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Analysis of Brownfield Cleanup Alternatives (ABCA)

Farmington Gas Station
West Farmington, Trumbull County, Ohio

September 3, 2025

Introduction and Background

The purpose of this ABCA is to document the remediation activities and the alternate remedial strategies that were considered for the Farmington Gas Station site (the "Property") located at 165 Main Street, West Farmington, Trumbull County, Ohio. The Property is located on the north side of East Main Street and the west side of 2nd Street in a mixed commercial and residential area of West Farmington. The Property is comprised of one parcel (59-024750) and is approximately 0.18 acres. There is one existing 1,232 square foot, former service station and auto repair building located on the Property built in 1955.

According to the Voluntary Action Program (VAP) Phase I Property Assessment (Phase I) conducted by Partners, the southern portion of the Property was occupied by a residential building from at least the early 1900s to the 1950s. The residential building served as a telephone exchange from at least 1902 to 1908. In the late 1950s, the current gas station with a repair shop was constructed in the northwest corner of the Property. The gas station and repair shop ceased operations in the late 1990s and the building has been vacant since. Brownfield Restoration Group (BRG) conducted an Ohio Environmental Protection Agency (Ohio EPA) Limited Phase II Investigation (Phase II) on the Property dated October 25, 2023 to evaluate environmental impacts within the Identified Areas (IAs) determined in the Phase I. Summaries of previous Phase I and Phase II assessment work completed by environmental consultants on the Property are provided in the following:

Voluntary Action Program (VAP) Phase I Property Assessment - Former Gas Station 165 Main Street (Partners – June 15, 2023) - This Phase I designated six Identified Areas (IAs) under the VAP including the following:

IA/REC-1: Three abandoned underground storage tanks (USTs) in the northeastern portion of the Property.

IA/REC-2: One aboveground storage tank (AST), petroleum product unknown, north of Property building (back side).

IA/REC-3: Pump island in the center of the Property.

IA/REC-4: Hydraulic lift system with grease and oil stains on the floor in the building garage bay.

IA/REC-5: Paint, grease, and oil stains on the floor in the building storage area.

IA/REC-6: Former residential building with unknown heating system and fill material in the southwestern portion of the Property.

Limited VAP Phase II Investigation - Liberty Gas Station (Brownfield Restoration Group, LLC – September 26, 2024) - Brownfield Restoration Group, LLC (BRG) performed a Phase II at the Property beginning in August 2023 and prepared a Phase II report dated October 25, 2023. Funding for this assessment work was received through the Ohio EPA Targeted Brownfield Assessment (TBA) program. A seventh off-property IA/REC, identified as **IA/REC-7**: Presence of two non-regulated USTs of more than 30 years, petroleum product unknown, located at Bristol Local School District, 121 North 2nd Street, west and north of the Property, was evaluated as part of this limited Phase II, but was not fully investigated due to limited access along the west and north portions of the Property.

Soil and ground water results were compared to both applicable VAP and Bureau of Underground Storage Tank Regulations (BUSTR) standards. Due to limited access inside the building and along the west and north portions of the Property, IA/REC-2 (one AST, petroleum product unknown), IA/REC-5 (paint, grease, and oil stains on the floor in the building storage area), and IA/REC-7 (presence of two non-regulated USTs of more than 30 years, petroleum product unknown, located at Bristol Local School District, 121 North 2nd Street, west and north of the Property) were not investigated.

Soil sample results identified the following COCs above Ohio EPA VAP DCSS in the eastern side of the Property in the area of the abandoned USTs and in the area of the dispenser island and UST fill ports including the following:

- TPH GRO (C6-C12) exceeding the BUSTR site check action level at boring locations B-3, B-4, and B-9 [**up to 11,000 mg/kg**];
- Benzene exceeding the BUSTR site check action in soil samples from borings B-3 and B-9 (**up to 4.6 mg/kg**);
- Ethylbenzene exceeding the BUSTR site check action level and the VAP residential direct contact standard in a soil sample from boring B-3 (**220 mg/kg**);
- Xylenes exceeding the BUSTR site check action level in soil samples from borings B-3 and B-9 (**1,100 mg/kg and 59 mg/kg**, respectively) and the VAP direct contact soil standards at boring location B-3 (**1,100 mg/kg**);
- Naphthalene exceeding the BUSTR site check action level in soil samples from borings B-3, B-4, B-6, B-8, and B-9 (**up to 56 mg/kg**); and
- 1,2,4-trimethylbenzene (124TMB) exceeding the BUSTR site check action level in soil samples from borings B-3, B-6, and B-9 (**up to 450 mg/kg**) and the VAP direct contact soil standards at boring location B-3 (**450 mg/kg**).

Concentrations of targeted COCs identified in ground water above applicable regulatory standards on the southwestern portion of the Property include the following:

- Benzene exceeding the BUSTR site check action level and EPA UPUS at TW-3 and TW-8 (**9.2 and 14 µg/L,** respectively);
- Naphthalene exceeding the BUSTR site check action level and EPA UPUS of at TW-3 and TW-8 (**up to 13 µg/L**);
- 124TMB exceeding the BUSTR site check action level at TW-3 (**42 µg/L**); and
- 1,2-Dichloroethane (EDC) exceeding the BUSTR site check action level and the EPA UPUS at TW-3 (**61 µg/L**).

According to the geophysical survey, site reconnaissance, and the historical records, at least three USTs are present at the Property with the possibility that two additional USTs reported during the limited Phase II fieldwork are present as well. Although the dispensers have been removed, it is assumed that the UST system product lines also remain at the site. Exploratory test pits could be used to determine if the two additional USTs are still present on the Property. In accordance with BUSTR rule OAC 1301:7-9-12(E), out of service USTs are required to be removed or closed in place. This obligation applies to owners and operators of the UST or *any person who holds a legal, possessory or equitable interest in a parcel of real property on which a UST system is located.* UST removal/closure must be conducted in accordance with 1301:7-9-12.

Applicable Regulations and Cleanup Standards

UST removals will be conducted in accordance with 1301:7-9-12(E). The intended cleanup standards for this Property will be encompassed within Ohio EPA VAP. The Property has received a Class C designation from BUSTR and is eligible to be remediated under the VAP. The Phase II at the Property conducted by BRG demonstrates that the predominant COCs are related to a petroleum release in both soil and ground water. Potential exposure pathways are direct contact with soil and ground water, ground water ingestion and vapor intrusion to indoor air.

The VAP soil direct-contact standards are applied to the upper two feet of soil (point of compliance) in order to comply with VAP commercial/industrial land use. The point of compliance for ground water is the Property boundary unless an alternative point of compliance is demonstrated in accordance with OAC 3745-300-10(E)(5), and direct contact with ground water in exceedance of VAP standards must be eliminated on the Property in order to comply with the VAP. The VAP provides baseline standards that are generic but also contains provisions for modifying generic standards based on actual environmental conditions and guidelines for performing site-specific risk assessment. Acceptable remedies under the VAP include various combinations of source removal, in-situ treatment, institutional controls (e.g., land use restrictions), and engineering controls. Assessment and remedial activities under the VAP must be overseen by an Ohio EPA Certified Professional.

Remedial actions must be implemented on this property in order to achieve compliance with the VAP and/or BUSTR regulations. The following objectives must be met:

- All existing out of service USTs must be removed or closed in accordance with BUSTR regulation OAC 1301:7-9-12(E). Confirmation sampling must be conducted following removal of the USTs.

- Exceedances of COCs in soil and ground water shall be addressed through BUSTR or the VAP.

- The vapor intrusion to indoor air pathway must be addressed through remedial activities, engineering controls or use restrictions.

The proposed cleanup will take into account the requirement of BUSTR regulations and advantages of the flexibility of the VAP to meet all applicable environmental laws and

regulations, while maximizing protections of human health and the environment, and minimizing the overall cost. The preferred approach will combine UST removal, soil source removal and replacement and institute practical land use restrictions (e.g., mandate commercial/industrial land use over the Property and prohibit ground water use as required).

Evaluation of Cleanup Alternatives

There are several remedial alternatives available to address the closure of the existing USTs and the contamination at the Property. These alternatives and their rough order of magnitude costs are evaluated in the following summaries. The selected remedial actions conducted under the VAP will require oversight and documentation by a VAP Certified Professional and No Further Action (NFA) documents must be prepared no matter which remedial alternatives are implemented. Closure of the existing USTs under the BUSTR program will require investigation and reporting by a Qualified Environmental professional (QEP) in accordance with BUSTR regulations. For the purpose of evaluating cleanup alternatives, these associated activities are considered to be relatively fixed across each alternative. These fixed costs are estimated to be on the order of **$100,000** for the QEP and VAP Certified professional services (e.g., oversight, confirmatory sampling, report preparation, NFA preparation and submittal). A brief description of the alternatives considered, and the approximate associated costs are provided in the following summaries.

Take No Action - Although low cost and easy to implement, this alternative would not provide any positive effect toward reaching the remedial goal of achieving Ohio VAP re-use standards or obtaining a No Further Action Letter from BUSTR or the Ohio EPA. Without removal and proper assessment and remediation as required following the removal of the existing out of service USTs, the Property will remain environmentally impaired and subject to BUSTR corrective action. Planned redevelopment would likely fail due to the site's regulatory status.

UST Removal – This alternative would consist of the removal of the existing UST systems (i.e. piping, dispensers and USTs) and exploratory test pits only. The removal of the existing USTs must be performed per BUSTR regulations, regardless of which regulatory program any remaining work is performed under. This alternative would not address any impacts to soil or ground water at the site due to releases from the UST system and would not result in an NFA from BUSTR or VAP. If this alternative alone were implemented, planned redevelopment would likely fail due to remaining environmental impairments and/or the site's regulatory status. Previous environmental assessments have found documentation for the potential of five USTs to be present on the Property. The estimated cost for removal of five existing USTs is **$95,000**.

Building Demolition – Soil and ground water data analyzed on the Property indicate the potential for source areas to extend beneath the on-Property building. Demolition of the existing building would allow remediation to occur beneath and surrounding the building footprint as needed. The estimated cost for building demolition is **$50,000**.

Excavation and Disposal - This alternative would consist of the excavation and disposal of the soil exceeding applicable standards following the removal of the existing USTs. Based on the Phase II assessment work completed to date, it is estimated that 3,592 tons of contaminated soil could be required to be removed from remediation areas REM-1 and REM-2, disposed of at a properly licensed landfill, and replaced with clean fill. A significant benefit of this remedial approach is that it would meet the BUSTR and/or VAP closure requirements for the existing USTs and contaminated soil would no longer be available at the site to be a source of potential human health risk, environmental harm, or an impediment to future development plans. This alternative is readily implemented, effective, and reliable. However, it is costly. The estimated cost of removal, disposal, and replacement of 2,750 tons of non-hazardous soil at $130 per ton is **$357,471**.

Clean Fill Barrier Placement - Under the VAP direct contact standards for commercial/industrial land use incorporate a point-of-compliance that is comprised of the upper two feet of soil. An acceptable remedy for direct contact under the VAP is the excavation of two feet of soil and backfilling of excavations with clean soil meeting the applicable direct contact standard. A disadvantage is that impacted soil may potentially remain below two feet of grade at the site and is therefore available as a future source of potential human risk or environmental harm for future development of the site. There is also the potential for COCs remaining in soil to leach to ground water. The estimated cost of excavating the upper two feet of soil and replacement with clean soil over REM-1 and REM-2 at $130 per ton is **$71,370.** Although the cost of this approach is comparatively low, this alternative alone would not meet the requirements of the closure of existing USTs in accordance with BUSTR and/or VAP regulations and would not result in an NFA from BUSTR or VAP. If this alternative alone were implemented, planned redevelopment would likely fail due to remaining environmental impairments and/or the site's regulatory status.

In-situ Biodegradation – This alternative would consist of the in-place treatment of petroleum impacted soil and ground water through the application of active carbon to absorb total petroleum hydrocarbons and the addition of an electron acceptor to stimulate hydrocarbon

biodegradation directly to soils (i.e. into excavations following tank removal). The estimated cost of in-situ biodegradation application is **$30,000**. The advantages of this alternative include reducing the need to transport and dispose of soil to a licensed landfill. The disadvantages include the potential for residual COCs to remain in soil and ground water beyond the radius of influence of the active carbon following the remedy.

In-situ Biodegradation Barrier – This alternative would consist of the injection of active carbon to absorb total petroleum hydrocarbons and the addition of an electron acceptor to stimulate hydrocarbon biodegradation. This alternative would be used to treat impacted ground water and to prevent the off-site migration of COCs. The estimated cost of the biodegradation barrier in-situ treatment is **$60,000**. The disadvantages of this alternative are that it would not address impacts to soil and ground water throughout the Property and would only provide a barrier prevent the off-property migration of COCs.

Engineering Controls – Blocking or severing exposure pathways through implementation of engineering controls (e.g., pavement, building floors, vapor barrier systems) is a cost effective and proven approach. If site development plans include large, paved areas, such as parking lots, this approach is readily implementable. The primary disadvantage is that the contaminated soil remains at the site and is therefore available as a future source of potential human risk or environmental harm if the engineering control is removed or altered during future site work. An operation and maintenance plan (an agreement with the Ohio EPA) is required to be established and continued in perpetuity under this alternative in order to ensure continued protectiveness. The estimated cost of installing 4,950 square feet of pavement engineering control in Remediation Areas REM-1 and REM-2 at $7.00 per square foot is **$34,650**. Although the cost of this approach is comparatively low, this alternative alone would not meet the requirements of the closure of existing USTs in accordance with BUSTR and/or VAP regulations and would not result in an NFA from BUSTR or VAP. If this alternative alone were implemented, planned redevelopment would likely fail due to remaining environmental impairments and/or the site's regulatory status.

Institutional Controls (Land Use Restrictions) – Land Use restrictions instituted via an Environmental Covenant with the Ohio EPA are a very cost effective and readily implemented means of addressing certain remediation issues. For example, a land use restriction prohibiting ground water use on the Property for potable purposes eliminates the ground water ingestion pathway or a building restriction for inhabitable structures eliminates the vapor intrusion to indoor air pathway. The estimated cost of implementing institutional controls stringent enough

to eliminate the known exposure pathways is estimated to cost **$10,000**. Although the cost of this approach is comparatively low, this alternative alone would not meet the requirements of the closure of existing USTs in accordance with BUSTR and/or VAP regulations and would not result in an NFA from BUSTR or VAP. If this alternative alone were implemented, planned redevelopment would likely fail due to remaining environmental impairments and/or the site's regulatory status.

Climate Change Evaluation

The Property is not located within a special flood hazard area. The nearest body of water is a tributary to the Grand River approximately 600 feet to the south of the Property. Impacts to the alternatives evaluated for the Property by flood water or other environmental factors due to climate change are not anticipated.

Recommended Cleanup Alternative

The preferred remedial approach incorporates a combination of the above alternatives. Removal of the USTs ($95,000), existing building ($50,000) and the worst of the soil sources via 'excavation ($255,000) and disposal' will be performed which equates to an estimated cost of $400,000. Biodegradation in-situ treatment may also be conducted as needed to remediate residue soil and or ground water contamination at an estimated cost of $90,000. As previously described, the fixed costs of active remediation are estimated to be on the order of $100,000 for the QEP and VAP Certified Professional services (e.g., oversight, confirmatory sampling, report preparation, BUSTR documentation as required, institutional control preparation, NFA preparation and submittal, Ohio EPA filing fee). Institutional controls ($10,000) consisting of prohibiting ground water use and limiting land use to commercial/industrial activities will also potentially be employed. Institutional and/or engineering controls may also be needed to address the vapor intrusion to indoor air pathway. This combination of alternatives will maximize the benefits of the remedial actions while maintaining good use of required resources. Estimated total cost of the recommended cleanup is **$600,000**.

Matt Martin, Executive Director
Trumbull County Land Bank

Signed: _____

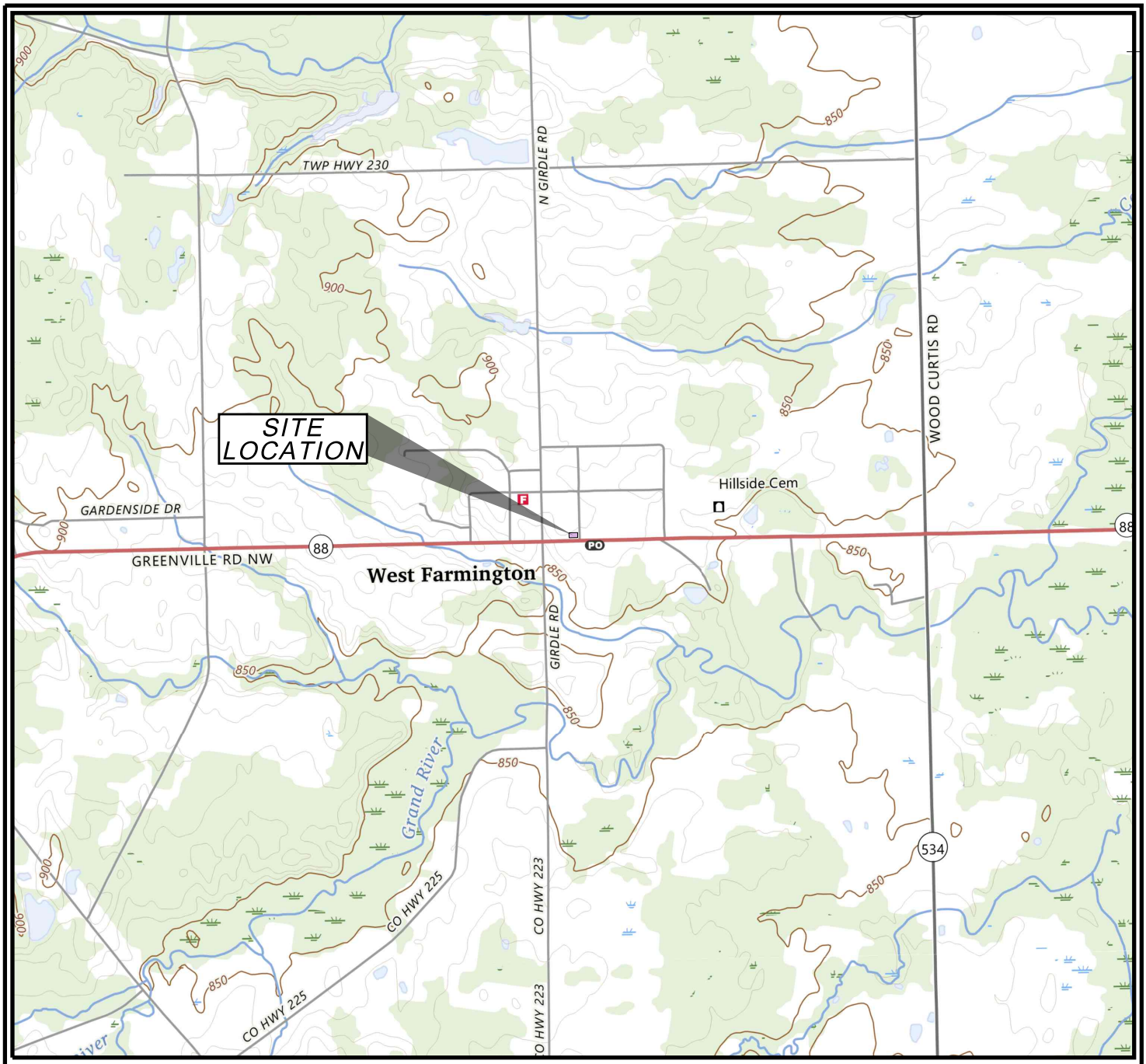
Title: Exec Director TMP

Date: 9-5-25

Attachments

- *Site Location Map*
- *Potential Remediation Areas Map*

[This document prepared by Jim C. Smith (Ohio EPA Certified Professional No. 121) of Brownfield Restoration Group, LLC].



SCALE 1:24,000

1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1988

QUADRANGLE LOCATION

GEOGRAPHIC COORDINATE-
LATITUDE: N. 41° 23' 26.26"
LONGITUDE: W. 80° 58' 19.24"
HORIZONTAL DATUM: NAD83

USGS 7.5 MINUTE SERIES (U.S. TOPO) QUADRANGLES:

WEST FARMINGTON, OHIO 2023

SOUTHINGTON, OHIO 2023

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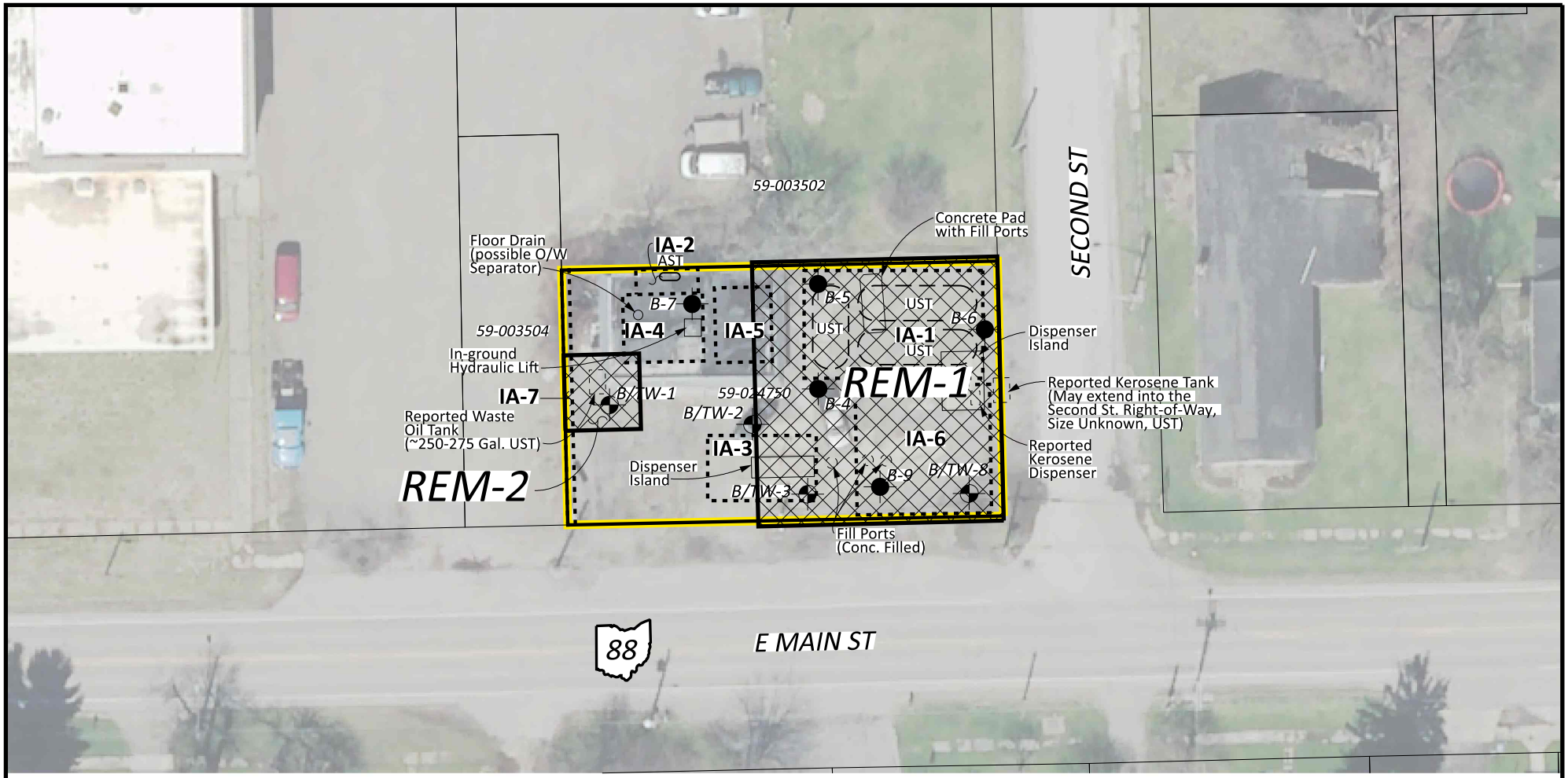
Figure 1 - Site Location on U.S.G.S. Topographic Map

Former Gas Station - West Farmington
165 East Main Street, West Farmington, Ohio 44491

Prepared by: U.S.G.S.	Date: September 2023	Project No. 23009



Legend

- Subject Property
- IA Boundary
- 59-024750 Auditor's Parcel No.
- Soil Boring
- Soil Boring/Temporary Well

Notes

1) Property Lines are from the Trumbull County GIS department dated May 2022.

2) Aerial Image is a 6 Inch County Mosaic dated 2017 from O.G.R.I.P.

3) IA Features are from VAP Phase I PA performed by Partners (July 2023).

Identified Areas

- IA-1 Three (3) Abandoned USTs
- IA-2 One (1) AST, Petroleum Product Unknown
- IA-3 Pump Island
- IA-4 Hydraulic Lift System with Grease and Oil Stains on the Floor
- IA-5 Paint, Grease, and Oil Stains on the Floor
- IA-6 Former Residential Building,Unknown Heating System and Fill material
- IA-7 Presence of Two (2) Off-Property Non-Regulated USTs at former school building more than 30 Years, Petroleum Product Unknown

W E S

0 20 40

Scale in Feet

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Figure 2 - Potential Remediation Areas

Former Gas Station - West Farmington
165 East Main Street, West Farmington, Ohio 44491

Prepared by: T. Thoma	Date: August 2025	Project No. 23009