incident Remedial Action Plan

Well Location Map

Upper Makefield Township
Bucks County, Pennsylvania

Project Number	006 0000034328
Date	06/2026
Author	jbloomer
Scale	1 in = 200 ft

2-2



▲ Shallow Monitoring Well
▼ Deep Monitoring Well
⊙ Multipurpose Well
⊕ Recovery Well
● Groundwater Concentration Above Act 2 Statewide Health Standard Medium-Specific Concentration

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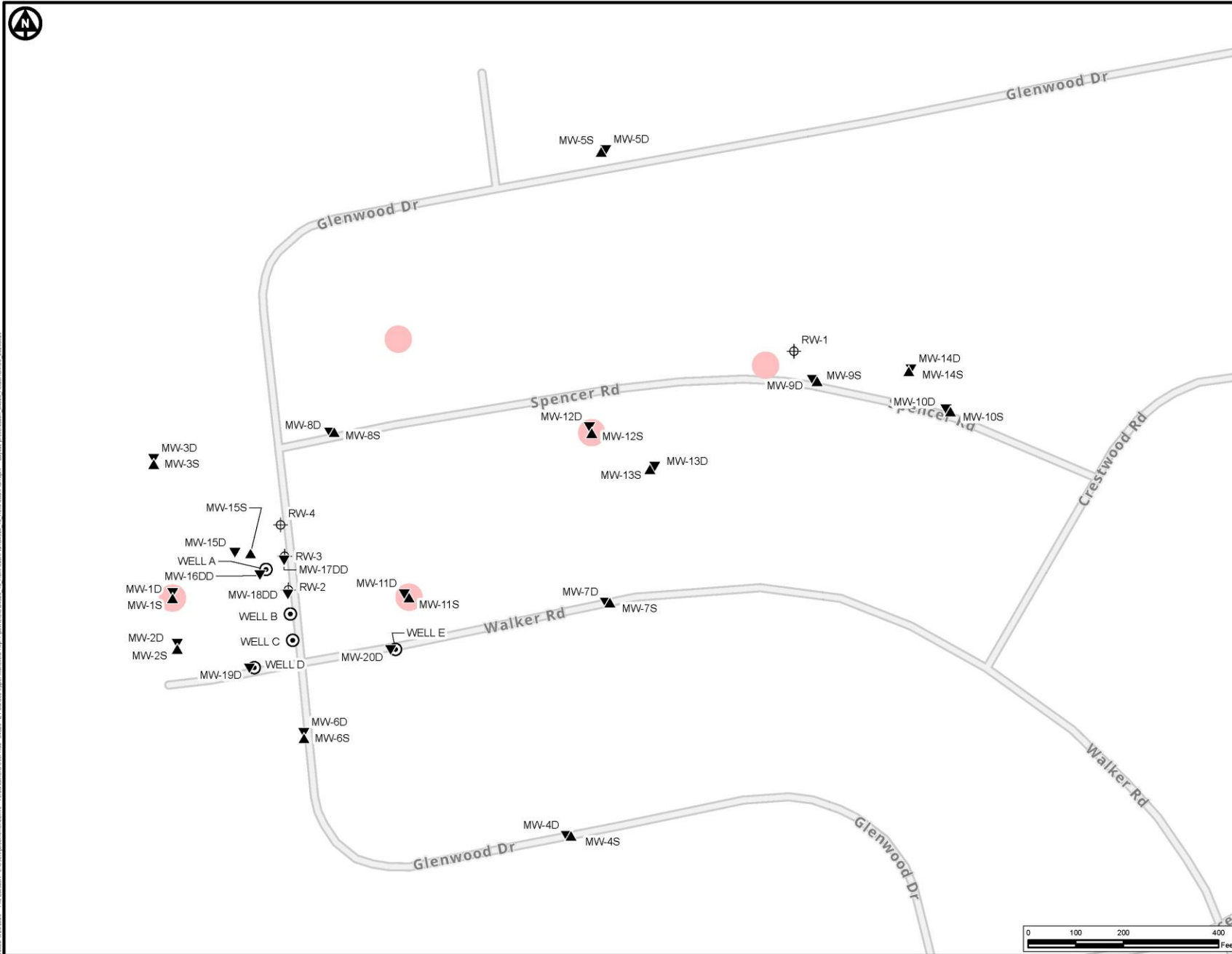


Twin Oaks - Newark 14" Diameter Pipeline
LNAPL Incident: Remedial Action Plan

**Historical
Groundwater Detections
Over Medium-Specific
Concentrations Map**

Upper Makefield Township
Bucks County, Pennsylvania

Project Number	006 0000034328
Date	06/2026
Author	jbloomer
Scale	1 in = 200 ft
Figure	2-7



LEGEND

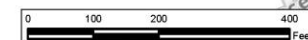
- ▲ Shallow Monitoring Well
- ▼ Deep Monitoring Well
- ⊙ Multipurpose Well
- ⊕ Recovery Well
- Groundwater Concentration Above Act 2 Statewide Health Standard Medium-Specific Concentration

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Twin Oaks - Newark 14" Diameter Pipeline
LNAPL Incident: Remedial Action Plan
**Groundwater Detections Over
Medium-Specific Concentrations
in Most Recent Sampling Event
(as of June 16, 2026)**
Upper Makefield Township
Bucks County, Pennsylvania

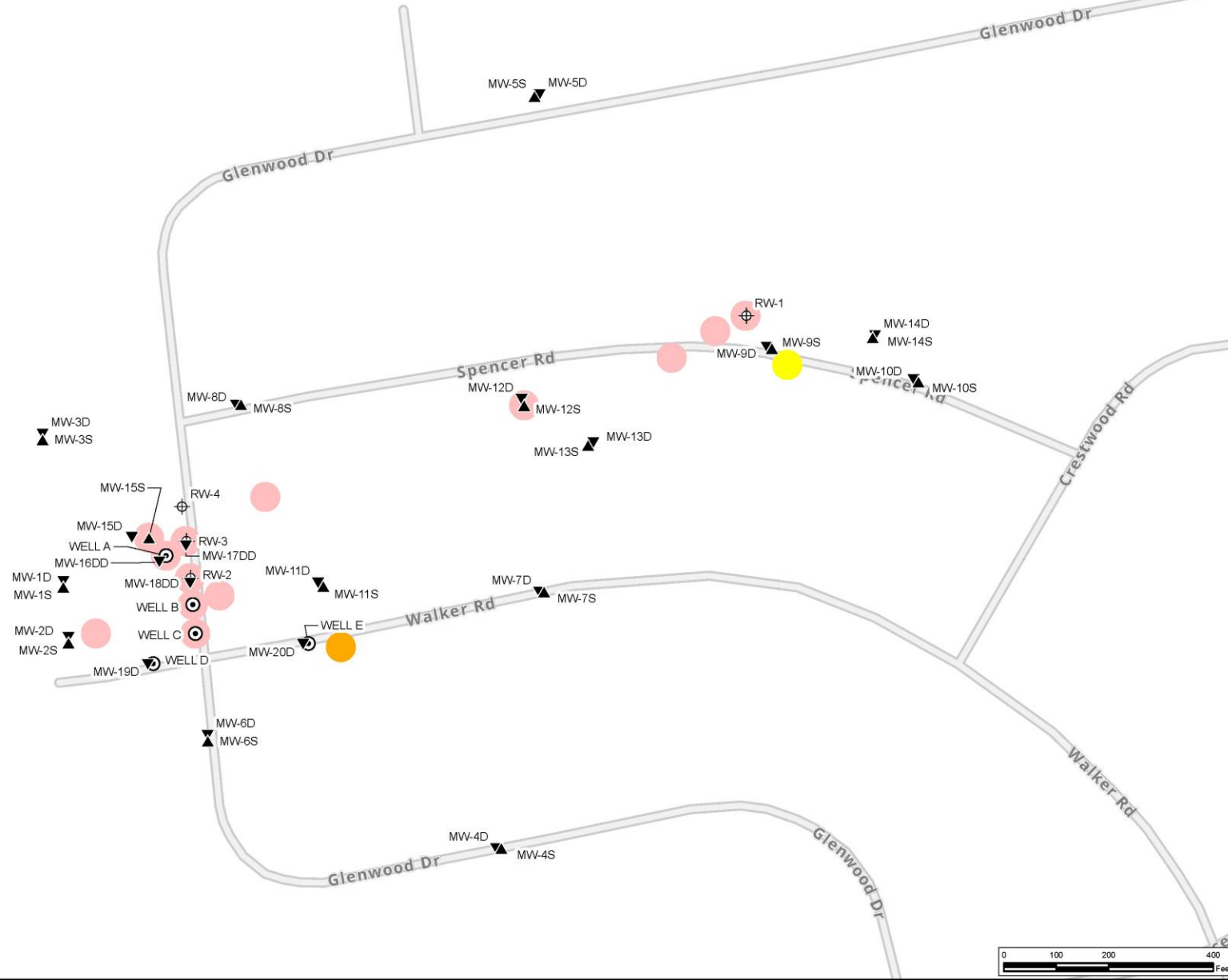
Project Number	006 0000034328
Date	06/20/26
Author	Bloomer
Scale	1 in = 200 ft
Figure	





Scale: 6/19/2026 File Location: C:\Users\jdoyle\OneDrive - Verdantas LLC\Documents\Twin Oaks - 14" Diameter Pipeline LNAPl Incident Remedial Action Plan - 06/2026\Map 2-8 Historical LNAPl Detections Map.dwg User: jdoyle Date: 6/19/2026 Project Number: 006 0000034328

Produced Using: ERTI ArcGIS Software



LEGEND

- ▲ Shallow Monitoring Well
- ▼ Deep Monitoring Well
- ⊕ Multipurpose Well
- ⊕ Recovery Well

LNAPl Light Non-Aqueous Phase Liquid

LNAPl Observed (Historical)

- LNAPl Attributed to Release Detected
- LNAPl That is A Mixture of Jet A and No. 2 Heating Oil Detected
- LNAPl That Does Not Appear to be Related to the Release Detected

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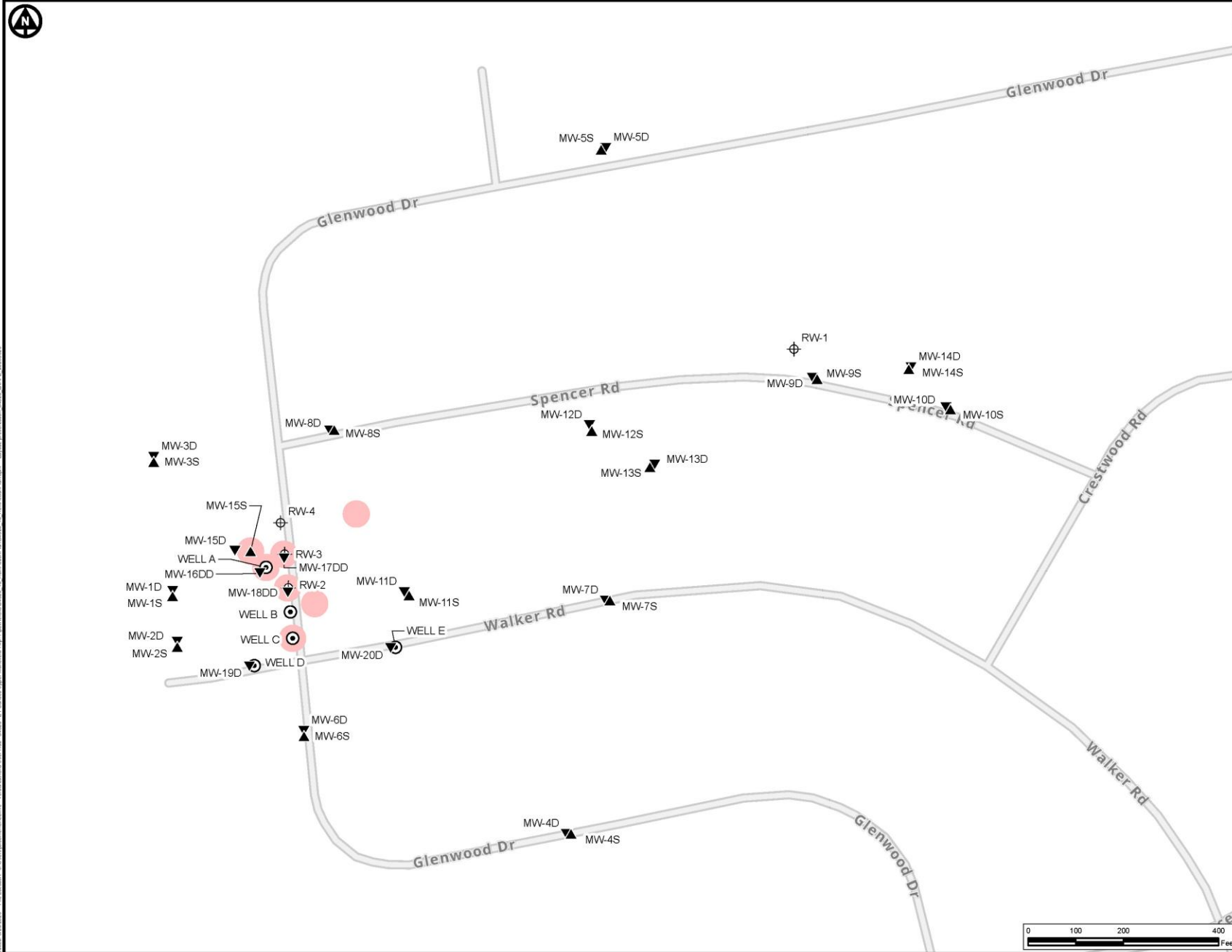
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Twin Oaks - Newark 14" Diameter Pipeline
LNAPl Incident: Remedial Action Plan

**Historical
LNAPl Detections Map**

Upper Makefield Township
Bucks County, Pennsylvania

Project Number	006 0000034328
Date	06/2026
Author	Bloomer
Scale	1 in = 200 ft
Figure	2-8



LEGEND

- ▲ Shallow Monitoring Well
- ▼ Deep Monitoring Well
- ⊙ Multipurpose Well
- ⊕ Recovery Well
- LNAPL Light Non-Aqueous Phase Liquid
- LNAPL Attributed to Release Detected

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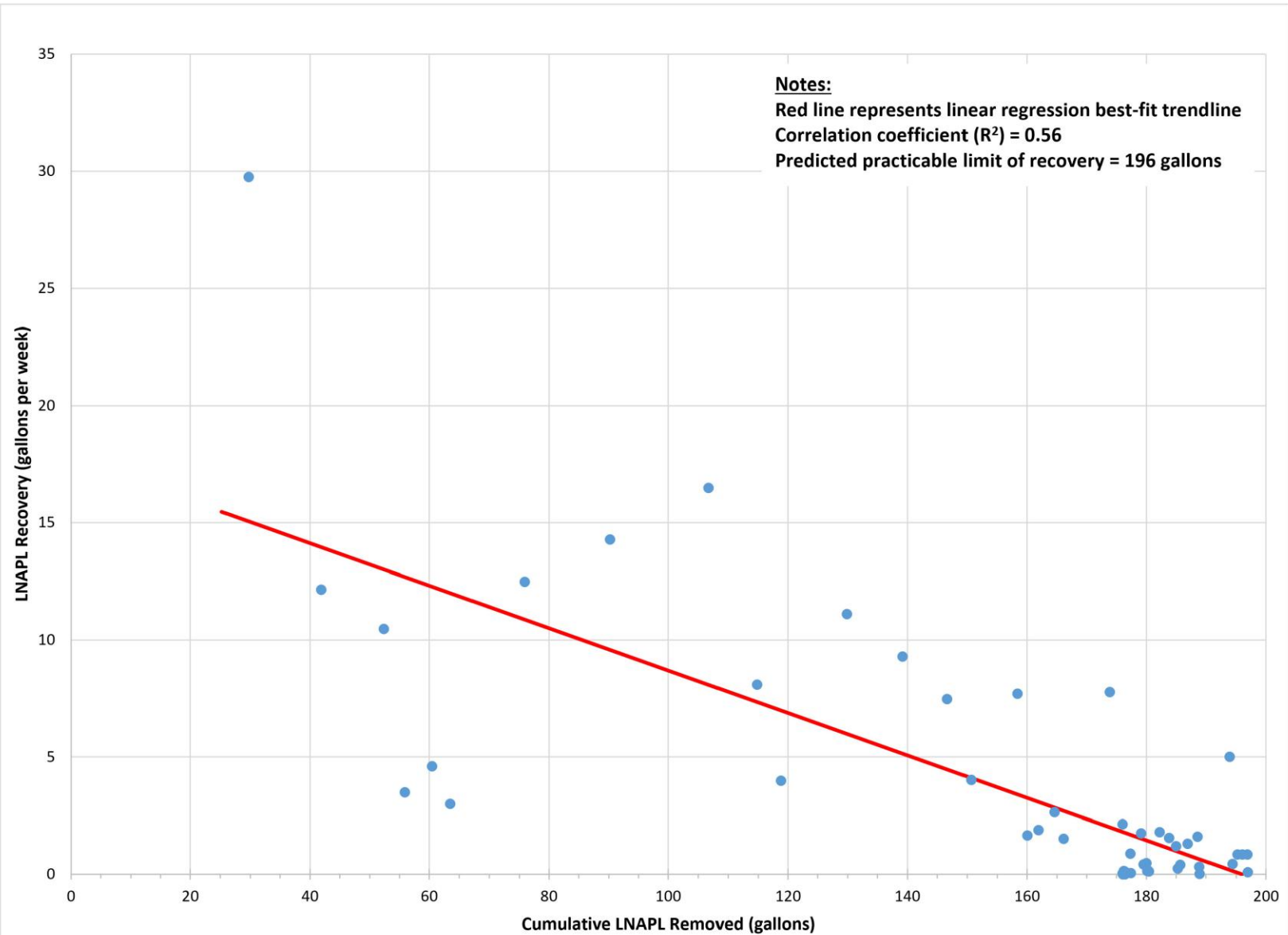
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Twin Oaks - Newark 14" Diameter Pipeline
LNAPL Incident: Remedial Action Plan

LNAPL Detections Map
(May 17 - June 16, 2026)

Upper Makefield Township
Bucks County, Pennsylvania

Project Number	006 0000034328
Date	06/20/26
Author	Bloomer
Scale	1 in = 200 ft
Figure	



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Twin Oaks - Newark 14" Diameter Pipeline LNAPL Incident: Remedial Action Plan		Project Number 006.0000034328
		Date 06/2026
		Author Bloomer
		Scale
		Figure 2-5
Upper Makefield Township Bucks County, Pennsylvania		

Identification of Remediation Objectives

Interim Remediation Objectives

Attainment Remediation Objectives

Identification & Screening of Technologies

LNAPL

1. Multiphase Extraction
2. Biosparging/Bioventing
3. Air Sparge/Vapor Extraction
4. Thermal
5. LNAPL Recovery
6. In-Situ Chemical Oxidation
7. Enhanced Bioremediation w/
Amendments
8. Natural Source Zone Depletion

Groundwater

1. Hydraulic Containment
2. Physical Containment
3. Multiphase Extraction
4. Surfactant Flushing
5. Carbon Injection
6. In-Situ Chemical Reduction
7. In-Situ Chemical Oxidation
8. Monitored Natural Attenuation

Identification & Screening of Technologies

LNAPL

1. Multiphase Extraction
2. Biosparging/Bioventing
3. Air Sparge/Vapor Extraction
4. Thermal
5. LNAPL Recovery
6. In-Situ Chemical Oxidation
7. Enhanced Bioremediation w/
Amendments
8. Natural Source Zone Depletion

Groundwater

1. Hydraulic Containment
2. Physical Containment
3. Multiphase Extraction
4. Surfactant Flushing
5. Carbon Injection
6. In-Situ Chemical Reduction
7. In-Situ Chemical Oxidation
8. Monitored Natural Attenuation

Evaluation of Remedial Alternatives

LNAPL

1. Multiphase Extraction (MPE)
2. LNAPL Recovery
3. Natural Source Zone Depletion

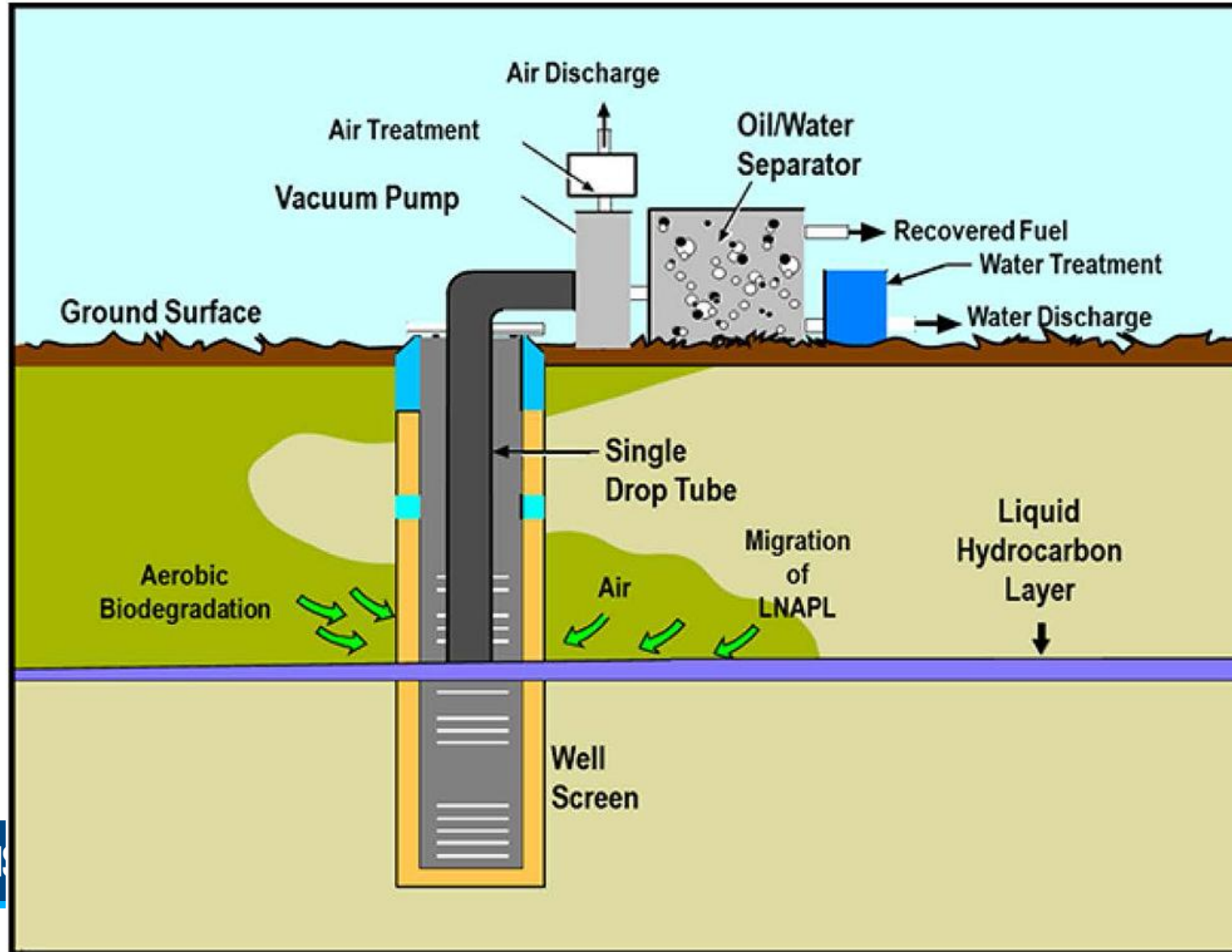
Groundwater

1. Multiphase Extraction (MPE)
2. Carbon Injection
3. Monitored Natural Attenuation

Remedial Pilot Testing - MPE

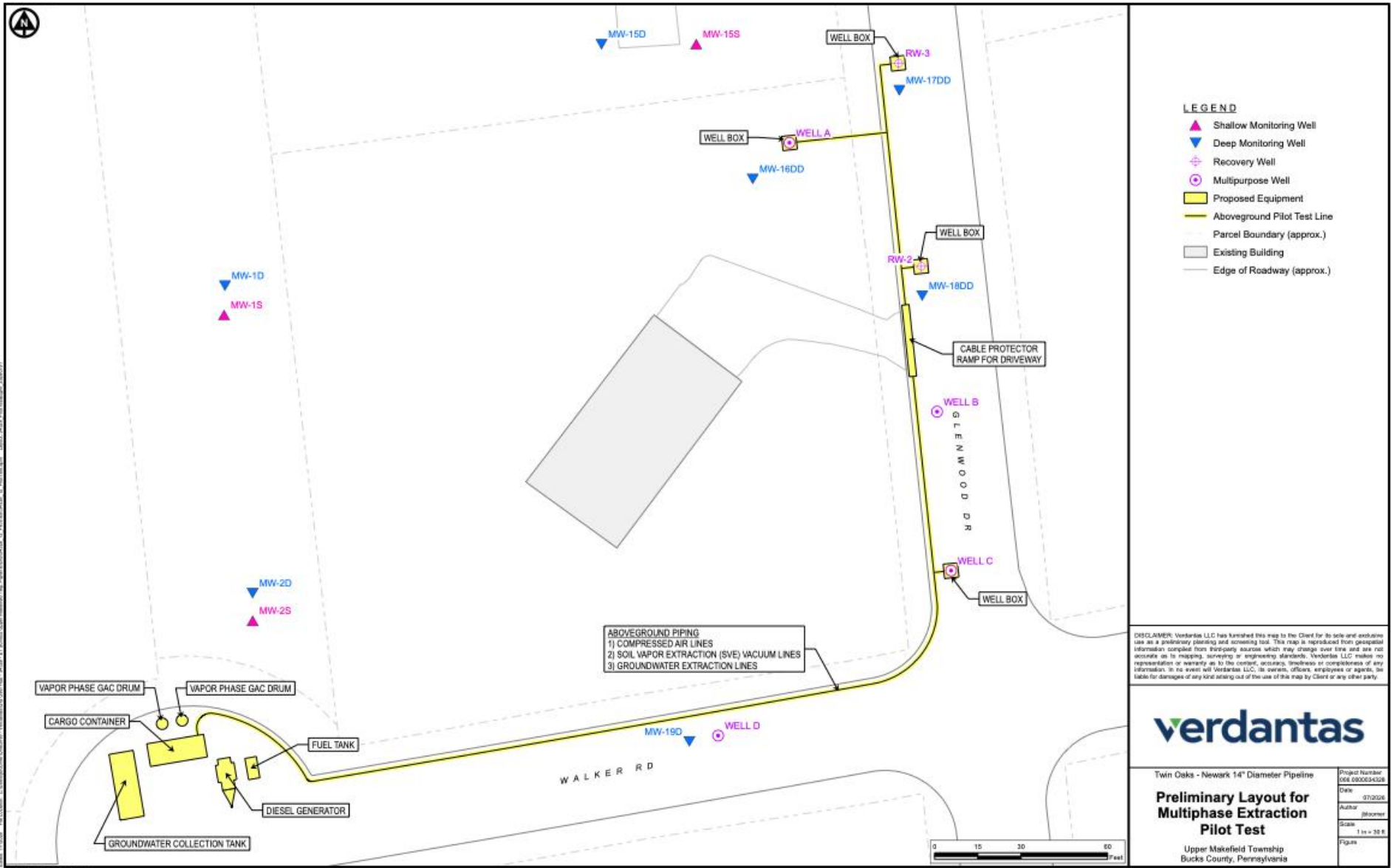
Representative Example Schematic

Figure used for illustrative purposes only – does not represent the exact MPE system proposed



Schematic from Federal Remediation Technologies Roundtable website

Remedial Pilot Testing



Remedial Pilot Testing



**Photos from Mid-Atlantic Environmental Equipment (MAE²) website*

Public Comment

- Written public comments will be accepted through **Aug. 3, 2026** and can be sent via email or in writing:
 - *Email:* uppermakefieldact2@energytransfer.com
 - *Mail:* SPLP, 525 Fritztown Road, Sinking Spring, PA 19608
- Please direct written comments to **Attention: RAP**
Public Comment

**For information shared at this meeting, or to
view documents related to Act 2 and our
Public Involvement Plan, please visit:**

uppermakefield.incidentupdates.com

