Parcel C, RU-C2 Remedial Action Project Update Hunters Point Naval Shipyard San Francisco, California

December 4 2014 BCT Meeting

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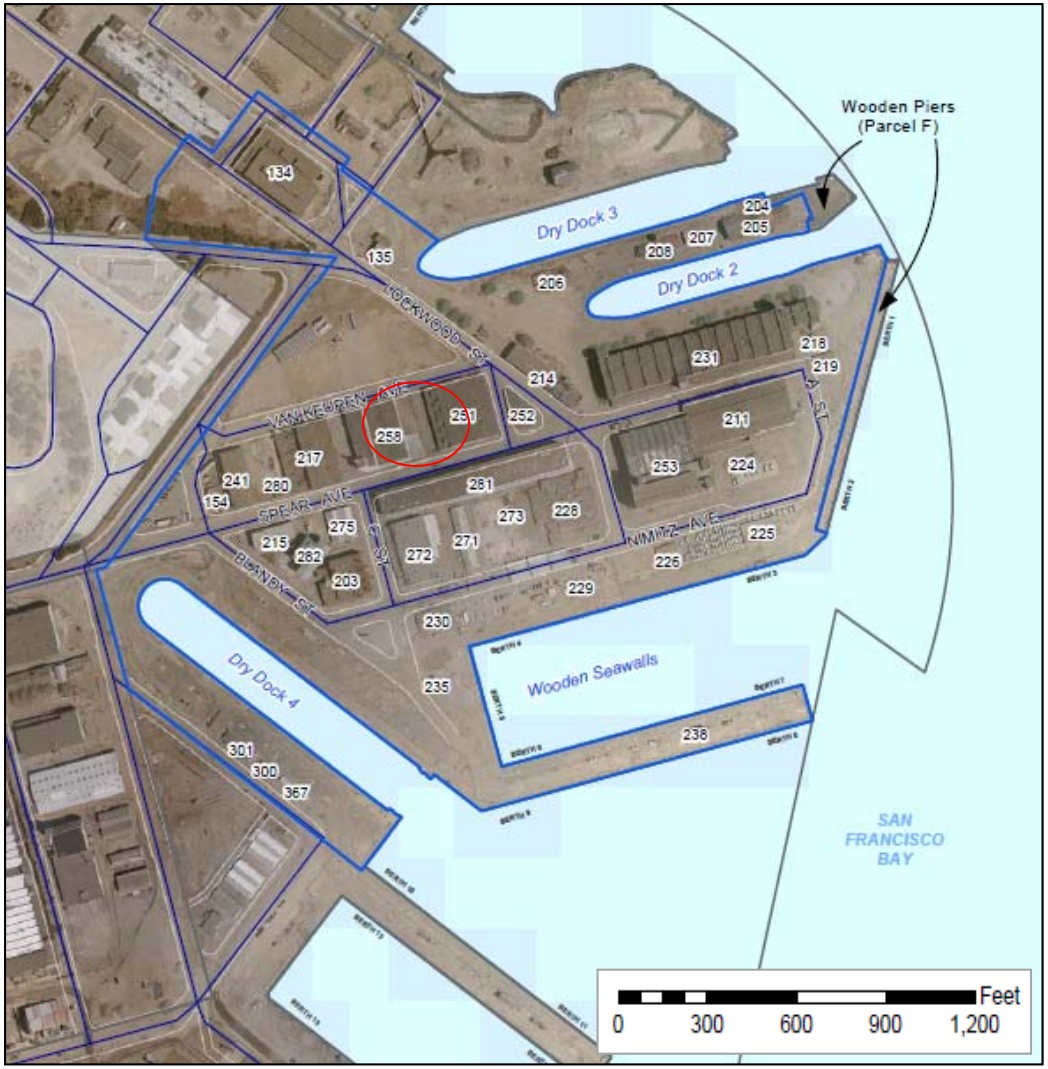
Contracted Support for Navy BRAC

12/04/2014

Parcel C Remedial Action

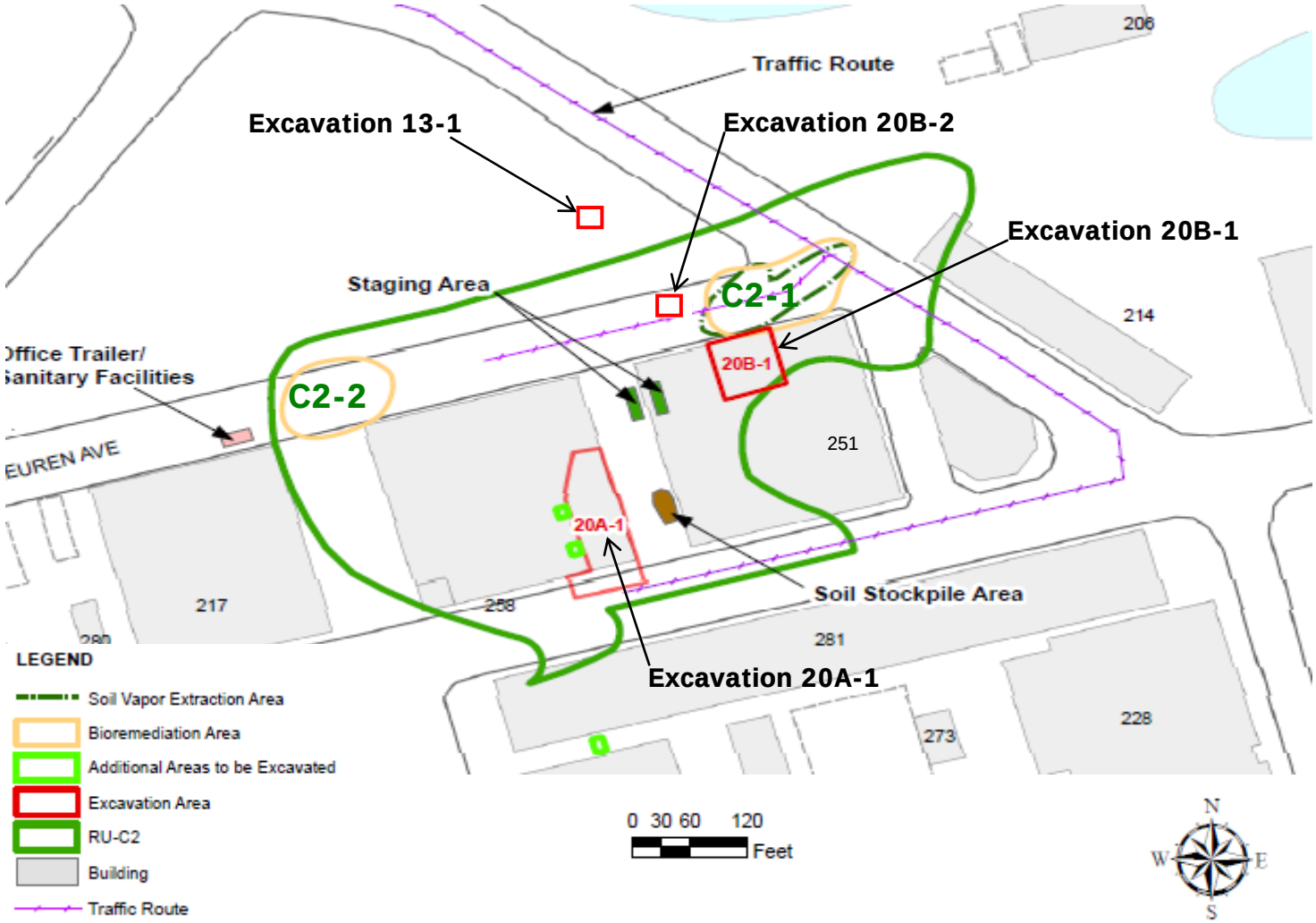


Parcel C Boundary

231 Building Number

Approximate RU-C2 Boundary

RU-C2 Map


Traffic Route
Excavation 13-1
Excavation 20B-2
Excavation 20B-1
Staging Area
C2-1
C2-2
20B-1
20A-1
Office Trailer/
Sanitary Facilities
EUREN AVE
Soil Stockpile Area
Excavation 20A-1
206
214
251
217
258
281
273
228
LEGEND
Soil Vapor Extraction Area
Bioremediation Area
Additional Areas to be Excavated
Excavation Area
RU-C2
Building
Traffic Route
0 30 60 120
Feet
N
W
E
S

RU-C2 Update

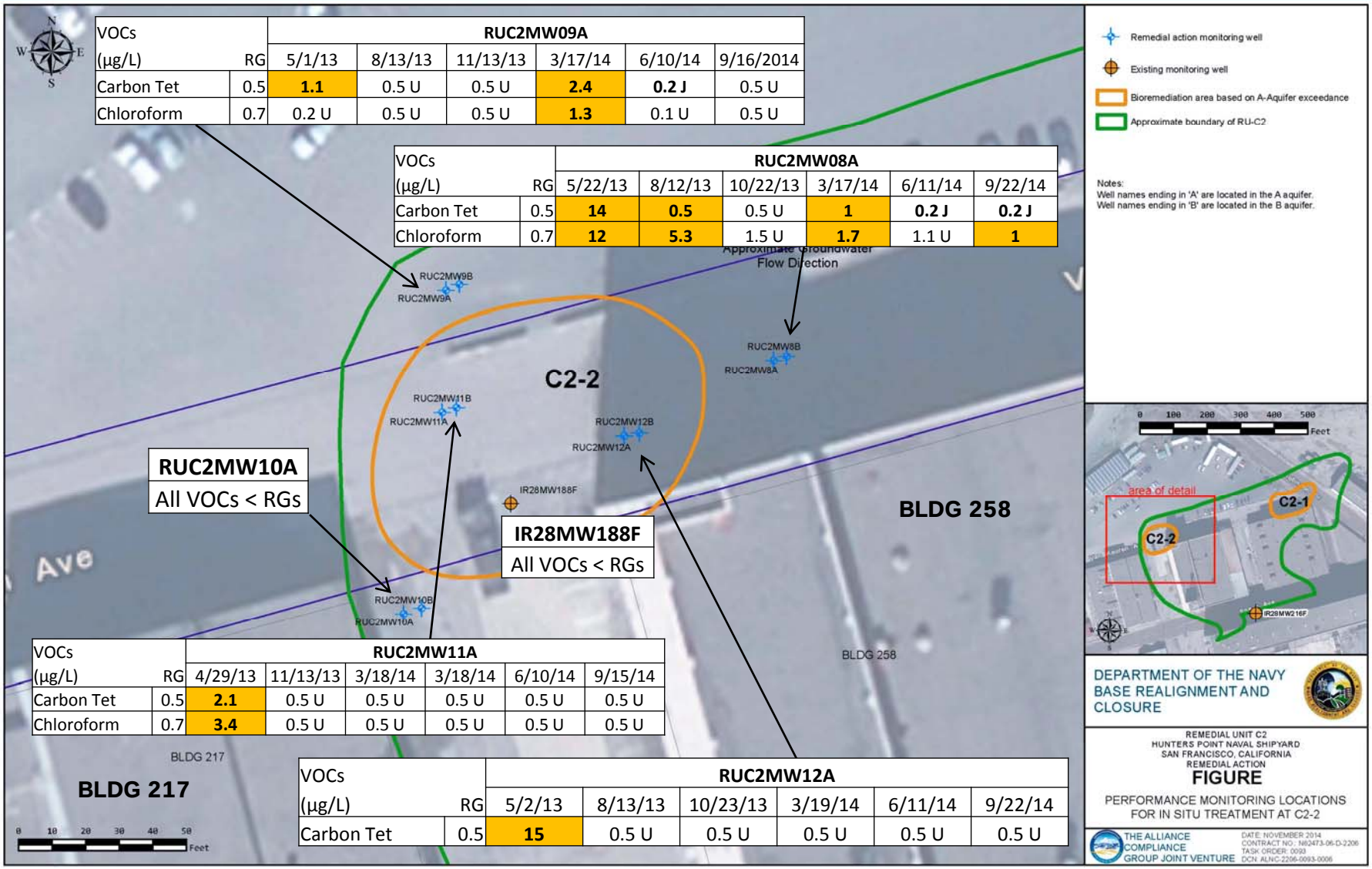
This presentation includes:

- A summary of Remedial Action Groundwater performance monitoring results at C2-1 and C2-2.
  - Baseline
  - Post Injection: 1 month, 3 months, 6 months, 9 months, and 1 year.
  - Recommendations for C2-1 and C2-2.
- Backfilling and shoring removal at Excavation 20A-1.
- SVE infrastructure installation.

RU-C2 RA Performance Monitoring – Building 258 (C2-2) "A" Aquifer

VOCs (µg/L)	RG	RUC2MW09A 5/1/13	8/13/13	11/13/13	3/17/14	6/10/14	9/16/2014
Carbon Tet	0.5	**1.1**	0.5 U	0.5 U	**2.4**	**0.2 J**	0.5 U
Chloroform	0.7	0.2 U	0.5 U	0.5 U	**1.3**	0.1 U	0.5 U

VOCs (µg/L)	RG	RUC2MW08A 5/22/13	8/12/13	10/22/13	3/17/14	6/11/14	9/22/14
Carbon Tet	0.5	**14**	**0.5**	0.5 U	**1**	**0.2 J**	**0.2 J**
Chloroform	0.7	**12**	**5.3**	1.5 U	**1.7**	1.1 U	**1**



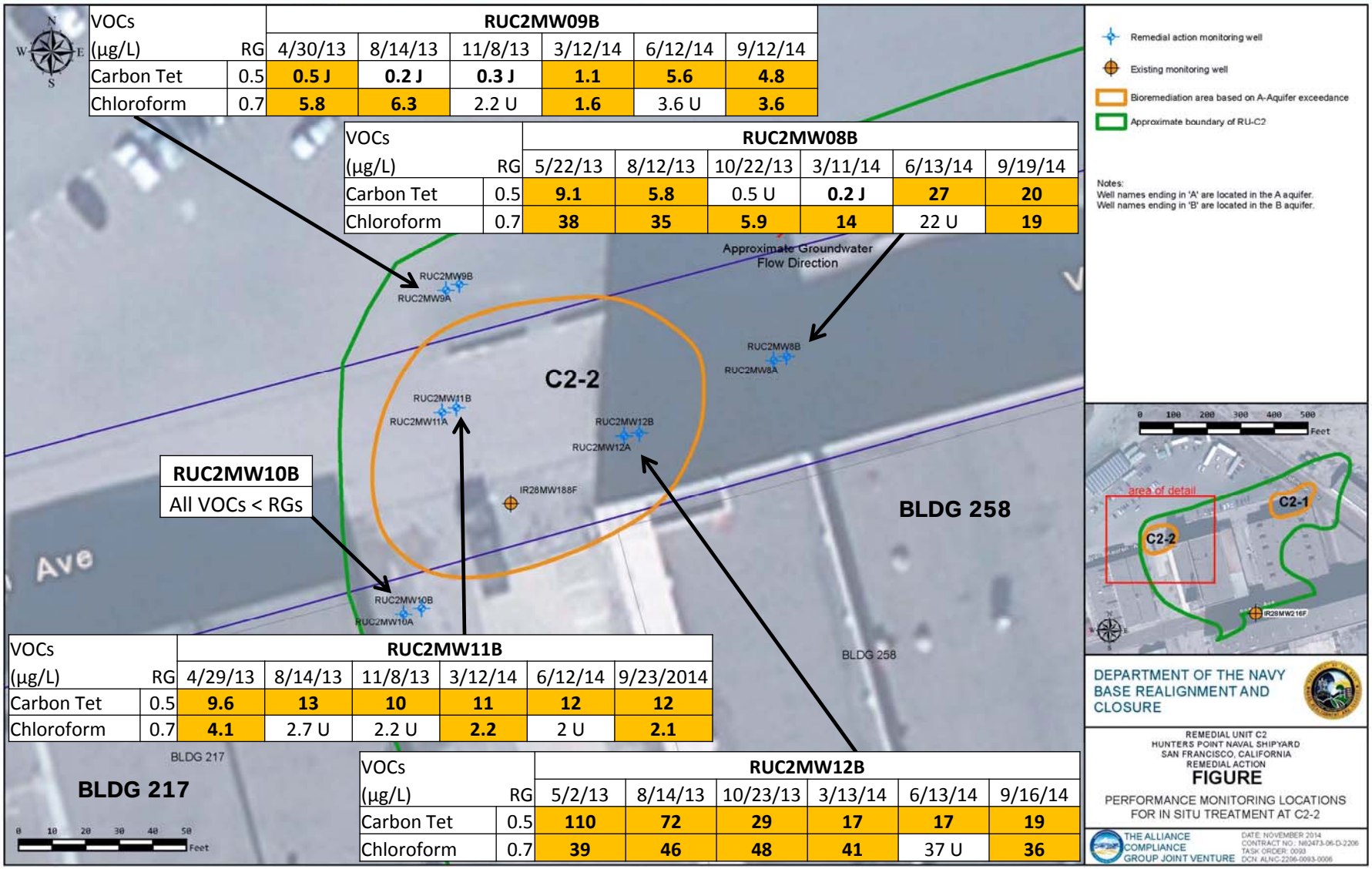
RUC2MW10A
All VOCs < RGs

IR28MW188F
All VOCs < RGs

VOCs (µg/L)	RG	RUC2MW11A 4/29/13	11/13/13	3/18/14	3/18/14	6/10/14	9/15/14
Carbon Tet	0.5	**2.1**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	0.7	**3.4**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

VOCs (µg/L)	RG	RUC2MW12A 5/2/13	8/13/13	10/23/13	3/19/14	6/11/14	9/22/14
Carbon Tet	0.5	**15**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

RU-C2 RA Performance Monitoring – Building 258 (C2-2) "B" Aquifer



VOCs (µg/L)	RG	RUC2MW09B 4/30/13	8/14/13	11/8/13	3/12/14	6/12/14	9/12/14
Carbon Tet	0.5	**0.5 J**	**0.2 J**	**0.3 J**	**1.1**	**5.6**	**4.8**
Chloroform	0.7	**5.8**	**6.3**	2.2 U	**1.6**	3.6 U	**3.6**

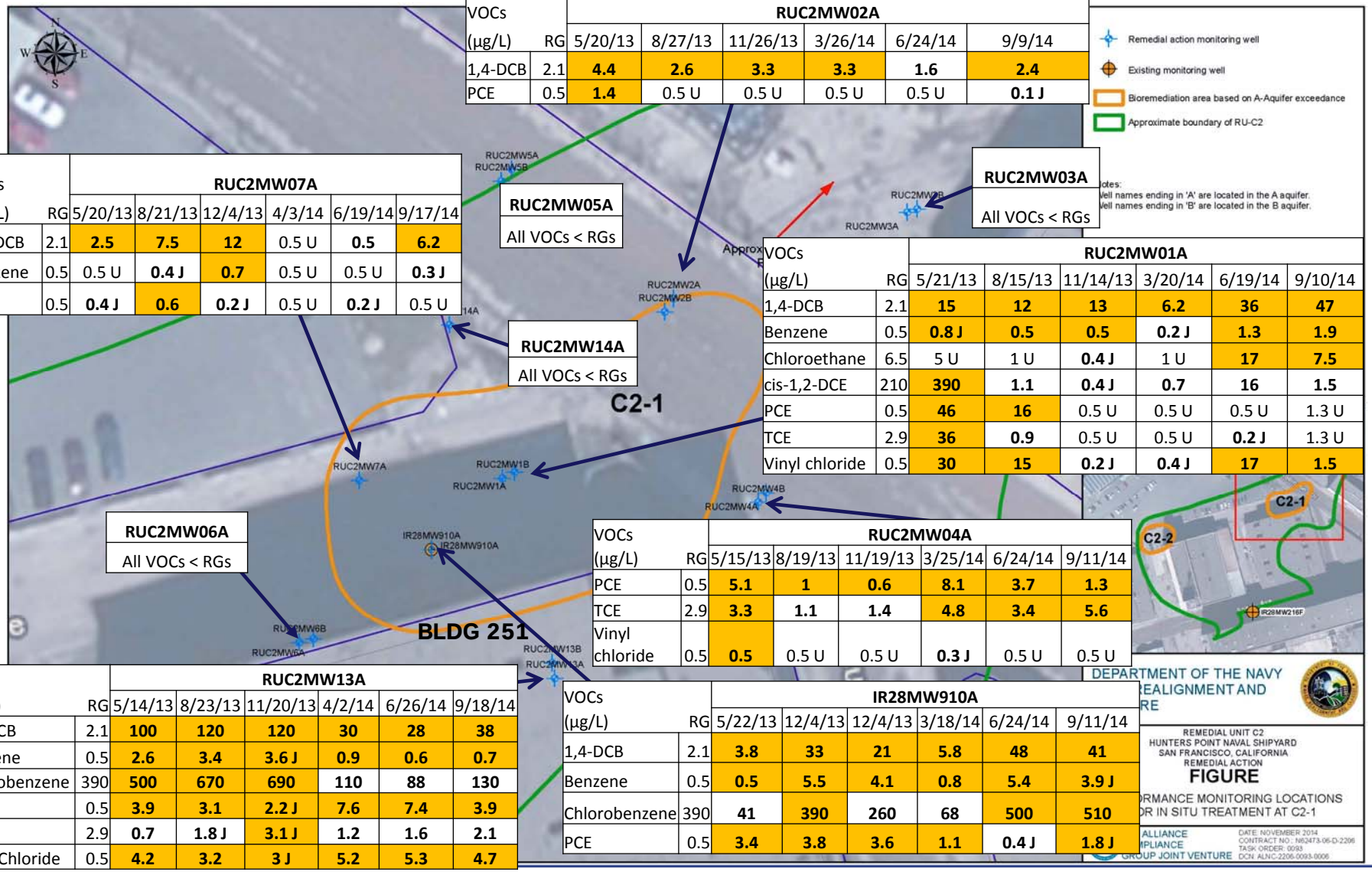
VOCs (µg/L)	RG	RUC2MW08B 5/22/13	8/12/13	10/22/13	3/11/14	6/13/14	9/19/14
Carbon Tet	0.5	**9.1**	**5.8**	0.5 U	**0.2 J**	**27**	**20**
Chloroform	0.7	**38**	**35**	**5.9**	**14**	22 U	**19**

RUC2MW10B
All VOCs < RGs

VOCs (µg/L)	RG	RUC2MW11B 4/29/13	8/14/13	11/8/13	3/12/14	6/12/14	9/23/2014
Carbon Tet	0.5	**9.6**	**13**	**10**	**11**	**12**	**12**
Chloroform	0.7	**4.1**	2.7 U	2.2 U	**2.2**	2 U	**2.1**

VOCs (µg/L)	RG	RUC2MW12B 5/2/13	8/14/13	10/23/13	3/13/14	6/13/14	9/16/14
Carbon Tet	0.5	**110**	**72**	**29**	**17**	**17**	**19**
Chloroform	0.7	**39**	**46**	**48**	**41**	37 U	**36**

RU-C2 RA Performance Monitoring - Building 251 (C2-1)
"A" Aquifer



VOCs (µg/L)	RG	RUC2MW02A 5/20/13	8/27/13	11/26/13	3/26/14	6/24/14	9/9/14
1,4-DCB	2.1	**4.4**	**2.6**	**3.3**	**3.3**	**1.6**	**2.4**
PCE	0.5	**1.4**	0.5 U	0.5 U	0.5 U	0.5 U	**0.1 J**

VOCs (µg/L)	RG	RUC2MW07A 5/20/13	8/21/13	12/4/13	4/3/14	6/19/14	9/17/14
1,4-DCB	2.1	**2.5**	**7.5**	**12**	0.5 U	**0.5**	**6.2**
Benzene	0.5	0.5 U	**0.4 J**	**0.7**	0.5 U	0.5 U	**0.3 J**
PCE	0.5	**0.4 J**	**0.6**	**0.2 J**	0.5 U	**0.2 J**	0.5 U

RUC2MW05A

All VOCs < RGs

RUC2MW03A

All VOCs < RGs

RUC2MW14A

All VOCs < RGs

VOCs (µg/L)	RG	RUC2MW01A 5/21/13	8/15/13	11/14/13	3/20/14	6/19/14	9/10/14
1,4-DCB	2.1	**15**	**12**	**13**	**6.2**	**36**	**47**
Benzene	0.5	**0.8 J**	**0.5**	**0.5**	**0.2 J**	**1.3**	**1.9**
Chloroethane	6.5	5 U	1 U	**0.4 J**	1 U	**17**	**7.5**
cis-1,2-DCE	210	**390**	**1.1**	**0.4 J**	**0.7**	**16**	**1.5**
PCE	0.5	**46**	**16**	0.5 U	0.5 U	0.5 U	1.3 U
TCE	2.9	**36**	**0.9**	0.5 U	0.5 U	**0.2 J**	1.3 U
Vinyl chloride	0.5	**30**	**15**	**0.2 J**	**0.4 J**	**17**	**1.5**

RUC2MW06A

All VOCs < RGs

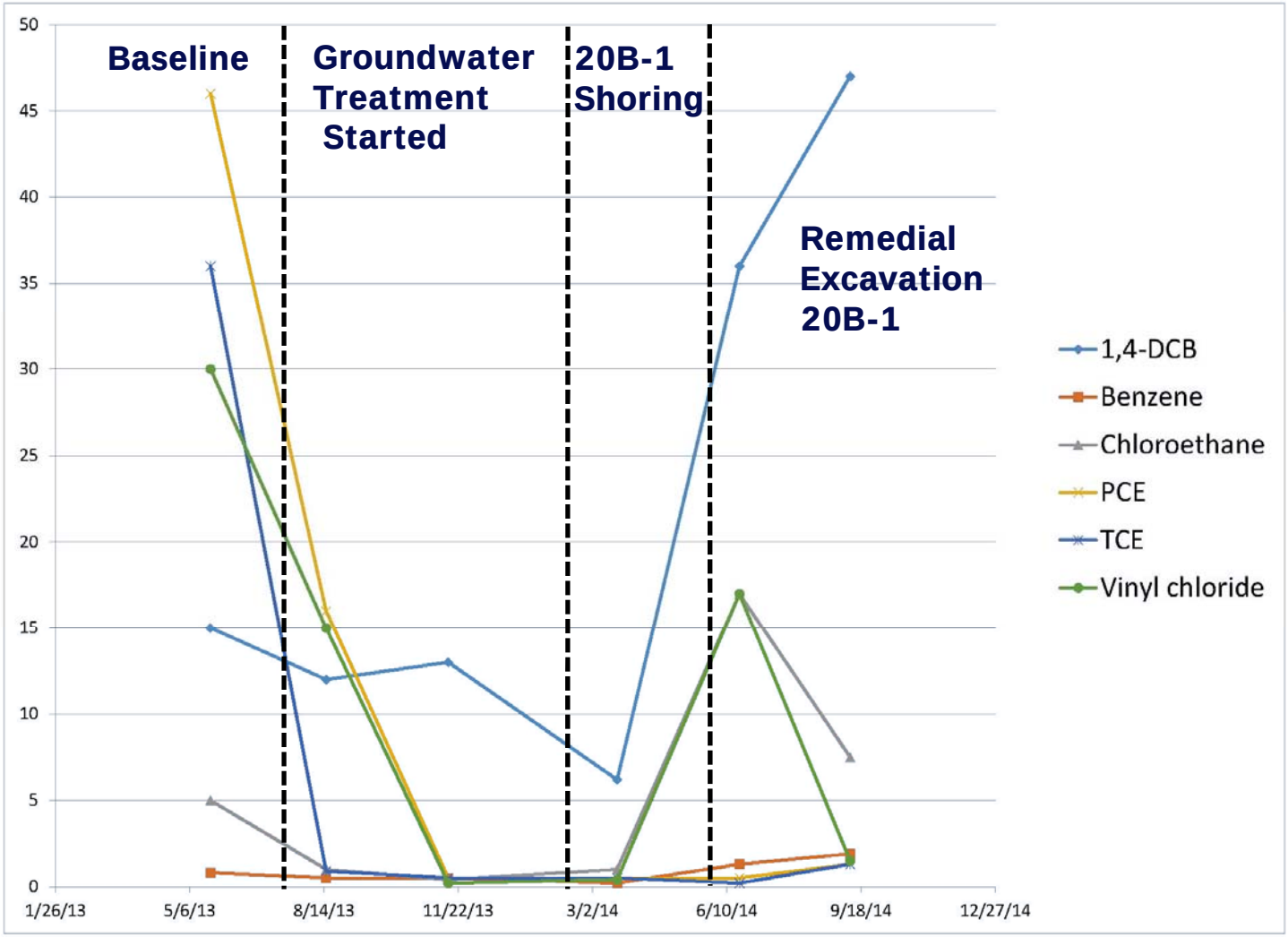
VOCs (µg/L)	RG	RUC2MW04A 5/15/13	8/19/13	11/19/13	3/25/14	6/24/14	9/11/14
PCE	0.5	**5.1**	**1**	**0.6**	**8.1**	**3.7**	**1.3**
TCE	2.9	**3.3**	**1.1**	**1.4**	**4.8**	**3.4**	**5.6**
Vinyl chloride	0.5	**0.5**	0.5 U	0.5 U	**0.3 J**	0.5 U	0.5 U

VOCs (µg/L)	RG	RUC2MW13A 5/14/13	8/23/13	11/20/13	4/2/14	6/26/14	9/18/14
1,4-DCB	2.1	**100**	**120**	**120**	**30**	**28**	**38**
Benzene	0.5	**2.6**	**3.4**	**3.6 J**	**0.9**	**0.6**	**0.7**
Chlorobenzene	390	**500**	**670**	**690**	**110**	**88**	**130**
PCE	0.5	**3.9**	**3.1**	**2.2 J**	**7.6**	**7.4**	**3.9**
TCE	2.9	**0.7**	**1.8 J**	**3.1 J**	**1.2**	**1.6**	**2.1**
Vinyl Chloride	0.5	**4.2**	**3.2**	**3 J**	**5.2**	**5.3**	**4.7**

VOCs (µg/L)	RG	IR28MW910A 5/22/13	12/4/13	12/4/13	3/18/14	6/24/14	9/11/14
1,4-DCB	2.1	**3.8**	**33**	**21**	**5.8**	**48**	**41**
Benzene	0.5	**0.5**	**5.5**	**4.1**	**0.8**	**5.4**	**3.9 J**
Chlorobenzene	390	**41**	**390**	**260**	**68**	**500**	**510**
PCE	0.5	**3.4**	**3.8**	**3.6**	**1.1**	**0.4 J**	**1.8 J**

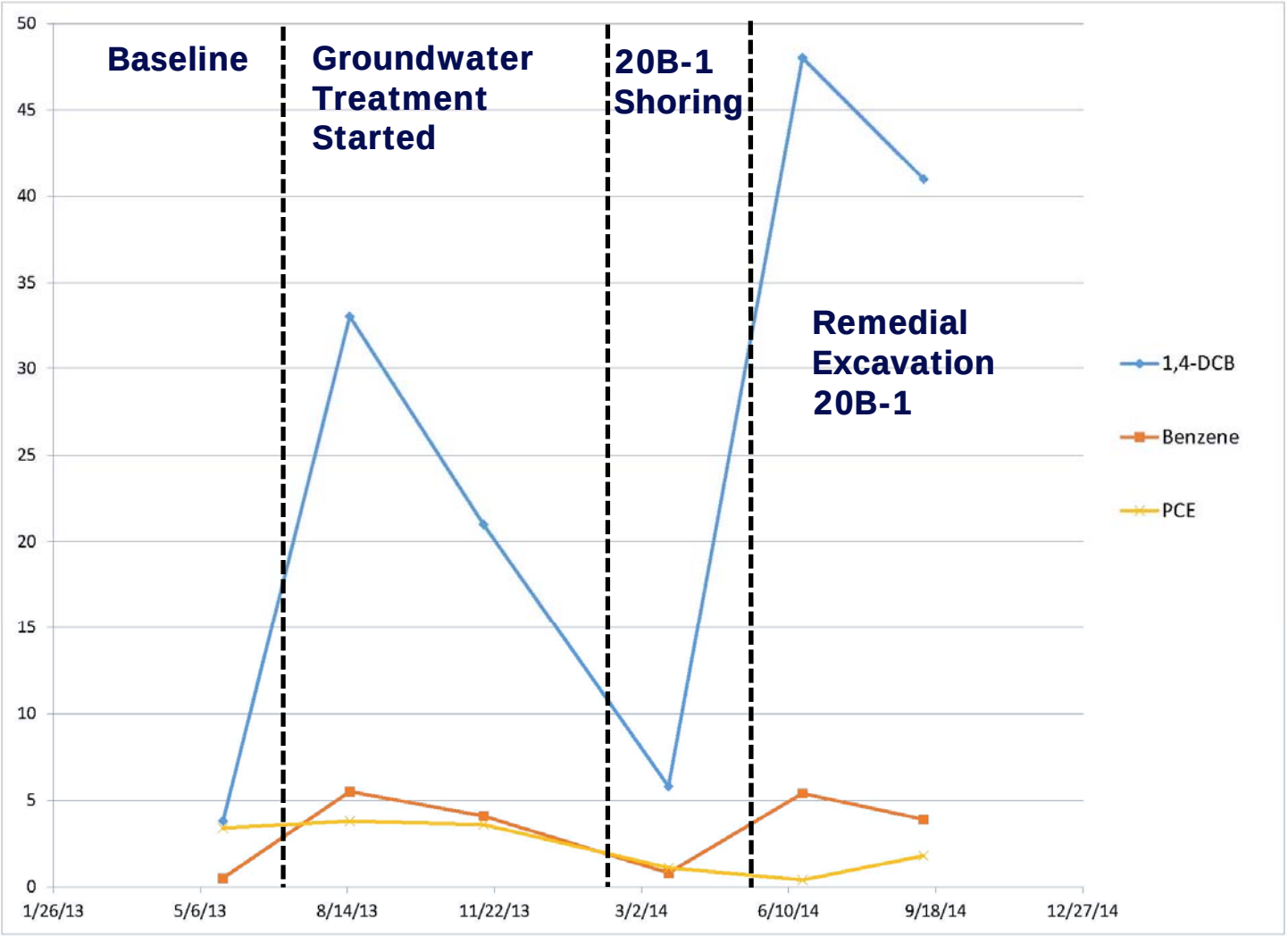
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Concentrations (µg/L) vs. Time in Source Area Well MW1A



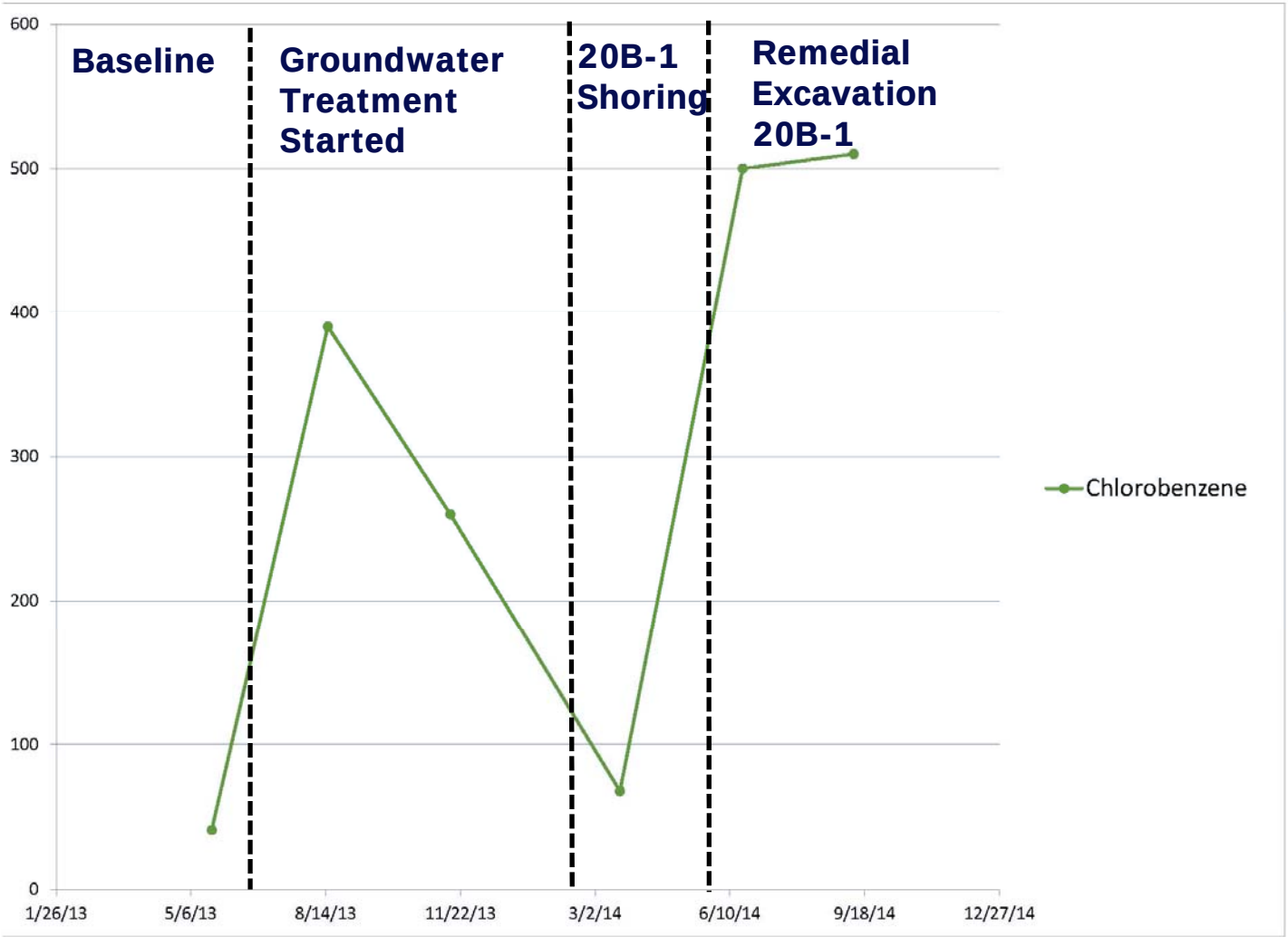
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Concentrations (µg/L) vs. Time in Source Area Well MW910A



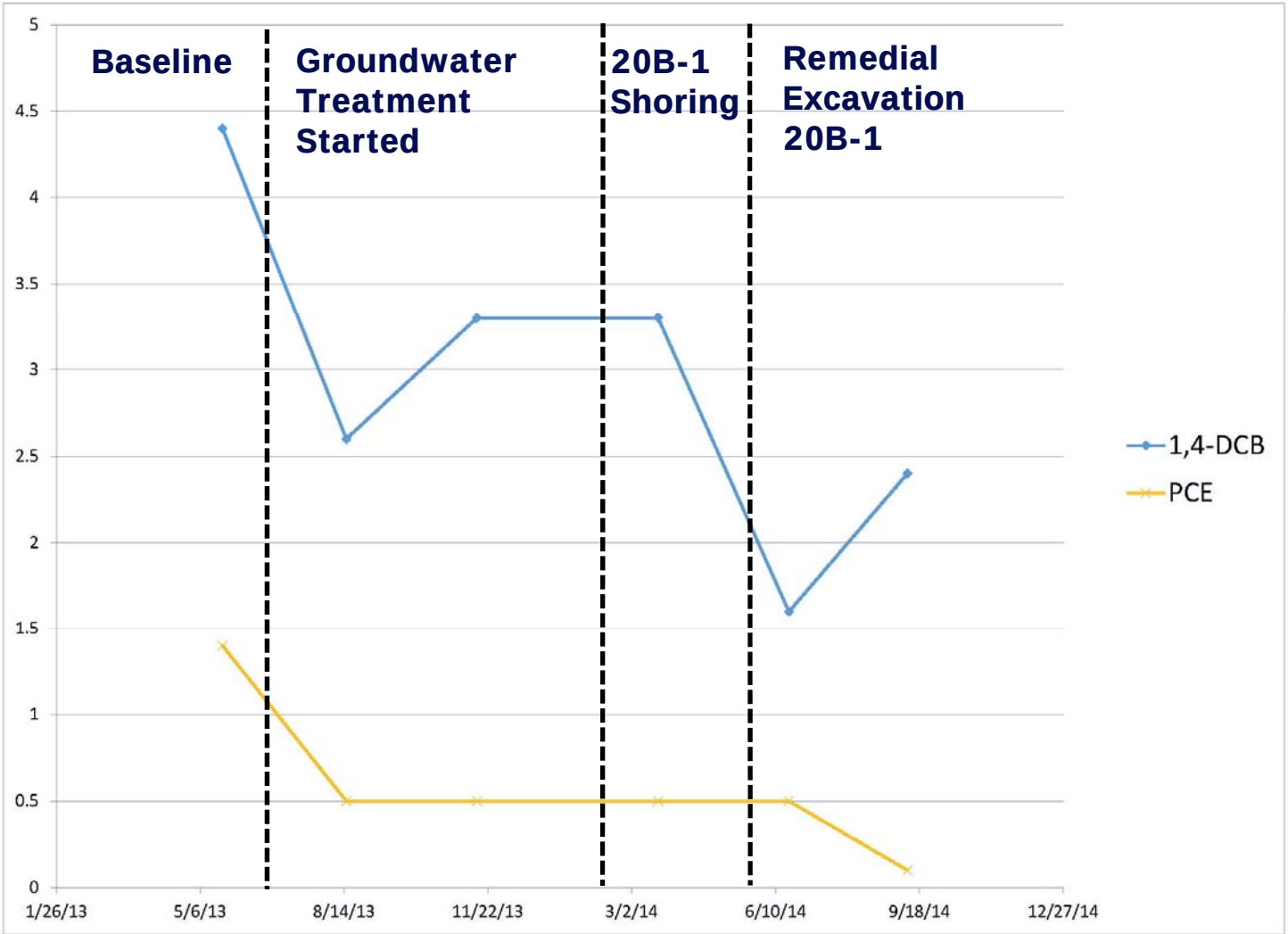
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Chlorobenzene (µg/L) vs. Time in Source Area Well MW910A



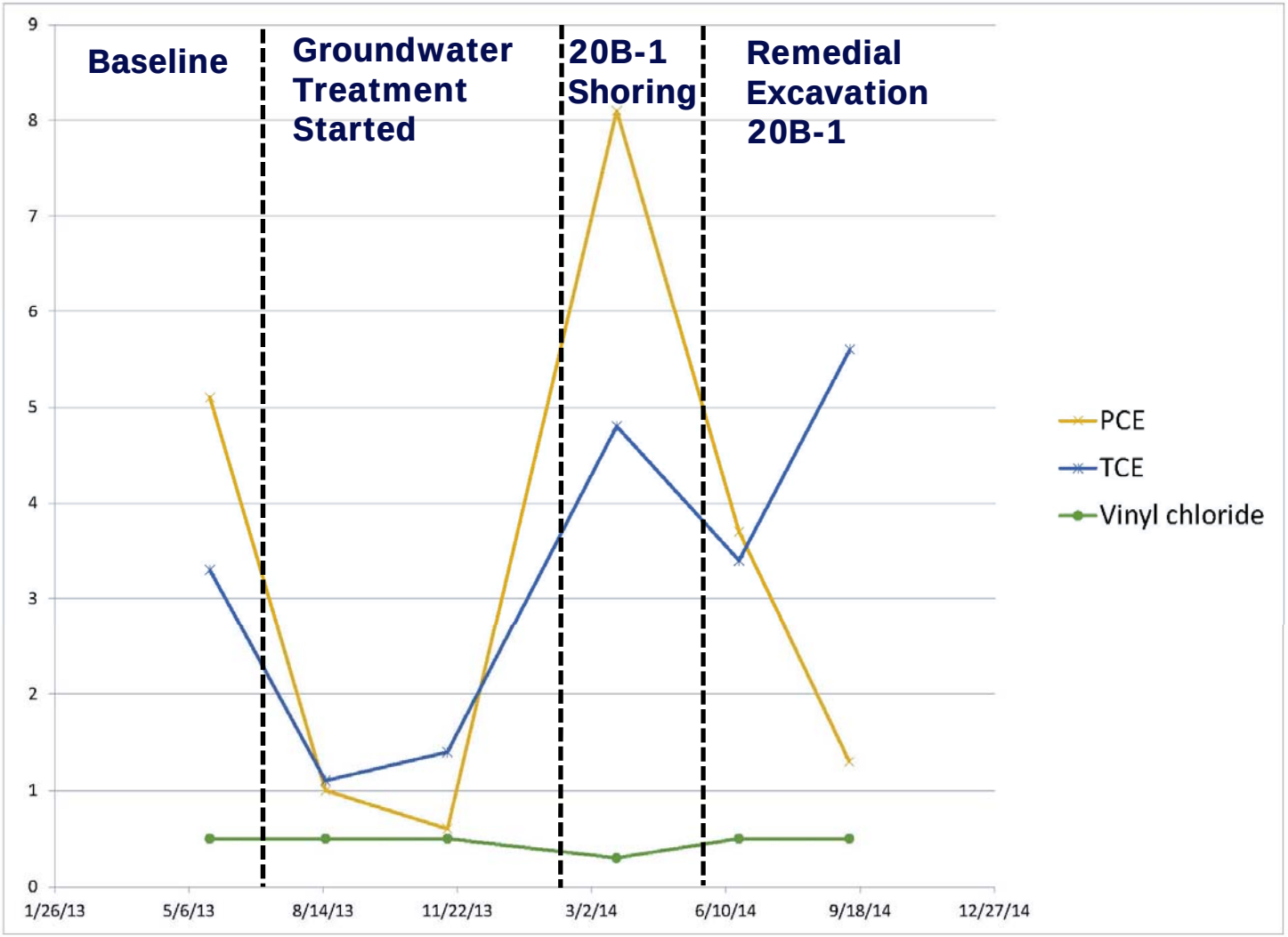
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Concentrations (µg/L) vs. Time in Downgradient Well MW2A



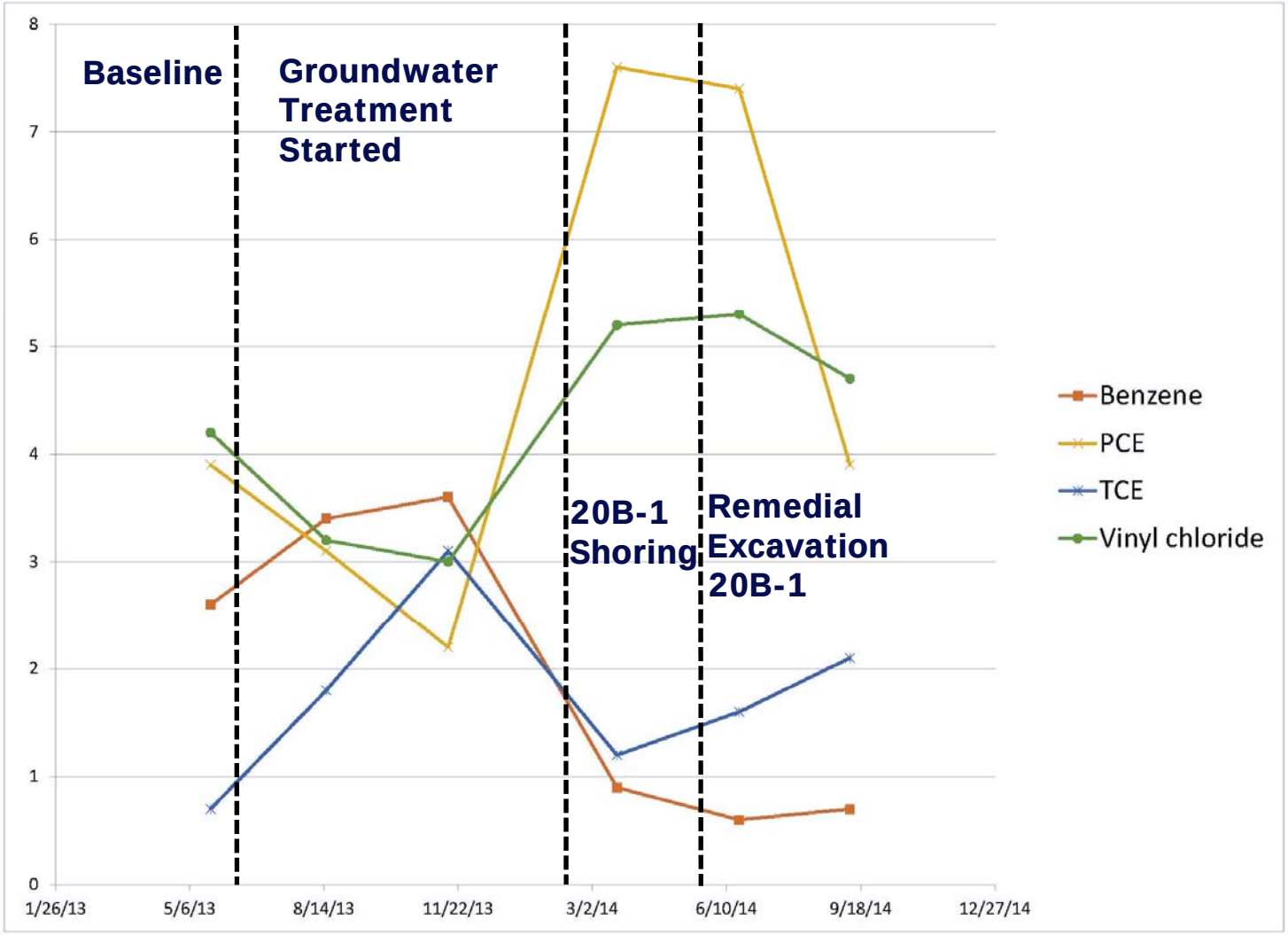
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Concentrations (µg/L) vs. Time in Downgradient Well MW4A



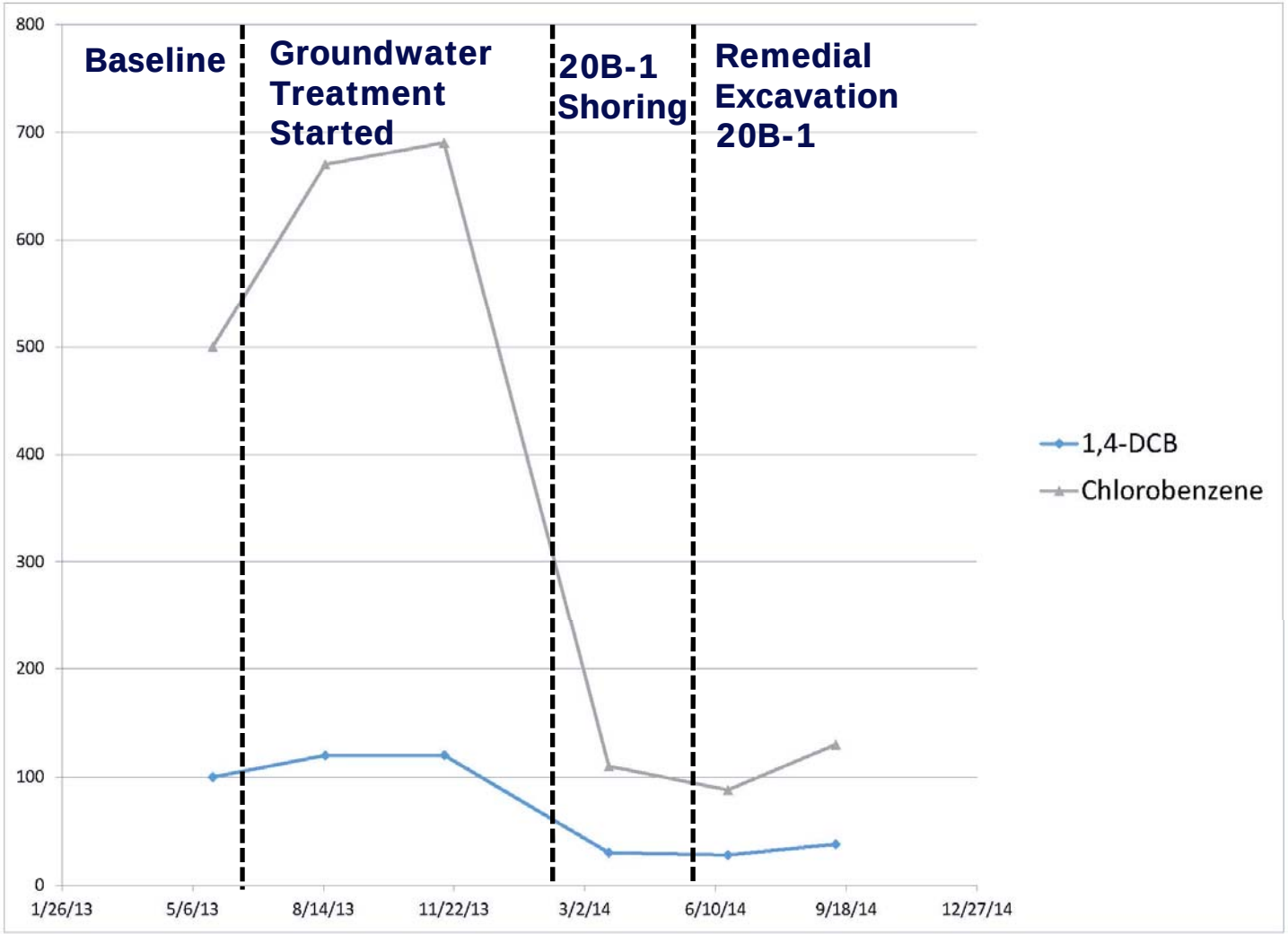
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Concentrations (µg/L) vs. Time in Crossgradient Well MW13A



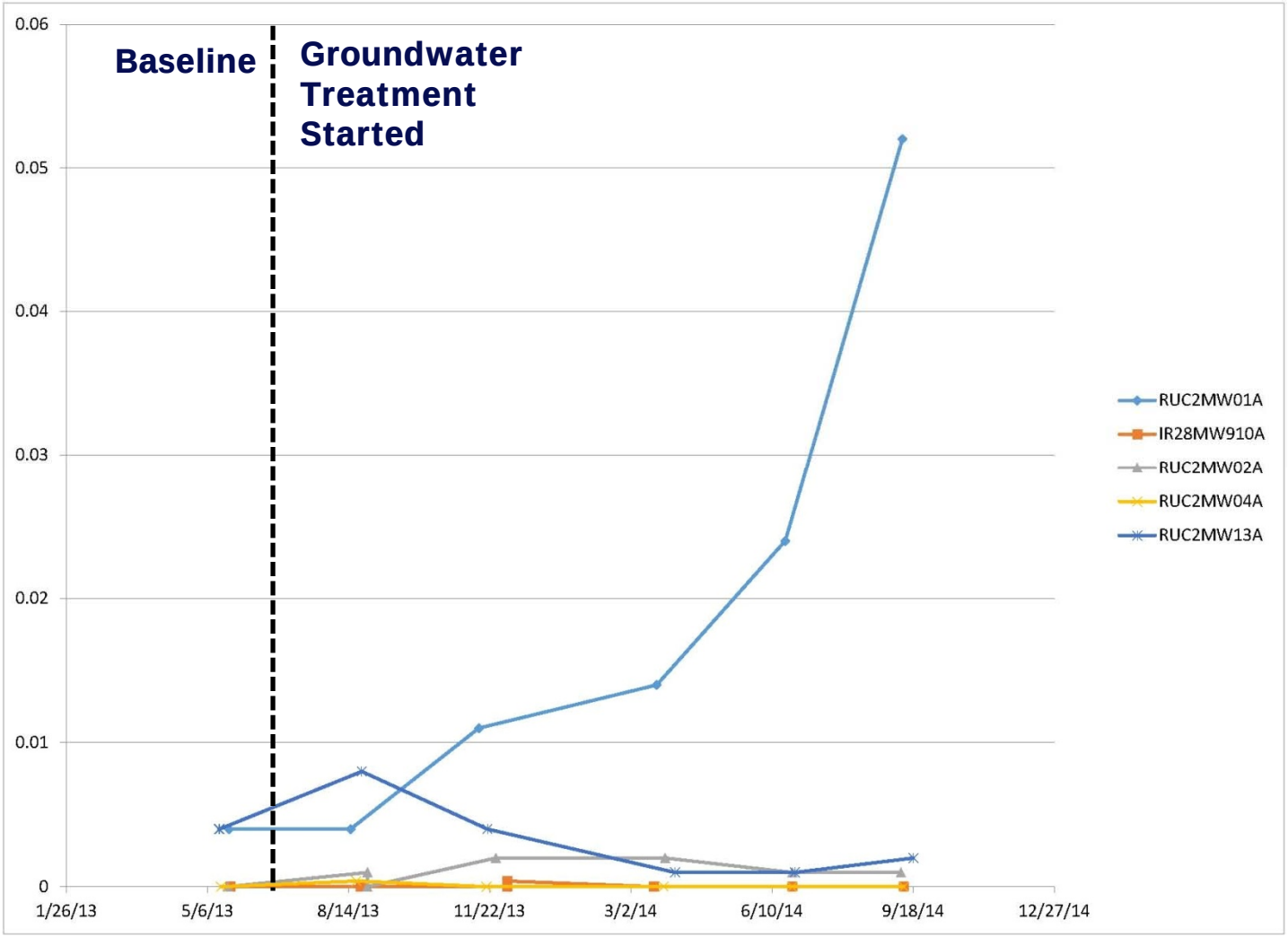
Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Chlorobenzene and 1,4-DCB (µg/L) vs. Time in Crossgradient Well MW13A



Building 251 (C2-1) - Analytical Results Summary – "A" Aquifer

Dissolved Ethane (mg/L) vs. Time



RU-C2 RA Performance Monitoring - Building 251 (C2-1)
"B" Aquifer

VOCs (µg/L)	RG	RUC2MW05B 5/16/13	8/26/13	11/26/13	3/24/14	6/20/14	9/25/2014
Chloroform	0.7	2.3 U	1.3 U	1.1 U	**1.9**	1.3 U	**1.3**
PCE	0.5	**25**	**12**	**17**	**24**	**24**	**21**

VOCs (µg/L)	RG	RUC2MW03B 5/21/13	8/22/13	12/5/13	4/3/14	6/25/14	9/25/2014
PCE	0.5	**5.4**	**6.4**	NS	NS	**3.2**	**3.1**

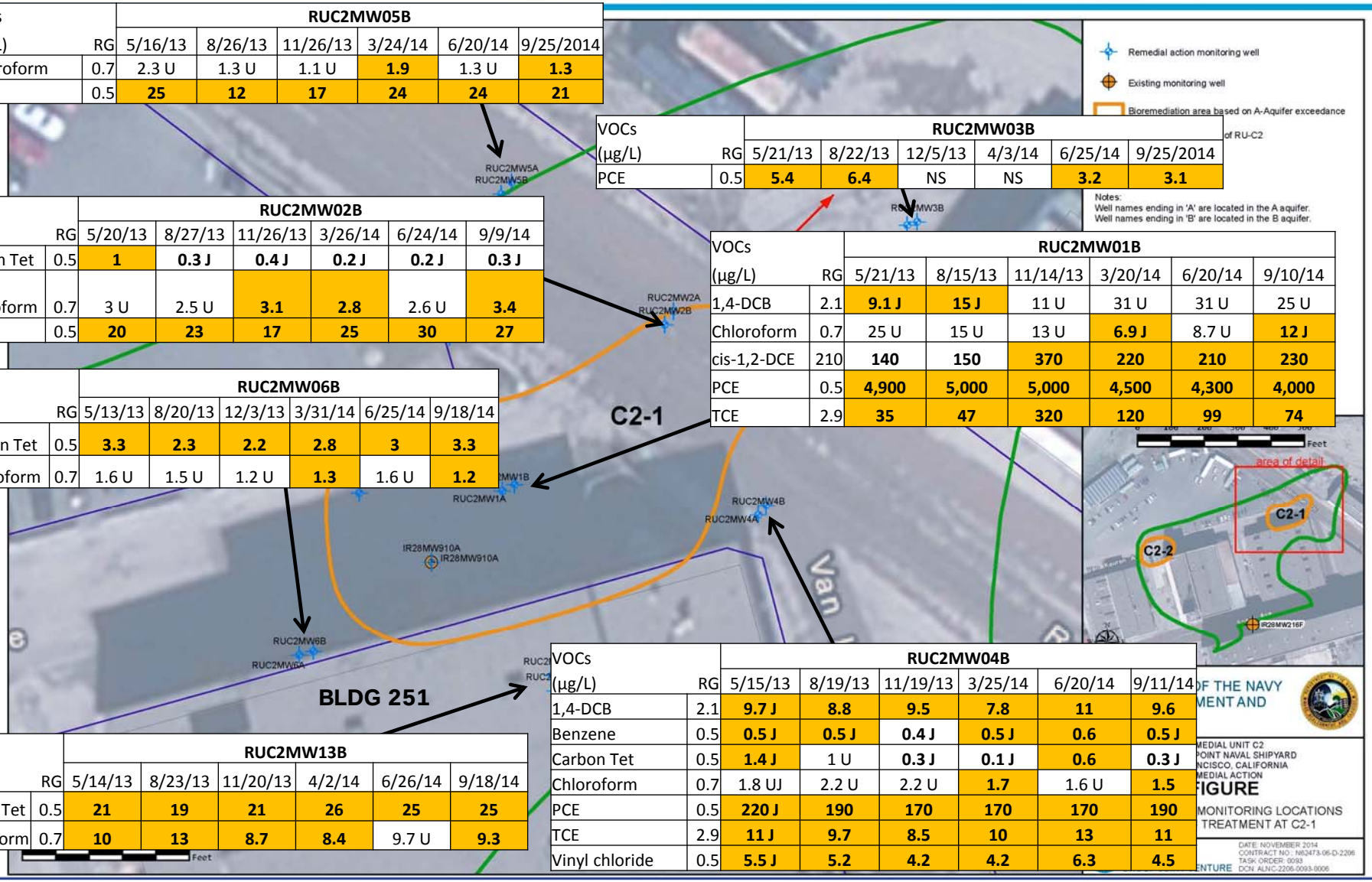
VOCs (µg/L)	RG	RUC2MW02B 5/20/13	8/27/13	11/26/13	3/26/14	6/24/14	9/9/14
Carbon Tet	0.5	**1**	**0.3 J**	**0.4 J**	**0.2 J**	**0.2 J**	**0.3 J**
Chloroform	0.7	3 U	2.5 U	**3.1**	**2.8**	2.6 U	**3.4**
PCE	0.5	**20**	**23**	**17**	**25**	**30**	**27**

VOCs (µg/L)	RG	RUC2MW01B 5/21/13	8/15/13	11/14/13	3/20/14	6/20/14	9/10/14
1,4-DCB	2.1	**9.1 J**	**15 J**	11 U	31 U	31 U	25 U
Chloroform	0.7	25 U	15 U	13 U	**6.9 J**	8.7 U	**12 J**
cis-1,2-DCE	210	**140**	**150**	**370**	**220**	**210**	**230**
PCE	0.5	**4,900**	**5,000**	**5,000**	**4,500**	**4,300**	**4,000**
TCE	2.9	**35**	**47**	**320**	**120**	**99**	**74**

VOCs (µg/L)	RG	RUC2MW06B 5/13/13	8/20/13	12/3/13	3/31/14	6/25/14	9/18/14
Carbon Tet	0.5	**3.3**	**2.3**	**2.2**	**2.8**	**3**	**3.3**
Chloroform	0.7	1.6 U	1.5 U	1.2 U	**1.3**	1.6 U	**1.2**

VOCs (µg/L)	RG	RUC2MW04B 5/15/13	8/19/13	11/19/13	3/25/14	6/20/14	9/11/14
1,4-DCB	2.1	**9.7 J**	**8.8**	**9.5**	**7.8**	**11**	**9.6**
Benzene	0.5	**0.5 J**	**0.5 J**	**0.4 J**	**0.5 J**	**0.6**	**0.5 J**
Carbon Tet	0.5	**1.4 J**	1 U	**0.3 J**	**0.1 J**	**0.6**	**0.3 J**
Chloroform	0.7	1.8 UJ	2.2 U	2.2 U	**1.7**	1.6 U	**1.5**
PCE	0.5	**220 J**	**190**	**170**	**170**	**170**	**190**
TCE	2.9	**11 J**	**9.7**	**8.5**	**10**	**13**	**11**
Vinyl chloride	0.5	**5.5 J**	**5.2**	**4.2**	**4.2**	**6.3**	**4.5**

VOCs (µg/L)	RG	RUC2MW13B 5/14/13	8/23/13	11/20/13	4/2/14	6/26/14	9/18/14
Carbon Tet	0.5	**21**	**19**	**21**	**26**	**25**	**25**
Chloroform	0.7	**10**	**13**	**8.7**	**8.4**	9.7 U	**9.3**



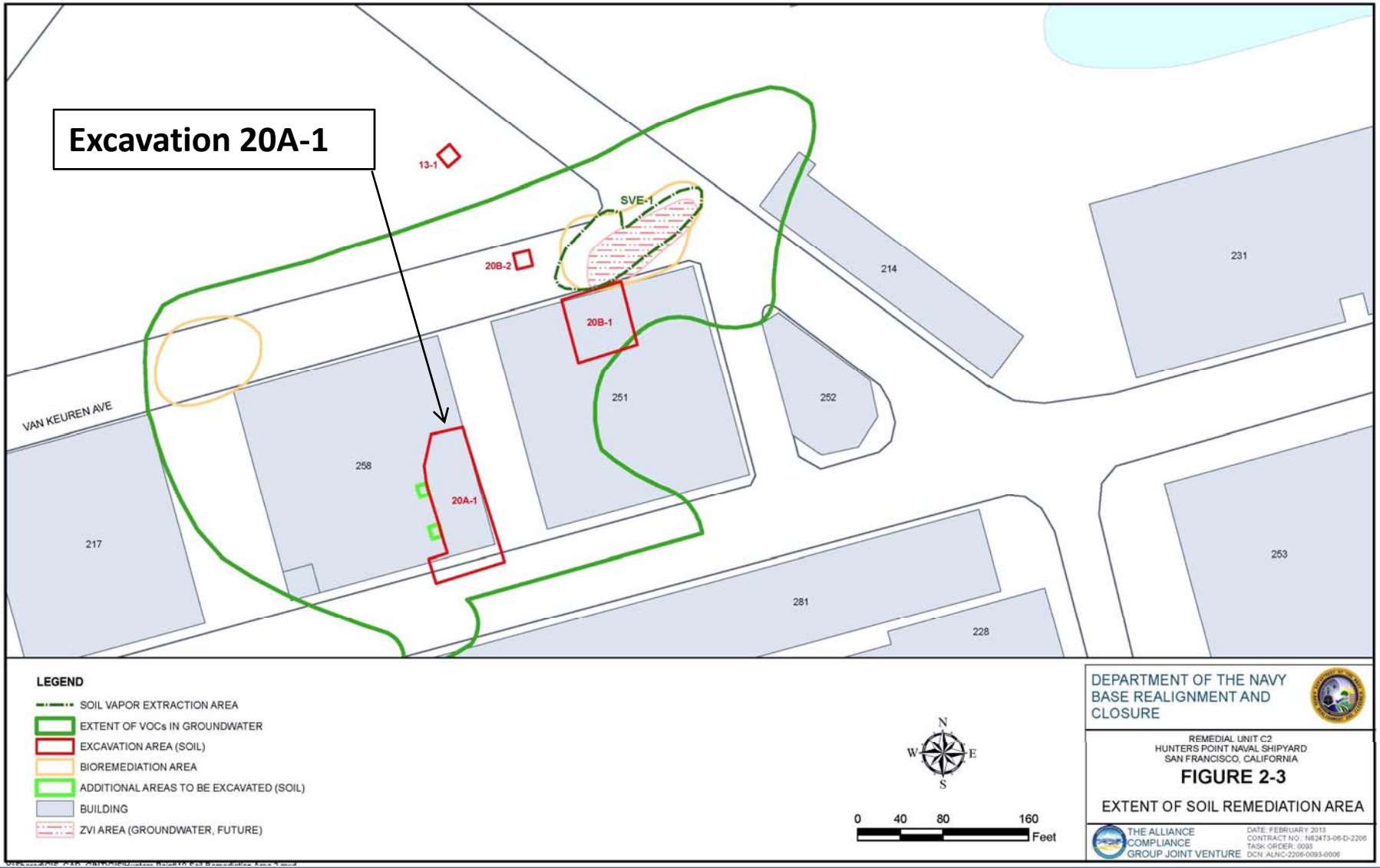
RU-C2 RA Groundwater Recommendations

Based on these findings, it is recommended:

- Building 258 (C2-2) Groundwater Plume
  - Continue groundwater monitoring of plume on north side of building under BGMP to evaluate concentration trends with time and remedial action effectiveness.
  - Navy plans to characterize carbon tetrachloride in the vicinity of well IR28MW190F on the south side of Building 258 and potentially treat this area.

- Building 251 (C2-1) Groundwater Plume
  - Continue groundwater monitoring to:
    - Confirm degradation of PCE and daughter products to below RGs.
    - Confirm increases of 1,2-DCB and chlorobenzene are transitory.
    - Assess need for additional limited “A” Aquifer injections.
  - Conduct additional characterization of “B” Aquifer PCE hotspot discovered at MW1B and inject ZVI into area with the highest concentrations.

Backfill and Shoring Removal at Excavation 20A-1



Backfill and Shoring Removal at Excavation 20A-1

- Backfill, Compaction, and Dust Suppression Activities.
- Completed September 19th - 23rd, 2014

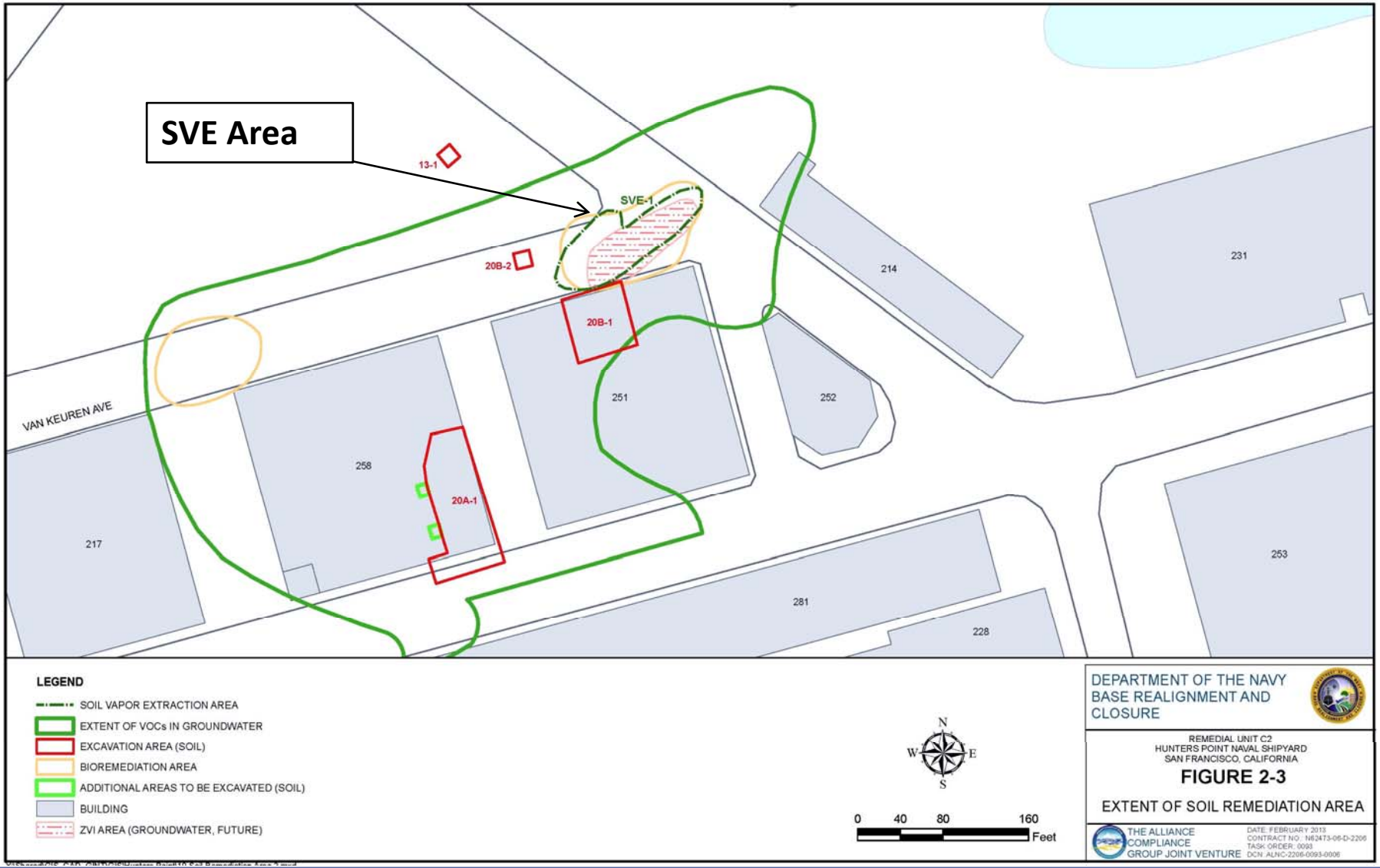
Backfill and Shoring Removal at Excavation 20A-1

- Backfill Compaction

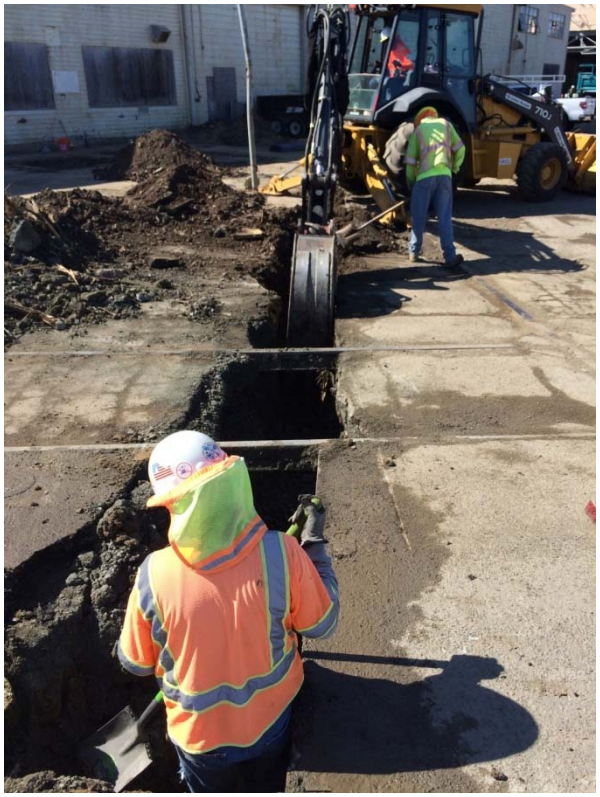
Backfill and Shoring Removal at Excavation 20A-1

- Shoring Removal Activities
- Completed October 20th to November 3rd, 2014

SVE Infrastructure Installation at RU-C2

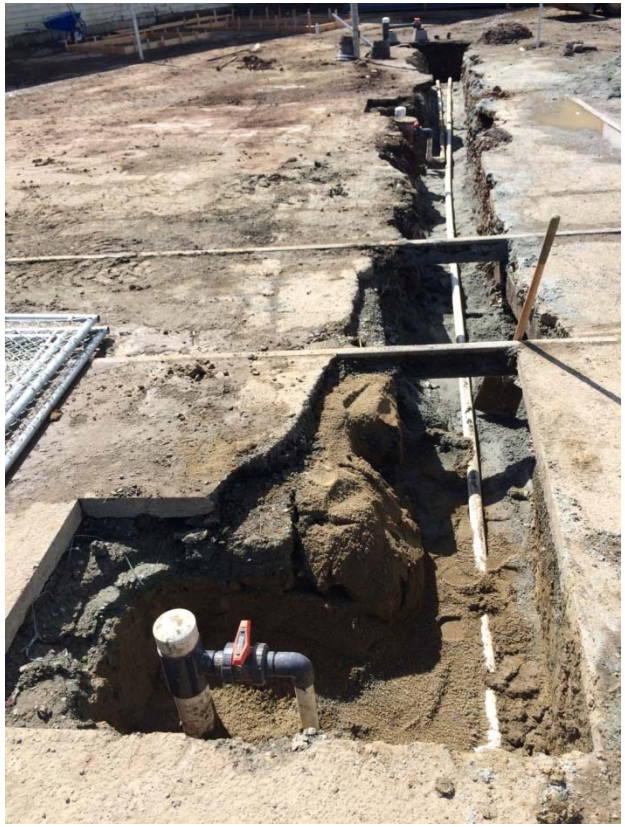


SVE Infrastructure Installation at RU-C2



Trenching in Roadway Intersection

Below-grade conveyance piping



- SVE Infrastructure Installation Activities
- Completed September 22nd - 26th and October 9th - 10th, 2014.

SVE Infrastructure Installation at RU-C2

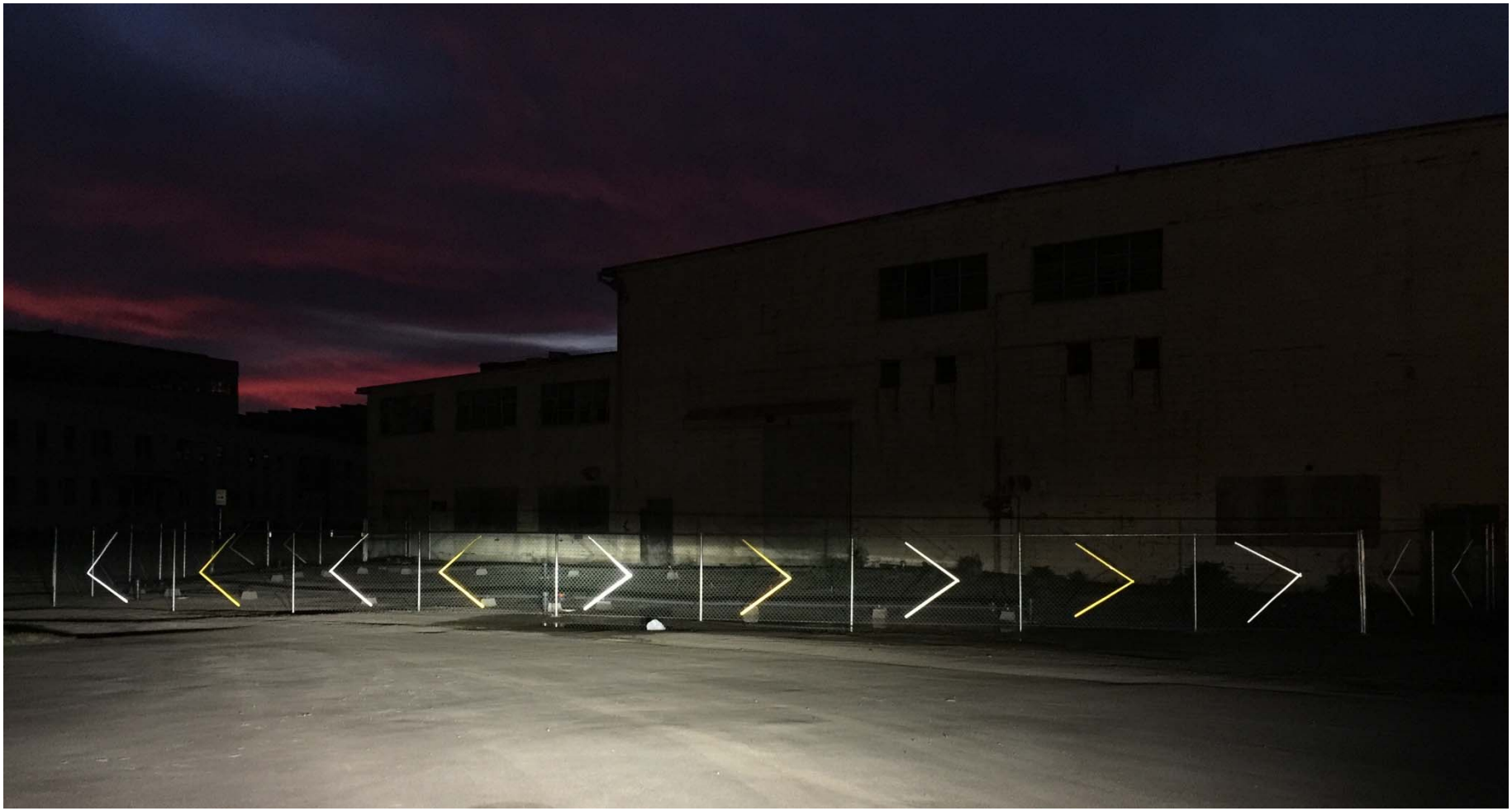
- Pouring Concrete Pads and Sealing Trench

SVE Infrastructure Installation at RU-C2

- Surface conveyance piping and compound fencing.

SVE Infrastructure Installation at RU-C2

- Safety reflectors on compound fencing.



RU-C2 -Schedule

Schedule

- **Excavations/Shoring –**
  - Shoring at Building 251 — Completed Feb 2014
  - Demolition of Canopy and Concrete at Building 258 — Completed Feb 2014
  - Install Shoring at Building 258 — Completed Mar 2014
  - Excavations 13-1 and 20B-2 — Completed May 2014
  - Excavation at Building 251 — Completed May 2014
  - Excavation at Building 258 — Completed May 2014
  - Backfill and shoring Removal — Completed Nov 2014

- **Groundwater Sampling** (1, 3, 6, 9, and 12 month post injection events)

  Aug 2013 (1-month)
  Nov 2013(3-month)
  Mar 2014 (6-month)
  June 2014 (9-month)
  Sep 2014 (12-month)

- **Installation of SVE system infrastructure** — Completed Oct 2014

QUESTIONS?