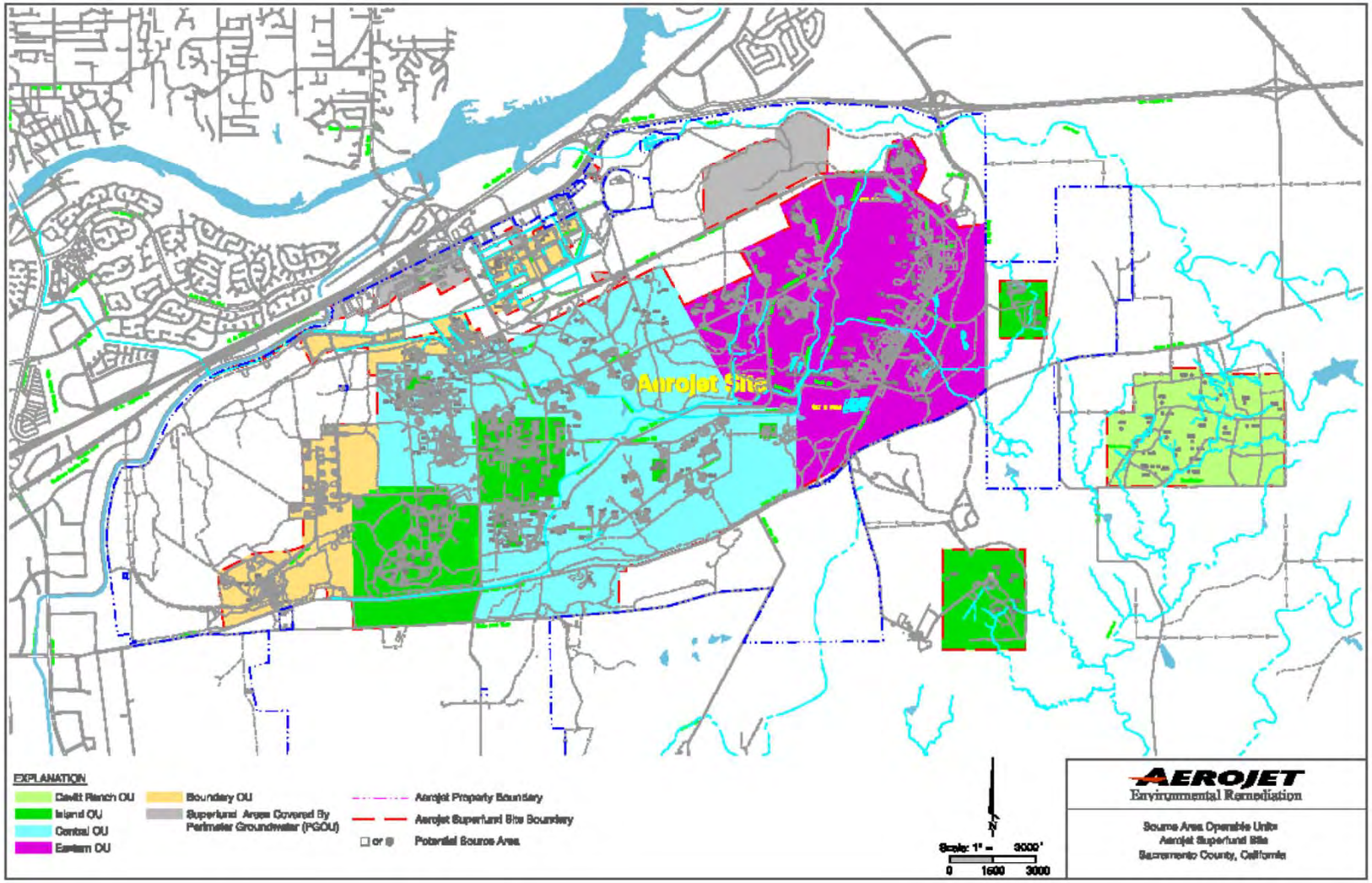
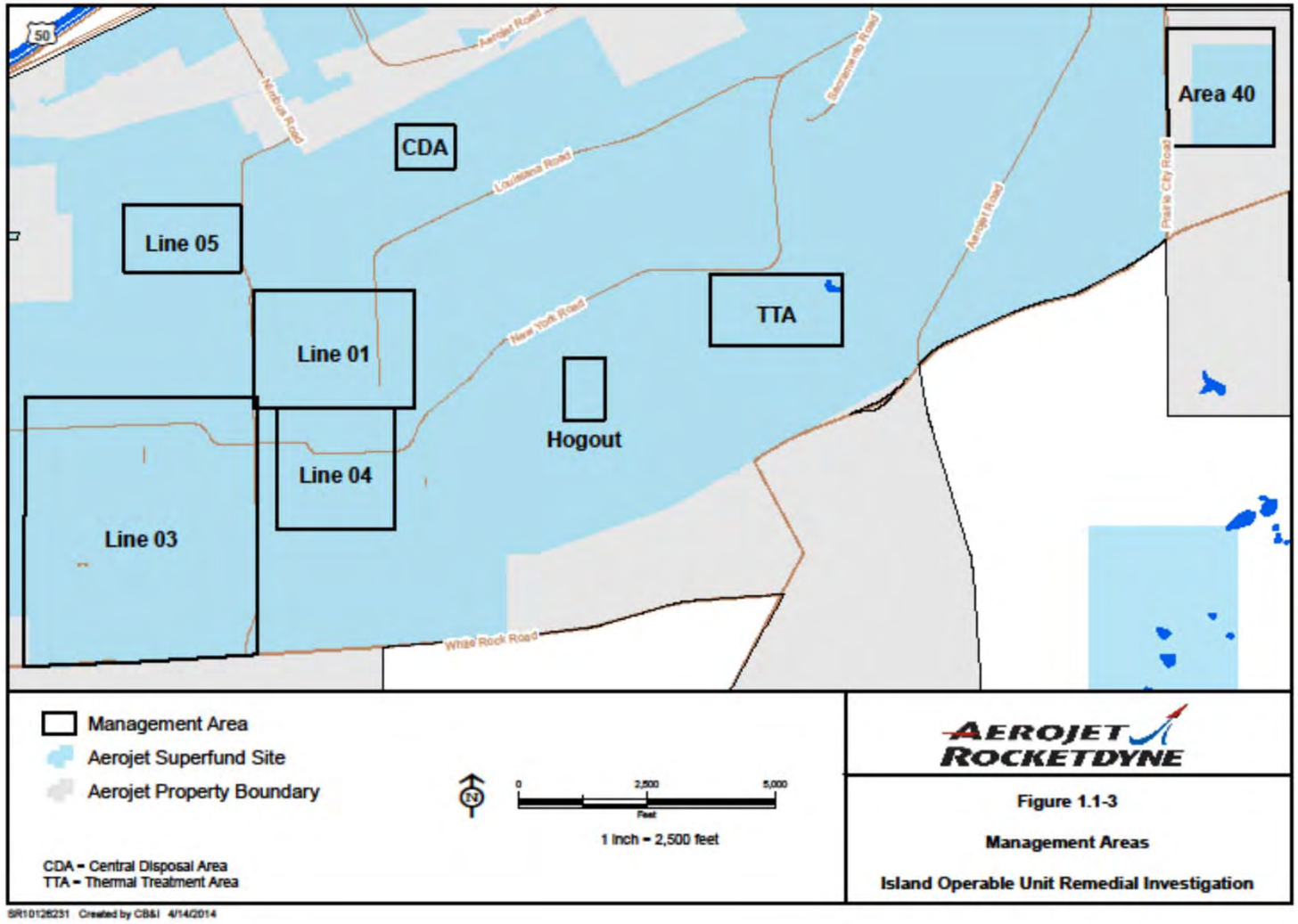
Island Operable Unit (OU-7) Remedial Investigation Area 40

Chris Fennessy, P.E.
Aerojet Rocketdyne
July 16, 2014

Operable Units



OU-7 Management Areas



History of OU-7

- Source Areas Identified in Partial Consent Decree
- Initial investigation conducted in mid-1980s to early-1990s – Stage 1 Remedial Investigation Report
- Program Plan Modification Report – 2004
  - Island OU – This OU contains potential source areas (73 areas) that have very high concentrations of VOCs in either groundwater or soil vapor and/or very high concentrations of perchlorate in soil.
- Priority Evaluation, Central OU Source Areas – 2006
  - Evaluated all Central OU source areas to determine if any contained concentrations of TCE or perchlorate that would warrant early evaluation in IOU. Nine source areas transferred to IOU.
- Sampling and Analysis Plan – 2007
- Remedial Investigation field work – 2007 and 2008
- Area 39 transferred to IOU following completion of BOU RI and RA

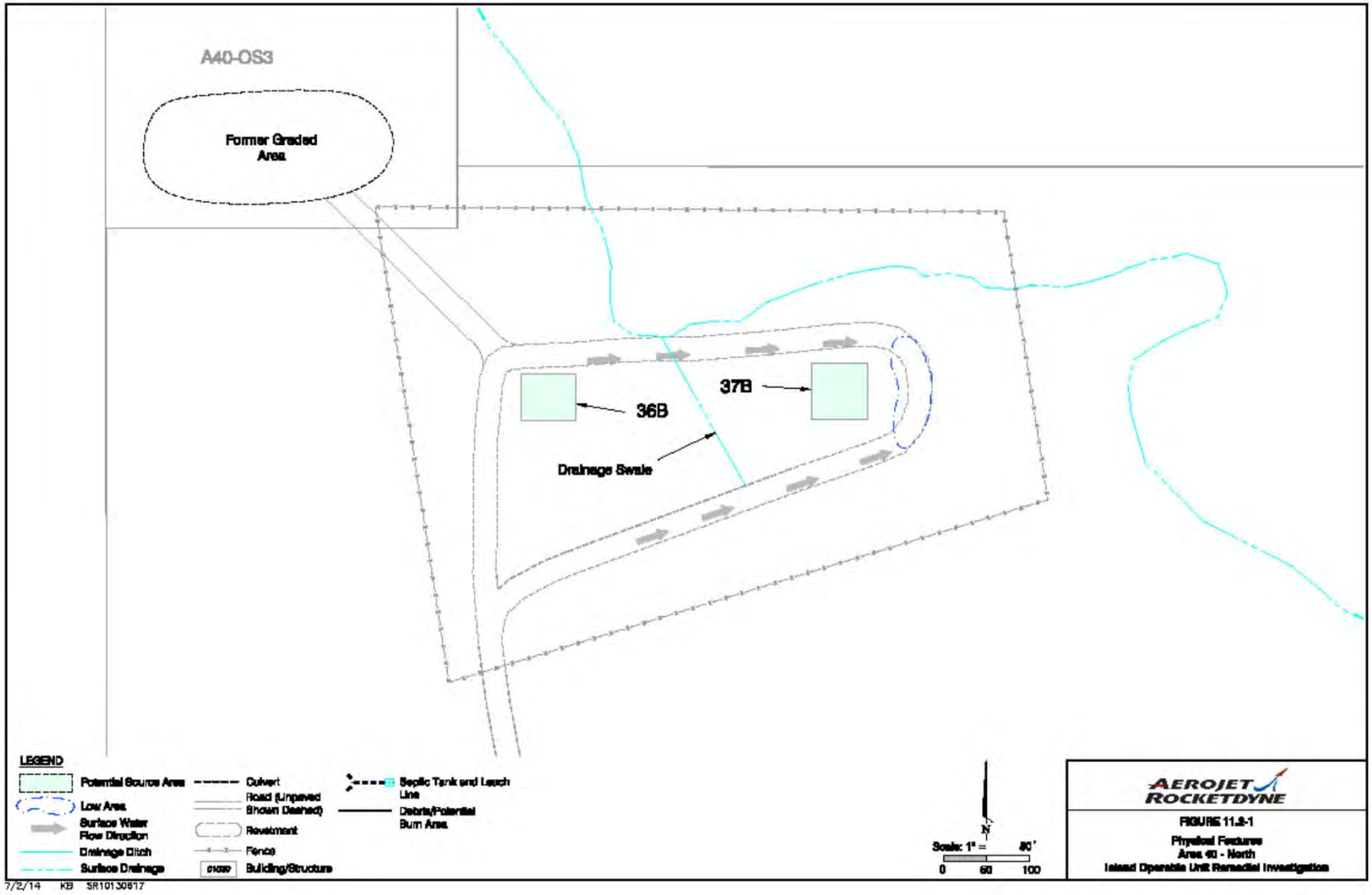
OU-7 Field Sampling Plan

- Preparation
  - Historical Data Review
  - Aerial Photograph Research
  - Risk Management Decision Boundaries (RMDB)
  - Screening level determination
- Identified Goals
  - Nature and Extent of chemicals in soil, soil vapor, groundwater, surface water and sediment
  - Extent of RMDB
  - Evaluate releases and, if necessary, extent of chemicals in open space areas

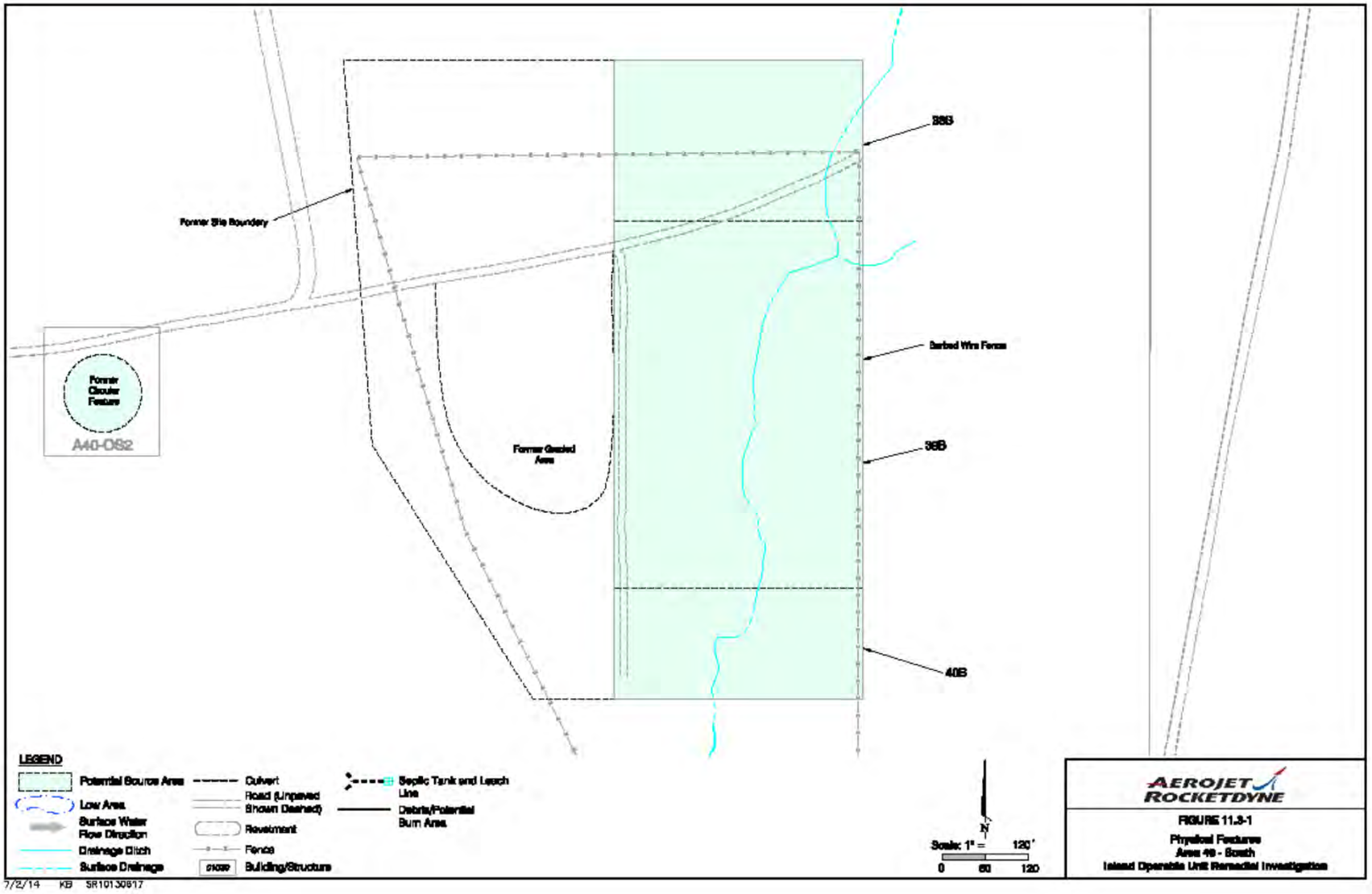
Area 40 FSP

- Area 40
  - Unconfined groundwater within 15 feet of surface
  - Bedrock outcrops and dips to the west. Encountered about 30 feet bgs at Prairie City Road
  - 36B and 37B – former 50 foot square, 4-5 foot deep gunite lined solvent separation sumps.
  - 38B, 39B, and 40B – former lab waste and waste propellant burn areas
  - Three features were identified during aerial photography review and added as Open Space areas

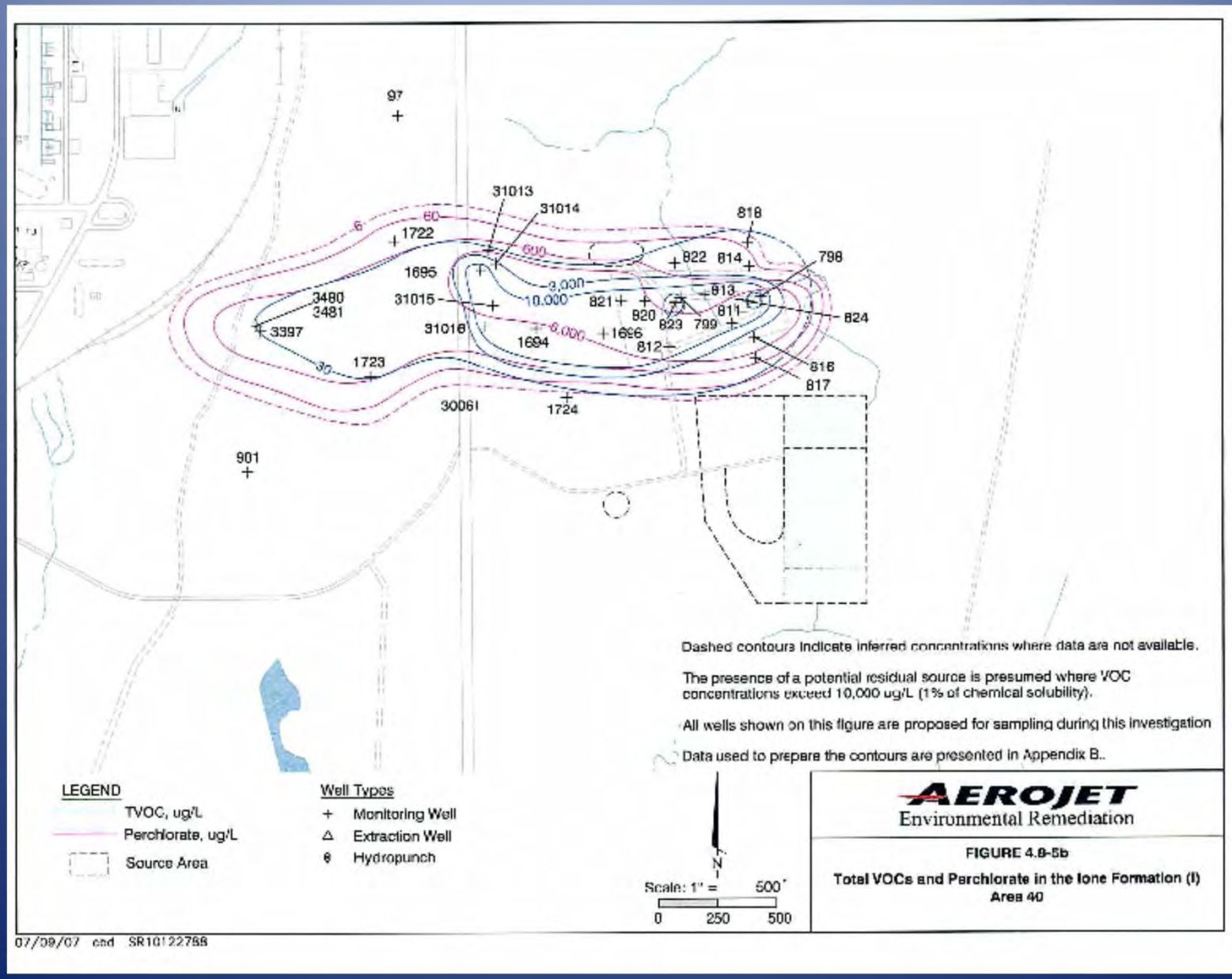
Area 40 Source Areas



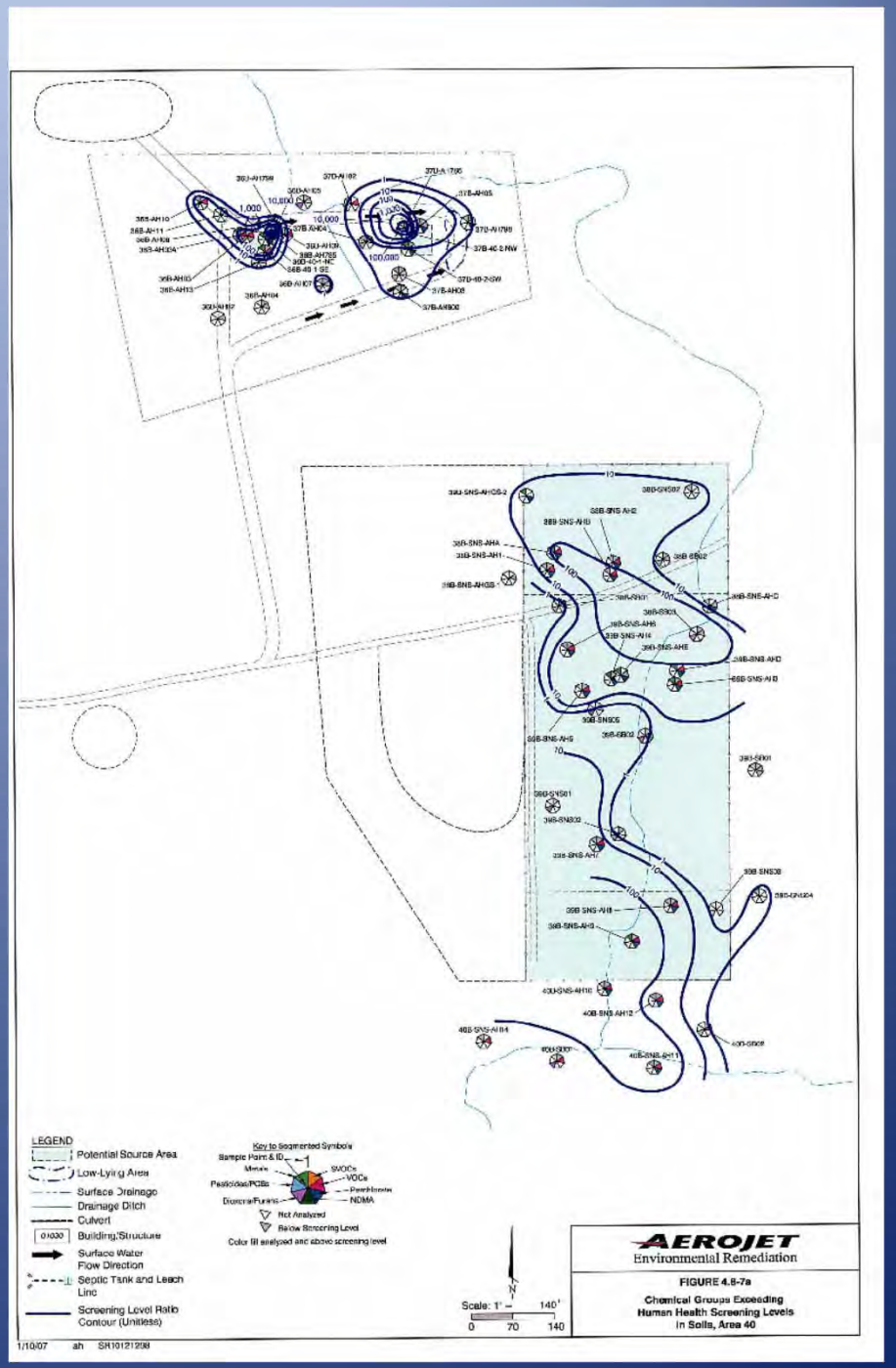
Area 40 Source Areas



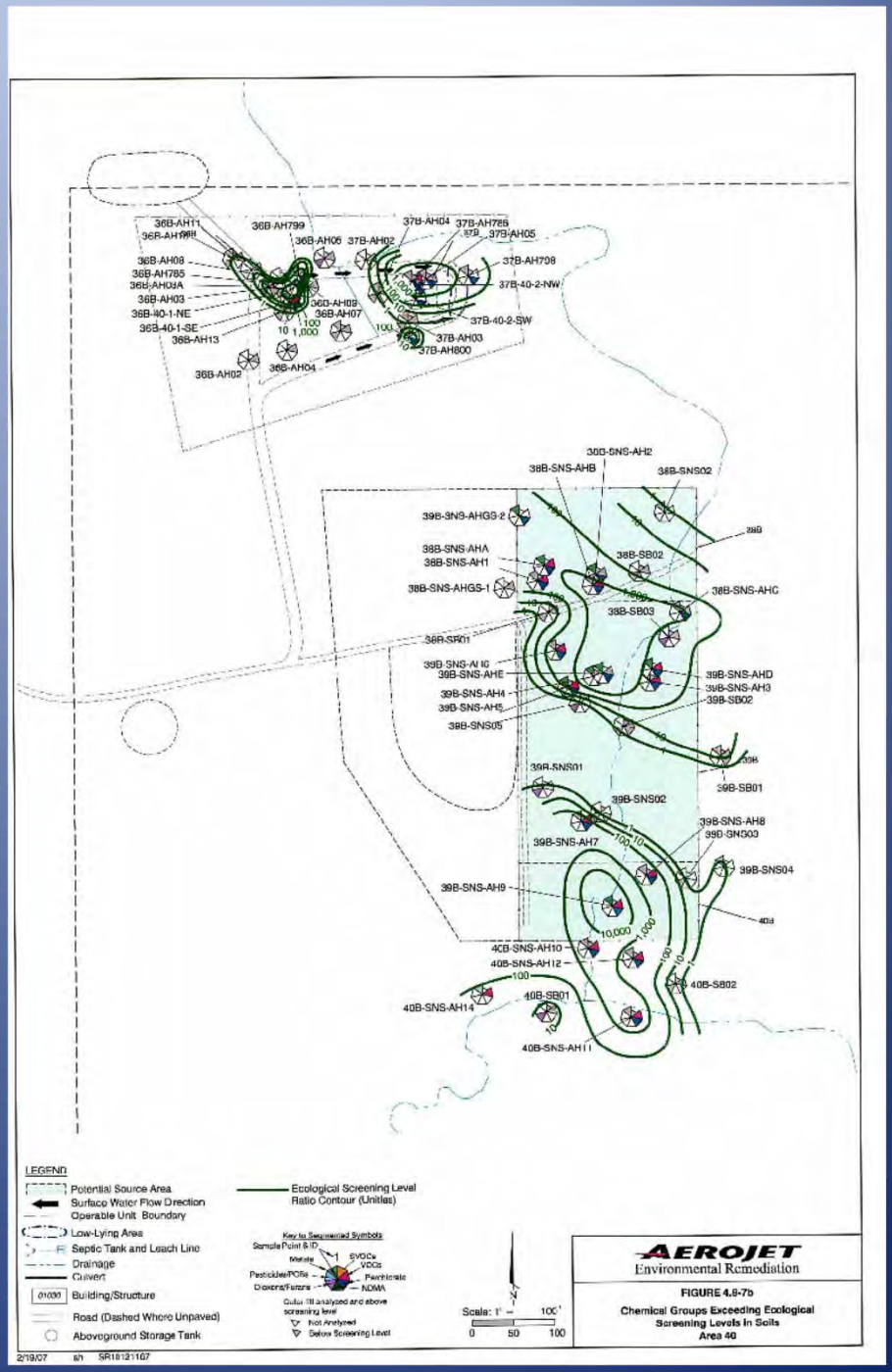
Pre-2000 Groundwater Data



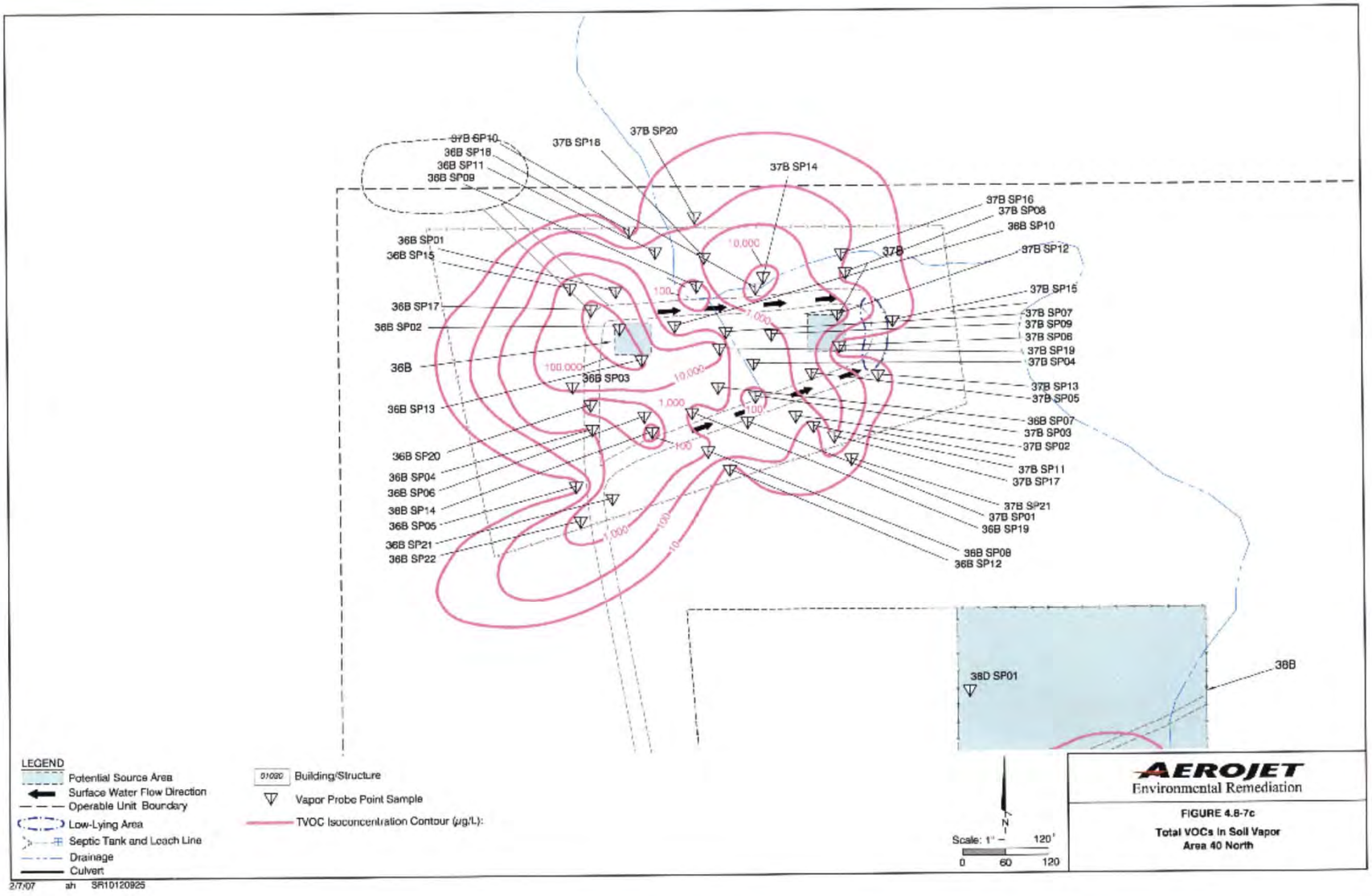
Pre-2000 Human Health Data Evaluation



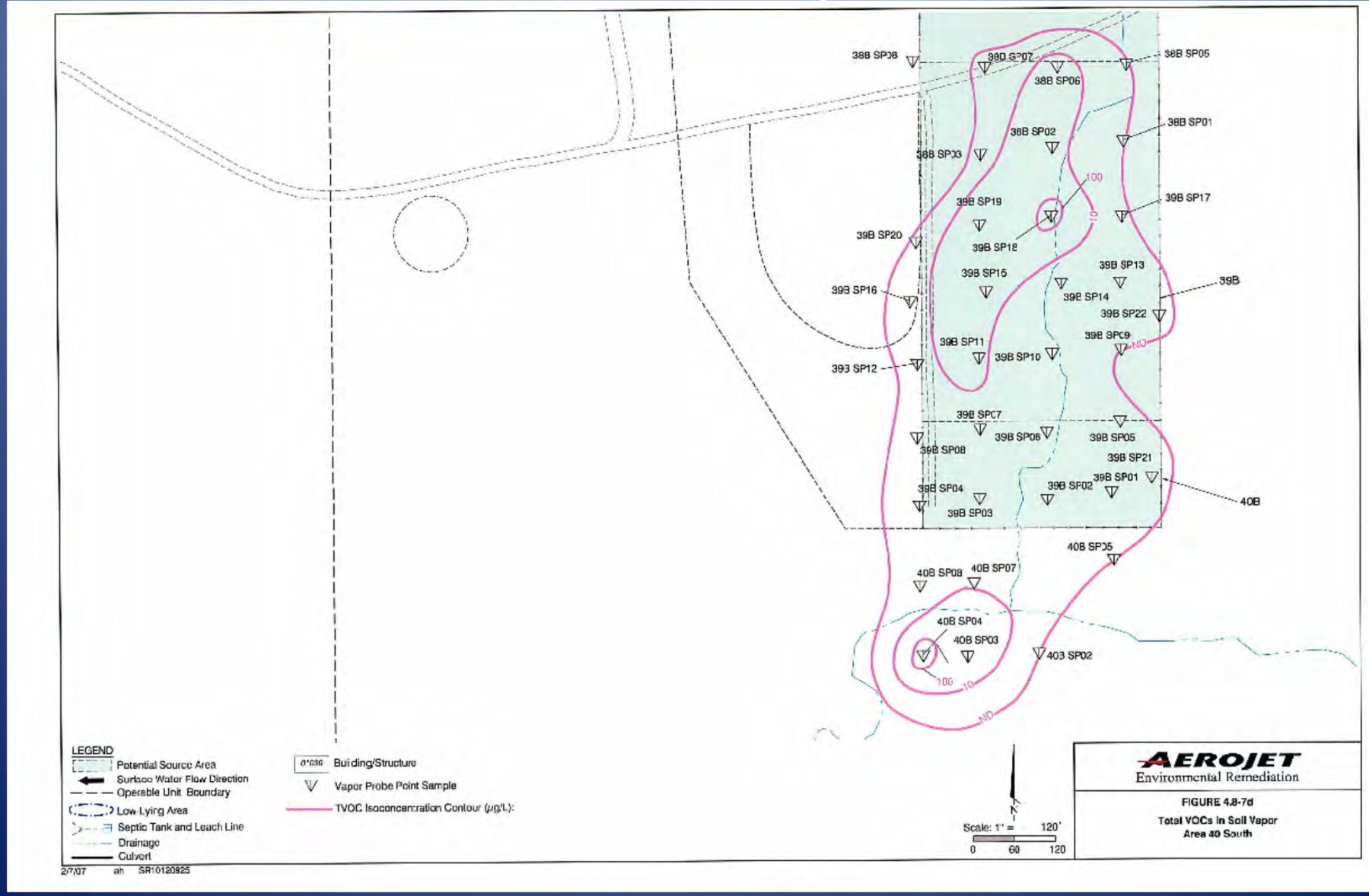
Pre-2000 Ecological Data Evaluation



Pre-2000 Soil Vapor Data



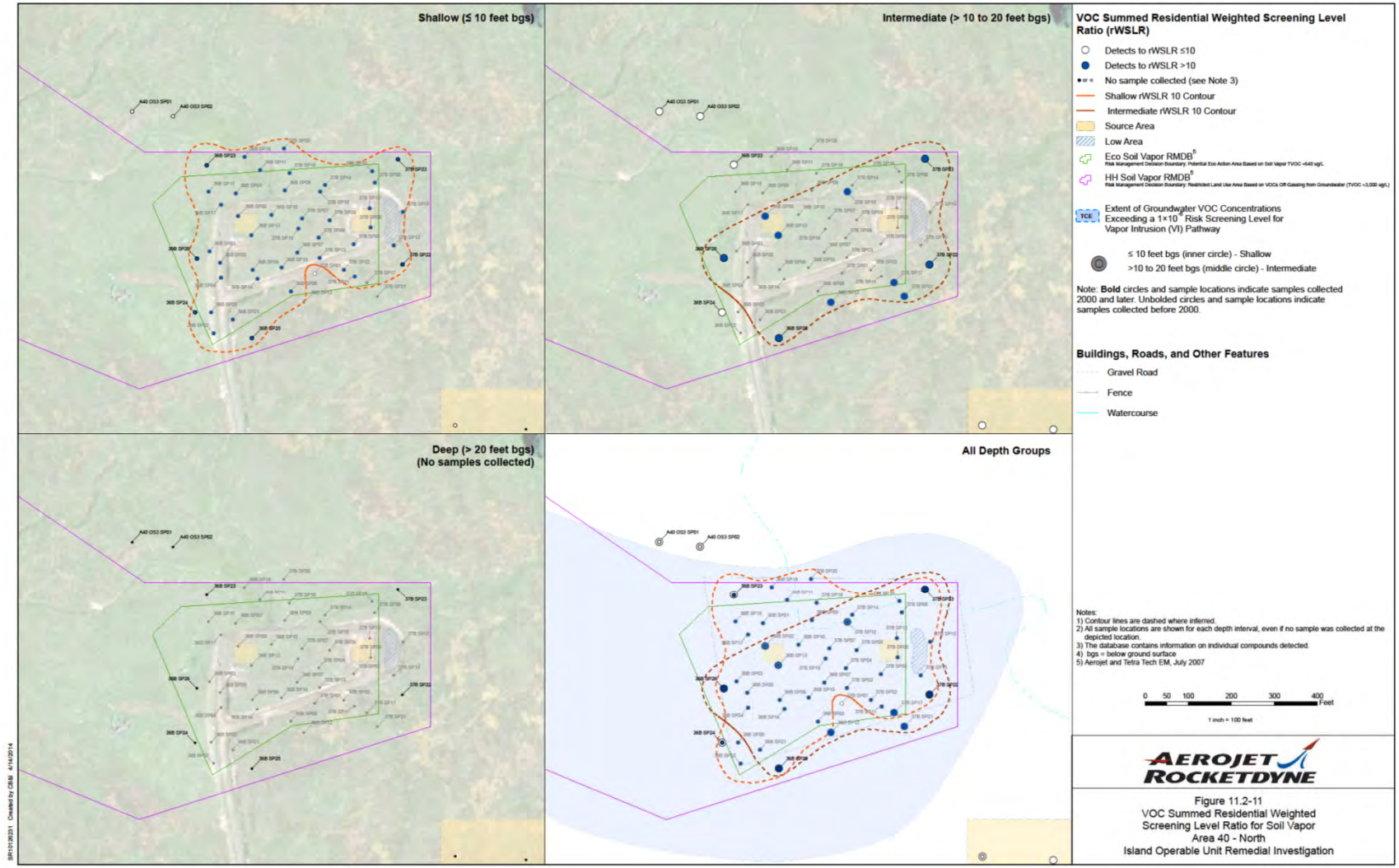
Pre-2000 Soil Vapor Data



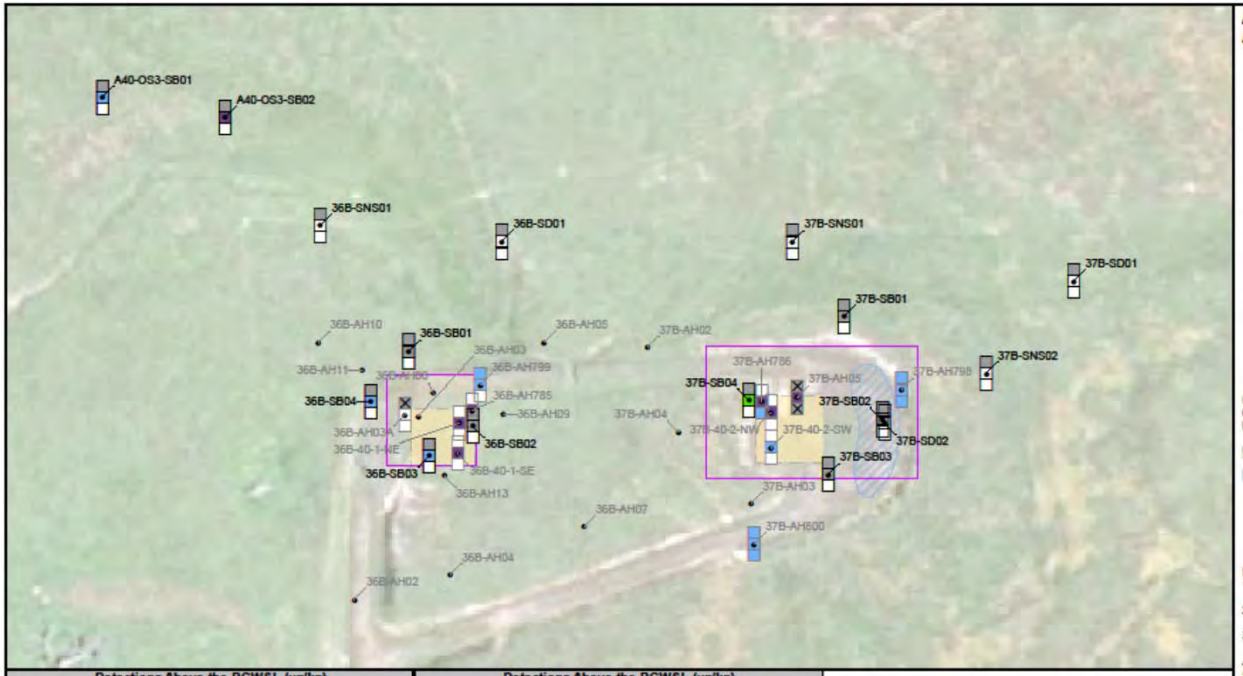
Area 40 RMDB

2B
3B
7B
37B
36B
38B
39B
40B
LEGEND
Area Indicative of Residual Continuing Source of VOCs to Groundwater
Likely Release Area
Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10^-4 and/or Ecological HI >100)
Potential Ecological Action Area Based on Soil Vapor TVOC >640 ug/L
Restricted Land Use Area Based on VOCs Off-Gassing from Groundwater (TVOC>3,000 ug/L)
Source Area
Scale: 1" = 400'
0 200 400
AEROJET
Environmental Remediation
FIGURE 3-3f
Risk Management Decision Boundaries for
Area 40
Island Operable Unit
12/12/08 ah SR10121279

Area 40 RI VOC Results



Perchlorate vs PGW SLs



Detections Above the PGWSL (µg/kg)					Detections Above the PGWSL (µg/kg)				
Sample Location	Sample Depth	Sample Date	Compound	Concentration	Sample Location	Sample Depth	Sample Date	Compound	Concentration
36B-40-1-NE	4	1/1/1985	Perchlorate	1.30E+04	37B-AH05	10	8/14/1991	Perchlorate	2.30E+04
36B-40-1-NE	5.5	1/1/1985	Perchlorate	3.00E+04	37B-AH786	10.5	1/4/1985	Perchlorate	3.00E+03
36B-40-1-SE	4	1/1/1985	Perchlorate	6.10E+03	37B-AH786	6.5	1/4/1985	Perchlorate	9.20E+03
36B-AH785	6.5	1/3/1985	Perchlorate	3.00E+03	37B-AH786	7.5	1/4/1985	Perchlorate	9.50E+03
36B-AH785	5	1/3/1985	Perchlorate	9.40E+03	37B-AH786	15	1/4/1985	Perchlorate	3.10E+03
36B-AH785	9.5	1/3/1985	Perchlorate	2.00E+03	37B-AH786	18	1/4/1985	Perchlorate	5.00E+03
36B-AH785	21.5	1/3/1985	Perchlorate	2.00E+03	37B-AH798	0	1/4/1985	Perchlorate	4.10E+03
36B-AH785	17	1/3/1985	Perchlorate	5.10E+03	37B-AH798	9	1/4/1985	Perchlorate	3.00E+03
36B-AH785	14	1/3/1985	Perchlorate	4.10E+03	37B-AH798	3	1/4/1985	Perchlorate	4.10E+03
36B-AH799	0	2/14/1985	Perchlorate	3.00E+03	37B-AH798	17	1/4/1985	Perchlorate	3.00E+03
36B-AH799	10.5	2/14/1985	Perchlorate	3.00E+03	37B-AH800	0	2/14/1985	Perchlorate	1.00E+03
36B-AH799	9	2/14/1985	Perchlorate	2.00E+03	37B-AH800	3	2/14/1985	Perchlorate	2.00E+03
36B-AH799	3	2/14/1985	Perchlorate	5.20E+03	37B-AH800	10.5	2/14/1985	Perchlorate	4.00E+03
36B-SB03	5	4/29/2008	Perchlorate	1.40E+03	37B-AH800	16.5	2/14/1985	Perchlorate	3.10E+03
36B-SB04	5	4/29/2008	Perchlorate	1.00E+03	A40-OS3-SB01	11	5/6/2008	Perchlorate	1.60E+03
37B-40-2-NW	4	1/1/1985	Perchlorate	4.40E+04	A40-OS3-SB02	8.5	5/6/2008	Perchlorate	1.40E+02
37B-40-2-SW	4	1/1/1985	Perchlorate	5.00E+03	A40-OS3-SB02	5	5/6/2008	Perchlorate	6.10E+03

Protection of Groundwater Screening Level (PGWSL) - Soil

- Not Analyzed
- Not Detected
- ≤ PGWSL
- > PGWSL and ≤ 10x PGWSL
- > 10x PGWSL and ≤ 100x PGWSL
- > 100x PGWSL
- Sample Location
  - 0 to 2 feet bgs - Shallow
  - > 2 to 12 feet bgs - Intermediate
  - > 12 to 25 feet bgs - Deep
- Not Detected, PQL > PGWSL

Perchlorate PGWSL (6.00E+01 µg/kg)

Note: **Bold** squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

- Source Area
- Low Area
- HH/Eco Soil RMDB[7]
  Risk Management Decision Boundary Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10 and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at any depth interval.
4) PQL = practical quantitation limit
5) bgs = below ground surface
6) Table includes only the sample results that exceeded the screening level
7) Aerojet and Tetra Tech EM, July 2007

0 80 160 Feet

1 inch = 80 feet

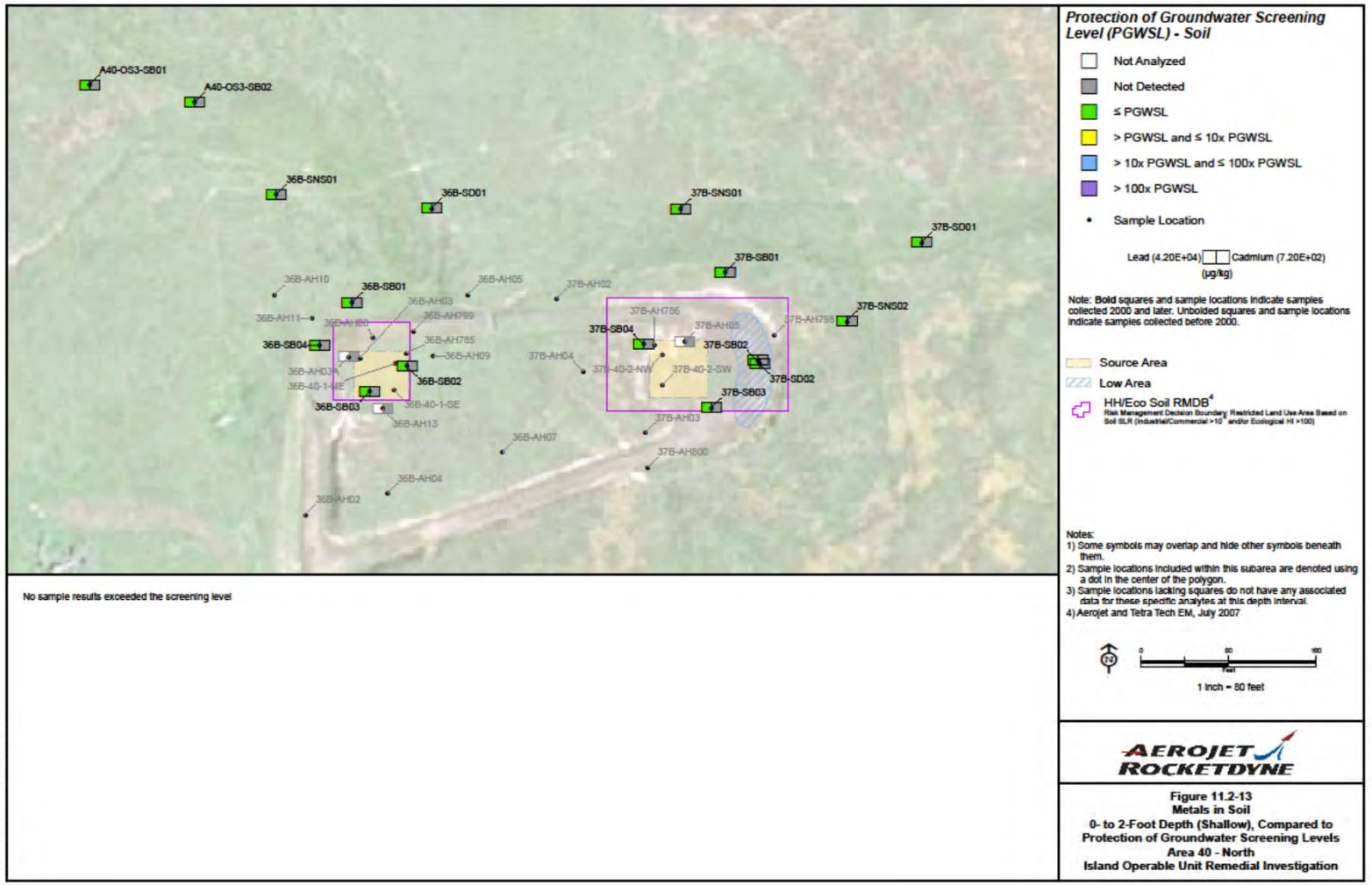
AEROJET ROCKETDYNE

Figure 11.2-12

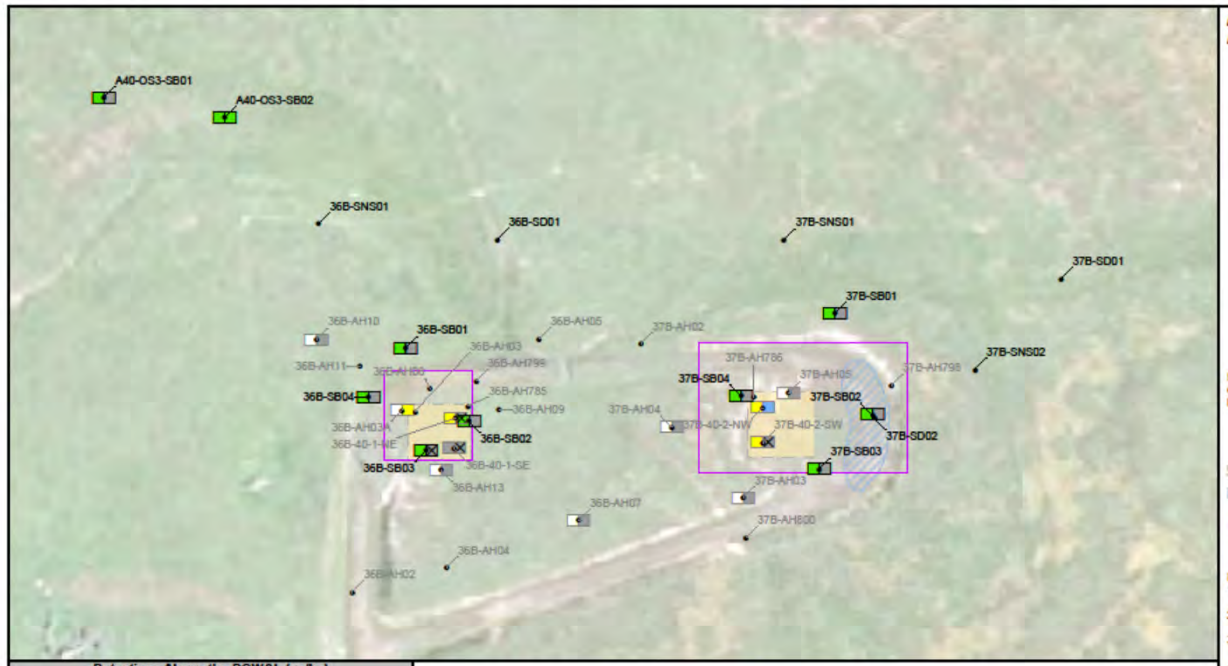
Perchlorate in Soil Compared to Protection of Groundwater Screening Level Area 40 - North Island Operable Unit Remedial Investigation

SR1012621 Created by Shaw CSM 4/14/2014

Metals vs PGW SLs



Metals vs PGW SLs



Detections Above the PGWSL (µg/kg)				
Sample Location	Sample Depth	Sample Date	Compound	Concentration
36B-40-1-NE	4	1/1/1985	Lead	6.10E+04
36B-AH03A	3	8/13/1991	Cadmium	1.00E+03
37B-40-2-NW	4	1/1/1985	Cadmium	8.10E+03
37B-40-2-NW	4	1/1/1985	Lead	1.70E+05
37B-40-2-SW	4	1/1/1985	Lead	7.10E+04

Protection of Groundwater Screening Level (PGWSL) - Soil

- Not Analyzed
- Not Detected
- ≤ PGWSL
- > PGWSL and ≤ 10x PGWSL
- > 10x PGWSL and ≤ 100x PGWSL
- > 100x PGWSL
- Sample Location

Lead (4.20E+04) Cadmium (7.20E+02) (µg/kg)

Not Detected, PQL > PGWSL

Note: **Bold** squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

Source Area

Low Area

HH/Eco Soil RMDB[6]
Risk Management Decision Boundary: Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10[6] and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at this depth interval.
4) PQL = practical quantitation limit
5) Table includes only the sample results that exceeded the screening level
6) Aerojet and Tetra Tech EM, July 2007

0 80 160
Feet
1 inch = 80 feet

AEROJET ROCKETDYNE

Figure 11.2-14
Metals in Soil
>2- to 12-Foot Depth (Intermediate), Compared to Protection of Groundwater Screening Levels
Area 40 - North
Island Operable Unit Remedial Investigation

SR10/26231 Created by CB&I 4/14/2014

Metals vs PGW SLs

Detections Above the PGWSL (µg/kg)

Sample Location	Sample Depth	Sample Date	Compound	Concentration
37B-AH786	18	1/4/1985	Cadmium	7.10E+03

Protection of Groundwater Screening Level (PGWSL) - Soil

- Not Analyzed
- Not Detected
- ≤ PGWSL
- > PGWSL and ≤ 10x PGWSL
- > 10x PGWSL and ≤ 100x PGWSL
- > 100x PGWSL
- Sample Location

Lead (4.20E+04) | Cadmium (7.20E+02) (µg/kg)

Note: Bold squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

- Source Area
- Low Area
- HH/Eco Soil RMDB[5]
  Risk Management Decision Boundary: Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10 and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at this depth interval.
4) Table includes only the sample results that exceeded the screening level
5) Aerojet and Tetra Tech EM, July 2007

0 80 160 Feet

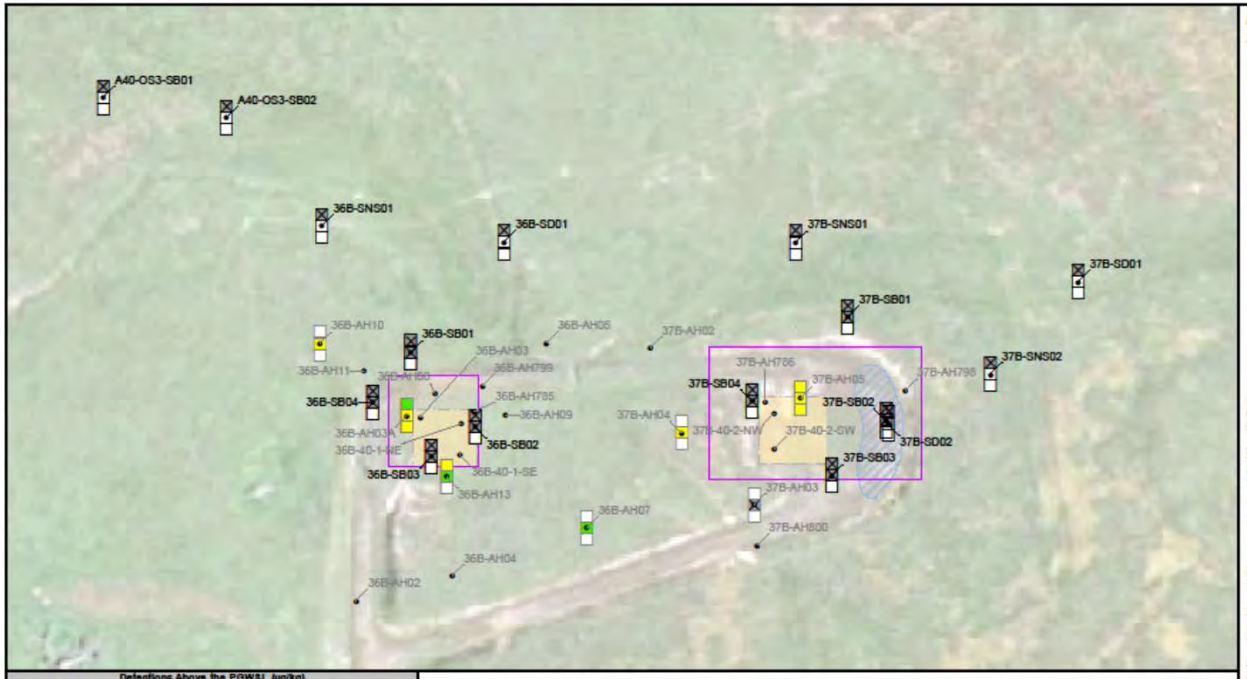
1 inch = 80 feet

AEROJET ROCKETDYNE

Figure 11.2-15
Metals in Soil
>12- to 25-Foot Depth (Deep), Compared to Protection of Groundwater Screening Levels
Area 40 - North
Island Operable Unit Remedial Investigation

SIR1012631 Created by CBM 4/1/2014

Phthalates vs PGW SLs



Detections Above the PGWSL (µg/kg)				
Sample Location	Sample Depth	Sample Date	Compound	Concentration
36B-AH03A	5	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.80E+02
36B-AH03A	10	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	2.50E+02
36B-AH03A	3	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.80E+02
36B-AH03A	15	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	8.20E+01
36B-AH10	5	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	8.00E+01
36B-AH10	5.33	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	8.00E+01
36B-AH13	0.01	8/16/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.50E+02
36B-AH13	0	8/16/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.50E+02
37B-AH04	5	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	8.70E+01
37B-AH04	4.71	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	8.70E+01
37B-AH05	1.33	8/14/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.30E+02
37B-AH05	1	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.30E+02
37B-AH05	3	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	7.80E+01
37B-AH05	10	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.80E+02
37B-AH05	5	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.20E+02
37B-AH05	15	8/13/1991	Bis(2-ethylhexyl)phthalate (BEHP)	1.60E+02

SR10126231 Created by CB&I 4/14/2014

Protection of Groundwater Screening Level (PGWSL) - Soil

- Not Analyzed
- Not Detected
- ≤ PGWSL
- > PGWSL and ≤ 10x PGWSL
- > 10x PGWSL and ≤ 100x PGWSL
- > 100x PGWSL
- Sample Location
  - 0 to 2 feet bgs - Shallow
  - > 2 to 12 feet bgs - Intermediate
  - > 12 to 25 feet bgs - Deep
- Not Detected, PQL > PGWSL

Bis(2-ethylhexyl)phthalate (BEHP) PGWSL (7.10E+01 µg/kg)

Note: **Bold** squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

- Source Area
- Low Area
- HH/Eco Soil RMDB[7]
  Risk Management Decision Boundary: Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10[-4] and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at any depth interval.
4) PQL = practical quantitation limit
5) bgs = below ground surface
6) Table includes only the sample results that exceeded the screening level
7) Aerojet and Tetra Tech EM, July 2007

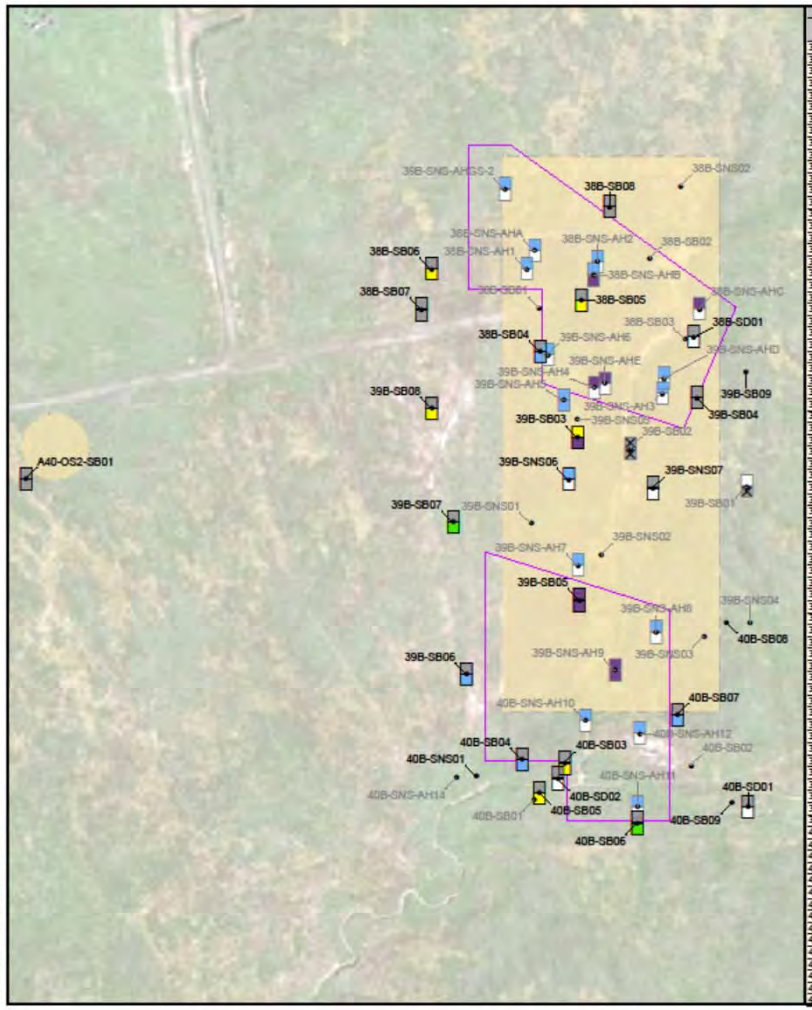
0 80 160
Feet
1 inch = 80 feet

AEROJET ROCKETDYNE

Figure 11.2-16

Bis(2-ethylhexyl)phthalate (BEHP) in Soil Compared to Protection of Groundwater Screening Level
Area 40 - North
Island Operable Unit Remedial Investigation

Perchlorate PGW SLs



Detections Above the PGWSL (µg/kg)

Sample Location	Sample Depth	Sample Date	Compound	Concentration
38B-SB04	5	4/28/2008	Perchlorate	1.20E+03
38B-SB04	11	4/28/2008	Perchlorate	5.20E+03
38B-SB05	5	4/28/2008	Perchlorate	1.60E+02
38B-SB06	5	4/28/2008	Perchlorate	9.40E+01
38B-SB06	11	4/28/2008	Perchlorate	7.50E+01
38B-SNS-AH1	0	2/1/1985	Perchlorate	2.00E+03
38B-SNS-AH1	0.6	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AH2	0	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AH2	0.5	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AH2	1.1	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AHA	0	2/1/1985	Perchlorate	5.00E+03
38B-SNS-AHA	1	2/1/1985	Perchlorate	3.10E+03
38B-SNS-AHA	1.6	2/1/1985	Perchlorate	3.10E+03
38B-SNS-AHB	0	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AHB	0.9	2/1/1985	Perchlorate	4.00E+03
38B-SNS-AHB	1.3	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AHB	3.3	2/1/1985	Perchlorate	6.10E+03
38B-SNS-AHC	0.5	2/1/1985	Perchlorate	3.00E+03
38B-SNS-AHC	1.4	2/1/1985	Perchlorate	2.00E+03
38B-SNS-AHC	2	2/1/1985	Perchlorate	7.10E+03
39B-SB03	1	4/28/2008	Perchlorate	1.20E+03
39B-SB03	5	4/28/2008	Perchlorate	3.90E+04
39B-SB03	11	4/28/2008	Perchlorate	2.00E+04
39B-SB05	1	4/30/2008	Perchlorate	2.10E+04
39B-SB05	5	4/30/2008	Perchlorate	8.50E+04
39B-SB05	9	4/30/2008	Perchlorate	1.70E+04
39B-SB06	5	4/30/2008	Perchlorate	7.00E+01
39B-SB06	11	4/30/2008	Perchlorate	7.70E+03
39B-SB08	5	4/28/2008	Perchlorate	1.90E+03
39B-SNS06	0.25	4/30/2008	Perchlorate	9.40E+01
39B-SNS06	1	4/30/2008	Perchlorate	4.00E+03
39B-SNS-AH3	0	2/1/1985	Perchlorate	5.00E+03
39B-SNS-AH3	0.3	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH3	0.7	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH3	1.2	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH3	1.9	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH4	0	2/1/1985	Perchlorate	4.00E+03
39B-SNS-AH4	0.7	2/1/1985	Perchlorate	1.20E+04
39B-SNS-AH4	1.4	2/1/1985	Perchlorate	1.20E+04
39B-SNS-AH5	0	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH5	0.2	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH5	0.6	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH5	1.1	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH5	1.7	2/1/1985	Perchlorate	4.00E+03
39B-SNS-AH5	2.1	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH6	0	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH6	0.8	2/1/1985	Perchlorate	4.00E+03
39B-SNS-AH7	0	2/1/1985	Perchlorate	4.00E+03
39B-SNS-AH7	0.6	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AH8	0	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH8	0.7	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH8	1.4	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH8	1.8	2/1/1985	Perchlorate	3.00E+03
39B-SNS-AH9	0	2/1/1985	Perchlorate	6.00E+03
39B-SNS-AH9	0.5	2/1/1985	Perchlorate	3.00E+04
39B-SNS-AH9	0.9	2/1/1985	Perchlorate	1.80E+04
39B-SNS-AH9	1.7	2/1/1985	Perchlorate	9.10E+04
39B-SNS-AH9	2.1	2/1/1985	Perchlorate	7.80E+04
39B-SNS-AHD	0	2/1/1985	Perchlorate	6.00E+03
39B-SNS-AHD	0.7	2/1/1985	Perchlorate	2.00E+03
39B-SNS-AHD	1.1	2/1/1985	Perchlorate	4.00E+03
39B-SNS-AHD	2	2/1/1985	Perchlorate	5.10E+03
39B-SNS-AHE	0.1	2/1/1985	Perchlorate	1.40E+04
39B-SNS-AHE	1.2	2/1/1985	Perchlorate	1.50E+04
39B-SNS-AHE	1.7	2/1/1985	Perchlorate	1.50E+04
39B-SNS-AH3S-2	0	2/1/1985	Perchlorate	3.00E+03
40B-SB03	11	5/5/2008	Perchlorate	2.50E+03
40B-SB04	5	5/5/2008	Perchlorate	2.20E+03
40B-SB04	11	5/5/2008	Perchlorate	6.60E+01
40B-SB05	5	5/5/2008	Perchlorate	1.90E+03
40B-SB05	11	5/5/2008	Perchlorate	7.20E+01
40B-SB07	5	8/7/2008	Perchlorate	6.60E+02
40B-SNS-AH10	0	2/1/1985	Perchlorate	4.00E+03
40B-SNS-AH10	0.3	2/1/1985	Perchlorate	4.00E+03
40B-SNS-AH10	0.7	2/1/1985	Perchlorate	5.00E+03
40B-SNS-AH10	1.3	2/1/1985	Perchlorate	4.00E+03
40B-SNS-AH11	0	2/1/1985	Perchlorate	5.00E+03
40B-SNS-AH11	0.6	2/1/1985	Perchlorate	4.00E+03
40B-SNS-AH12	0	2/1/1985	Perchlorate	3.00E+03
40B-SNS-AH12	0.3	2/1/1985	Perchlorate	3.00E+03
40B-SNS-AH12	0.6	2/1/1985	Perchlorate	3.00E+03

Protection of Groundwater Screening Level (PGWSL) - Soil

- Not Analyzed
- Not Detected
- ≤ PGWSL
- > PGWSL and ≤ 10x PGWSL
- > 10x PGWSL and ≤ 100x PGWSL
- > 100x PGWSL
- Sample Location
  - 0 to 2 feet bgs - Shallow
  - > 2 to 12 feet bgs - Intermediate
- Not Detected, PQL > PGWSL

Perchlorate PGWSL (6.00E+01 µg/kg)

Note: **Bold** squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

- Source Area
- Low Area
- HH/Eco Soil RMDB[7]
  Risk Management Decision Boundary: Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10[-5] and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at any depth interval.
4) PQL = practical quantitation limit
5) bgs = below ground surface
6) Table includes only the sample results that exceeded the screening level
7) Aerojet and Tetra Tech EM, July 2007

0 160 320 Feet

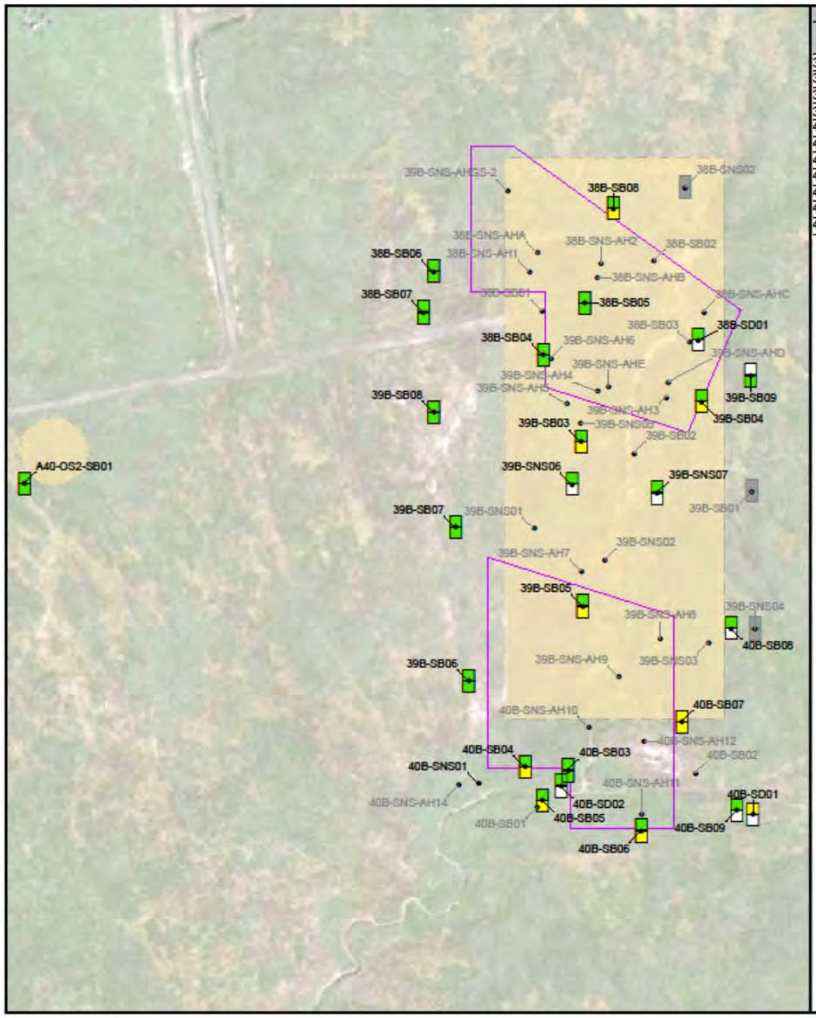
1 Inch = 160 feet

AEROJET ROCKETDYNE

Figure 11.3-9

Perchlorate in Soil Compared to Protection of Groundwater Screening Level Area 40 - South Island Operable Unit Remedial Investigation

Arsenic vs rRISLs



Detections Above the rRISL/PGWSL (µg/kg)

Sample Location	Sample Depth	Sample Date	Compound	Concentration
38B-SB08	5	9/10/2009	Arsenic	3.10E+04
39B-SB03	11	4/28/2008	Arsenic	1.30E+04
39B-SB04	10	4/29/2008	Arsenic	1.50E+04
39B-SB05	9	4/30/2008	Arsenic	1.90E+04
40B-SB04	11	5/5/2008	Arsenic	2.40E+04
40B-SB05	11	5/5/2008	Arsenic	1.40E+04
40B-SB06	9.5	5/5/2008	Arsenic	2.20E+04
40B-SB07	1	5/5/2008	Arsenic	2.00E+04
40B-SB07	5	8/7/2008	Arsenic	2.10E+04
40B-SB07	11	8/11/2008	Arsenic	2.80E+04
40B-SD01	1	6/12/2008	Arsenic	1.50E+04

Industrial Remedial Investigation Screening Level (iRISL)/Protection of Groundwater Screening Level (PGWSL) - Soil

- Not Analyzed
- Not Detected
- ≤ rRISL/PGWSL
- > rRISL/PGWSL and ≤ 10x rRISL/PGWSL
- > 10x rRISL/PGWSL and ≤ 100x rRISL PGWSL
- > 100x rRISL/PGWSL

0 to 2 feet bgs - Shallow
> 2 to 12 feet bgs - Intermediate

Arsenic rRISL/PGWSL (1.10E+04 µg/kg)

Note: **Bold** squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

Source Area
Low Area
HH/Eco Soil RMDB[6]
Risk Management Decision Boundary: Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10[-6] and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at any depth interval.
4) bgs = below ground surface
5) Table includes only the sample results that exceeded the screening level
6) Aerojet and Tetra Tech EM, July 2007

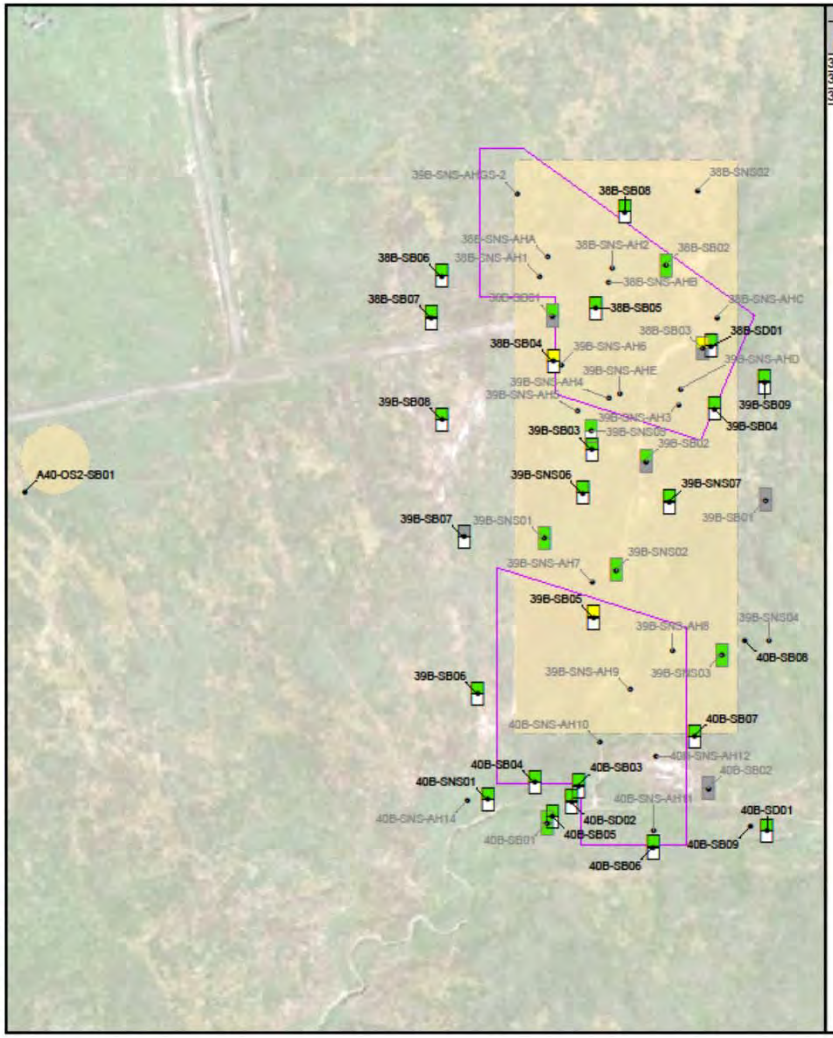
0 160 320 Feet

1 Inch = 160 feet

AEROJET ROCKETDYNE

Figure 11.3-10
Arsenic in Soil Compared to Residential Remedial Investigation Screening Level/ Protection of Groundwater Screening Level
Area 40 - South
Island Operable Unit Remedial Investigation

Dioxins vs rRISLs



Detections Above the rRISL (µg/kg)				
Sample Location	Sample Depth	Sample Date	Compound	Concentration
38B-SB03	0.01	5/3/1993	2,3,7,8-TCDD TEQ	4.43E-01
38B-SB04	0.25	4/28/2008	2,3,7,8-TCDD TEQ	7.63E-02
39B-SB05	0.25	4/30/2008	2,3,7,8-TCDD TEQ	5.92E-02

Residential Remedial Investigation Screening Level (rRISL) - Soil

- Not Analyzed
- Not Detected
- ≤ rRISL
- > rRISL and ≤ 10x rRISL
- > 10x rRISL and ≤ 100x rRISL
- > 100x rRISL

0 to 2 feet bgs - Shallow
> 2 to 12 feet bgs - Intermediate

2,3,7,8-TCDD TEQ rRISL (4.50E-02 µg/kg)

Note: Bold squares and sample locations indicate samples collected 2000 and later. Unbolded squares and sample locations indicate samples collected before 2000.

Source Area
Low Area
HH/Eco Soil RMDB[6]
Risk Management Decision Boundary; Restricted Land Use Area Based on Soil SLR (Industrial/Commercial >10[-4] and/or Ecological HI >100)

Notes:
1) Some symbols may overlap and hide other symbols beneath them.
2) Sample locations included within this subarea are denoted using a dot in the center of the polygon.
3) Sample locations lacking squares do not have any associated data for these specific analytes at any depth interval.
4) bgs = below ground surface
5) Table includes only the sample results that exceeded the screening level
6) Aerojet and Tetra Tech EM, July 2007

0 160 320 Feet

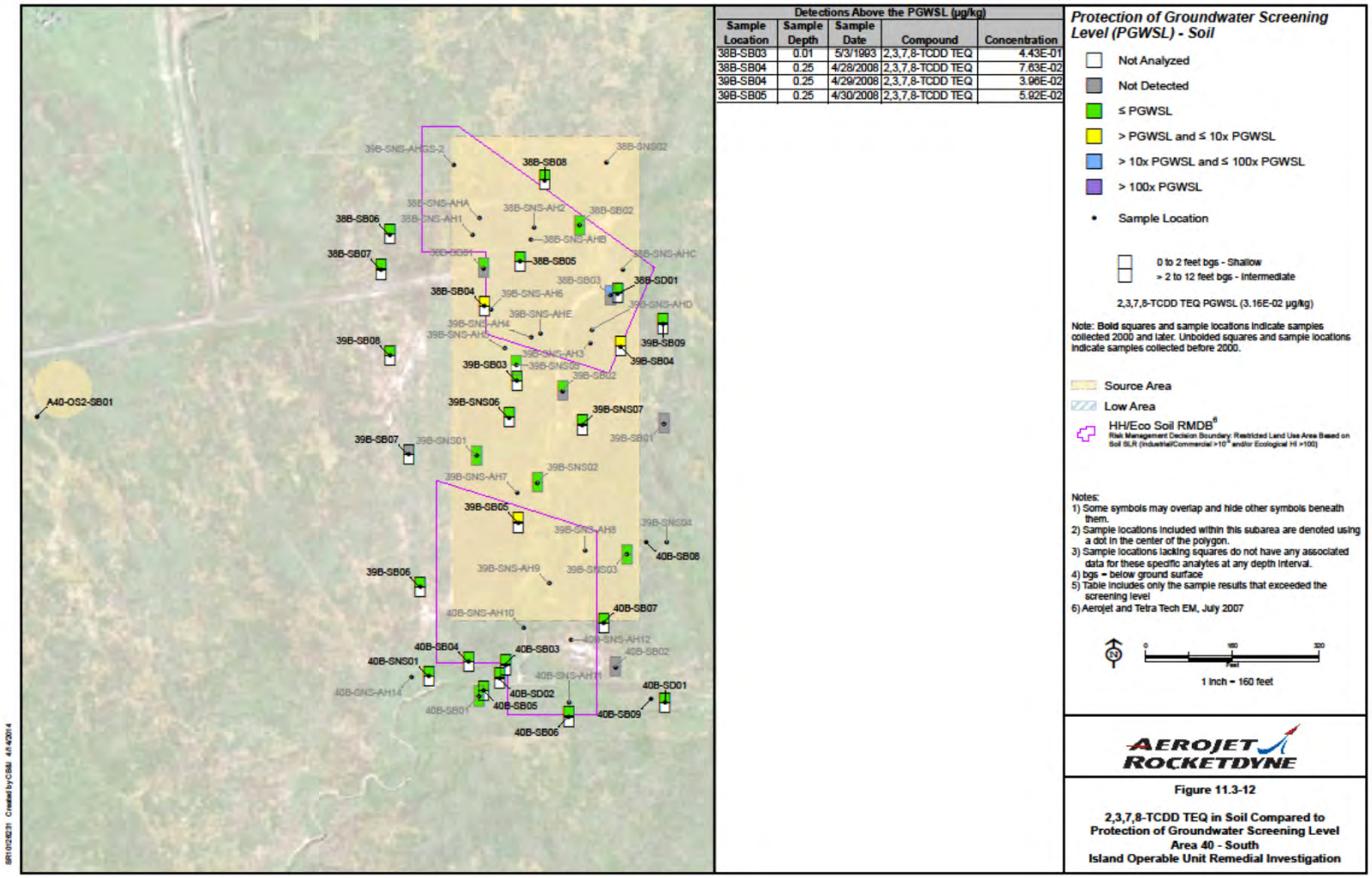
1 inch = 160 feet

AEROJET ROCKETDYNE

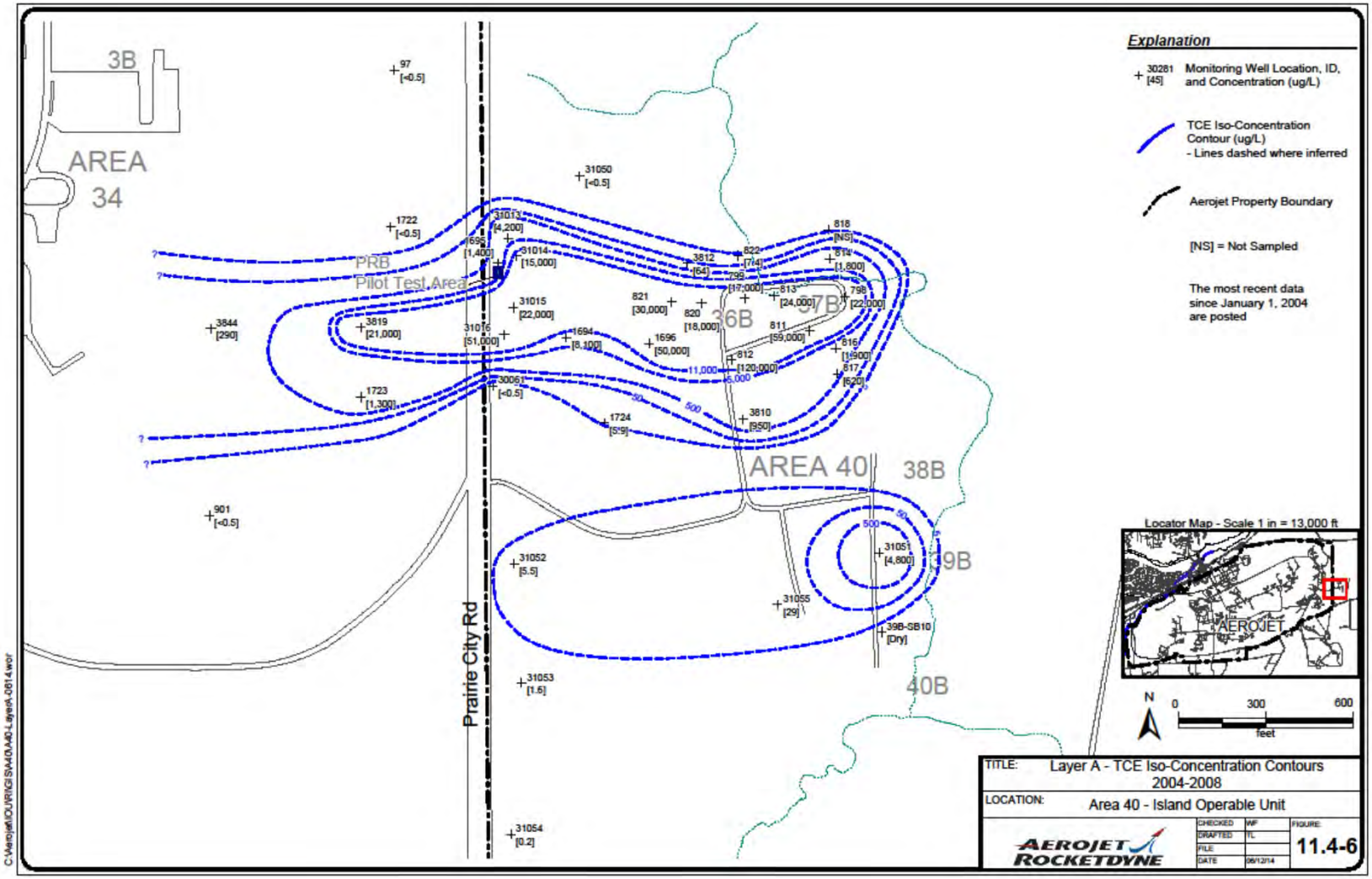
Figure 11.3-11

2,3,7,8-TCDD TEQ in Soil Compared to Residential Remedial Investigation Screening Level Area 40 - South Island Operable Unit Remedial Investigation

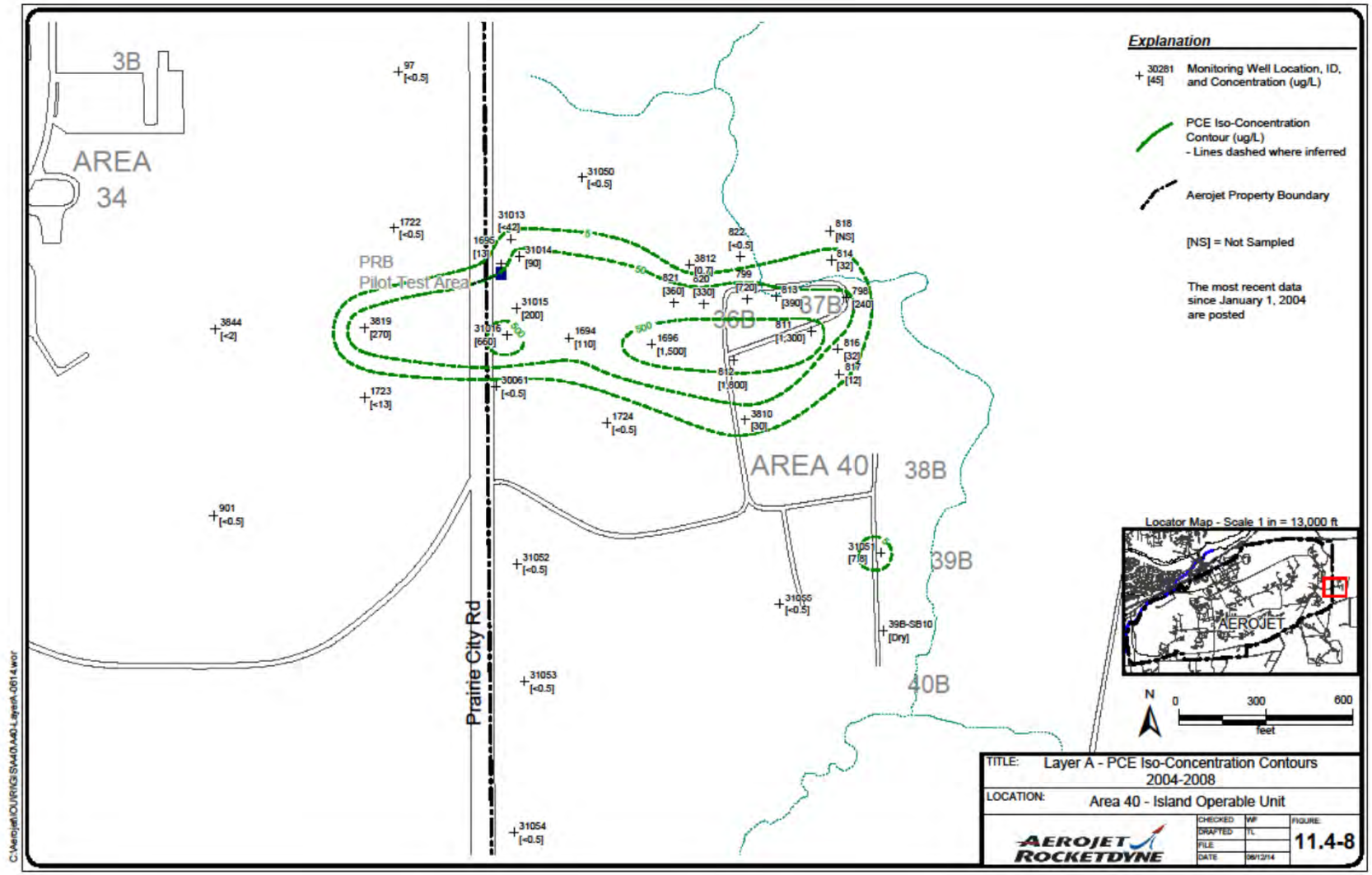
Dioxins vs PGW SLs



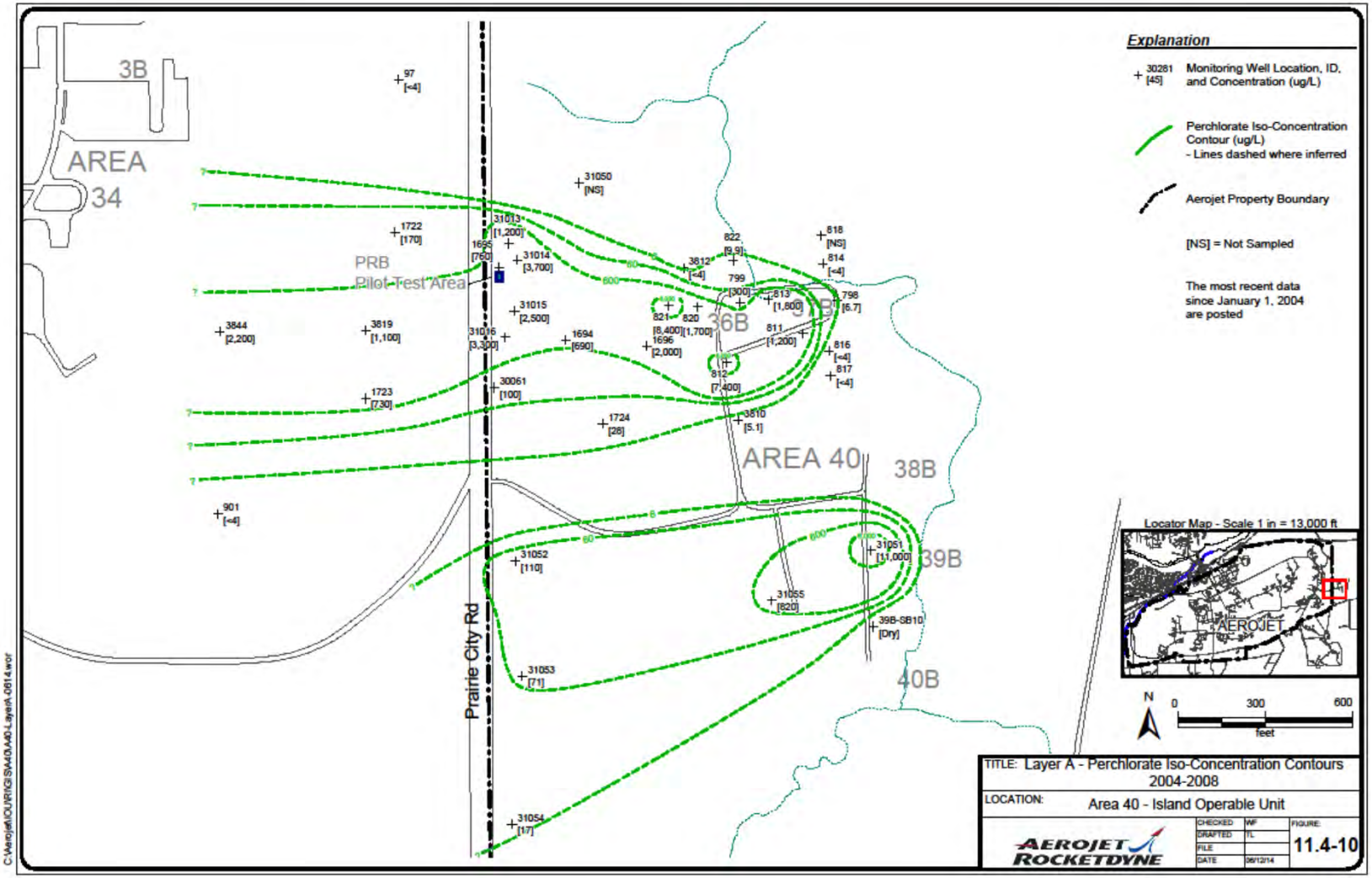
Extent of TCE in Groundwater



Extent of PCE in Groundwater

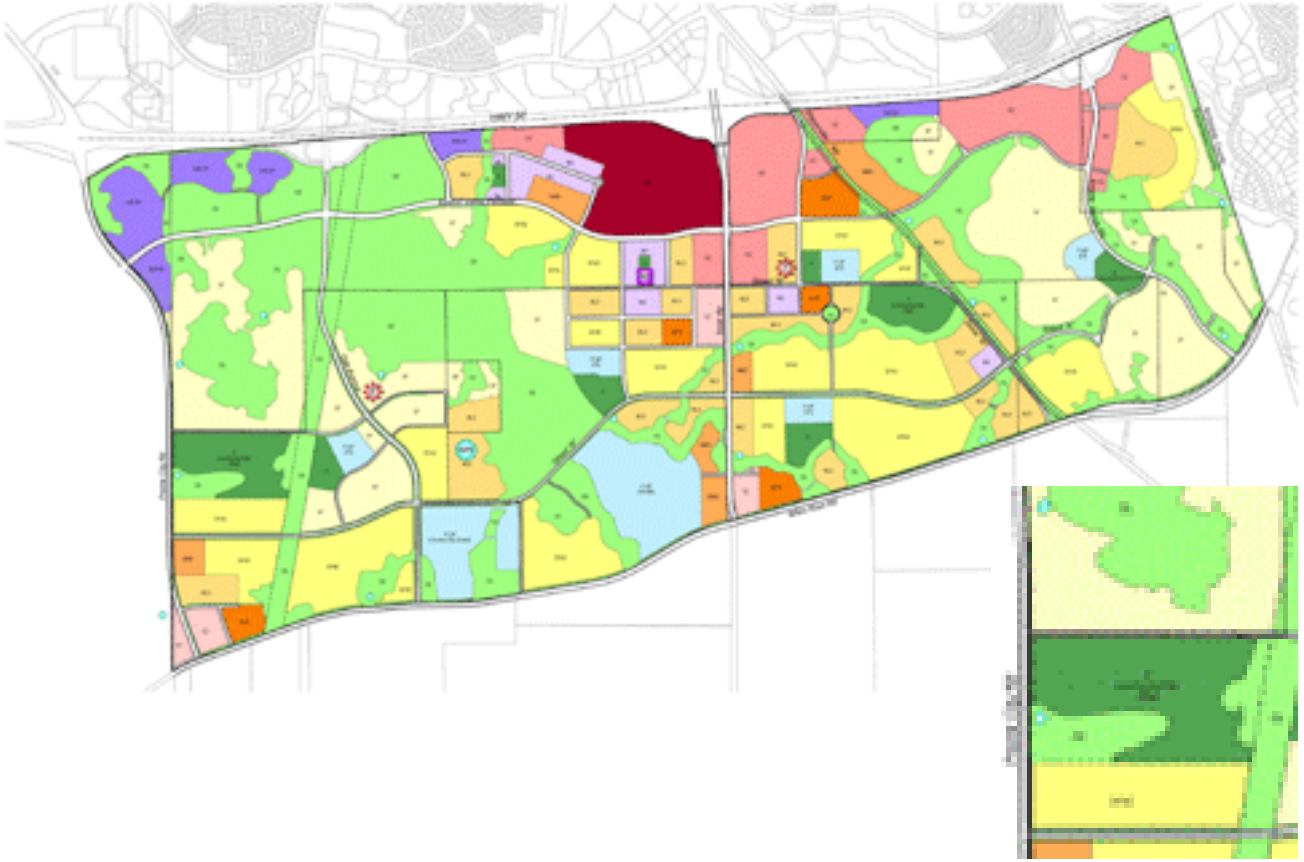


Extent of Perchlorate in Groundwater



Permeable Reactive Barrier

Folsom SOI Land Use Plan



SECTION 4
LAND USE DIAGRAM

Figure 4.1 Land Use Diagram