Former Fort Ord Operable Unit Carbon Tetrachloride Plume Data and Status

Remedial Summary

- **A-Aquifer:**
  - **8 COCs:** 1,1-DCE; Total 1,2-DCE; CT; chloroform; methylene chloride; PCE; TCE; and VC.
  - **Remediation:** EISB.
- **Upper 180-Foot Aquifer:**
  - **1 COC:** CT
  - **Remediation:** Pump and treat with GAC at OU2 GWTP since 2011. Operation split the single plume in half. However, CT never detected above the ACL at EW-OU2-09-180.
- **Lower 180-Foot Aquifer:**
  - **2 COCs:** 1,2-DCA and CT. TCE monitored also.
  - **Remediation:** MNA with supply wellhead treatment contingency.
- **Monitoring:** Quarterly groundwater monitoring and reporting, including annual 3Q monitoring and reports. Described in the most recent Groundwater QAPP.

Oct-Dec Key Events

- Oct 11: replaced failed flowmeter at EW-OU2-09-180.
- Oct 30: Removed failed pump in EW-OU2-09-180. Found 9 ft of suspected filter pack in well. New pump not installed.
- Oct 30-31: Decommissioned MW-OU2-68-180 and steel conductor pipe.
- Nov 4-15: Installed MW-BW-101-A, MW-BW-102-A, MW-BW-103-A in A-Aquifer Hydraulic Zone 2.
- Nov 13-16: Fourth Quarter 2023 GWMP event.
- Dec 6: downhole video of EW-OU2-09-180.
- Dec 13: Topped off settled grout (45”) in previously decommissioned well IW-OU1-02-A in FONR.
- Dec 19: Profile sampled new wells.

Future Key Events

- Install three monitoring wells in the A-Aquifer Hydraulic Zone 5 (work plan final).
- Install one extraction well in the Upper 180-Foot Aquifer (work plan/QAPP in pre-Draft).

Ahtna

GWM COC Summary

Table 1: OUCTP GWM Summary – A-Aquifer

Quarter	1,1-DCE	T 1,2-DCE	CT	Chloroform	Methylene Chloride	PCE	TCE	VC
2023-4Q	ND	<ACL	**>ACL**	<ACL	<ACL	<ACL	<ACL	**>ACL**
2023-3Q	ND	<ACL	**>ACL**	<ACL	ND	<ACL	<ACL	ND
2023-2Q	ND	<ACL	**>ACL**	<ACL	ND	<ACL	<ACL	ND
2023-1Q	ND	<ACL	**>ACL**	**>ACL**	ND	<ACL	<ACL	ND
Max COC/ACL Ratio	-	-	**6**	**2**	-	-	-	**4**
Hydraulic Zone	-	-	**4**	**4**	-	-	-	**2**

Notes:
*Preliminary data
>: greater than
<: less than
ACL: Aquifer Cleanup Level
1,1-DCE: 1,1-dichloroethene
T 1,2-DCE: total 1,2-dichloroethene
1,2-DCA: 1,2-dichloroethane
CT: carbon tetrachloride
TCE: trichloroethene
PCE: tetrachloroethene
VC: vinyl chloride
ND: The analyte was not detected above the detection limit.

Table 2: OUCTP GWM Summary – Upper 180-Foot Aquifer

Quarter	CT
2023-4Q	**>ACL**
2023-3Q	**>ACL**
2023-2Q	**>ACL**
2023-1Q	**>ACL**
Max COC/ACL Ratio	**9**
Hydraulic Zone	**6**

Table 3: OUCTP GWM Summary – Lower 180-Foot Aquifer

Quarter	CT	TCE	1,2-DCA
2023-4Q	**>ACL**	**>MCL**	ND
2023-3Q	**>ACL**	**>MCL**	ND
2023-2Q	**>ACL**	**>MCL**	ND
2023-1Q	**>ACL**	**>MCL**	ND
Max COC/ACL Ratio	**5**	**2**	-
Hydraulic Zone	**7**	**N/A**	-

3 COCs in the A-Aquifer, 1 in the Upper 180-Foot Aquifer, and 2 in the Lower 180-Foot Aquifer above the ACLs/MCLs.

60%+ Decrease in CT-A ratio and moved to HZ4. 40%+ Decreases in CT-U and CT-L ratios.

New wells VC hits above the ACL. HZ 2 shifted to cover them.

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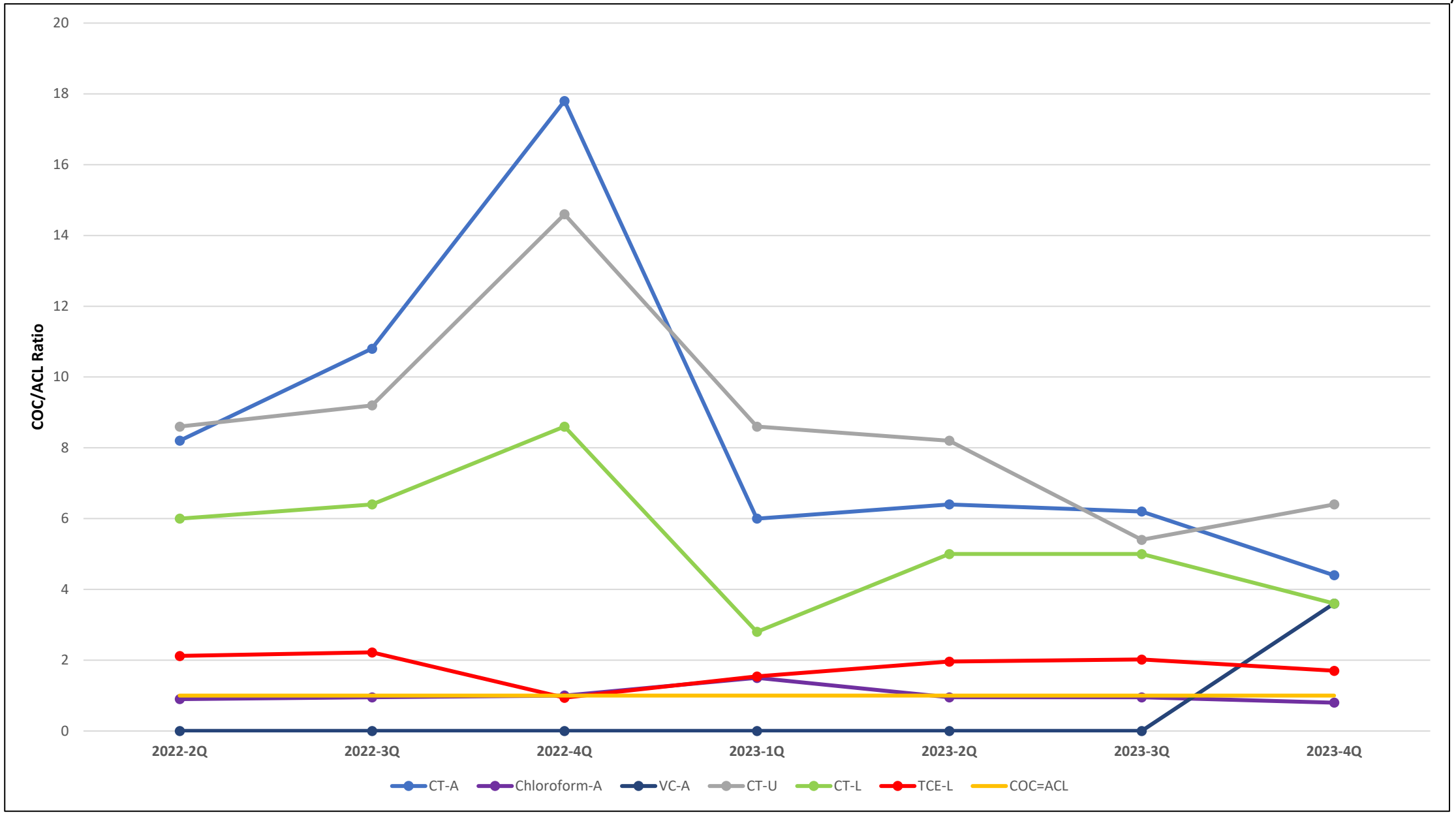
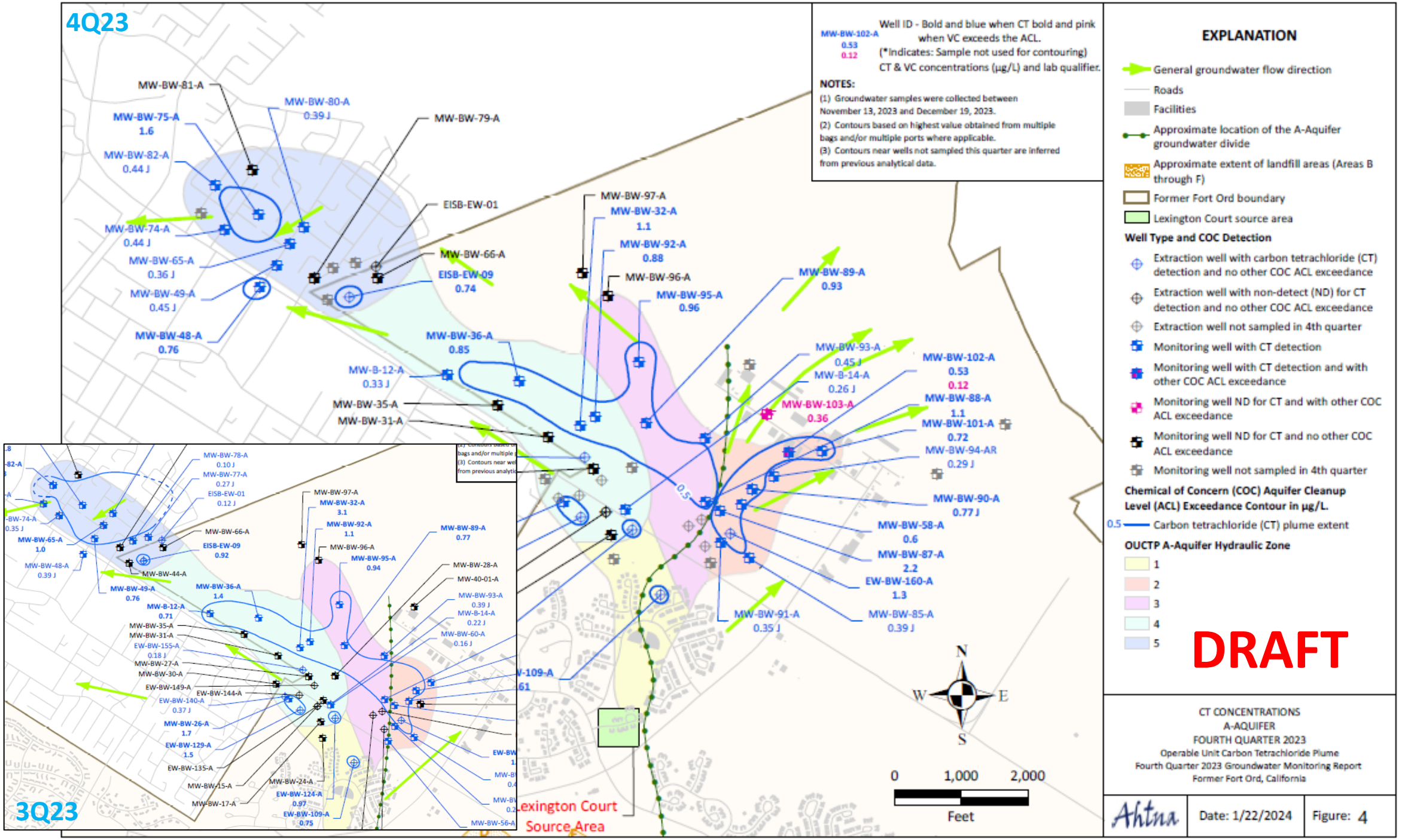
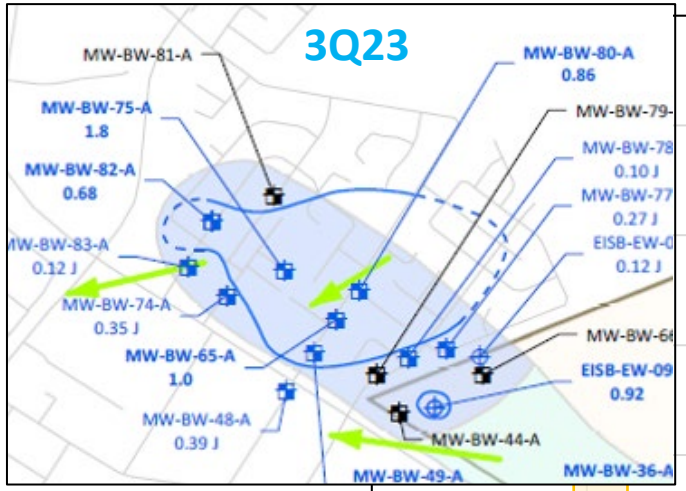
Max Quarterly COC/ACL Ratio Trend



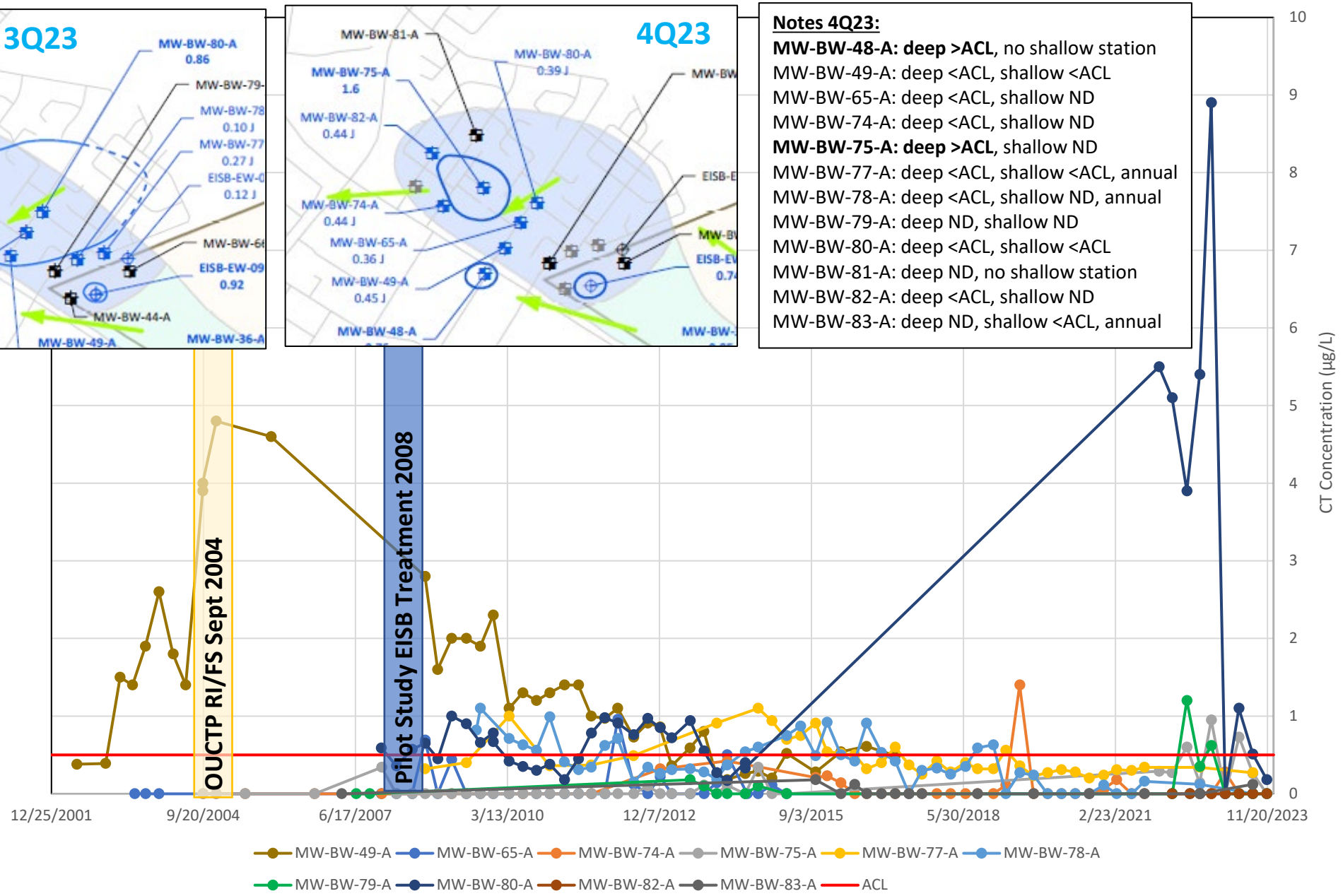

4Q23
MW-BW-102-A
0.53
0.12
Well ID - Bold and blue when CT bold and pink when VC exceeds the ACL.
(*Indicates: Sample not used for contouring)
CT & VC concentrations (µg/L) and lab qualifier.
NOTES:
(1) Groundwater samples were collected between November 13, 2023 and December 19, 2023.
(2) Contours based on highest value obtained from multiple bags and/or multiple ports where applicable.
(3) Contours near wells not sampled this quarter are inferred from previous analytical data.
EXPLANATION
General groundwater flow direction
Roads
Facilities
Approximate location of the A-Aquifer groundwater divide
Approximate extent of landfill areas (Areas B through F)
Former Fort Ord boundary
Lexington Court source area
Well Type and COC Detection
Extraction well with carbon tetrachloride (CT) detection and no other COC ACL exceedance
Extraction well with non-detect (ND) for CT detection and no other COC ACL exceedance
Extraction well not sampled in 4th quarter
Monitoring well with CT detection
Monitoring well with CT detection and with other COC ACL exceedance
Monitoring well ND for CT and with other COC ACL exceedance
Monitoring well ND for CT and no other COC ACL exceedance
Monitoring well not sampled in 4th quarter
Chemical of Concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L.
0.5 Carbon tetrachloride (CT) plume extent
OUCTP A-Aquifer Hydraulic Zone
1
2
3
4
5
DRAFT
MW-BW-81-A
MW-BW-80-A
0.39 J
MW-BW-75-A
1.6
MW-BW-79-A
MW-BW-82-A
0.44 J
EISB-EW-01
MW-BW-74-A
0.44 J
MW-BW-66-A
MW-BW-65-A
0.36 J
EISB-EW-09
0.74
MW-BW-49-A
0.45 J
MW-BW-48-A
0.76
MW-BW-36-A
0.85
MW-B-12-A
0.33 J
MW-BW-35-A
MW-BW-31-A
MW-BW-97-A
MW-BW-32-A
1.1
MW-BW-92-A
0.88
MW-BW-96-A
MW-BW-95-A
0.96
MW-BW-89-A
0.93
MW-BW-93-A
0.45 J
MW-B-14-A
0.26 J
MW-BW-103-A
0.36
MW-BW-102-A
0.53
0.12
MW-BW-88-A
1.1
MW-BW-101-A
0.72
MW-BW-94-AR
0.29 J
MW-BW-90-A
0.77 J
MW-BW-58-A
0.6
MW-BW-87-A
2.2
EW-BW-160-A
1.3
MW-BW-85-A
0.39 J
MW-BW-91-A
0.35 J
0.5
3Q23
MW-BW-78-A
0.10 J
MW-BW-77-A
0.27 J
EISB-EW-01
0.12 J
MW-BW-66-A
EISB-EW-09
0.92
MW-BW-44-A
MW-BW-97-A
MW-BW-32-A
3.1
MW-BW-92-A
1.1
MW-BW-96-A
MW-BW-95-A
0.94
MW-BW-89-A
0.77
MW-BW-28-A
MW-40-01-A
MW-BW-93-A
0.39 J
MW-B-14-A
0.22 J
MW-BW-60-A
0.16 J
MW-BW-36-A
1.4
MW-B-12-A
0.71
MW-BW-35-A
MW-BW-31-A
EW-BW-155-A
0.18 J
MW-BW-27-A
MW-BW-30-A
EW-BW-149-A
EW-BW-144-A
EW-BW-140-A
0.37 J
MW-BW-26-A
1.7
EW-BW-129-A
1.5
EW-BW-135-A
MW-BW-15-A
MW-BW-17-A
MW-BW-24-A
EW-BW-124-A
0.97
EW-BW-109-A
0.75
MW-BW-56-A
Lexington Court Source Area
N
W
E
S
0
1,000
2,000
Feet
CT CONCENTRATIONS
A-AQUIFER
FOURTH QUARTER 2023
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2023 Groundwater Monitoring Report
Former Fort Ord, California
Ahtna
Date: 1/22/2024
Figure: 4

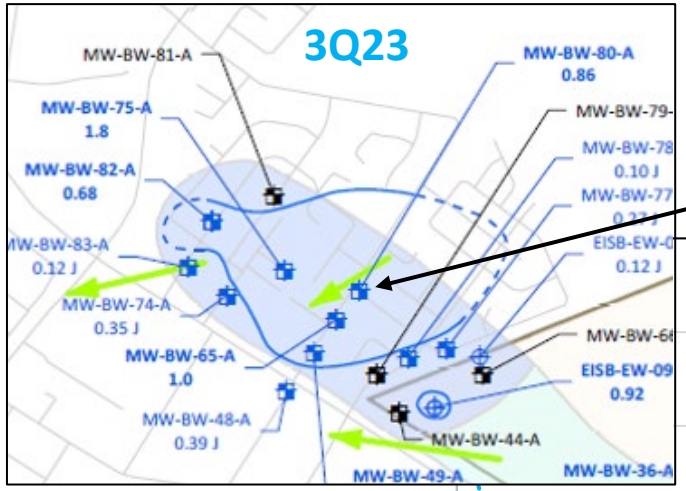
CT Shallow Stations: City of Marina HZ 5

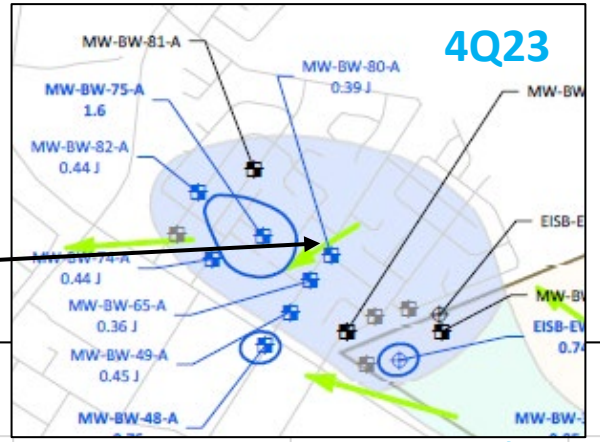


Notes 4Q23:

MW-BW-48-A: deep >ACL, no shallow station
MW-BW-49-A: deep <ACL, shallow <ACL
MW-BW-65-A: deep <ACL, shallow ND
MW-BW-74-A: deep <ACL, shallow ND
MW-BW-75-A: deep >ACL, shallow ND
MW-BW-77-A: deep <ACL, shallow <ACL, annual
MW-BW-78-A: deep <ACL, shallow ND, annual
MW-BW-79-A: deep ND, shallow ND
MW-BW-80-A: deep <ACL, shallow <ACL
MW-BW-81-A: deep ND, no shallow station
MW-BW-82-A: deep <ACL, shallow ND
MW-BW-83-A: deep ND, shallow <ACL, annual




3Q23
MW-BW-81-A
MW-BW-80-A
0.86
MW-BW-75-A
1.8
MW-BW-82-A
0.68
MW-BW-83-A
0.12 J
MW-BW-74-A
0.35 J
MW-BW-65-A
1.0
MW-BW-48-A
0.39 J
MW-BW-79-
MW-BW-78
0.10 J
MW-BW-77
EISB-EW-0
0.12 J
MW-BW-6
EISB-EW-09
0.92
MW-BW-44-A
MW-BW-49-A
MW-BW-36-A


4Q23
MW-BW-81-A
MW-BW-80-A
0.39 J
MW-BW-75-A
1.6
MW-BW-82-A
0.44 J
MW-BW-74-A
0.44 J
MW-BW-65-A
0.36 J
MW-BW-49-A
0.45 J
MW-BW-48-A
EISB-E
MW-BW
EISB-EW
0.7
MW-BW-

MW-BW-80-A CT

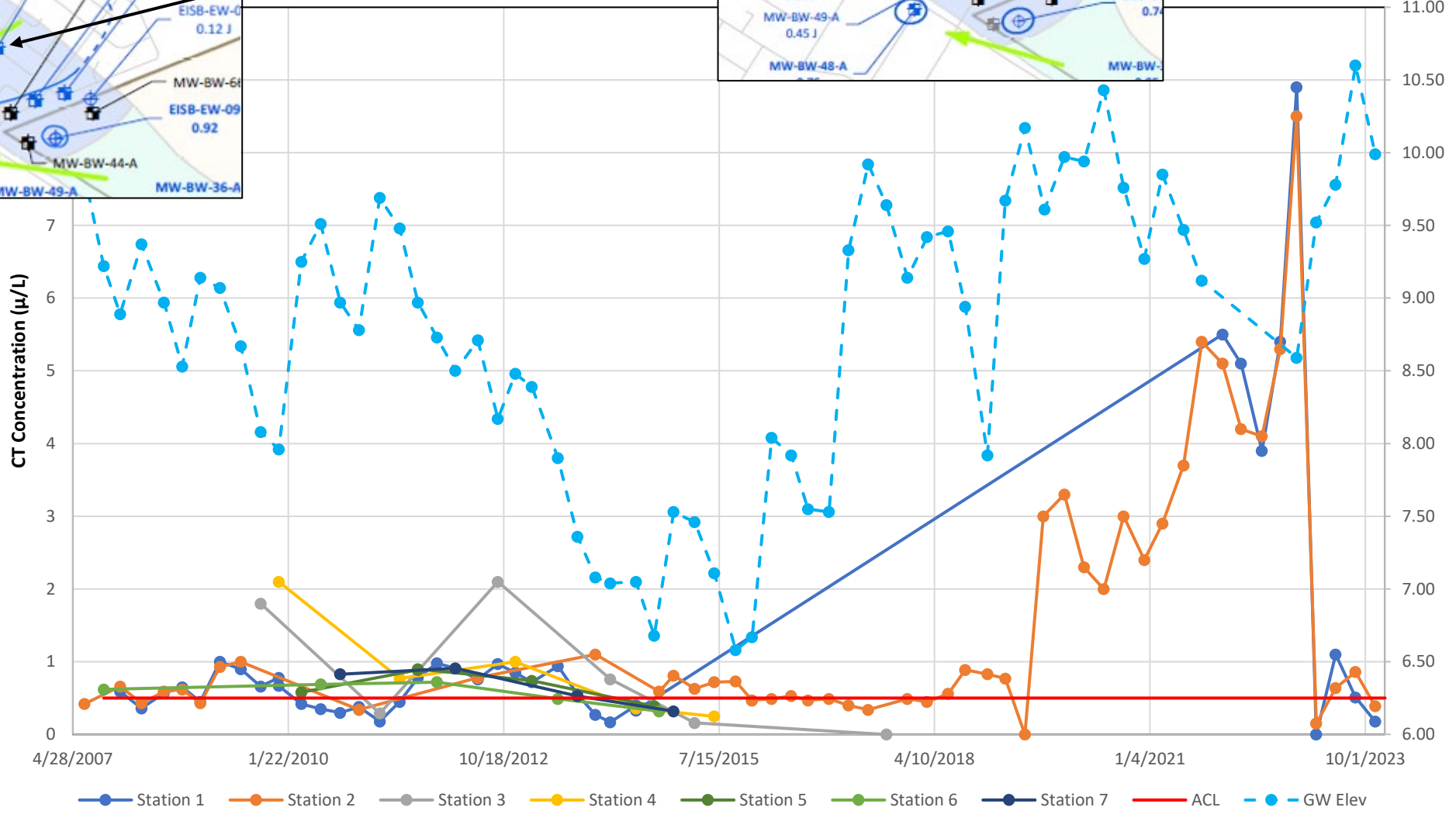
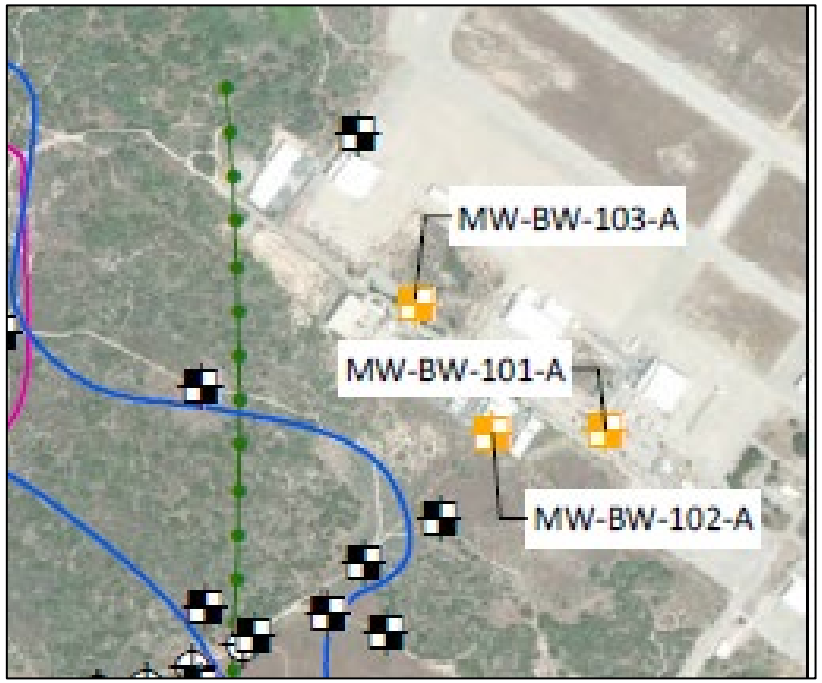

CT Concentration (µ/L)
0
1
2
3
4
5
6
7
11.00
10.50
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
4/28/2007
1/22/2010
10/18/2012
7/15/2015
4/10/2018
1/4/2021
10/1/2023
Station 1
Station 2
Station 3
Station 4
Station 5
Station 6
Station 7
ACL
GW Elev

Table 4: New OUCTP A-Aquifer Wells Profile Summary*^

Well ID	CT	Chloroform	VC
MW-BW-101-A	ND **0.63** **0.71** **0.72**	ND 0.12 J 0.12 J 0.12 J	ND ND ND ND
MW-BW-102-A	0.29 J **0.54** **0.53** 0.39 J 0.27 J	0.12 J 0.17 J 0.17 J 0.17 J 0.17 J	ND **0.13** **0.11** **0.12** 0.097 J
MW-BW-103-A	ND ND ND ND	ND ND 0.14 J ND	ND ND ND **0.36**

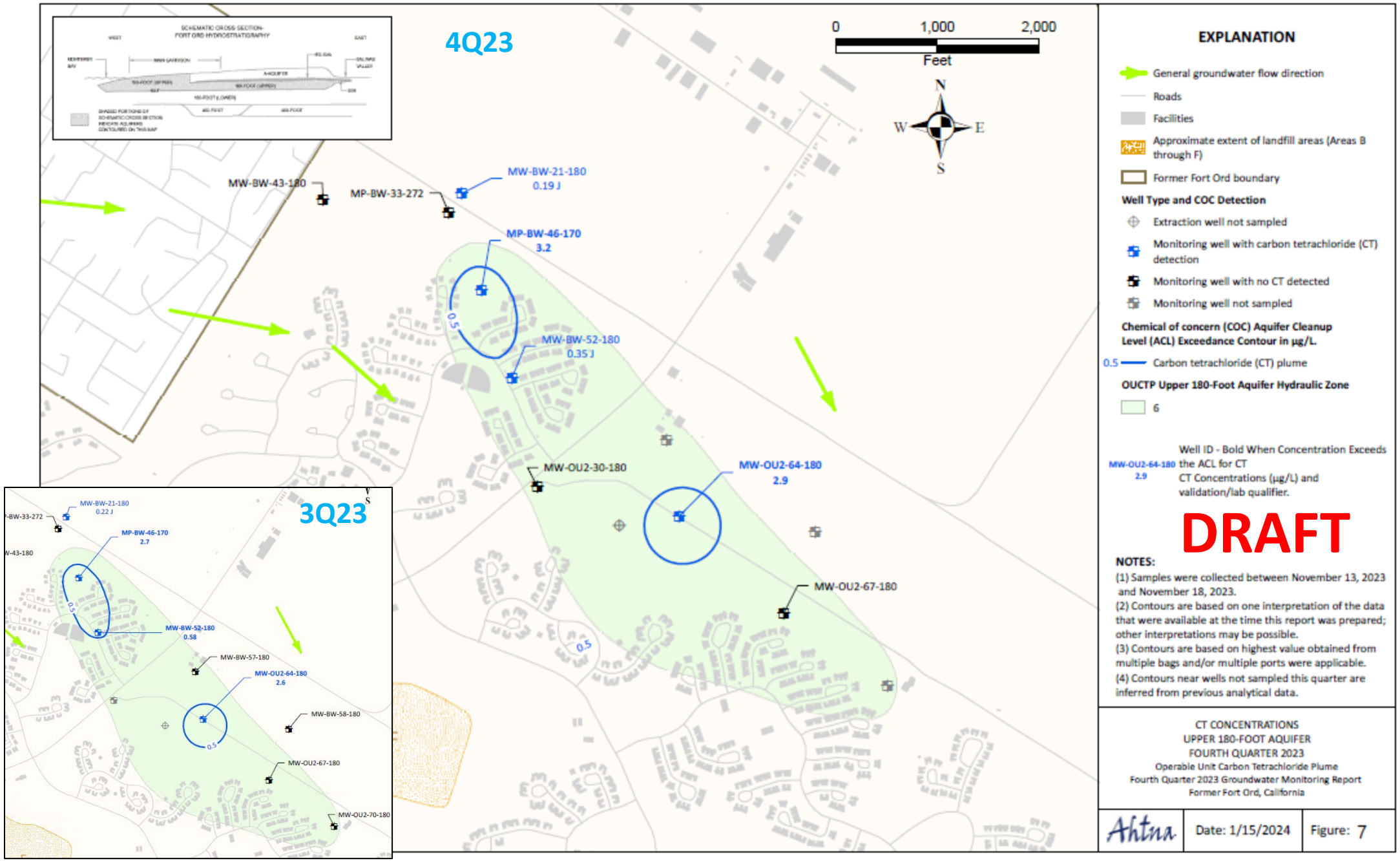


Notes:

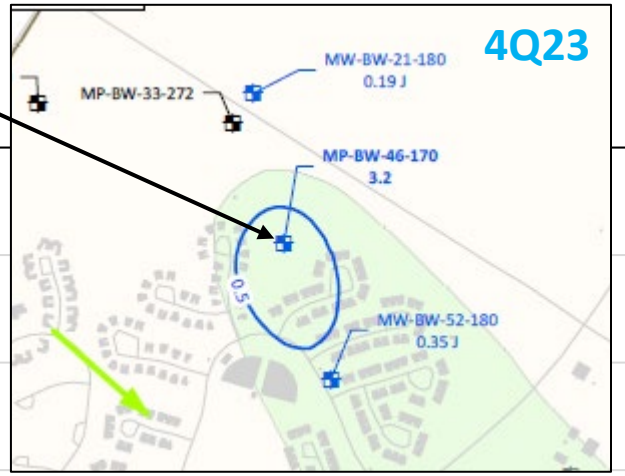
*Preliminary data

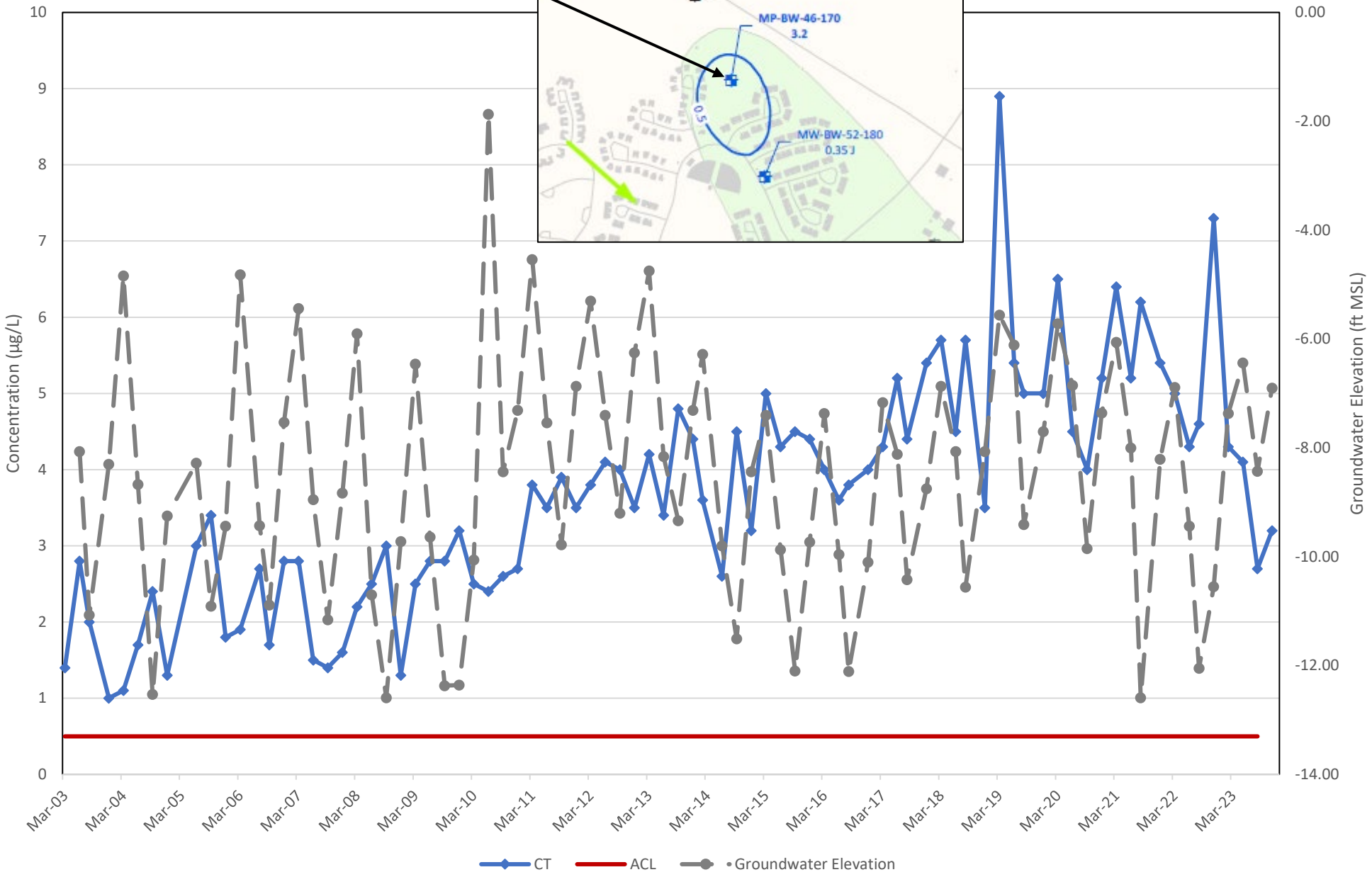
^Sample results are listed in order from shallowest to deepest stations

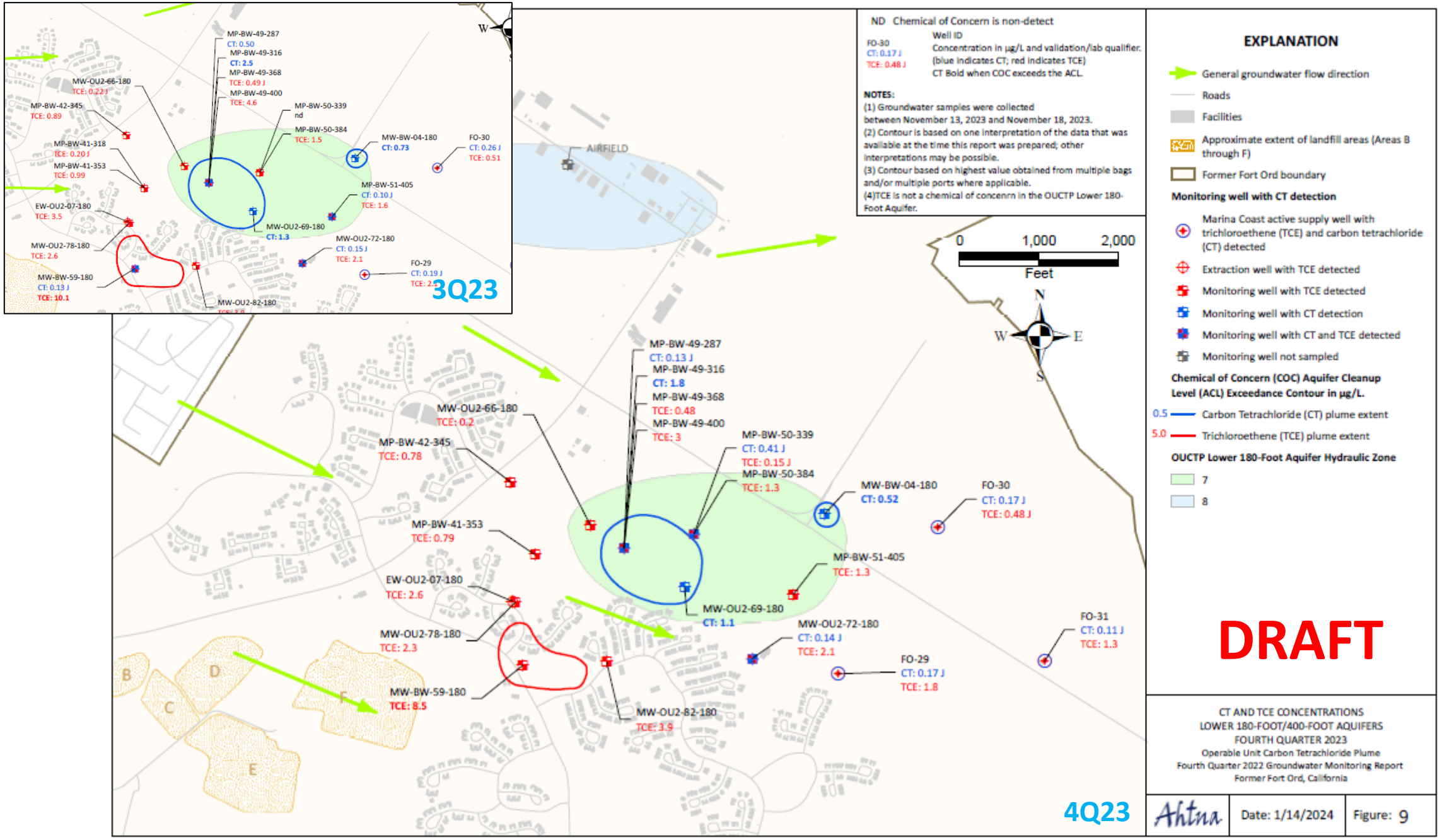
There is no indication of an upgradient VC source nor COCs that would dechlorinate into VC (PCE, TCE, and total-1,2-DCE) in the A-Aquifer. This will continue to be monitored and if VC is no longer detected, it may indicate these concentrations are a remnant of the PVC well construction material.

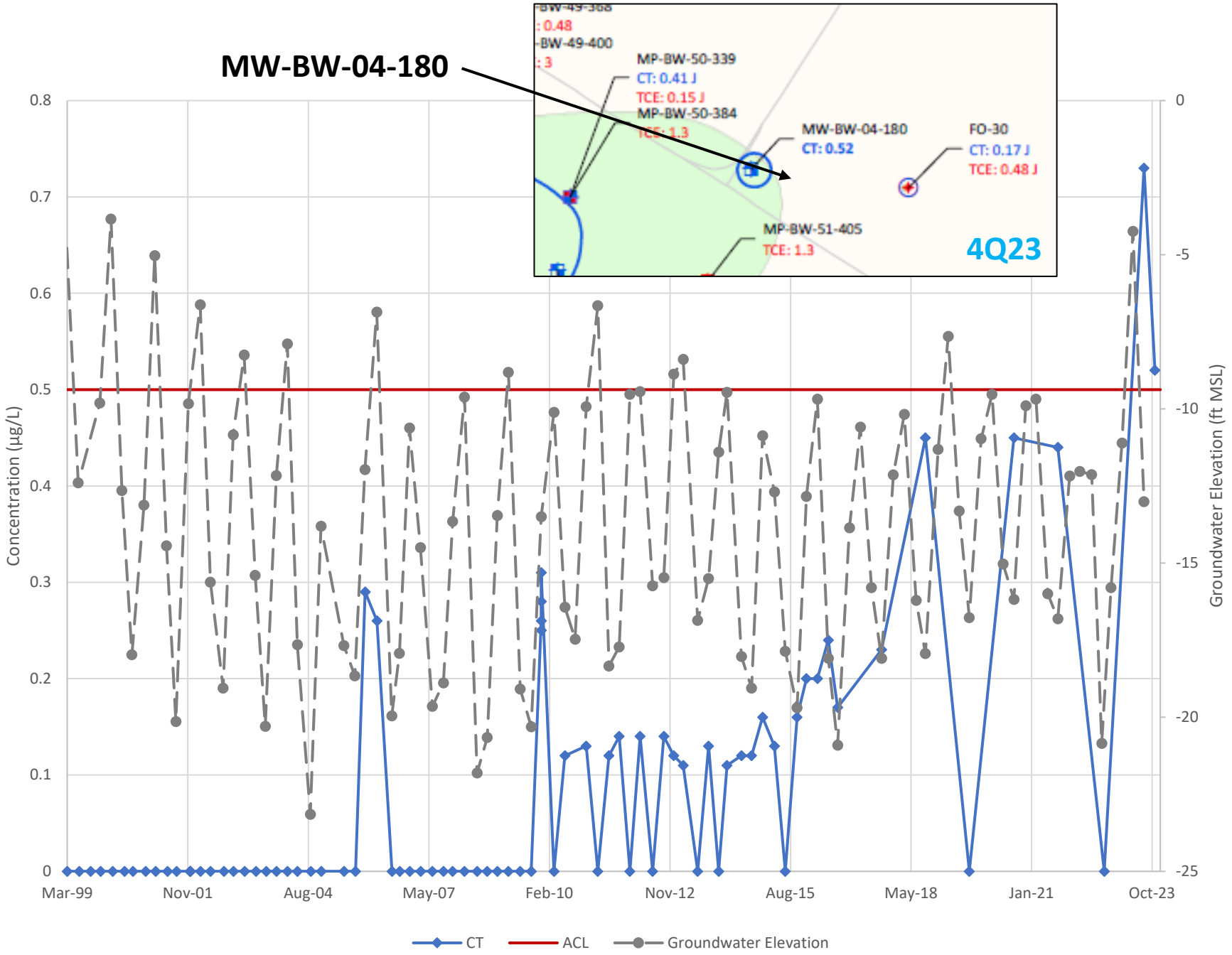

4Q23
0
1,000
2,000
Feet
N
W
E
S
MW-BW-43-180
MP-BW-33-272
MW-BW-21-180
0.19 J
MP-BW-46-170
3.2
0.5
MW-BW-52-180
0.35 J
MW-OU2-30-180
MW-OU2-64-180
2.9
MW-OU2-67-180
0.5
3Q23
MW-BW-21-180
0.22 J
MP-BW-46-170
2.7
MW-BW-52-180
0.58
MW-BW-57-180
MW-OU2-64-180
2.6
MW-BW-58-180
MW-OU2-67-180
MW-OU2-70-180
EXPLANATION
General groundwater flow direction
Roads
Facilities
Approximate extent of landfill areas (Areas B through F)
Former Fort Ord boundary
Well Type and COC Detection
Extraction well not sampled
Monitoring well with carbon tetrachloride (CT) detection
Monitoring well with no CT detected
Monitoring well not sampled
Chemical of concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L.
0.5 Carbon tetrachloride (CT) plume
OUCTP Upper 180-Foot Aquifer Hydraulic Zone
6
MW-OU2-64-180 2.9
Well ID - Bold When Concentration Exceeds the ACL for CT
CT Concentrations (µg/L) and validation/lab qualifier.
DRAFT
NOTES:
(1) Samples were collected between November 13, 2023 and November 18, 2023.
(2) Contours are based on one interpretation of the data that were available at the time this report was prepared; other interpretations may be possible.
(3) Contours are based on highest value obtained from multiple bags and/or multiple ports were applicable.
(4) Contours near wells not sampled this quarter are inferred from previous analytical data.
CT CONCENTRATIONS
UPPER 180-FOOT AQUIFER
FOURTH QUARTER 2023
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2023 Groundwater Monitoring Report
Former Fort Ord, California
Ahtna
Date: 1/15/2024
Figure: 7

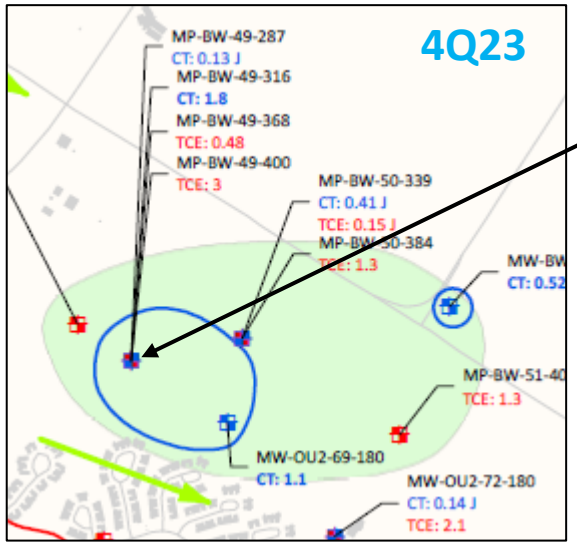
MP-BW-46-170

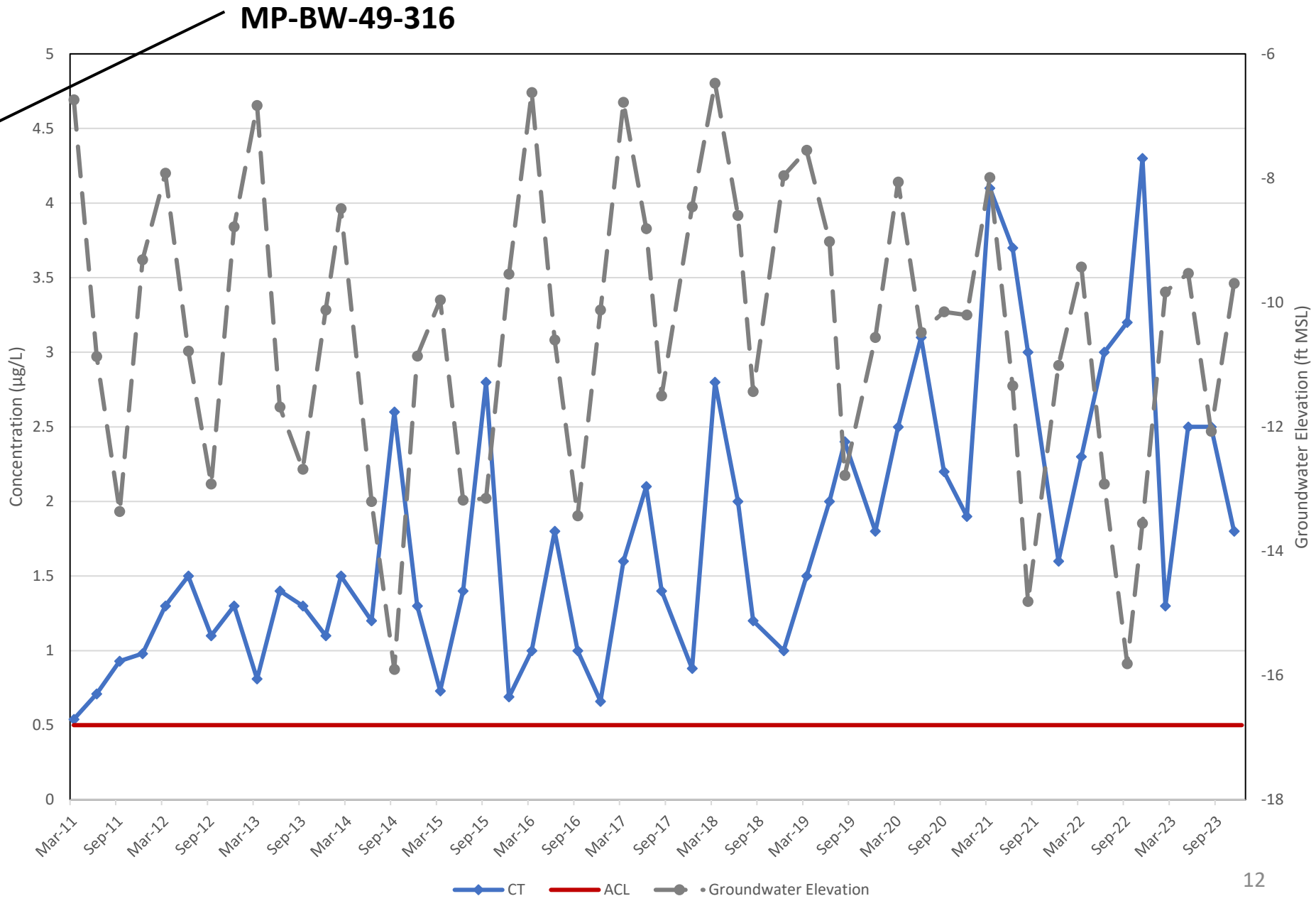

4Q23
MW-BW-21-180
0.19 J
MP-BW-33-272
MP-BW-46-170
3.2
0.5
MW-BW-52-180
0.35 J


Concentration (µg/L)
Groundwater Elevation (ft MSL)
0
1
2
3
4
5
6
7
8
9
10
0.00
-2.00
-4.00
-6.00
-8.00
-10.00
-12.00
-14.00
Mar-03
Mar-04
Mar-05
Mar-06
Mar-07
Mar-08
Mar-09
Mar-10
Mar-11
Mar-12
Mar-13
Mar-14
Mar-15
Mar-16
Mar-17
Mar-18
Mar-19
Mar-20
Mar-21
Mar-22
Mar-23
CT
ACL
Groundwater Elevation

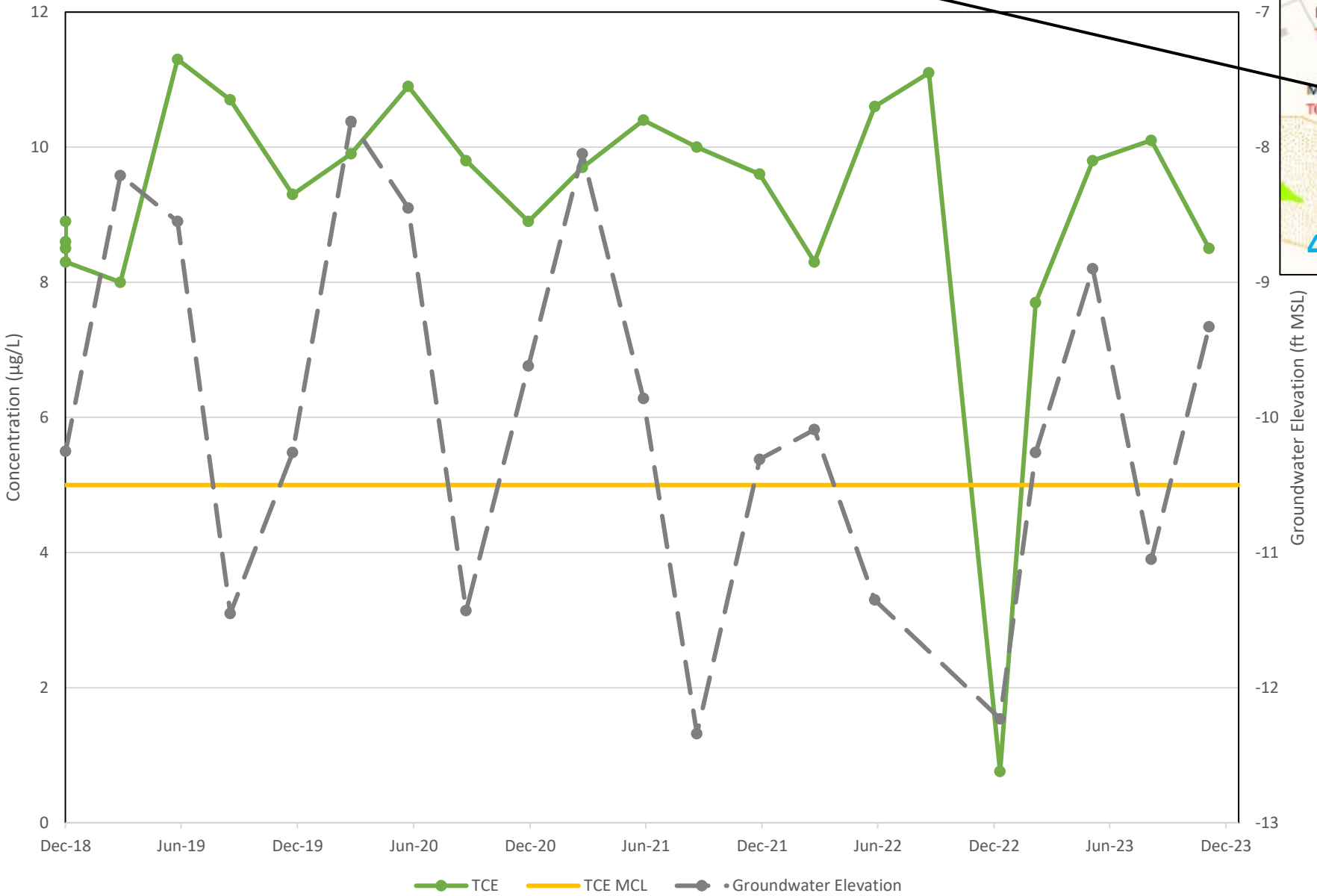

ND Chemical of Concern is non-detect
FO-30
CT: 0.17 J
TCE: 0.48 J
Well ID
Concentration in µg/L and validation/lab qualifier.
(blue indicates CT; red indicates TCE)
CT Bold when COC exceeds the ACL.
NOTES:
(1) Groundwater samples were collected between November 13, 2023 and November 18, 2023.
(2) Contour is based on one interpretation of the data that was available at the time this report was prepared; other interpretations may be possible.
(3) Contour based on highest value obtained from multiple bags and/or multiple ports where applicable.
(4)TCE is not a chemical of concenrn in the OUCTP Lower 180-Foot Aquifer.
EXPLANATION
General groundwater flow direction
Roads
Facilities
Approximate extent of landfill areas (Areas B through F)
Former Fort Ord boundary
Monitoring well with CT detection
Marina Coast active supply well with trichloroethene (TCE) and carbon tetrachloride (CT) detected
Extraction well with TCE detected
Monitoring well with TCE detected
Monitoring well with CT detection
Monitoring well with CT and TCE detected
Monitoring well not sampled
Chemical of Concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L.
0.5 Carbon Tetrachloride (CT) plume extent
5.0 Trichloroethene (TCE) plume extent
OUCTP Lower 180-Foot Aquifer Hydraulic Zone
7
8
0 1,000 2,000
Feet
N
W E
S
AIRFIELD
3Q23
4Q23
DRAFT
CT AND TCE CONCENTRATIONS
LOWER 180-FOOT/400-FOOT AQUIFERS
FOURTH QUARTER 2023
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2022 Groundwater Monitoring Report
Former Fort Ord, California
Ahtna
Date: 1/14/2024
Figure: 9

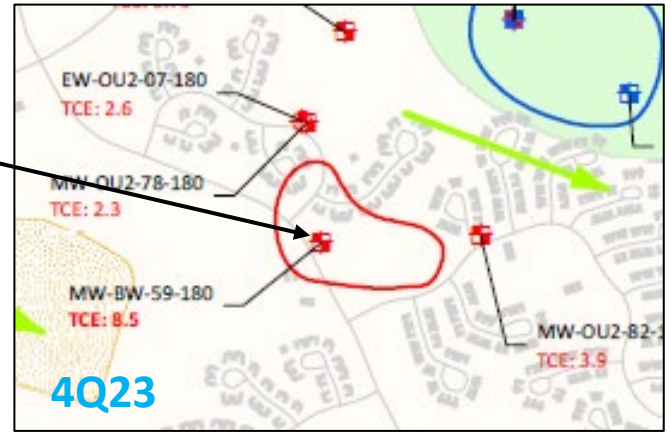

MW-BW-04-180
MP-BW-50-339
CT: 0.41 J
TCE: 0.15 J
MP-BW-50-384
TCE: 1.3
MW-BW-04-180
CT: 0.52
FO-30
CT: 0.17 J
TCE: 0.48 J
MP-BW-51-405
TCE: 1.3
4Q23
Concentration (µg/L)
Groundwater Elevation (ft MSL)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-5
-10
-15
-20
-25
Mar-99
Nov-01
Aug-04
May-07
Feb-10
Nov-12
Aug-15
May-18
Jan-21
Oct-23
CT
ACL
Groundwater Elevation


4Q23
MP-BW-49-287
CT: 0.13 J
MP-BW-49-316
CT: 1.8
MP-BW-49-368
TCE: 0.48
MP-BW-49-400
TCE: 3
MP-BW-50-339
CT: 0.41 J
TCE: 0.15 J
MP-BW-50-384
TCE: 1.3
MW-BW
CT: 0.52
MP-BW-51-40
TCE: 1.3
MW-OU2-69-180
CT: 1.1
MW-OU2-72-180
CT: 0.14 J
TCE: 2.1


MP-BW-49-316
Concentration (µg/L)
Groundwater Elevation (ft MSL)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-6
-8
-10
-12
-14
-16
-18
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
Mar-23
Sep-23
CT
ACL
Groundwater Elevation

MW-BW-59-180


12
10
8
6
4
2
0
Concentration (µg/L)
-7
-8
-9
-10
-11
-12
-13
Groundwater Elevation (ft MSL)
Dec-18
Jun-19
Dec-19
Jun-20
Dec-20
Jun-21
Dec-21
Jun-22
Dec-22
Jun-23
Dec-23
TCE
TCE MCL
Groundwater Elevation


EW-OU2-07-180
TCE: 2.6
MW-OU2-78-180
TCE: 2.3
MW-BW-59-180
TCE: 8.5
TCE: 3.9
4Q23

TCE in the Lower 180-Foot Aquifer