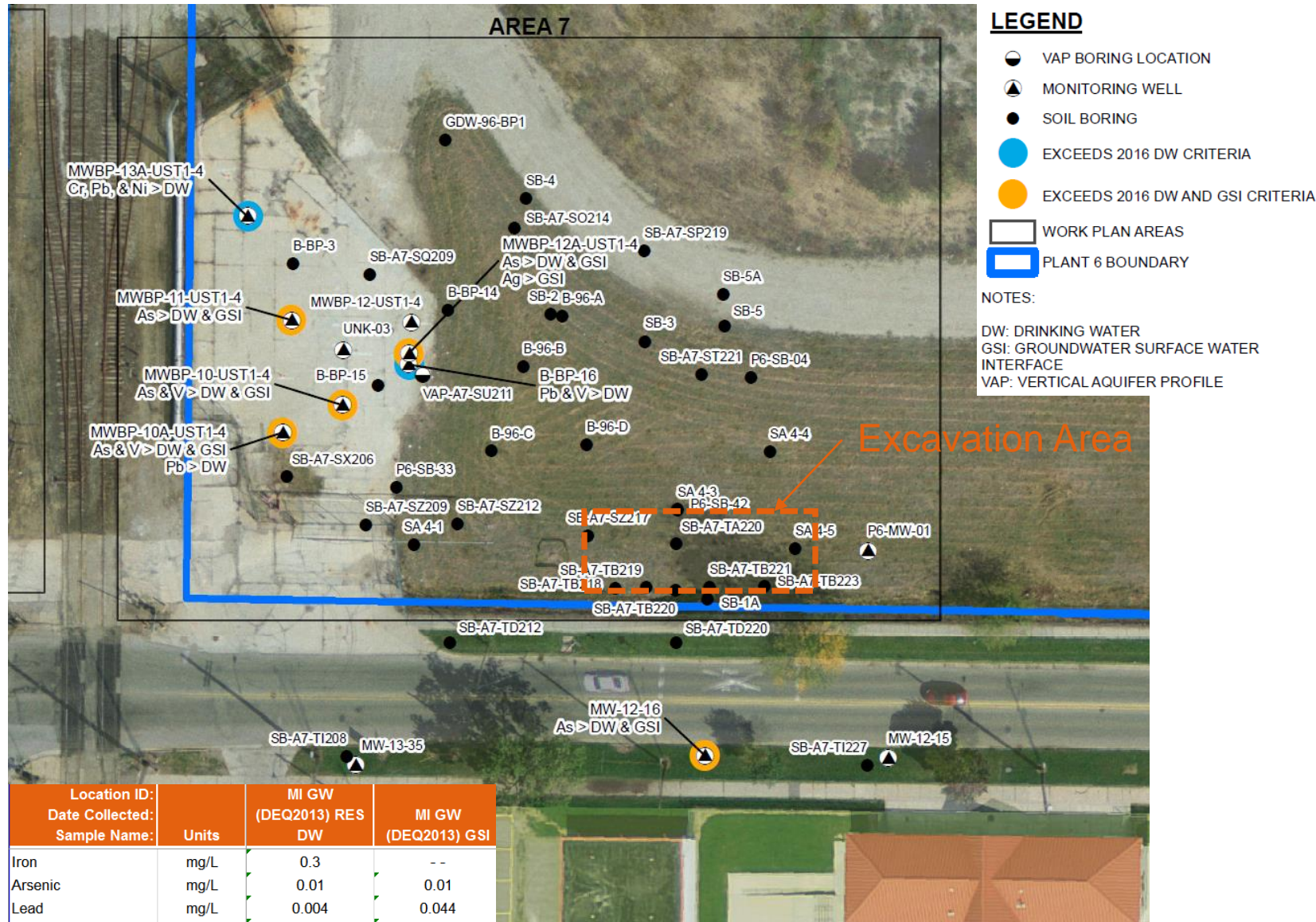


SOUTHERN PLANT 6 BOUNDARY METALS

RACER Lansing Plant 6

February 3, 2017

Plant 6 Metals Exceedances



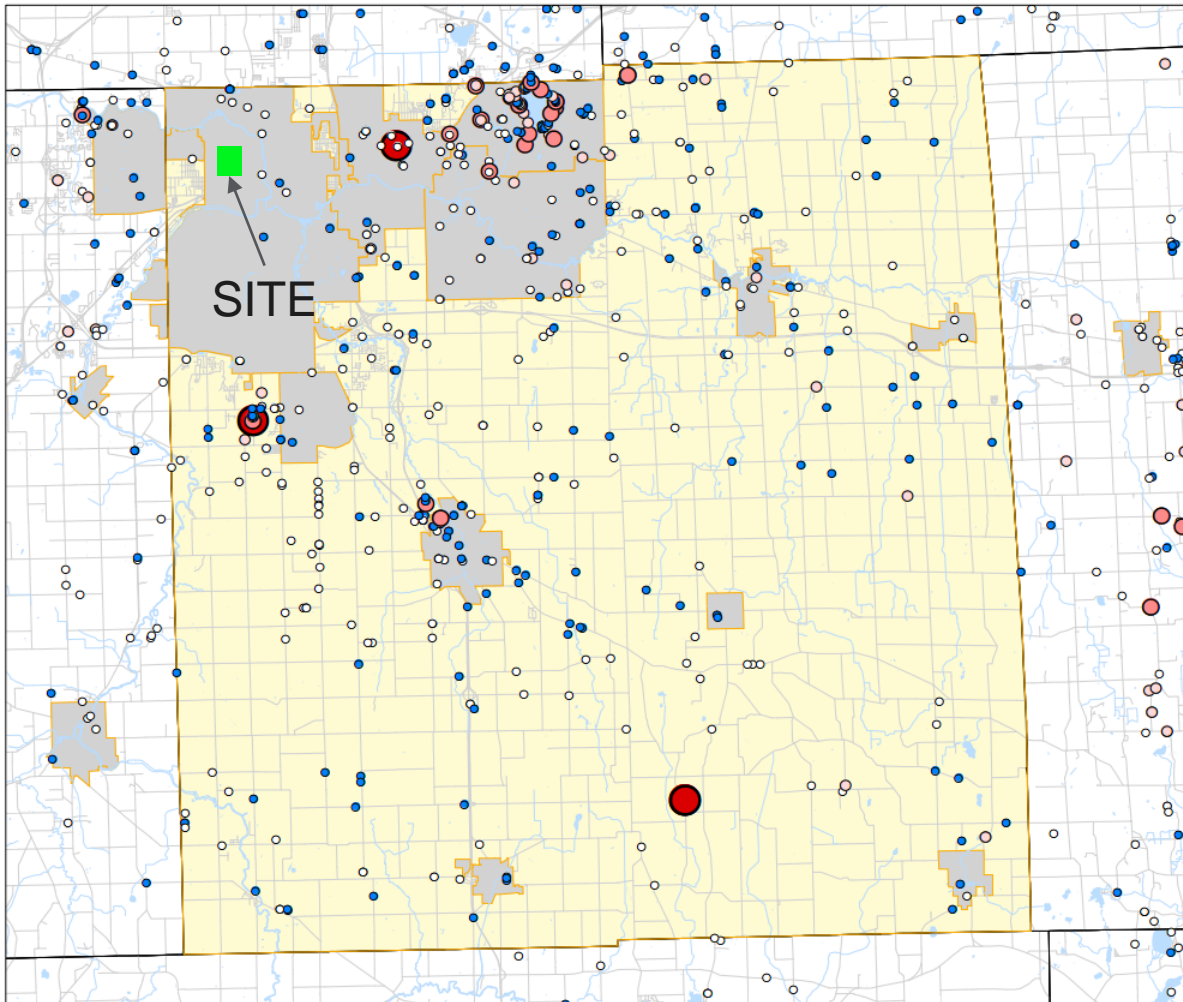
- Sporadic Arsenic in Area 7: 12-15 µg/L
- MW-12-16 Results, May 2016
 - Turbidity: 29.2
 - Total Arsenic: 19 µg/L
 - Dissolved: 13 µg/L
- Area of Xylenes soil impacts excavated in Spring 2016

Location ID: Date Collected: Sample Name:	Units	MI GW (DEQ2013) RES DW	MI GW (DEQ2013) GSI
Iron	mg/L	0.3	--
Arsenic	mg/L	0.01	0.01
Lead	mg/L	0.004	0.044
Nickel	mg/L	0.1	0.12
Vanadium	mg/L	0.0045	0.027

Note: results exclude Fe & Mn

Arsenic Background

Ingham County Arsenic Samples



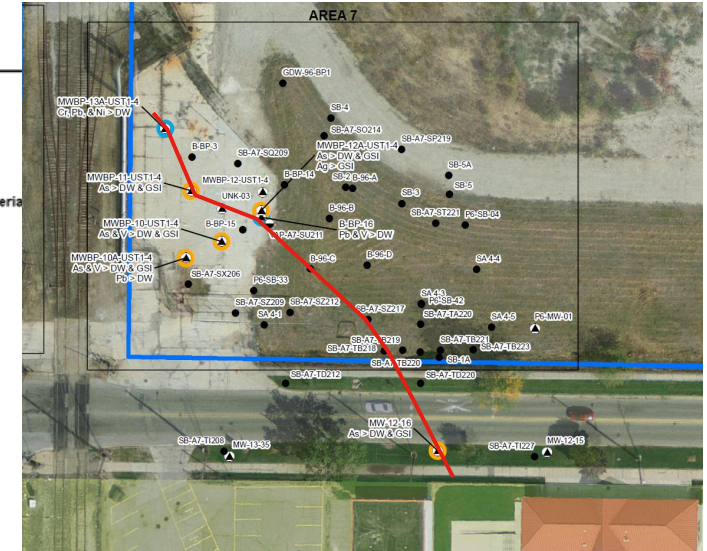
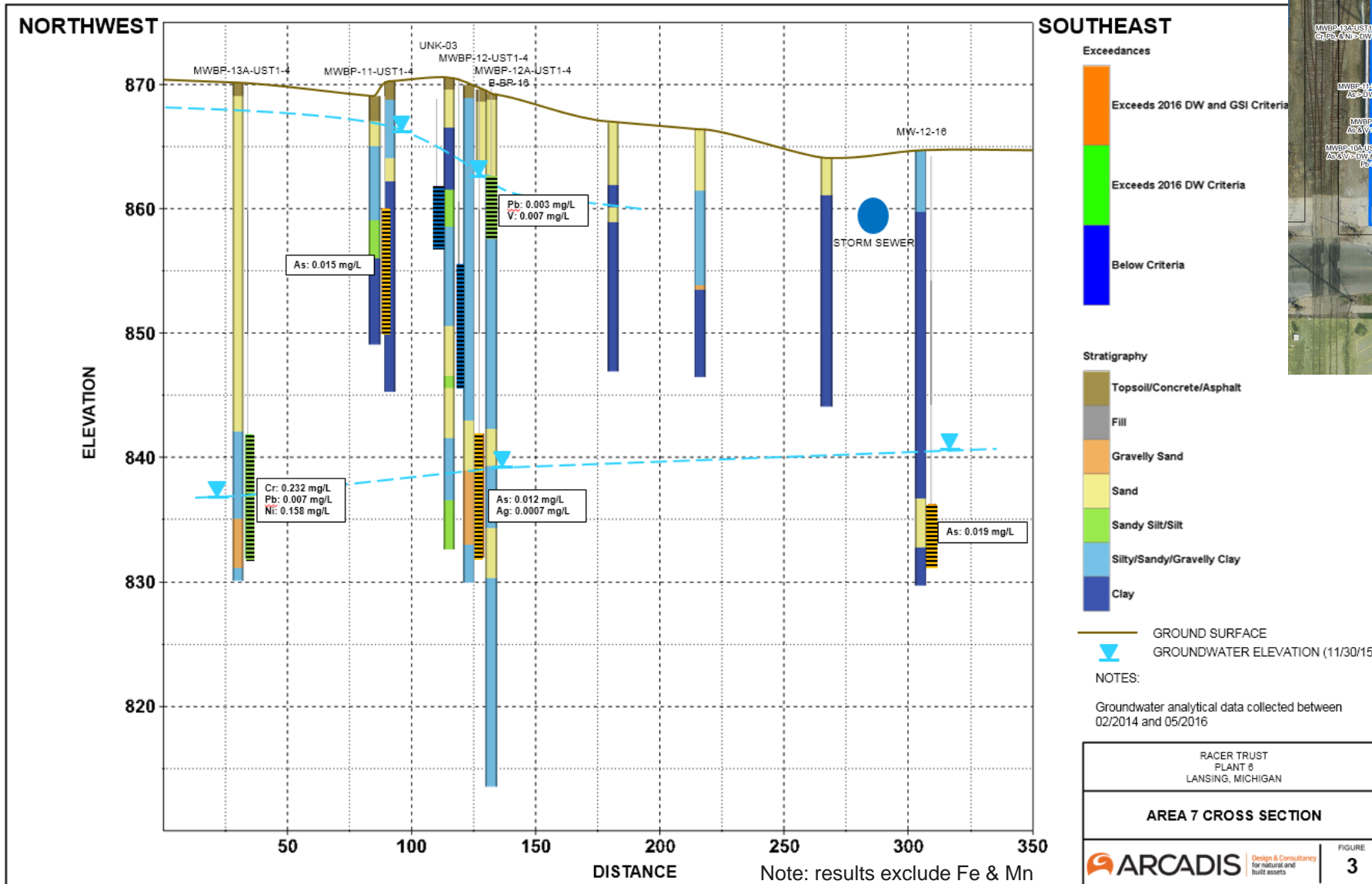
- Available information indicates arsenic concentrations in excess of drinking water criteria ($10 \mu\text{g/L}$) have been detected across the county (MDEQ 2013, MDEQ 2014, Welch 2000).
- Mean concentrations of metals at the site are within the range of regional concentrations recorded in this study, with the exception of nickel (i.e. Plant 3, Area 16)
- Regional groundwater is under reducing conditions, leading to iron and manganese dissolution and mobilization, as well as metals associated with iron bearing minerals; arsenic, copper, cobalt, lead, nickel, vanadium, and zinc.

Geochemistry

Location ID:	Date Collected:	Zone	Current	Previous	Justification for difference	CH4	DO	ORP	Fe total	Mn total	Fe dissolved	Mn dissolved	NO3-	SO42-
MW-12-15	06/10/15	Perched	strongly reducing	reducing	elevated methane, negative ORP, depleted sulfate	280 O	0.11	-74.20	8.29 ^a	0.324 ^a	7.67 ^a	0.309 ^a	<0.5	<10
MW-12-16	06/09/15	Perched	strongly reducing	reducing	elevated methane, negative ORP	130 O	0.38	-55.80	6.94 ^a	0.429 ^a	6.74 ^a	0.417 ^a	<0.5	178
P6-MW-01	06/09/15	Perched	reducing	reducing	--	39 O	0.47	58.2	2.75 ^a	0.573 ^a	1.93 ^a	0.594 ^a	<0.5	321 ^a

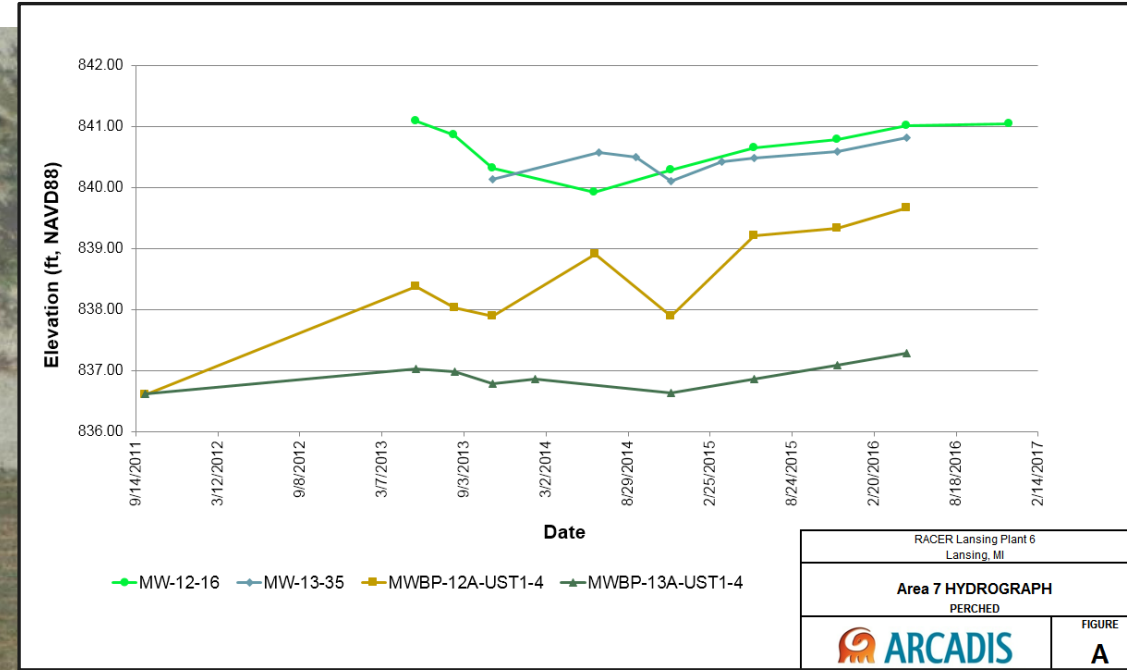
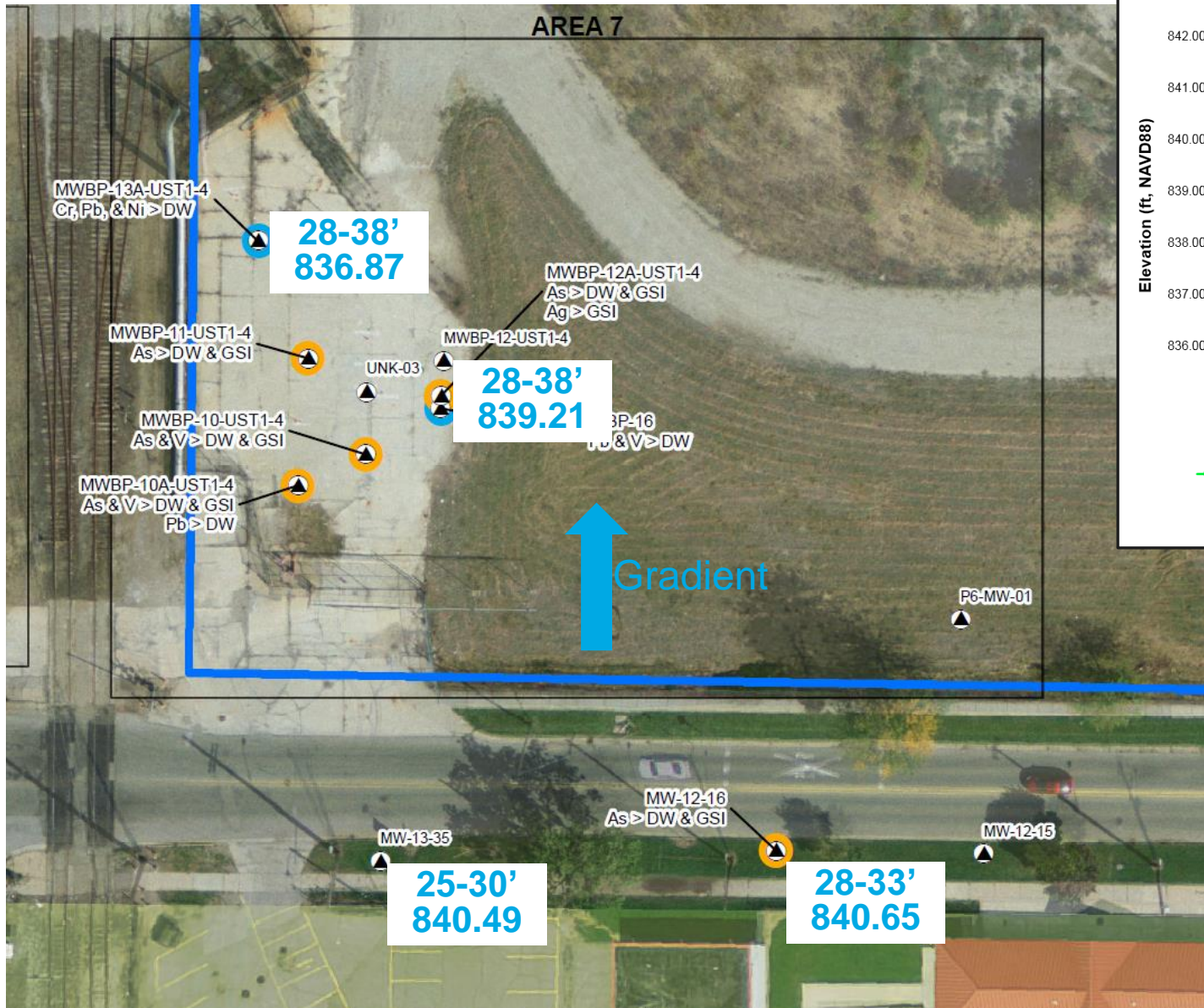
- Reducing conditions prevalent at the Site causing mobilization of arsenic and other iron related metals, particularly in areas impacted by VOCs.
- Monitoring wells without VOC impacts also show mildly reducing conditions suggesting regional groundwater in the perched zone is mildly reducing and conducive to the occurrence of mobile metal species even under ambient conditions.

NW-SE Cross-Section



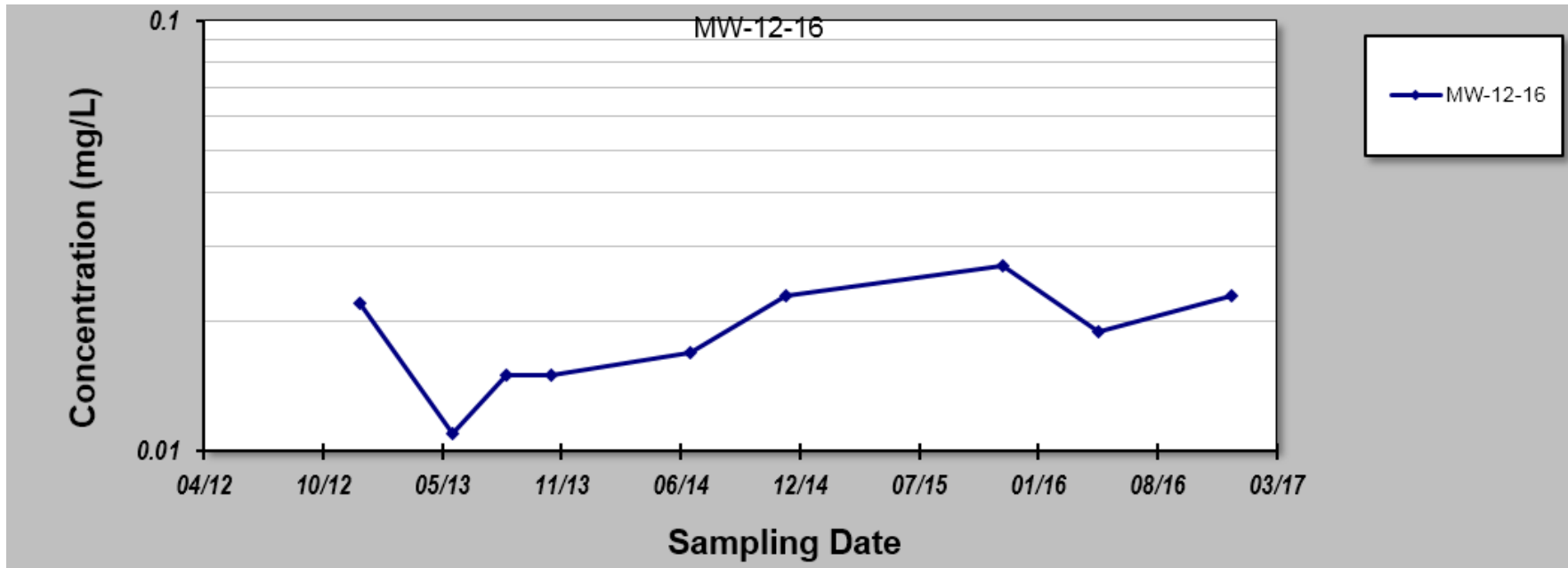
- Arsenic at MW-12-16 in deeper zone off-site
- Groundwater elevation suggests northerly horizontal gradient in deeper wells
- Variability in water levels demonstrates of hydraulic isolation of deeper zone off-site from shallow conditions on-site.

Deeper Groundwater Elevation



- Horizontal gradient in deeper zone is consistently to the north throughout the monitoring period of record
- Evidence that off-site arsenic associated with ambient geochemical conditions and not site related

MW-12-16 Trends



- Arsenic concentrations at MW-12-16 initially increasing, stable since 12/14.

Summary

- Based on current use, and reasonably expected future use, there is no risk associated with off-site arsenic concentrations
- Arsenic at MW-12-16 (~10-20 µg/L) consistent with regional arsenic background concentrations
- Groundwater within the deeper zone offsite is hydraulically isolated from shallow impacts identified on-site
 - Depth of off-site arsenic exceedance in groundwater below utility corridors (saturated sand zone at 28-32 ft bgs)
- Horizontal gradient within deeper zone is consistently to the north (off-site to on-site). Result indicates off-site arsenic at MW-12-16 is related to ambient geochemical conditions and not conditions related to past operations at Plant 6
- Arsenic concentration in deeper zone fluctuates, but has been generally stable since December 2014.

Path Forward

- No arsenic “plume” to delineate
- Arsenic exceedances in deeper zone are low-level and spatially variable and likely related to intermittent ambient reducing conditions
- Delineation to the south would be difficult and potentially not possible
- Hydraulic gradient to the north
- Arsenic related to background geochemical condition
- No further action required to characterize arsenic in deeper zone
- Continue monitoring under interim groundwater monitoring program to document arsenic is stable at well MW-12-16

