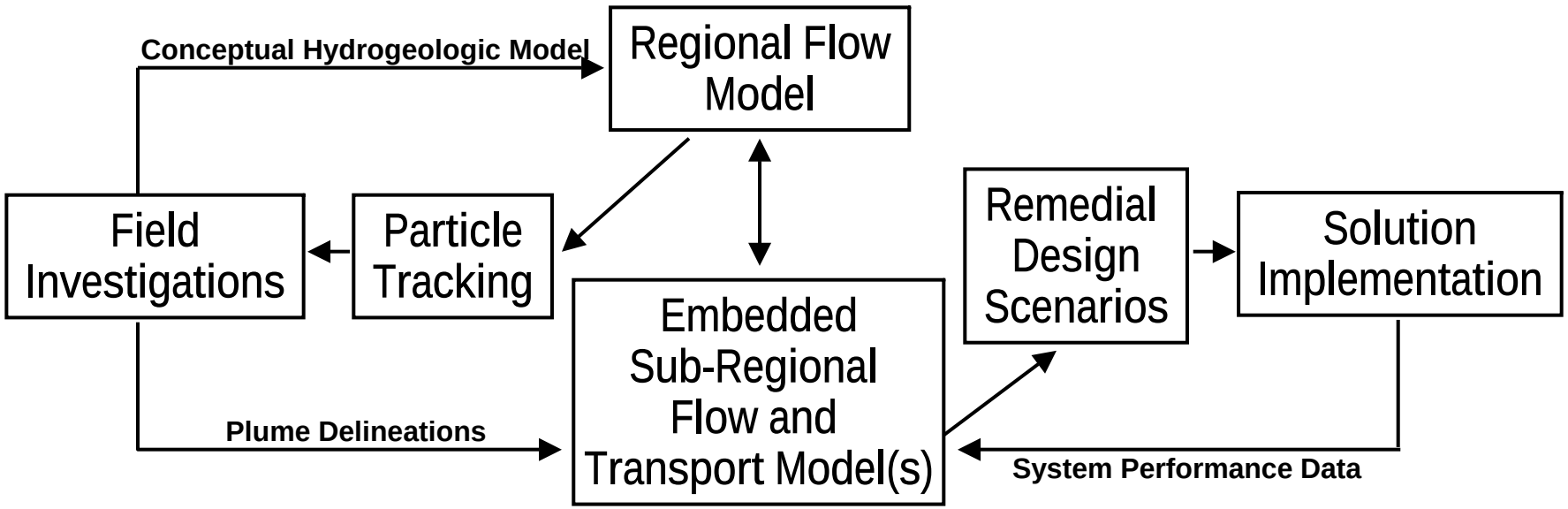
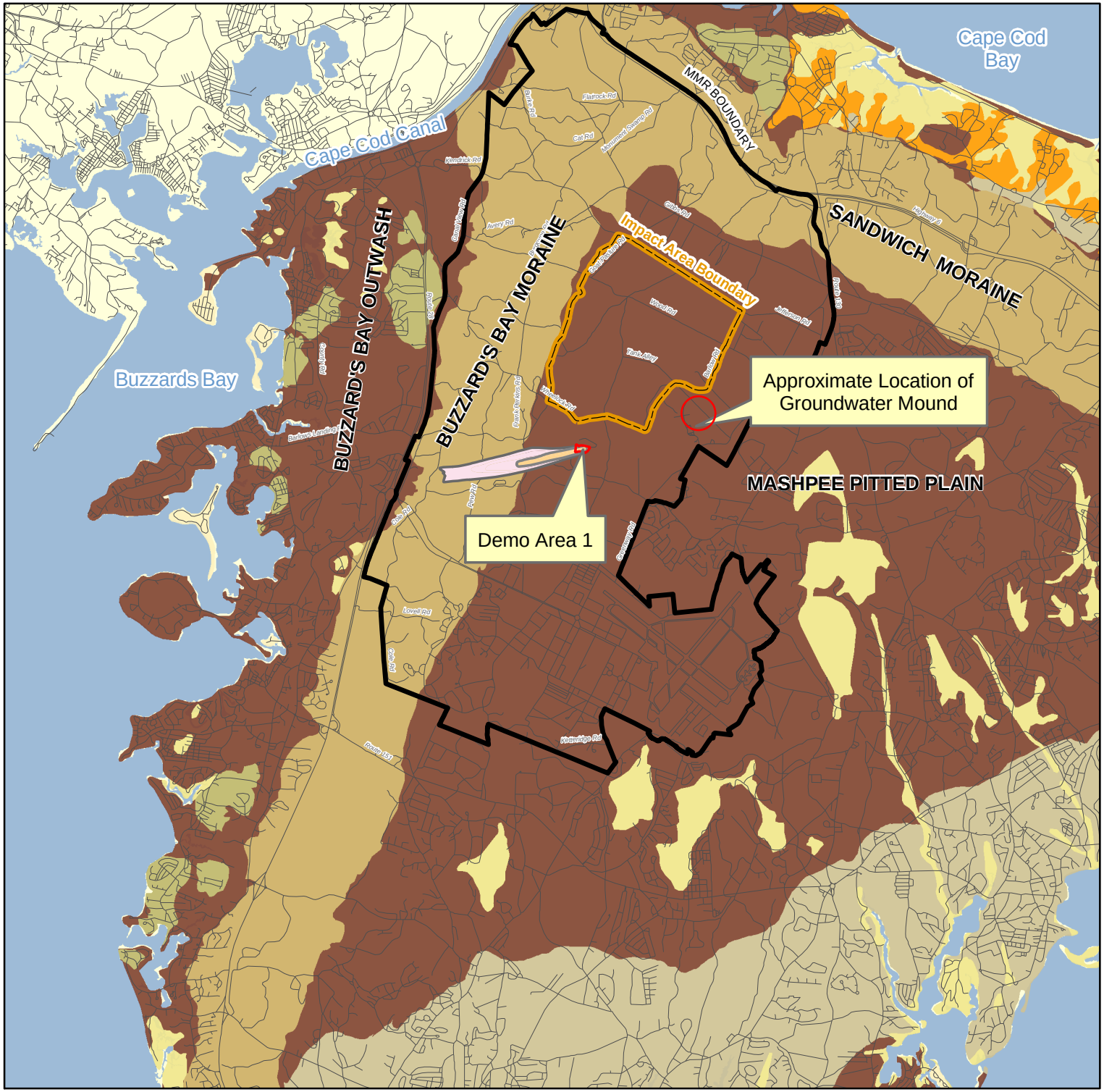


Figure A1-1. Flowchart of MMR Saturated Zone Modeling Process

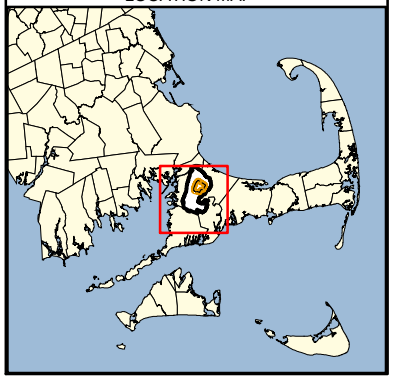


Impact Area
Groundwater Study Program

LEGEND

- Perchlorate Plume Extent
- RDX Plume Extent
- Sand and Gravel Deposits
- Till or Bedrock
- Sandy Till Over Sand
- End Moraines
- Large Sand Deposits
- Fine-Grained Deposits
- Floodplain Alluvium

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Surficial Geology of Western Cape Cod
Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1 Miles

N

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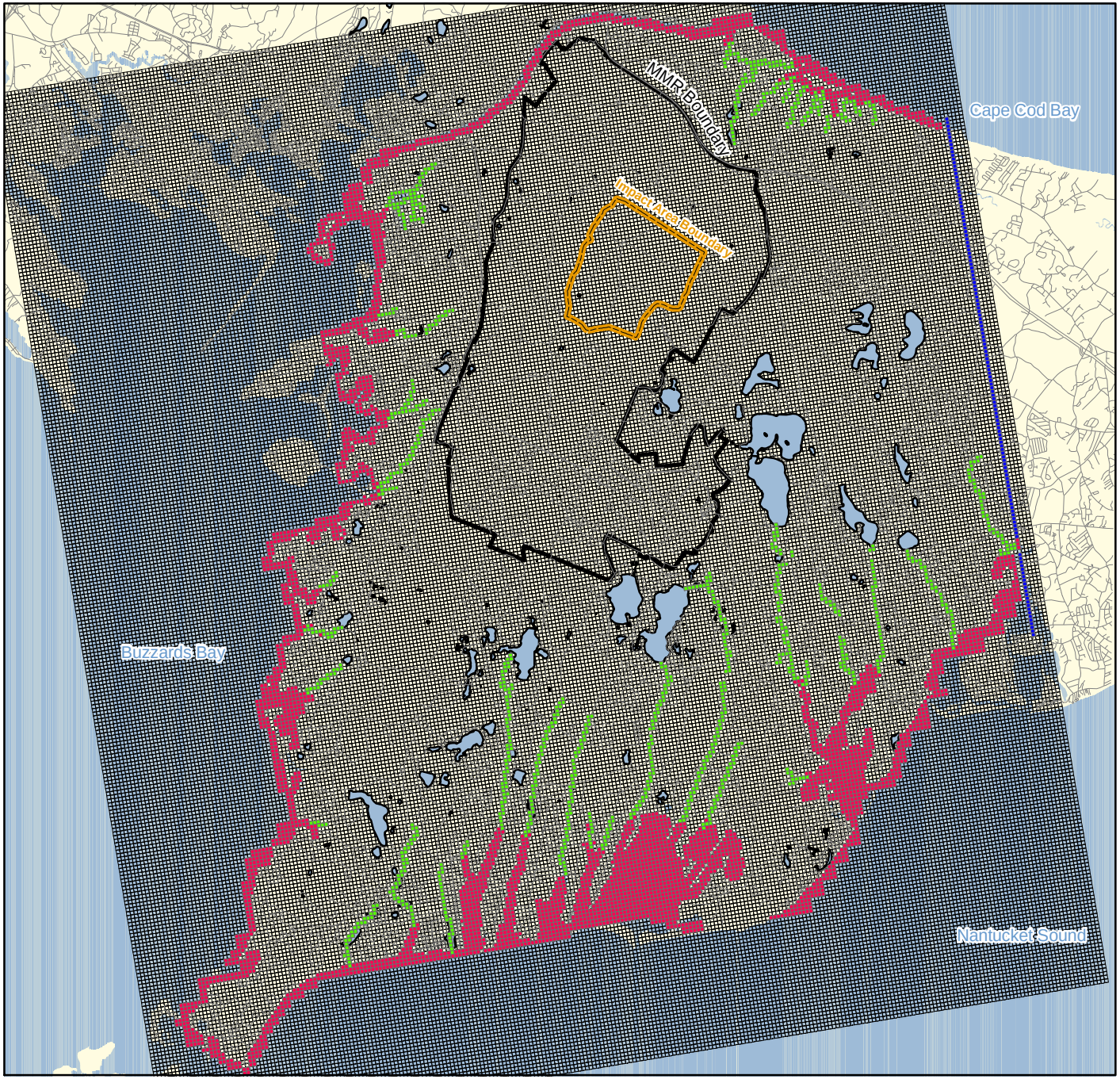
J:/mmr/ReportFigs2004/D8706/8706_FigA2-1.pdf
G:/MMR_COE/work/D8706/8706_FigA2-1.mxd
May 20, 2004 AP JBB

FIGURE
A2-1

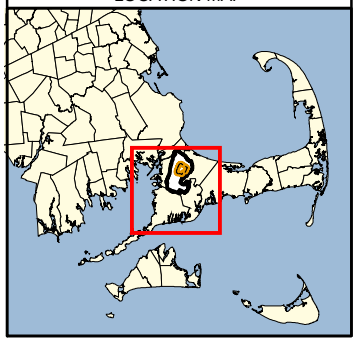


Impact Area
Groundwater Study Program

LEGEND

- Constant Head
- Drain
- General Head Boundary

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Regional Groundwater Flow Model (MMR-10) Grid and Boundary Conditions

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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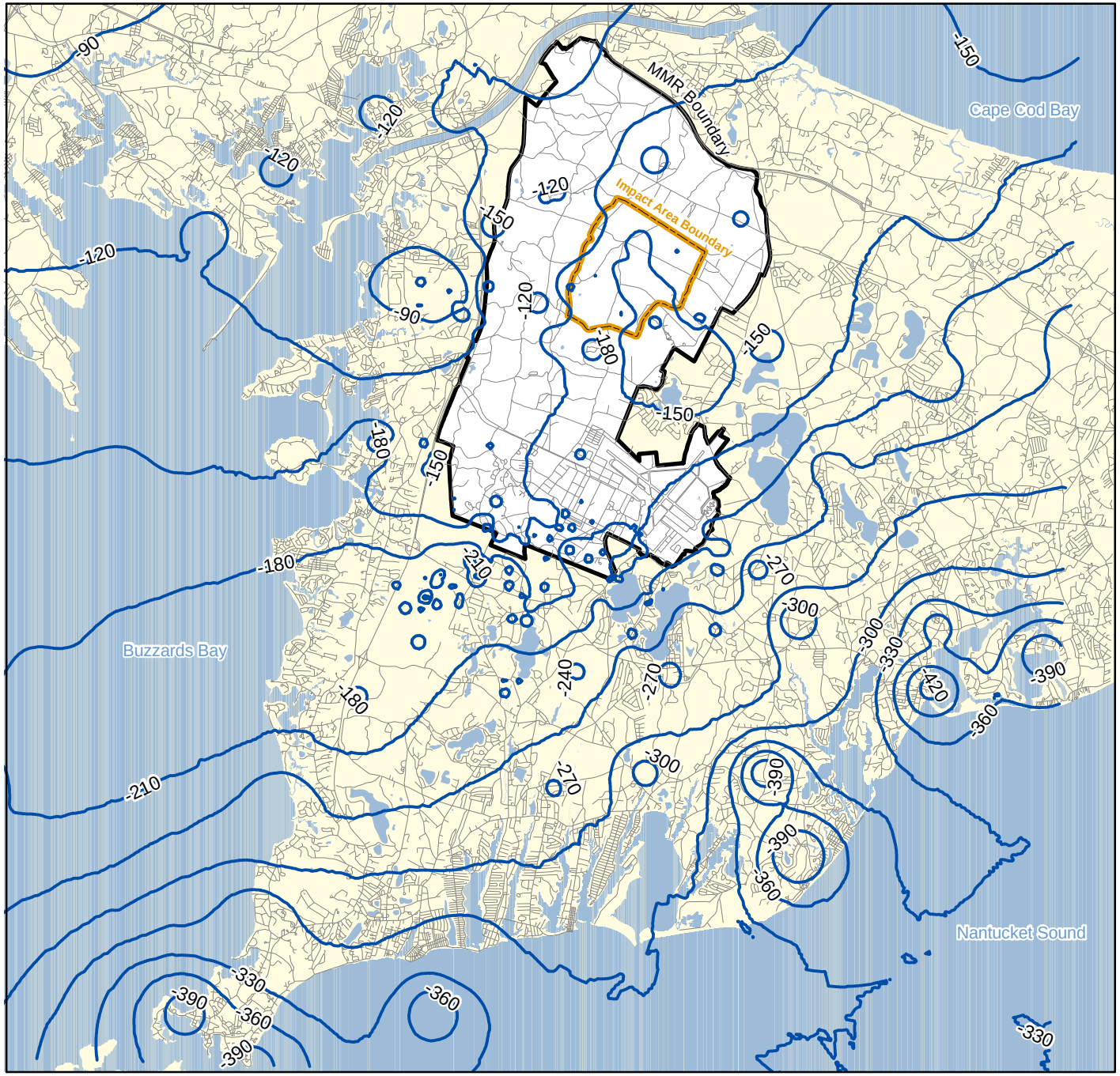
J:/mmr/ReportFigs2004/D8706/8706_FigA2-2.pdf
G:/MMR_COE/work/D8706/8706_FigA2-2.mxd
May 20, 2004 AP DNB JBB

FIGURE

A2-2

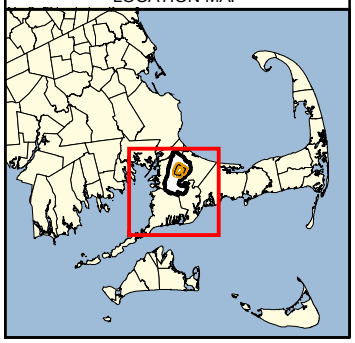


Impact Area
Groundwater Study Program

LEGEND

Bedrock Surface
Elevation Contours (30 ft)

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Updated Regional Bedrock Surface
Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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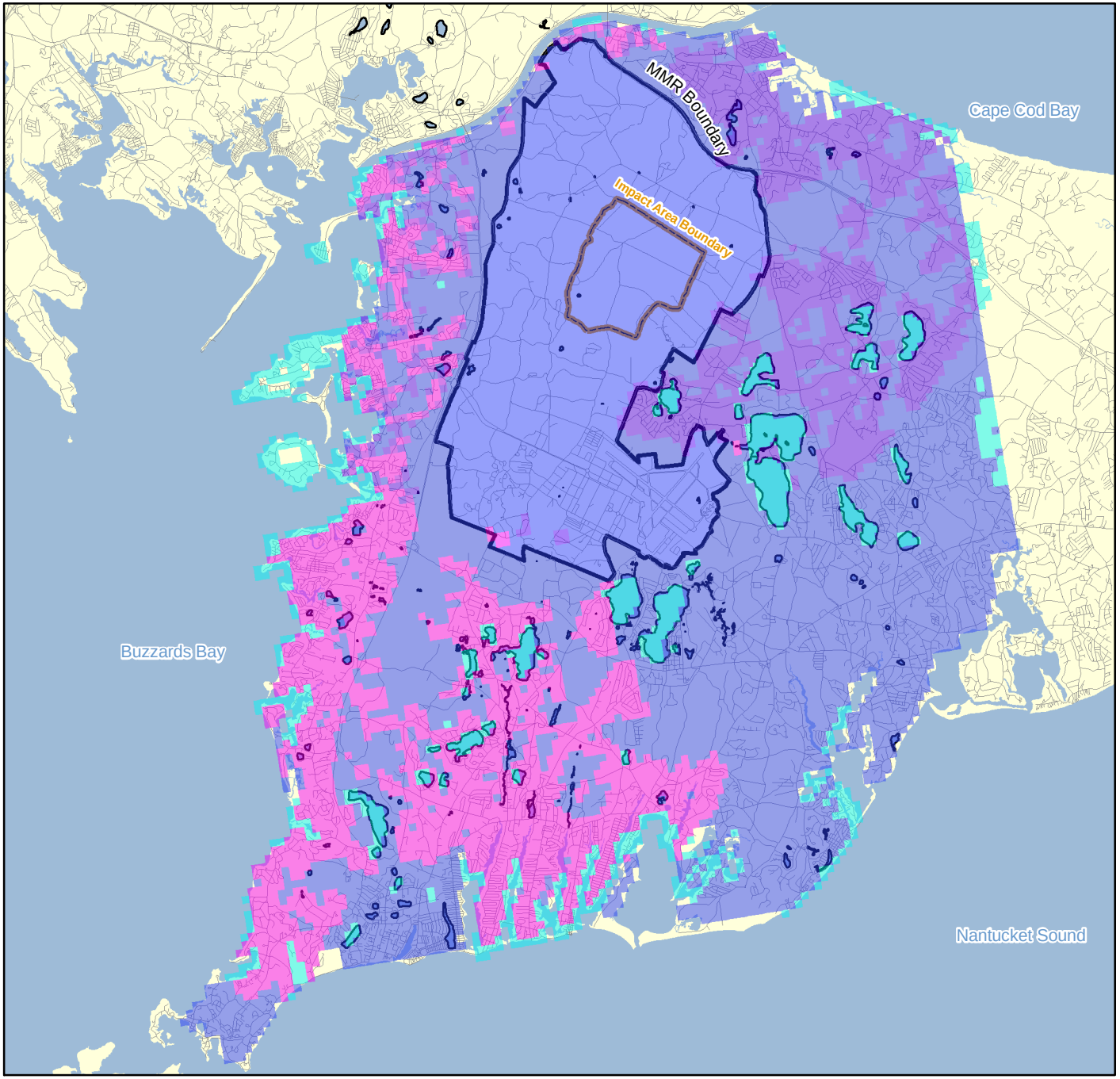
J:/mmr/ReportFigs2004/D8706/8706_FigA2-3.pdf
G:/MMR_COE/work/D8706/8706_FigA2-3.mxd
May 20, 2004 AP JBB

FIGURE

A2-3



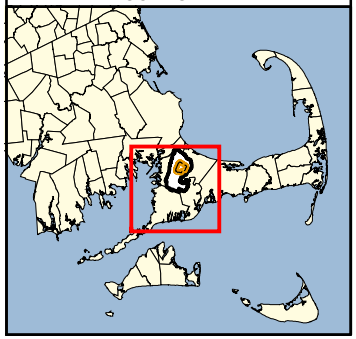
Impact Area
Groundwater Study Program

LEGEND

Recharge Rate (in/yr)

- Less than 22
- 22 - 27
- 27 - 28
- 28 - 29
- 29 - 30
- Greater than 30

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

MMR-10 Calibrated Recharge Distribution

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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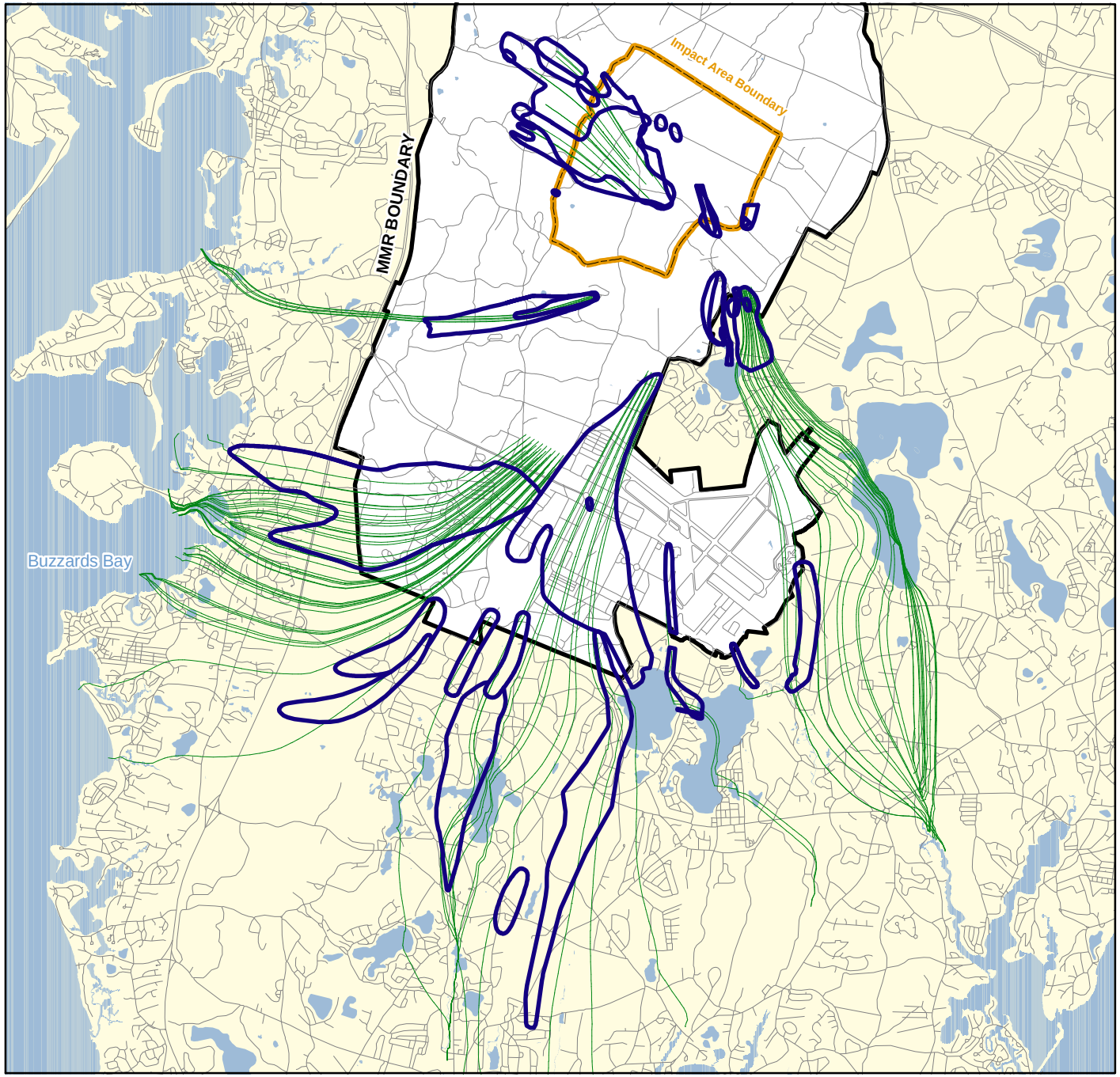
J:/mmr/ReportFigs2004/D8706/8706_FigA2-4.pdf
G:/MMR_COE/work/D8706/8706_FigA2-4.mxd
May 20, 2004 AP JBB

FIGURE

A2-4



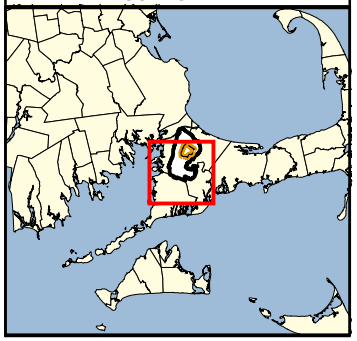
Impact Area
Groundwater Study Program

LEGEND

Major
Plume Outlines

Particle Tracks

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

MMR-10 Particle Track Correspondence to Observed Plume Trajectories
Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1 Miles

N

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J:/mmr/ReportFigs2004/D8706/8706_Fig2-5.pdf
G:/MMR_COE/work/D8706/8706_Fig2-5.mxd
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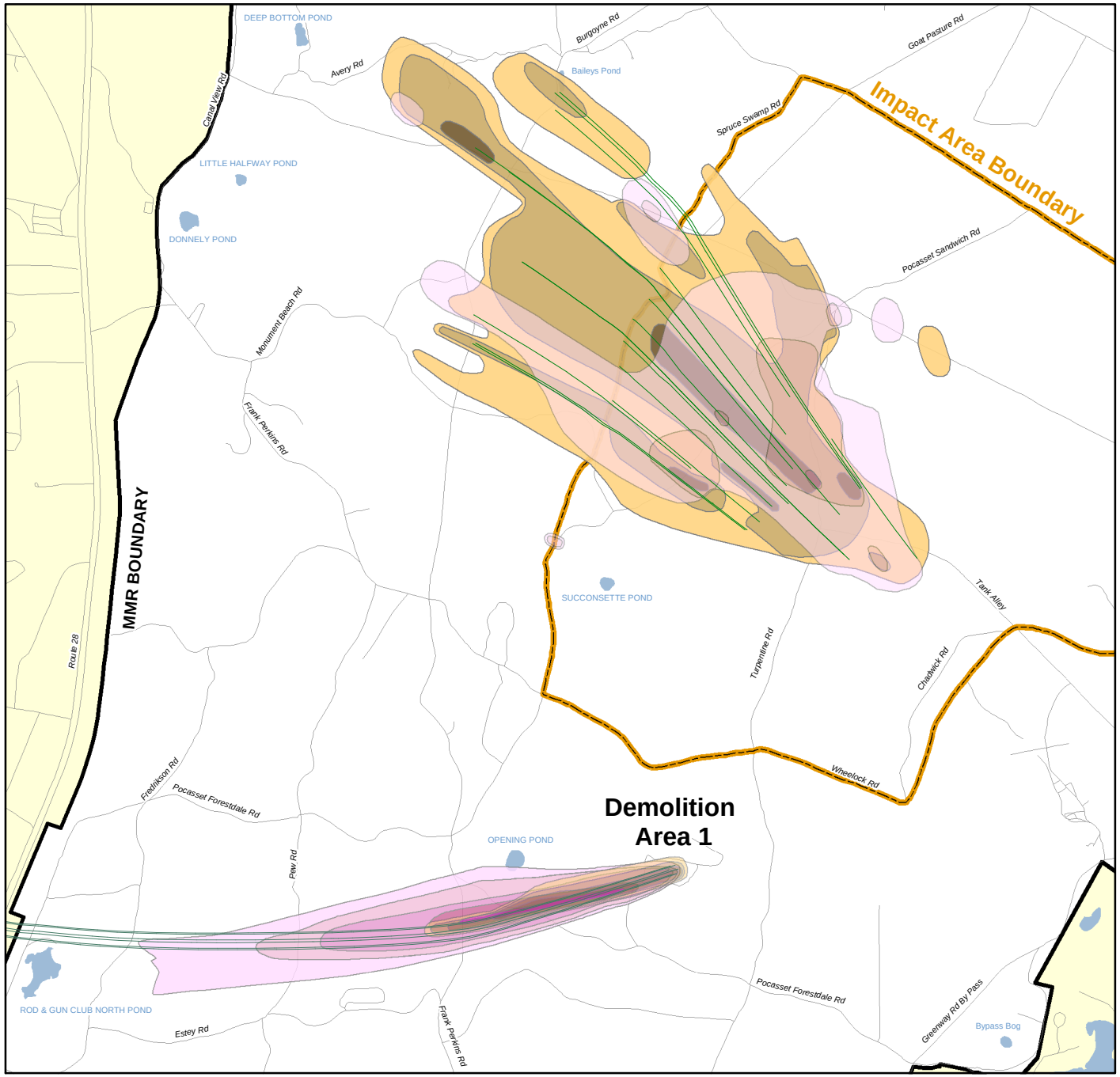
FIGURE
A2-5



Impact Area Groundwater Study Program

LEGEND

Perchlorate Plume Extents

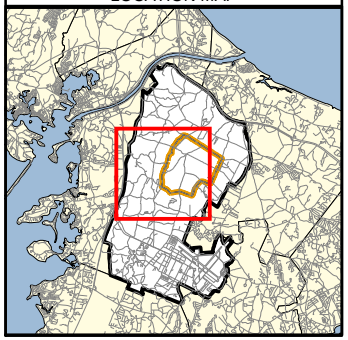
- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

Particle Tracks

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

MMR-10 Particle Track Correspondence to RDX and Perchlorate Plumes at Demolition Area 1 and the Impact Area

Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

0 0.5 Miles

N

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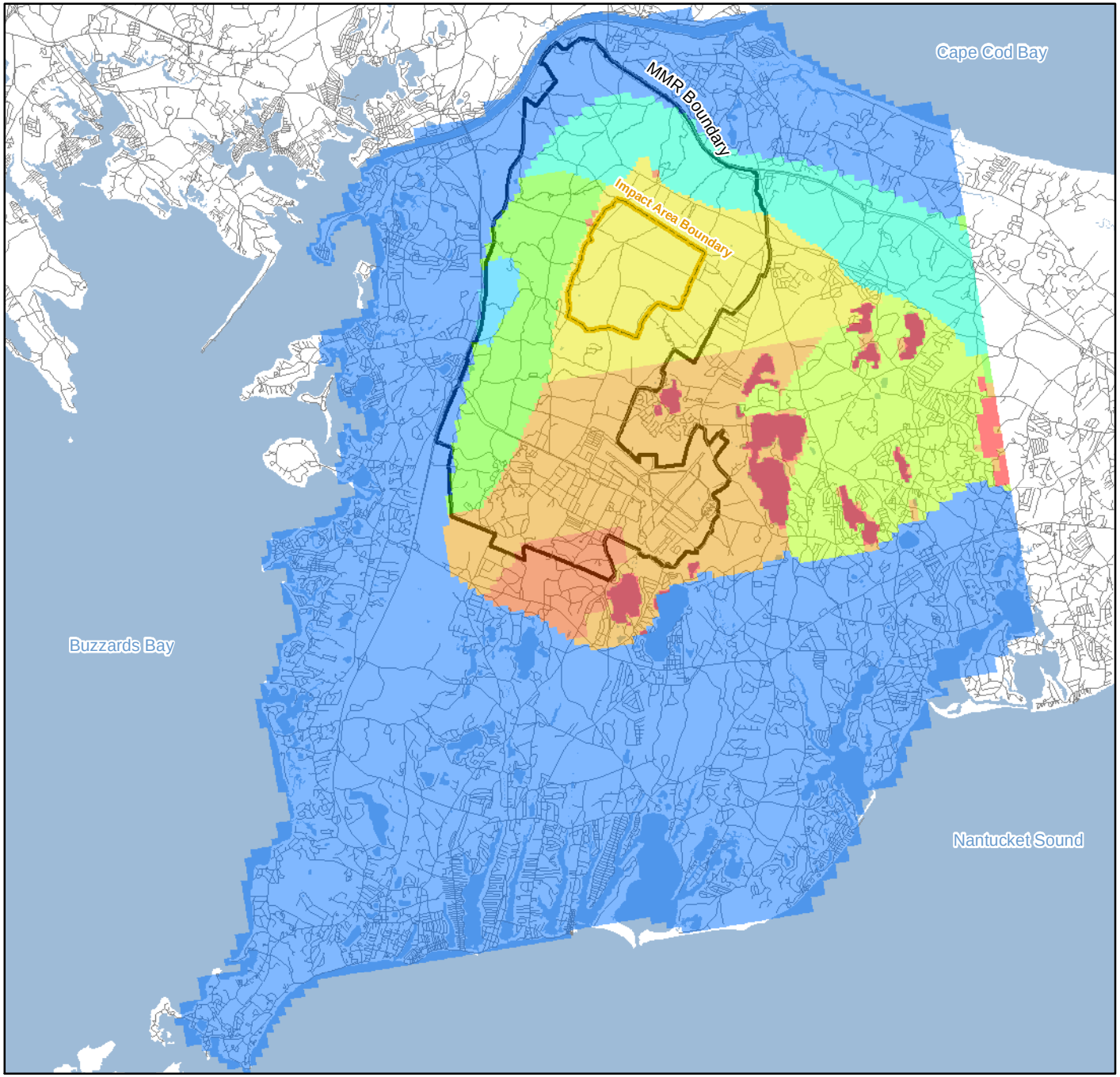
J:/mmr/ReportFigs2004/D8706/8706_FigA2-6.pdf
G:/MMR_COE/work/D8706/8706_FigA2-6.mxd
May 20, 2004 AP JBB

FIGURE

A2-6



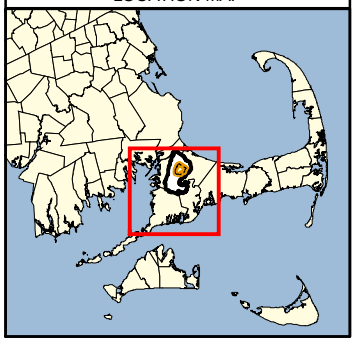
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	230
100	260
125	290
150	350
	50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 1

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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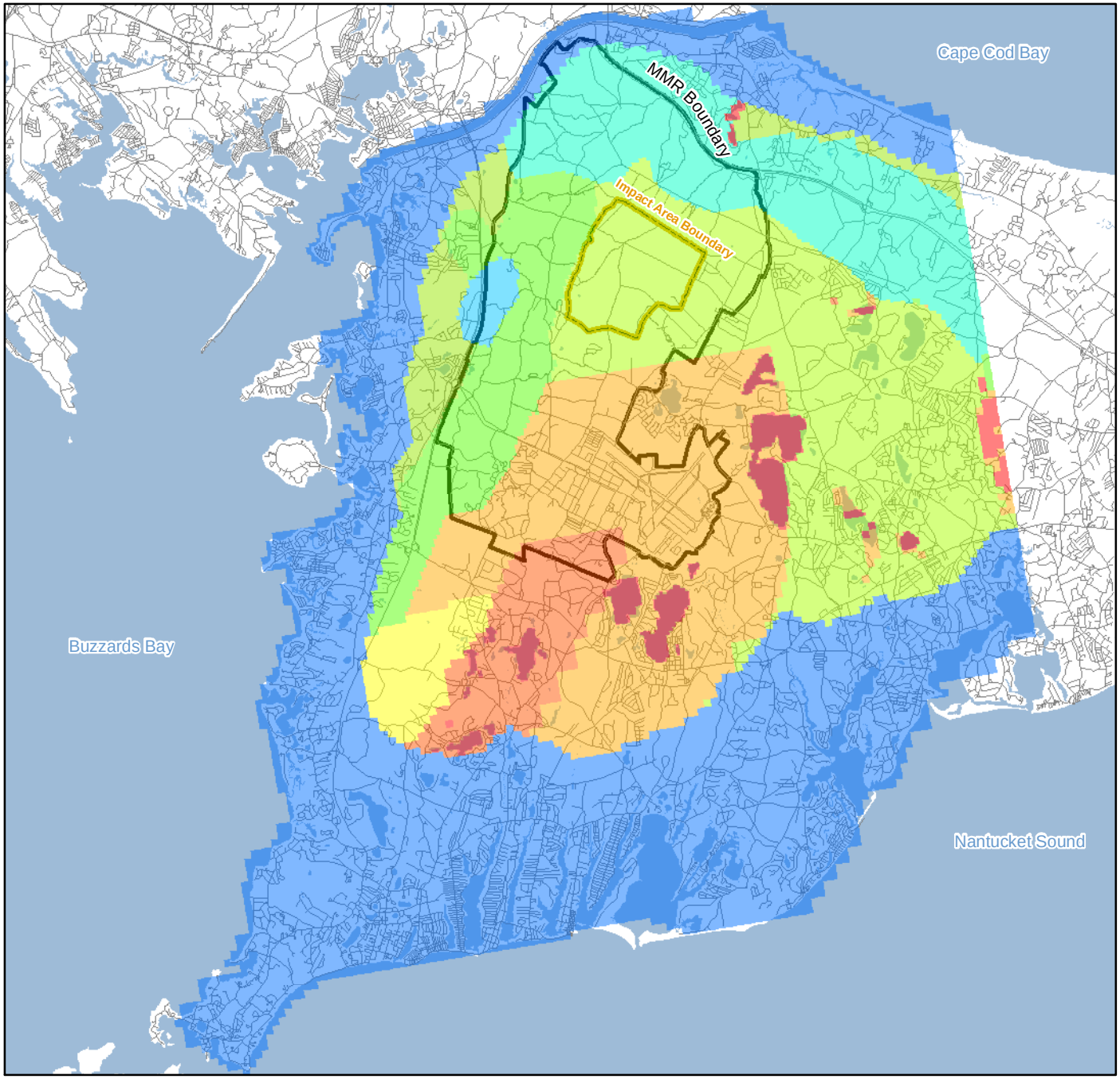
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7a.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7a.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7a



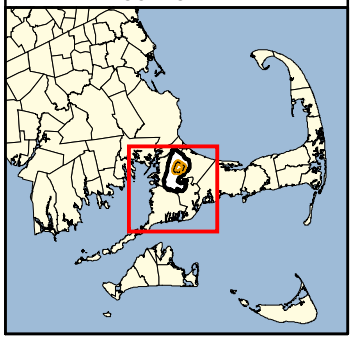
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	230
100	260
125	290
150	350
200	50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 2

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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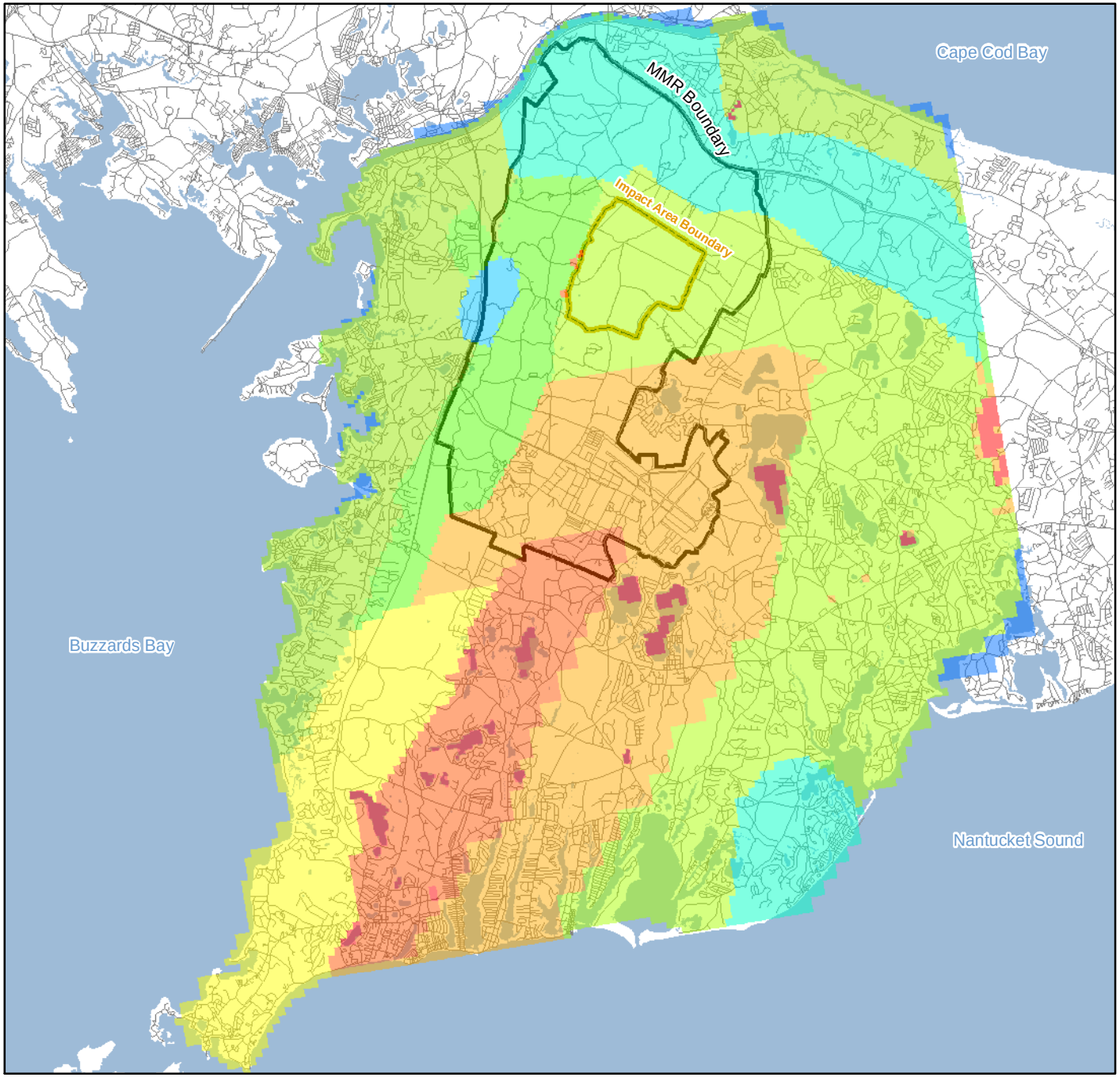
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7b.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7b.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7b



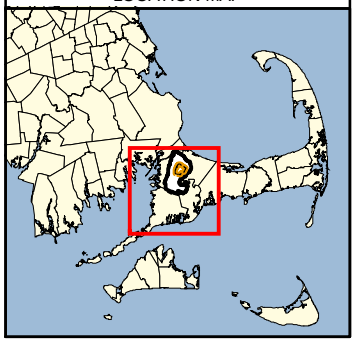
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	230
100	250
125	260
150	290
200	350
	50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 3

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

DRAFT

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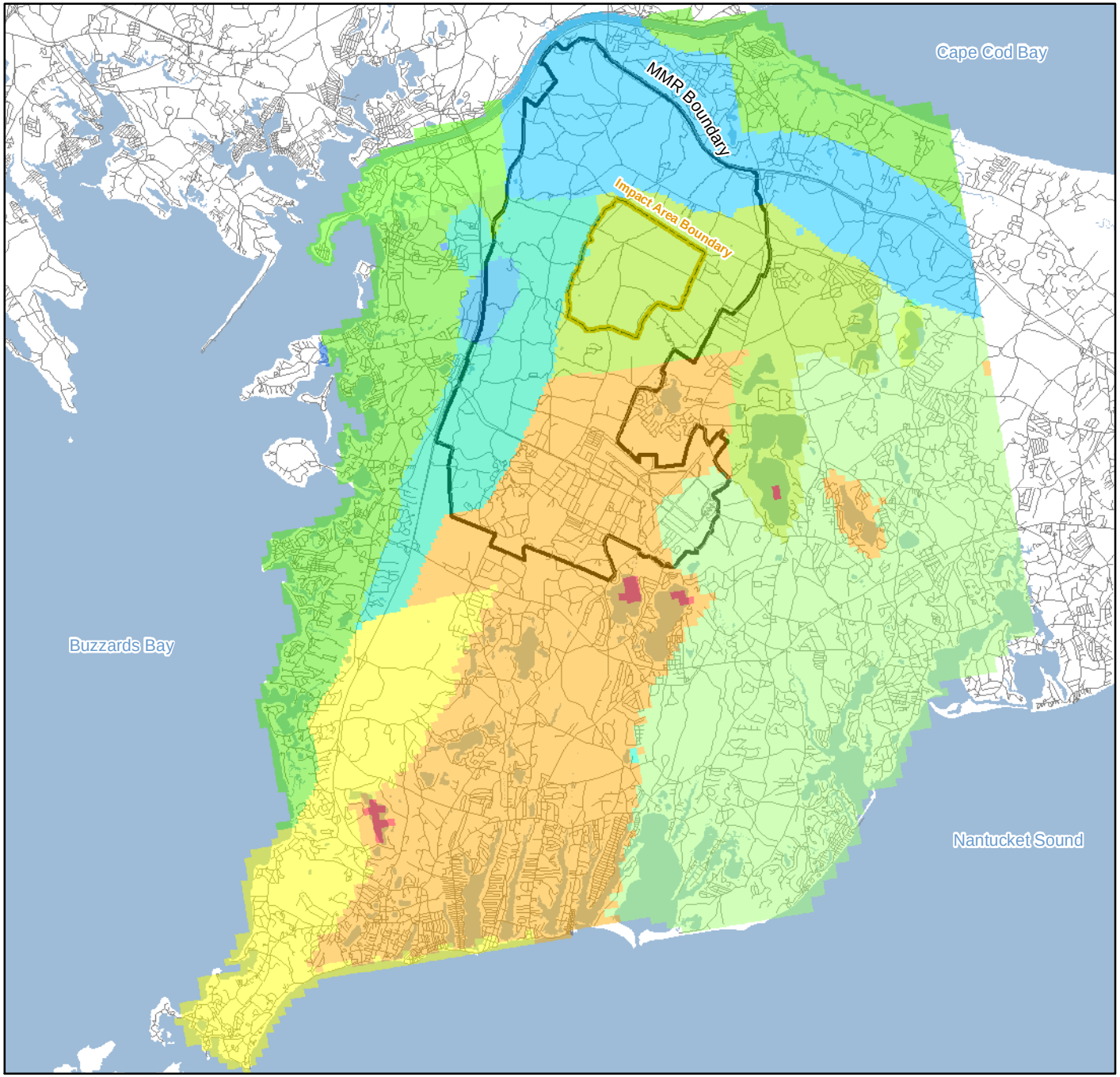
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7c.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7c.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7c



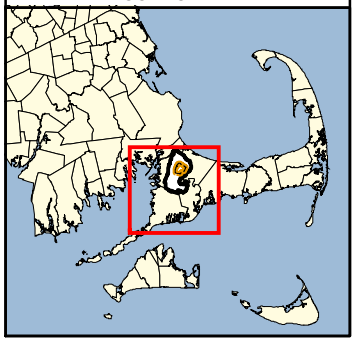
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	180
10	200
60	210
100	230
120	250
125	260
150	290
	50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 4

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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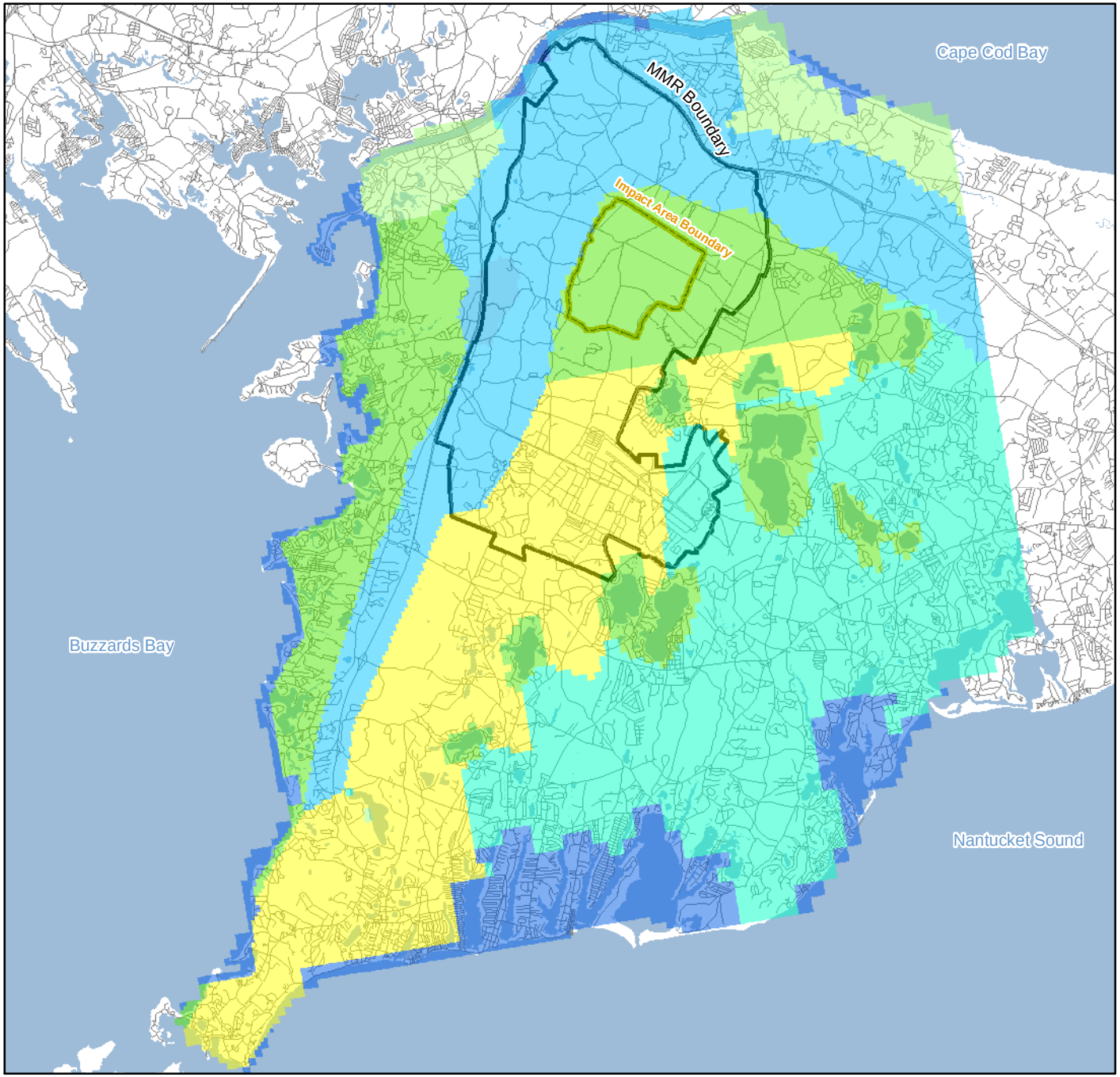
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7d.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7d.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7d



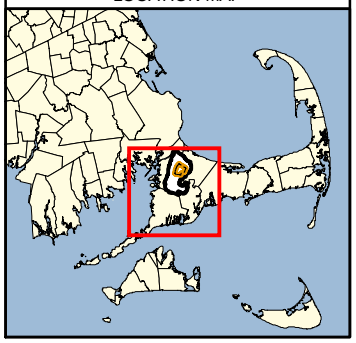
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	125
60	150
100	200
	260

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 5

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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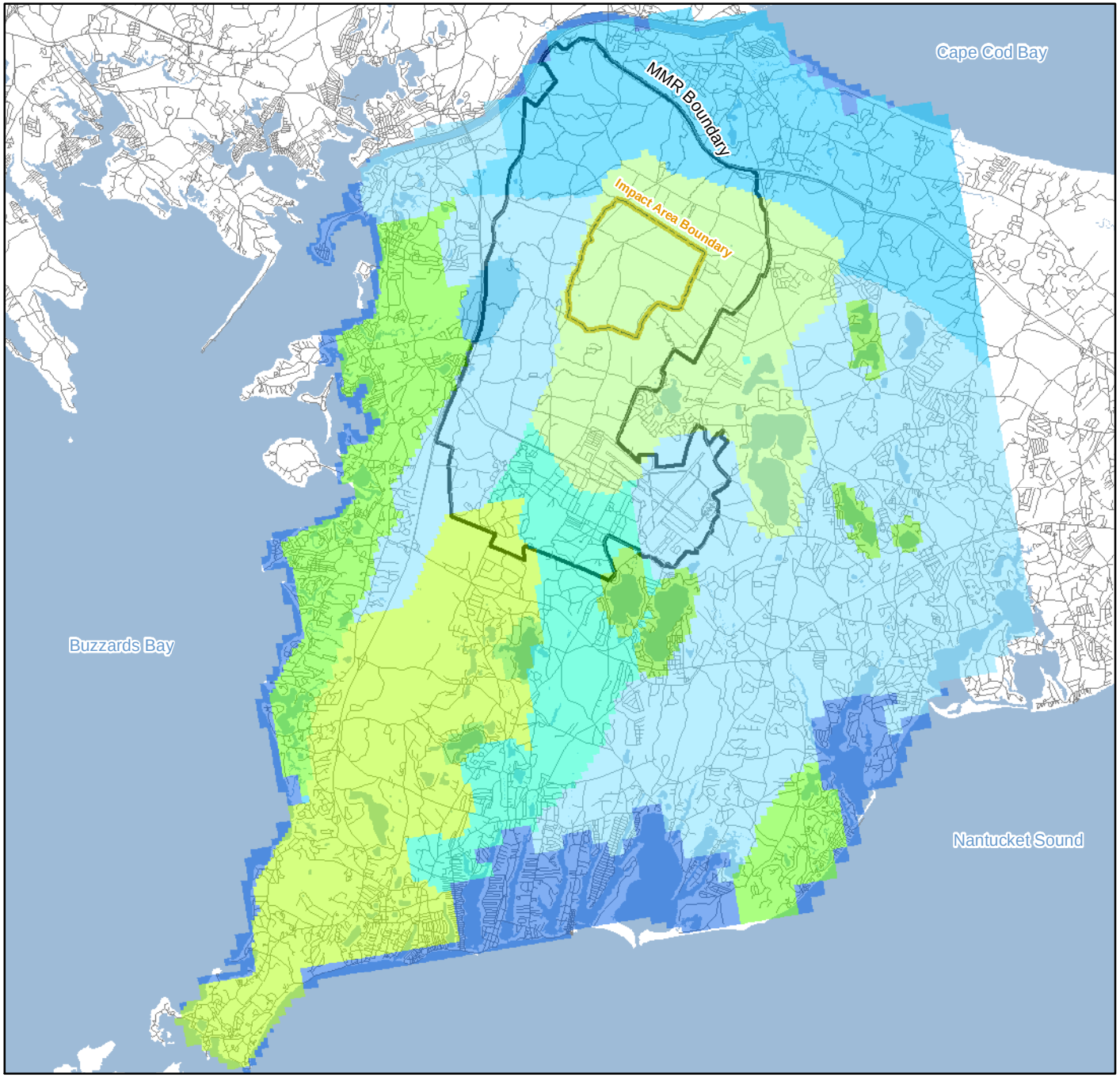
FIGURE

A2-7e

J:/mmr/ReportFigs2004/D8706/8706_FigA2-7e.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7e.mxd
May 20, 2004 ALS JEP JBB



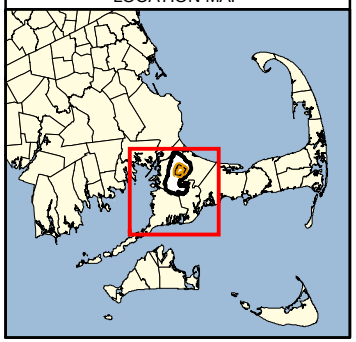
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	125
60	150
70	180
90	200
	230

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 6

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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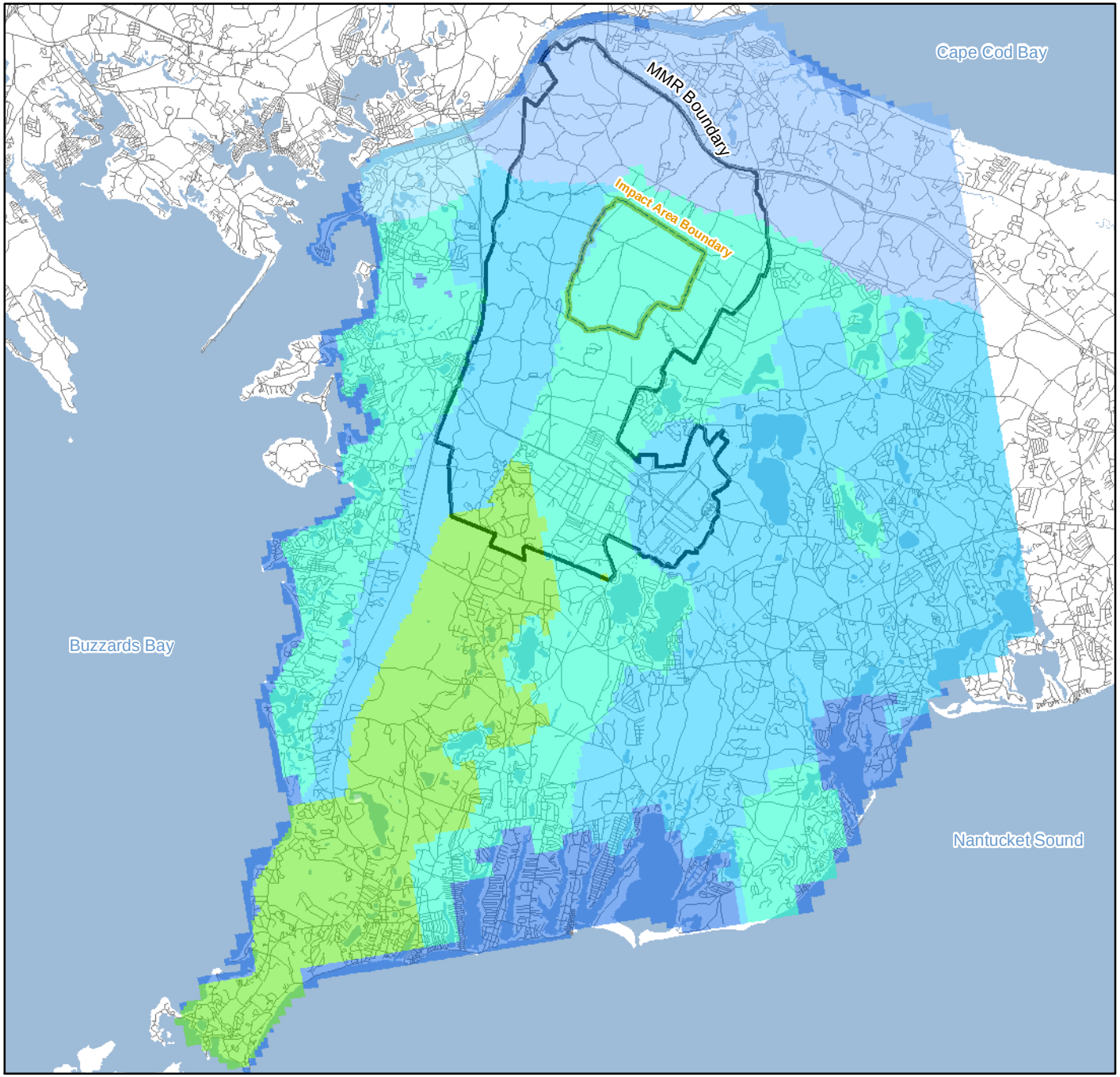
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7f.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7f.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7f



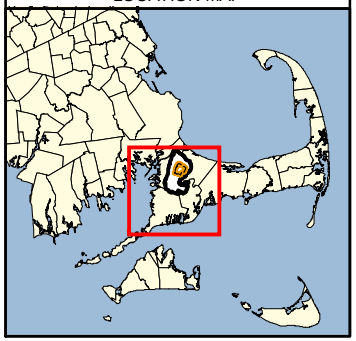
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	90
30	125
50	150
70	200

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 7

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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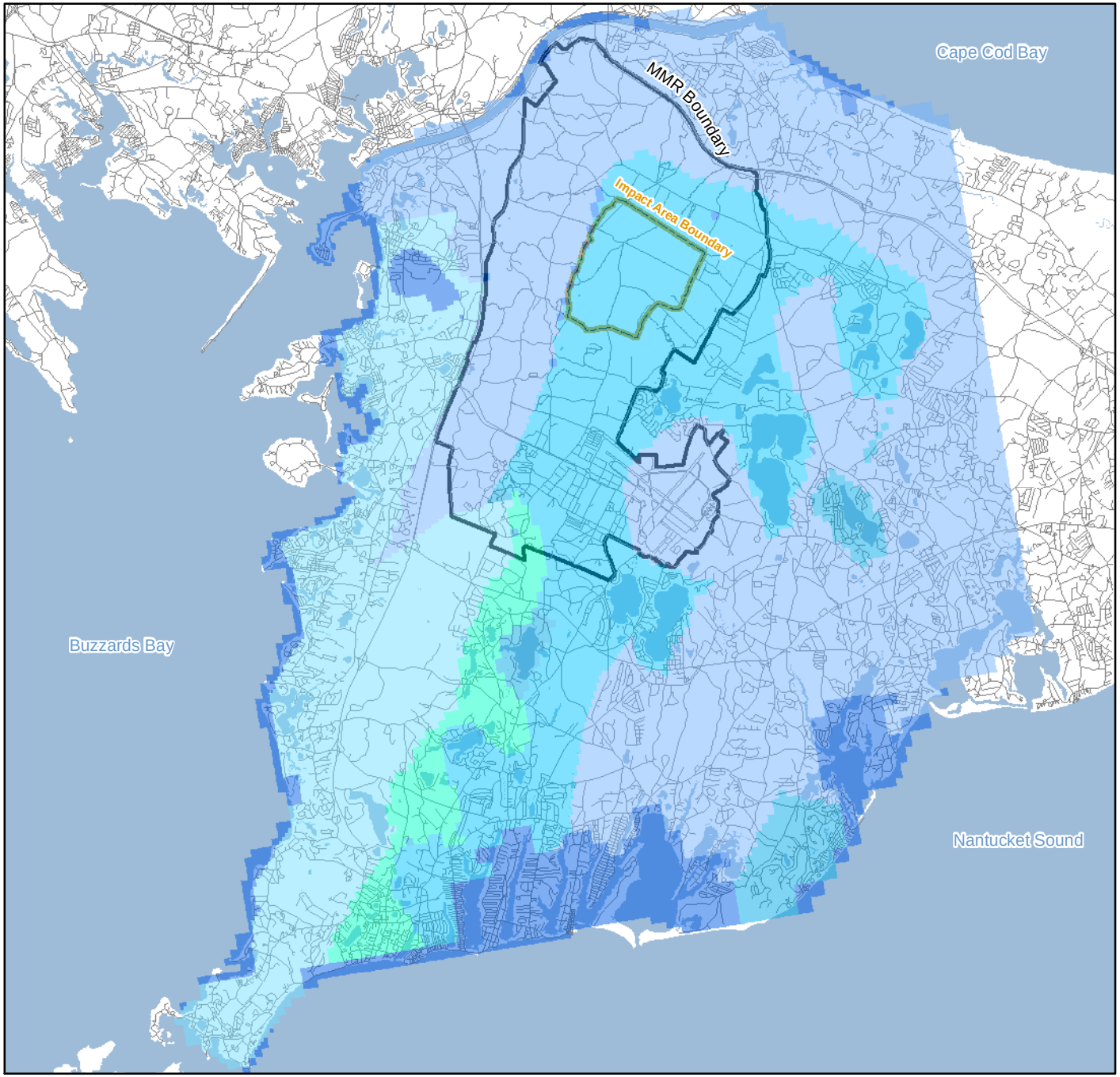
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7g.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7g.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7g



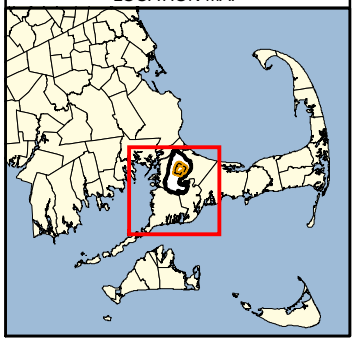
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	70
10	90
50	100
	125

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 8

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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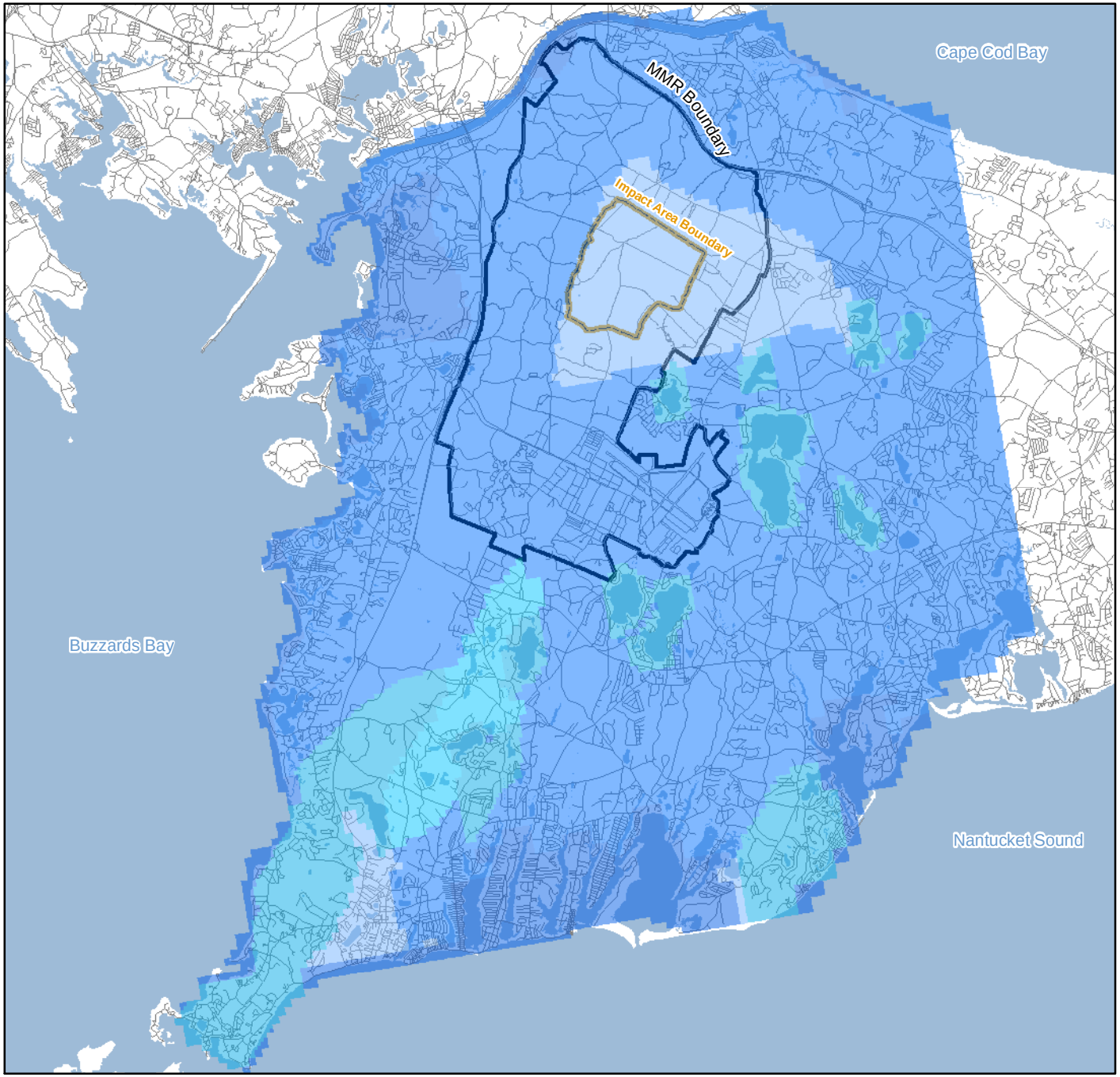
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7h.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7h.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7h



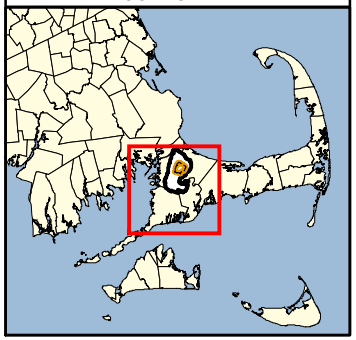
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0
30
50
70
90

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 9

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

DRAFT

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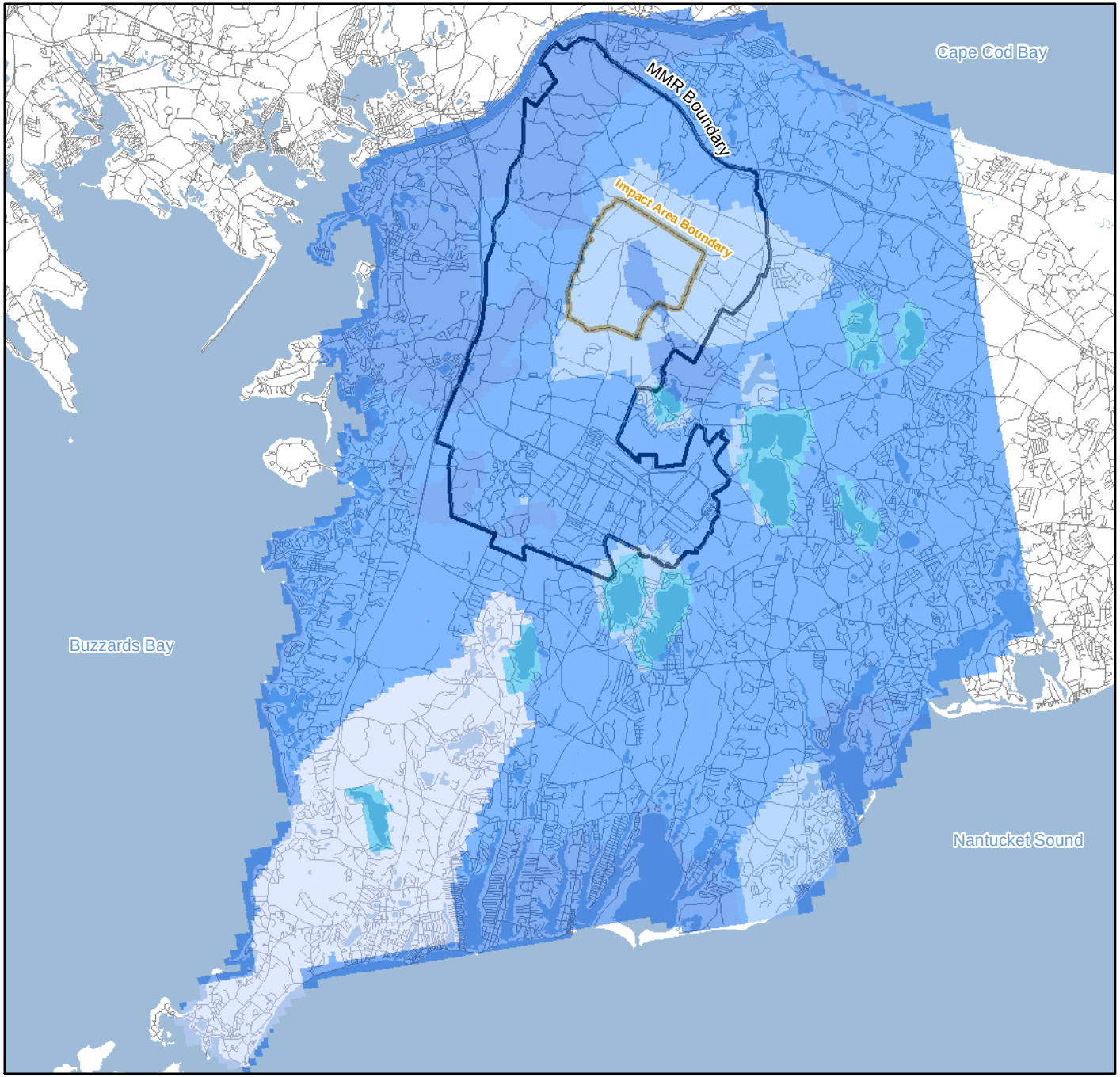
Westford, Massachusetts

FIGURE

A2-7i

J:/mmr/ReportFigs2004/D8706/8706_FigA2-7i.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7i.mxd
May 20, 2004 ALS JEP JBB



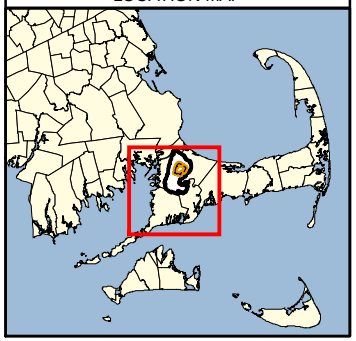
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0	30
10	50
	70

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 10

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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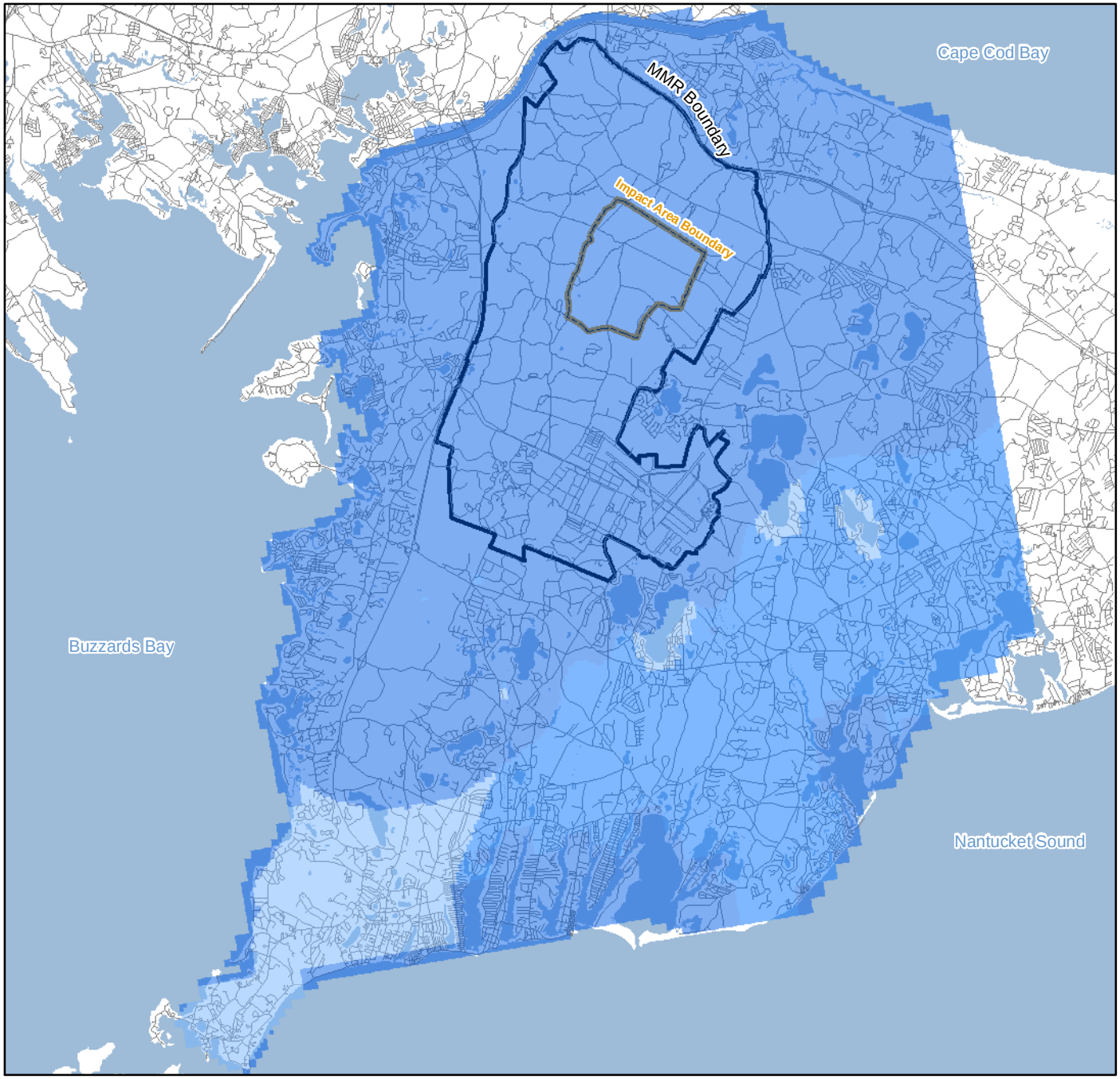
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7j.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7j.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7j



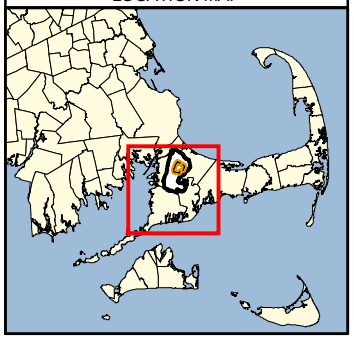
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

- 0
- 10
- 30

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Calibrated Hydraulic Conductivity Zones for Model MMR-10 Layer 11

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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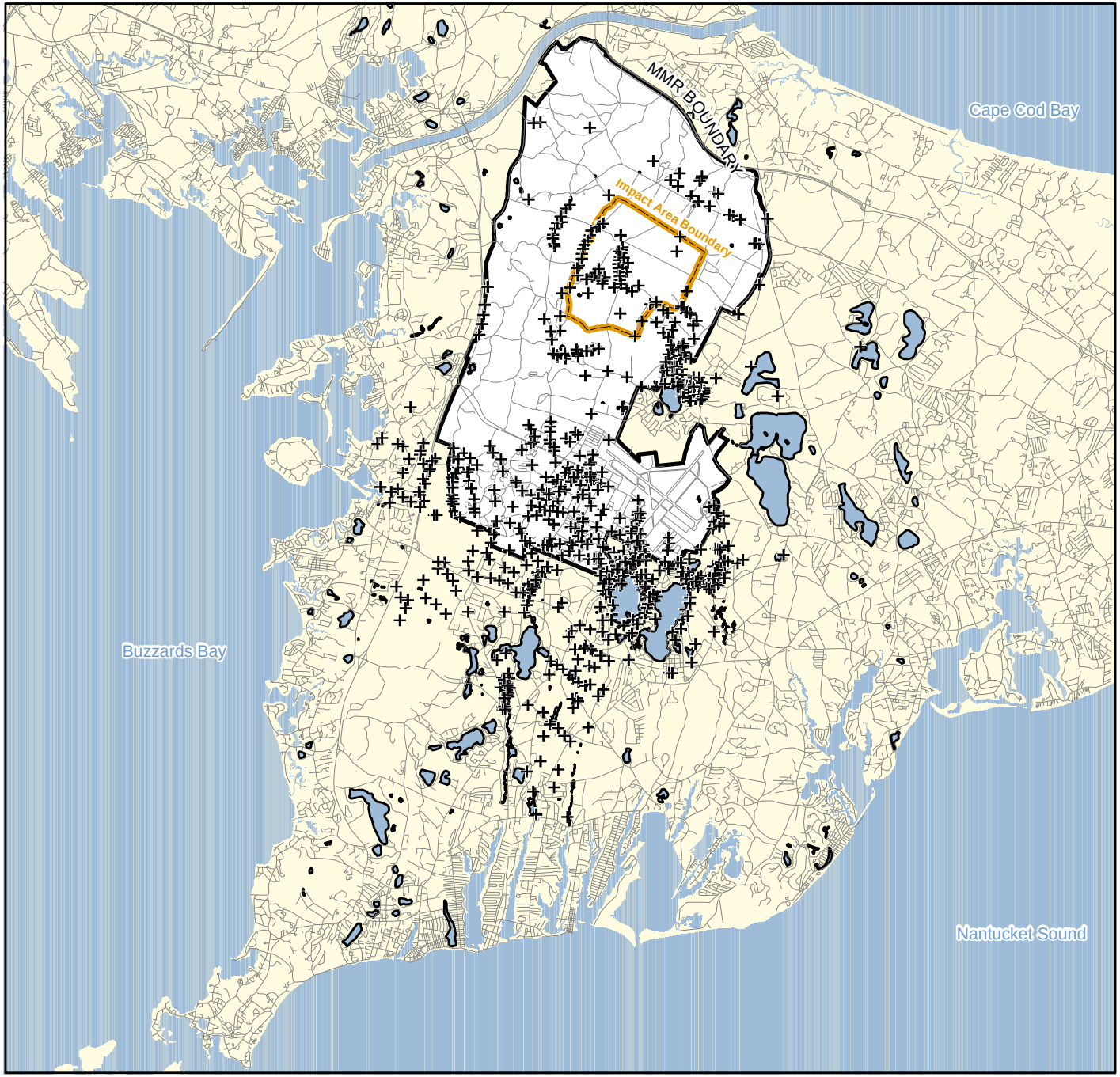
J:/mmr/ReportFigs2004/D8706/8706_FigA2-7k.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-7k.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A2-7k



Impact Area
Groundwater Study Program

LEGEND

+ Well Locations

LOCATION MAP

NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Year 2000 Groundwater Elevation Targets Considered in MMR-10 Calibration

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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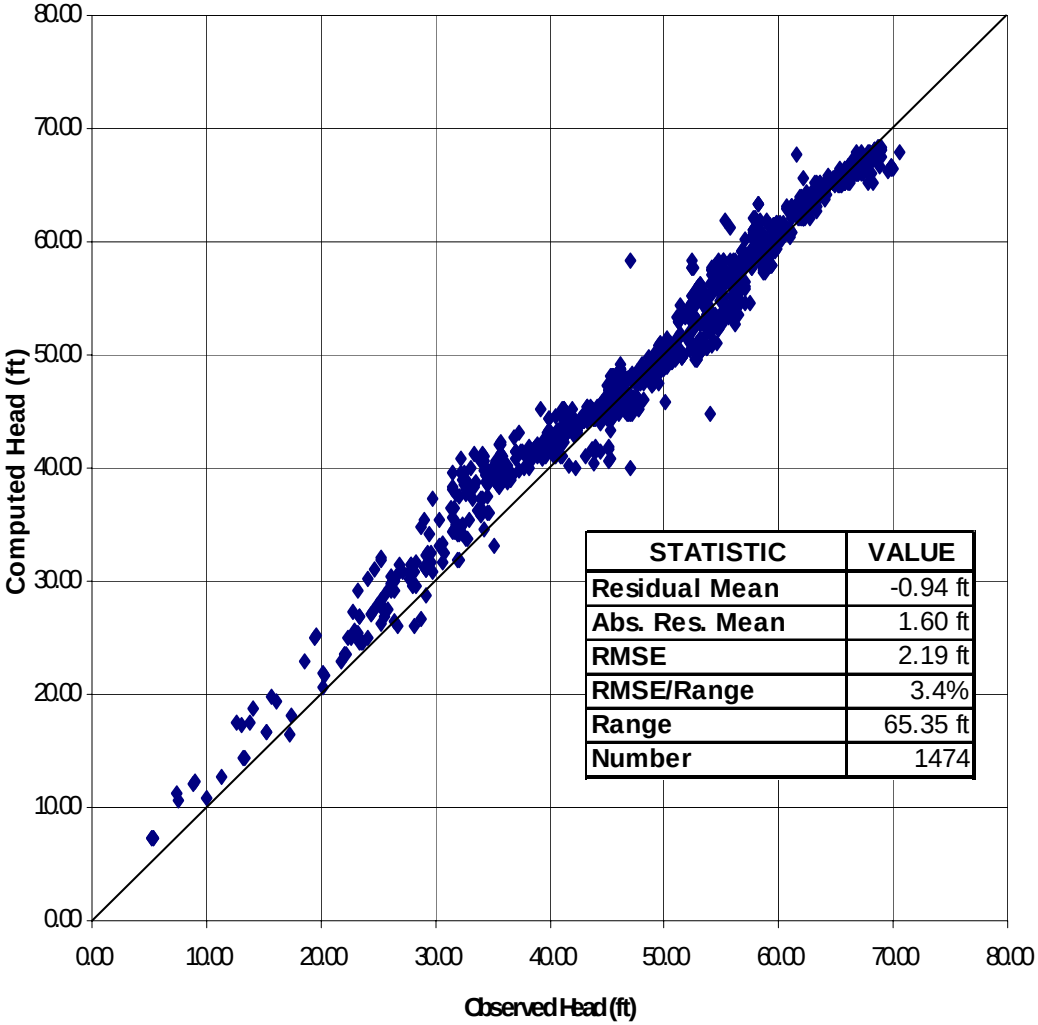
J:/mmr/ReportFigs2004/D8706/8706_FigA2-8.pdf
G:/MMR_COE/work/D8706/8706_FigA2-8.mxd
May 20, 2004 AP JBB

FIGURE

A2-8



STATISTIC	VALUE
Residual Mean	-0.94 ft
Abs. Res. Mean	1.60 ft
RMSE	2.19 ft
RMSE/Range	3.4%
Range	65.35 ft
Number	1474

Figure A2-9. Observed vs. Computed Year 2000 Groundwater Elevations

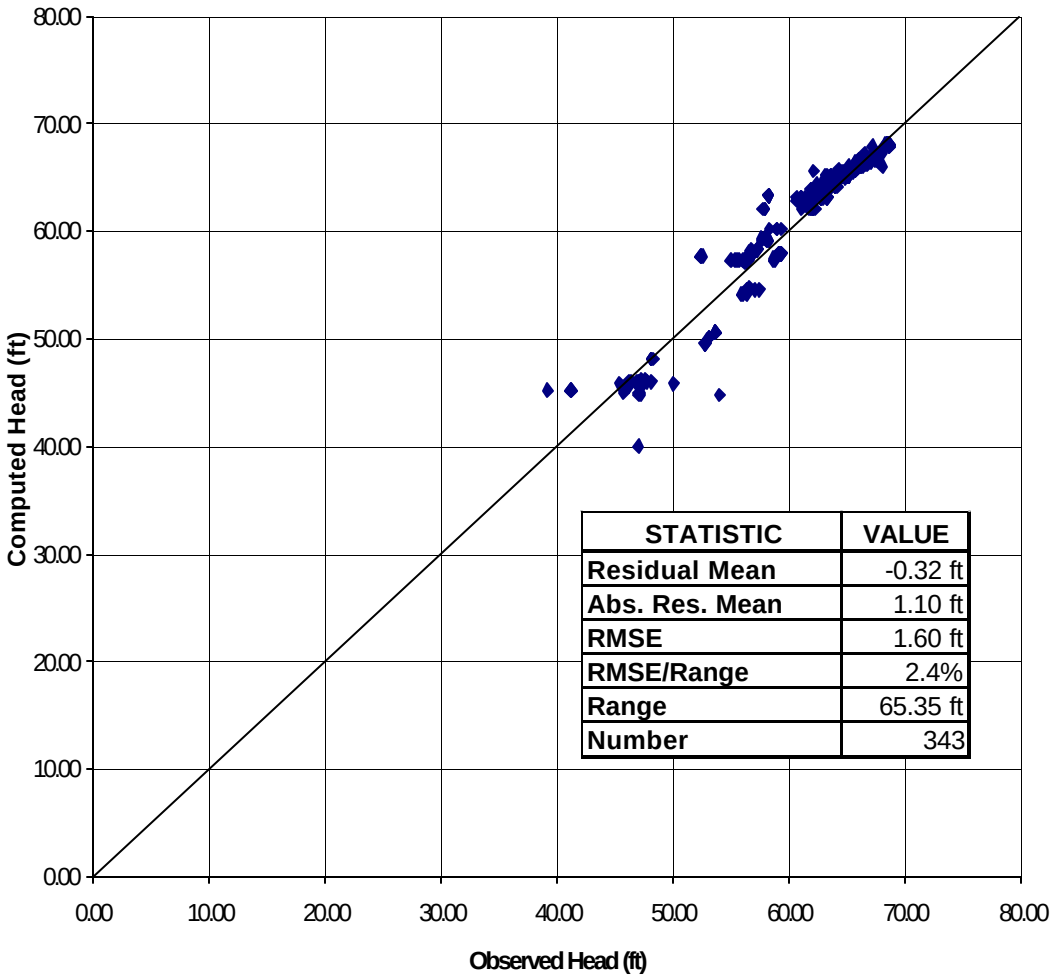
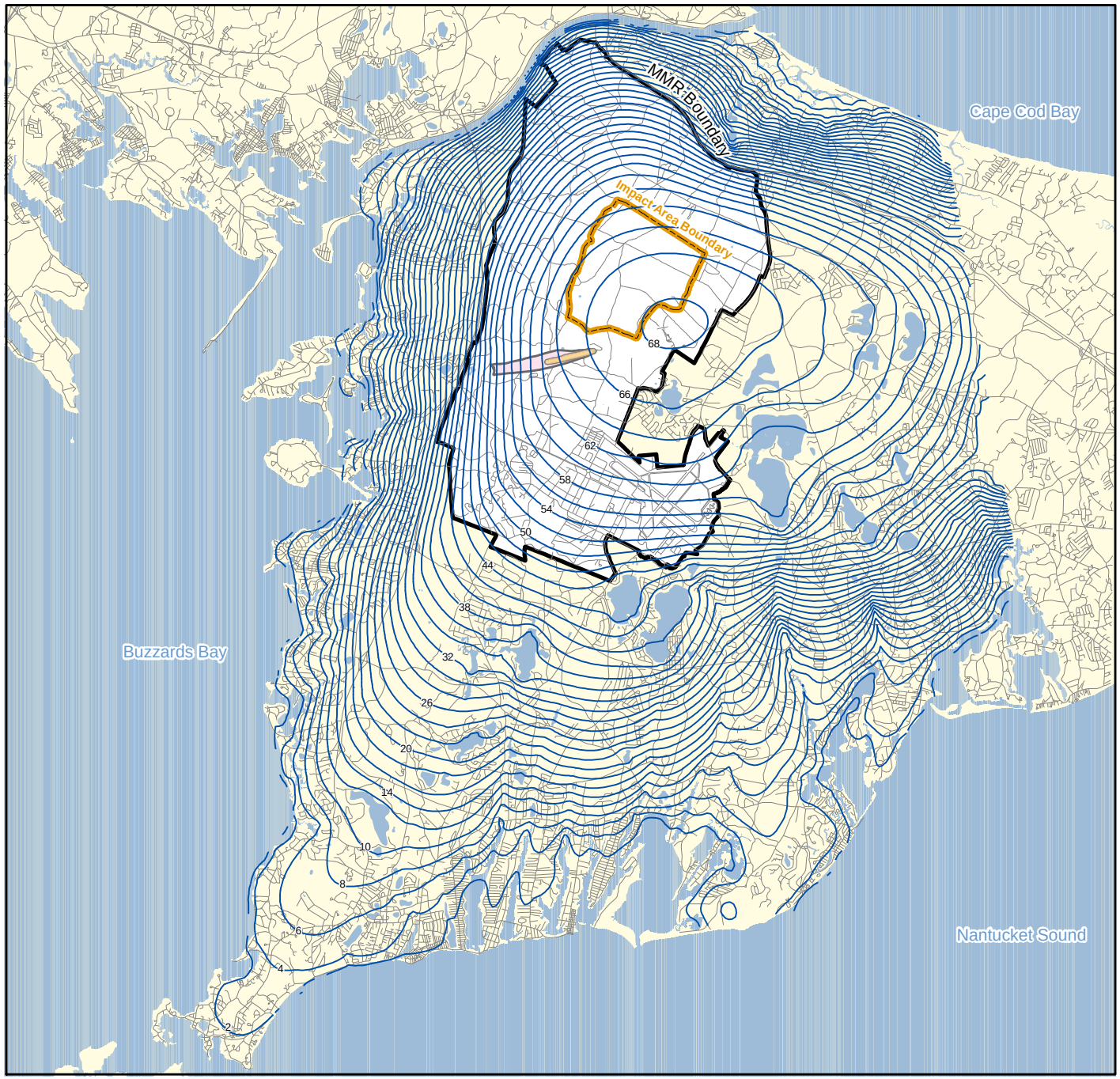


Figure A2-10. Observed vs. Computed Year 2000 Groundwater Elevations North and West of Snake Pond

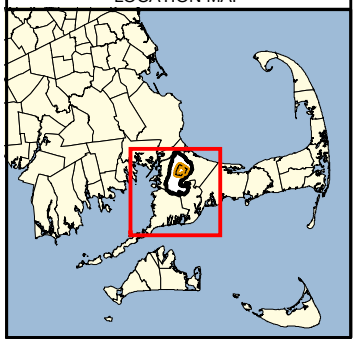


Impact Area
Groundwater Study Program

LEGEND

- Groundwater Contours (Model MMR-10) (2 ft)
- RDX Plume Extent
- Perchlorate Plume Extent

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Final Calibrated Watertable Contours for MMR-10

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2 Miles

N

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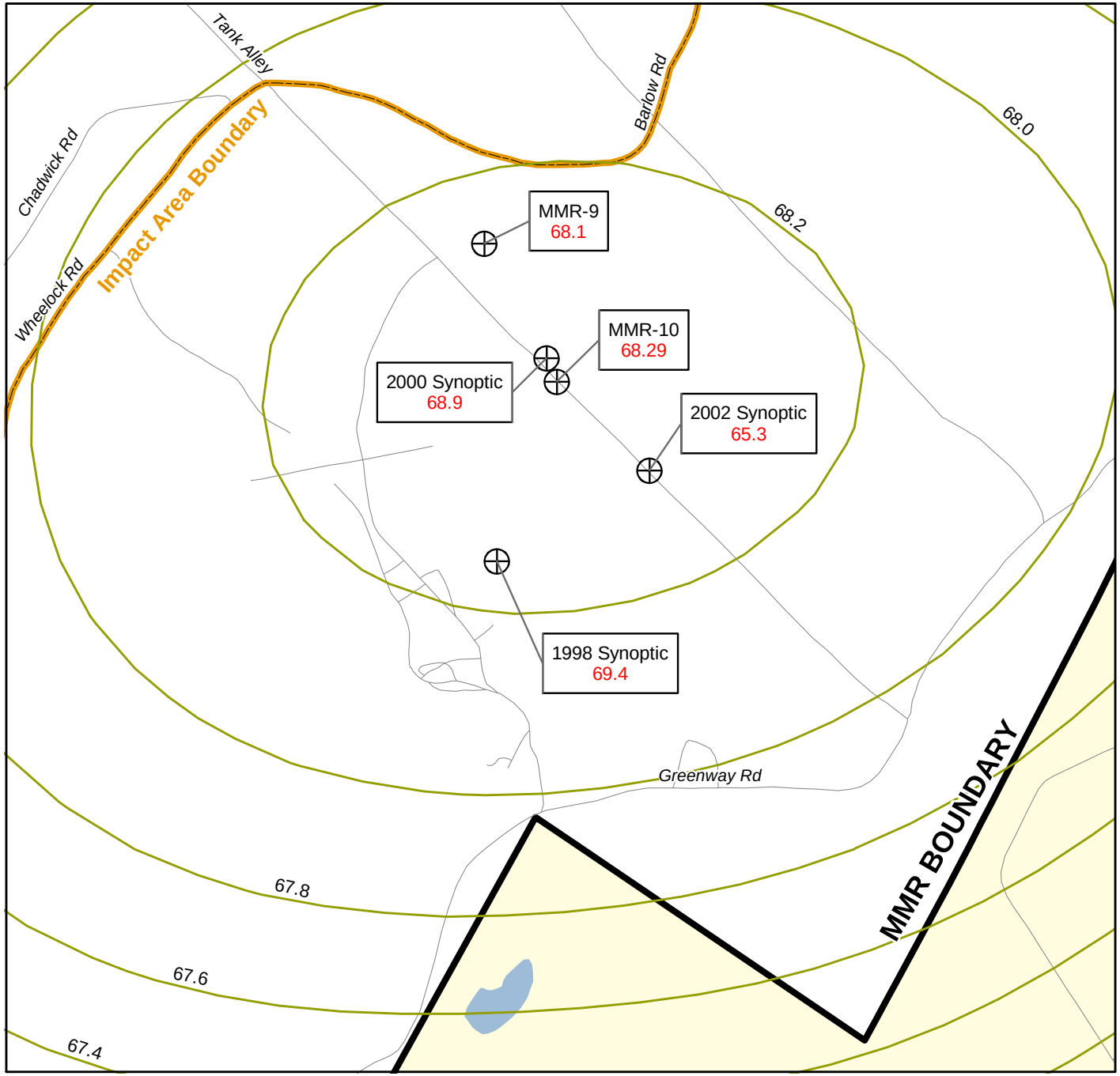
J:/mmr/ReportFigs2004/D8706/8706_FigA2-11.pdf
G:/MMR_COE/work/D8706/8706_FigA2-11.mxd
May 20, 2004 AP JBB

FIGURE

A2-11



Impact Area
Groundwater Study Program

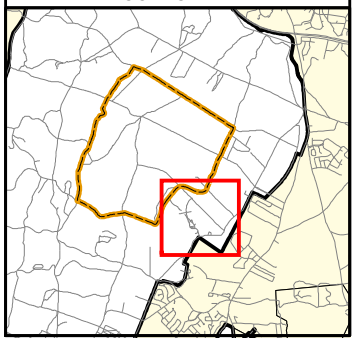
LEGEND

Top-of-Mound Locations

Model or Measurement Date
Elevation (ft)

Modeled Watertable Elevation Contours (ft)

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Correlation of Simulated and Observed Top-of-Mound Locations
Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 500 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA2-12.pdf
G:/MMR_COE/work/D8706/8706_FigA2-12.mxd
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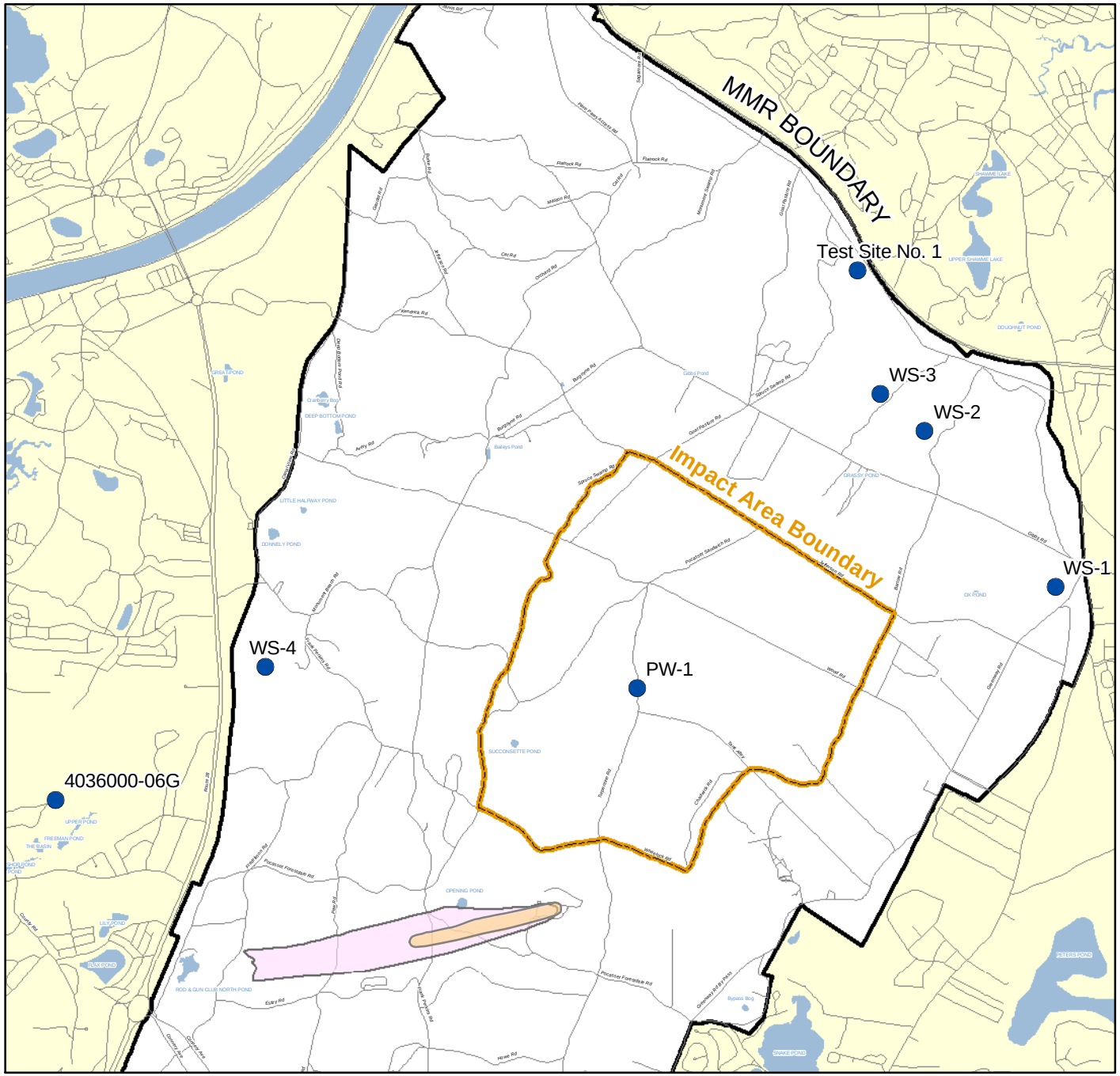
FIGURE
A2-12

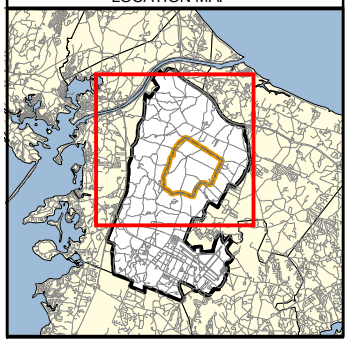


Impact Area
Groundwater Study Program

LEGEND

- Pumping Test Wells
- Perchlorate Plume Extent
- RDX Plume Extent

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Location of Long-term Pumping Tests Considered in MMR-10 Calibration

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA2-13.pdf
G:/MMR_COE/Work/D8706/8706_FigA2-13.mxd
May 20, 2004 AP JBB

FIGURE
A2-13

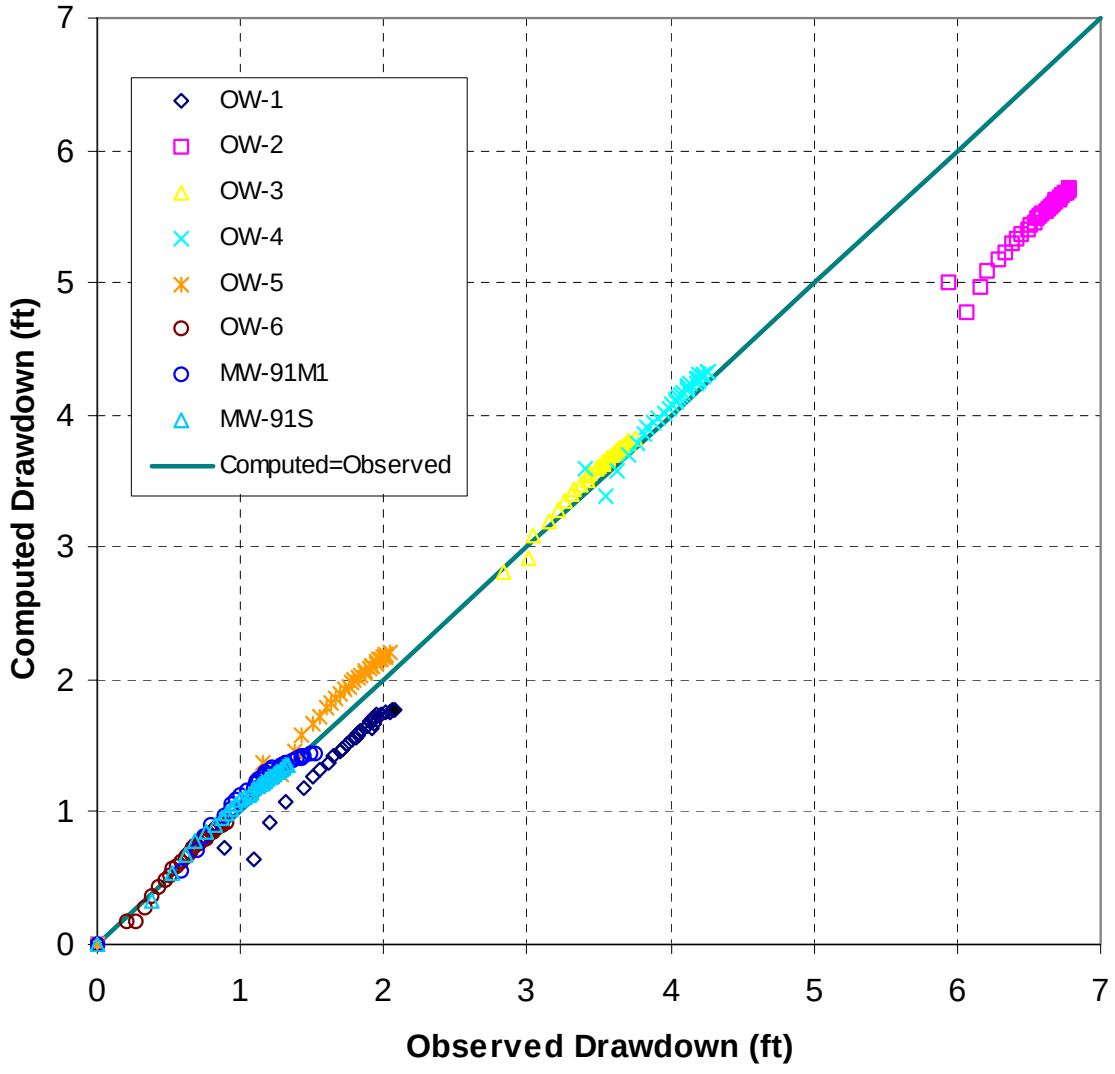


Figure A2-14. Observed vs Computed Drawdown for Long-term Pumping Test at PW-1.

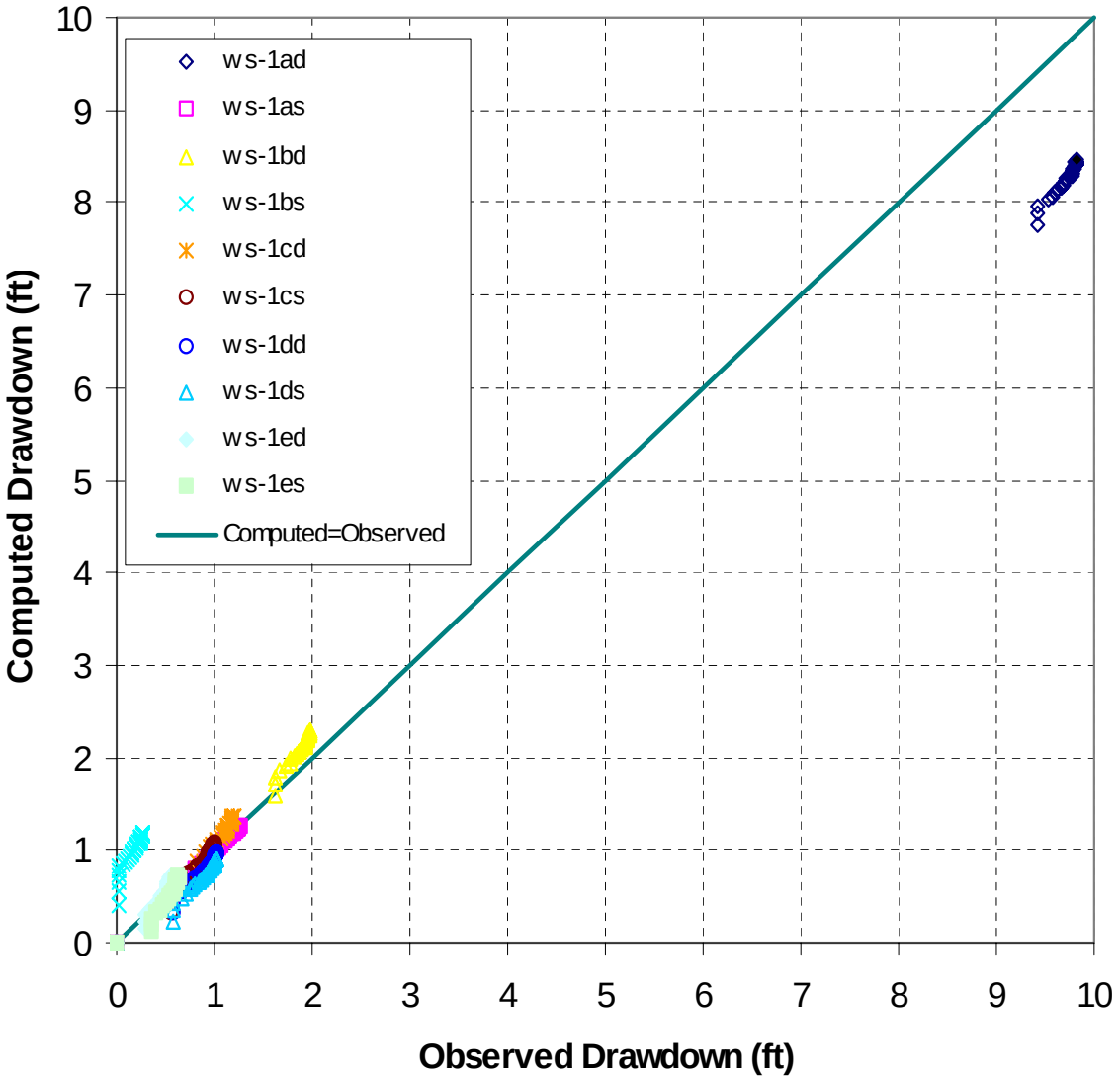


Figure A2-15. Observed vs Computed Drawdown for Long-term Pumping Test at WS-1.

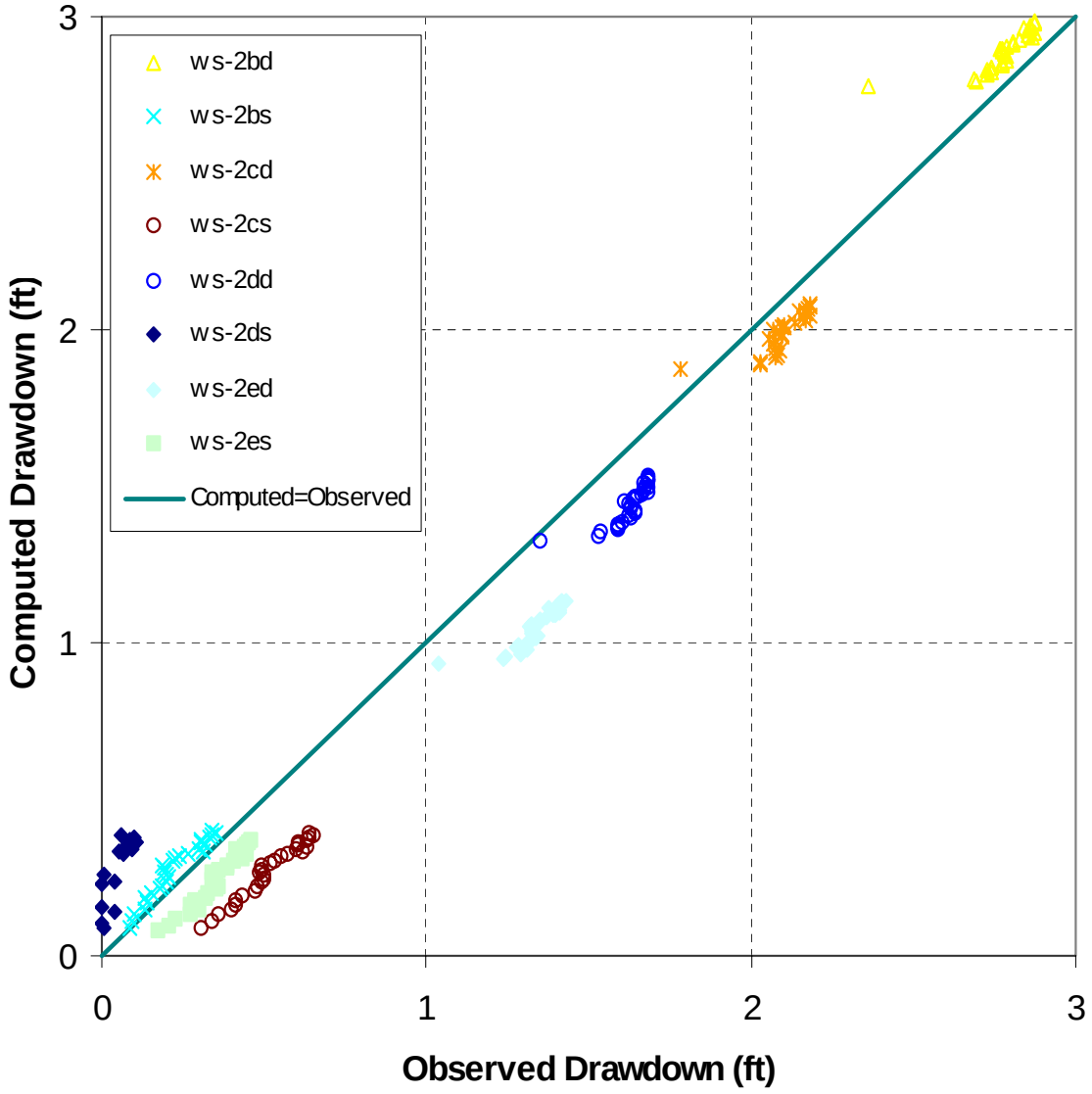


Figure A2-16. Observed vs Computed Drawdown for Long-term Pumping Test at WS-2.

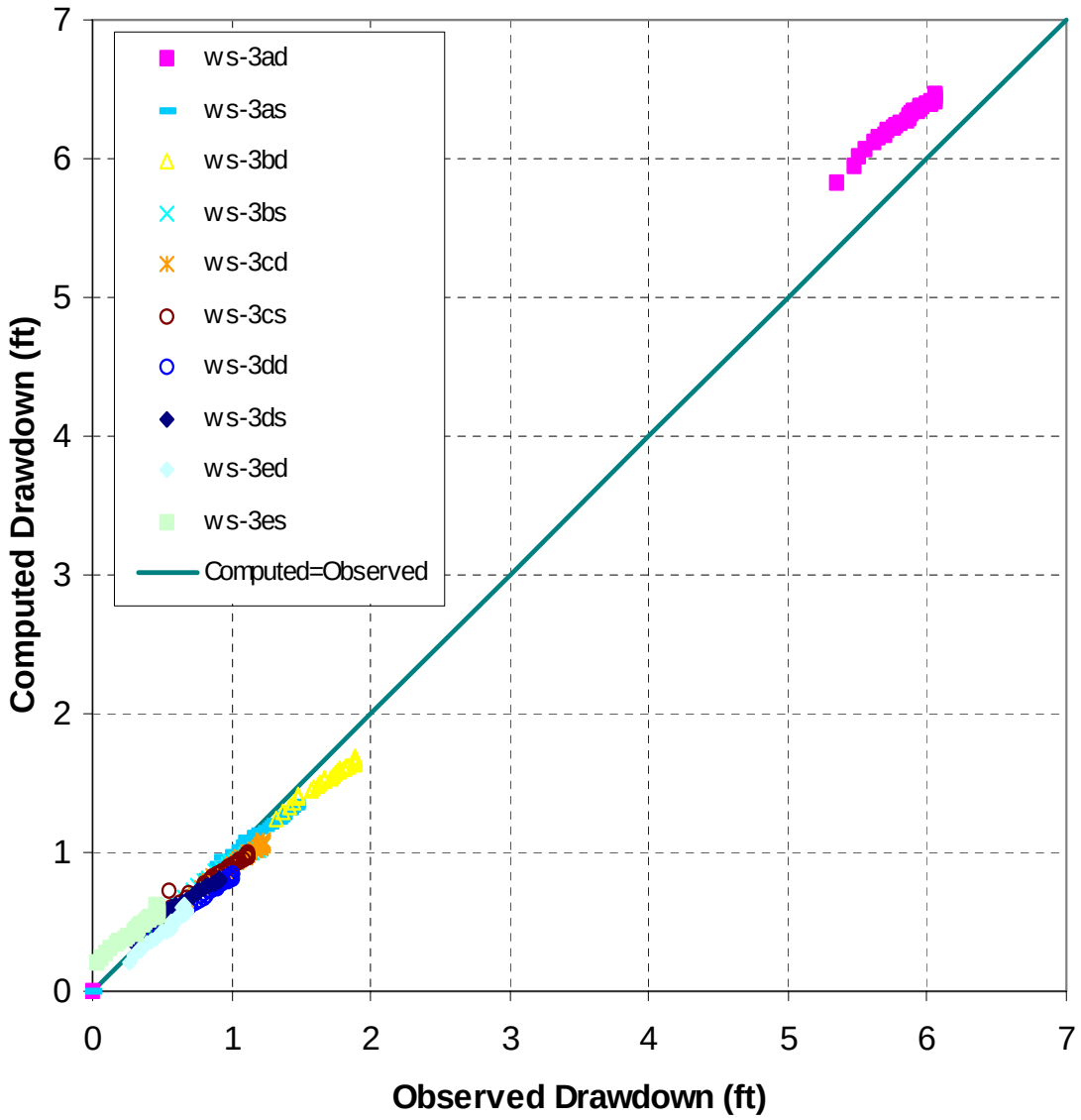


Figure A2-17. Observed vs Computed Drawdown for Long-term Pumping Test at WS-3.

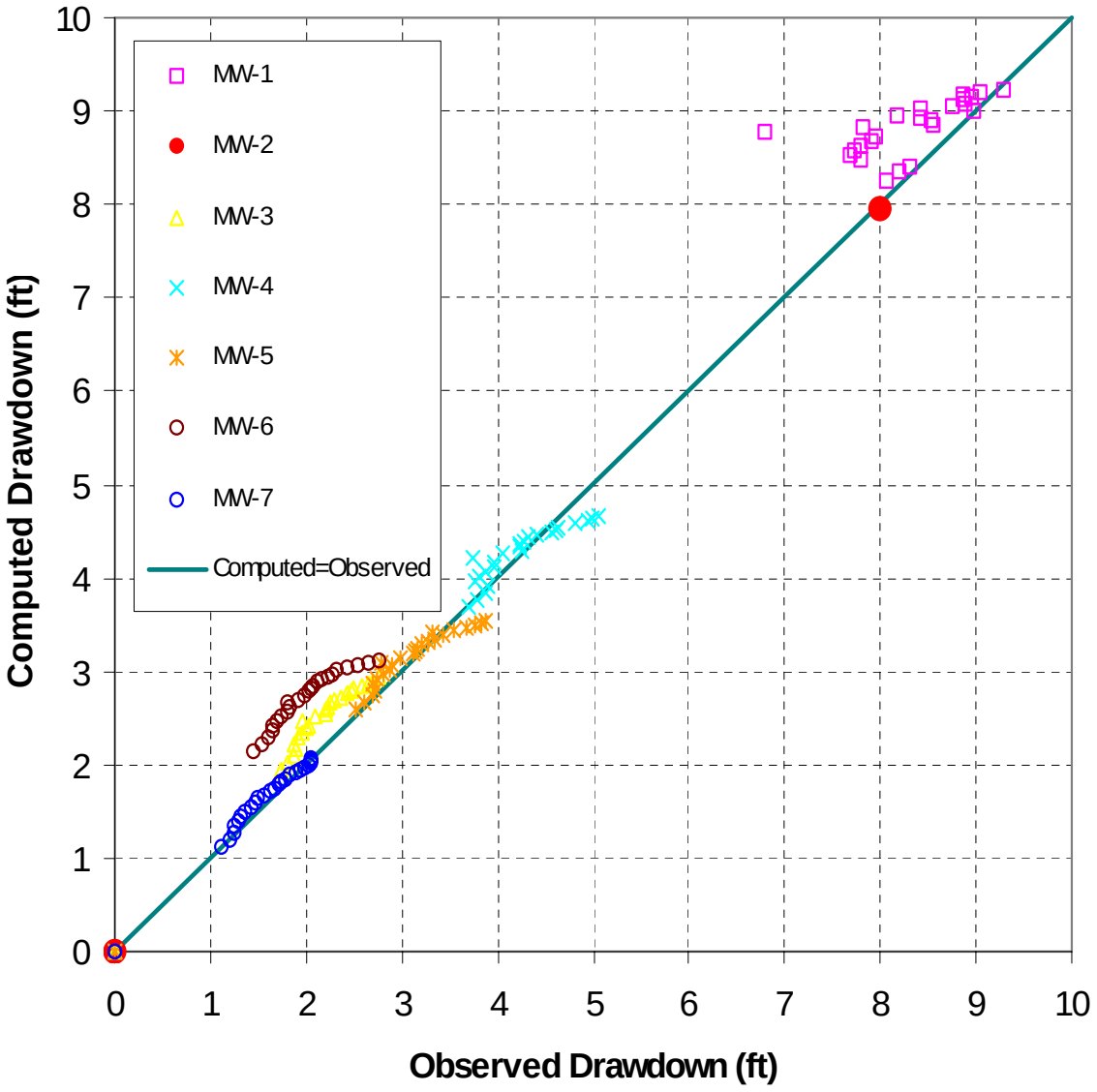


Figure A2-18. Observed vs Computed Drawdown for Long-term Pumping Test at Test Site No. 1.

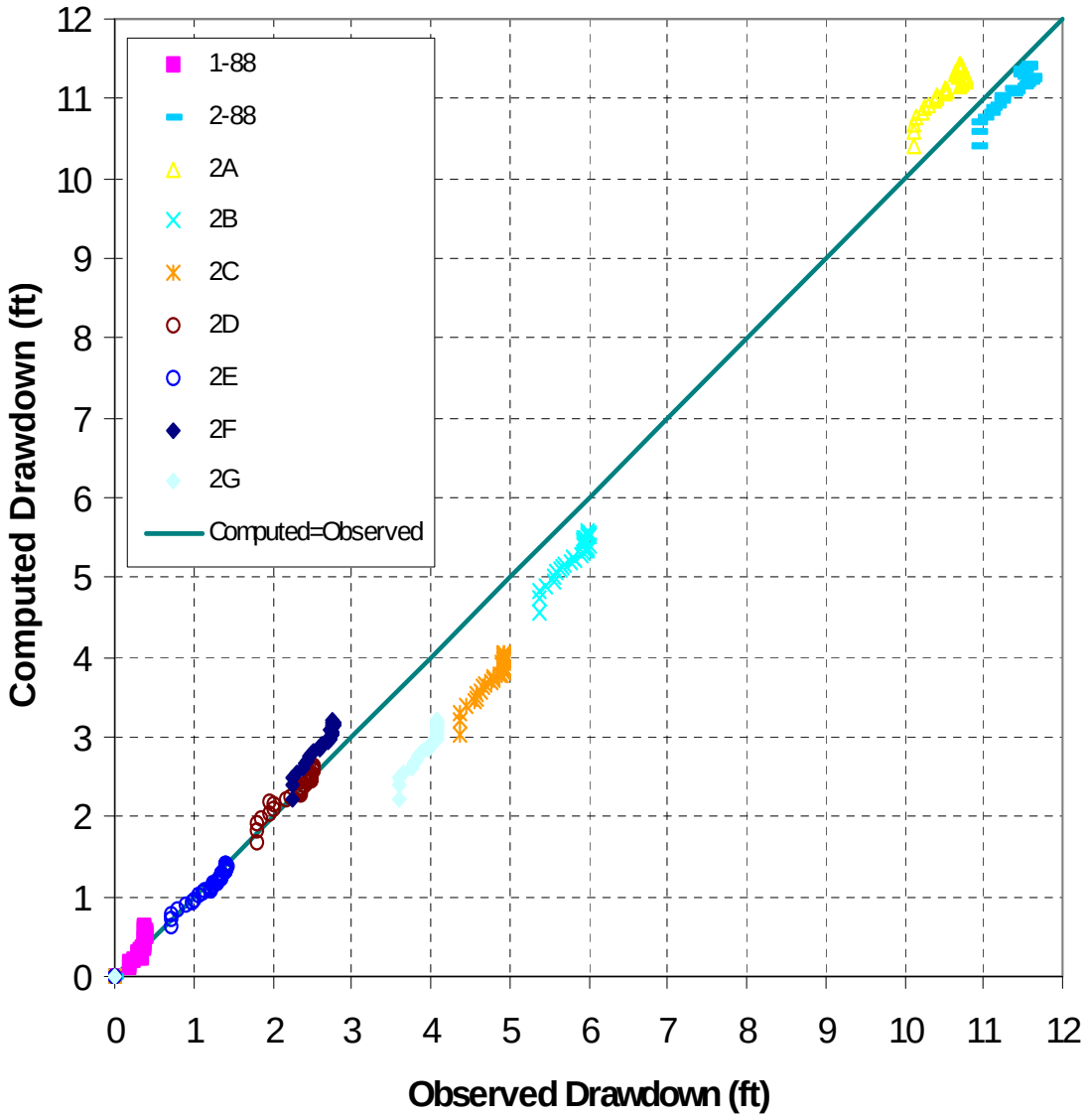


Figure A2-19. Observed vs Computed Drawdown for Long-term Pumping Test at Test Well 2-88.

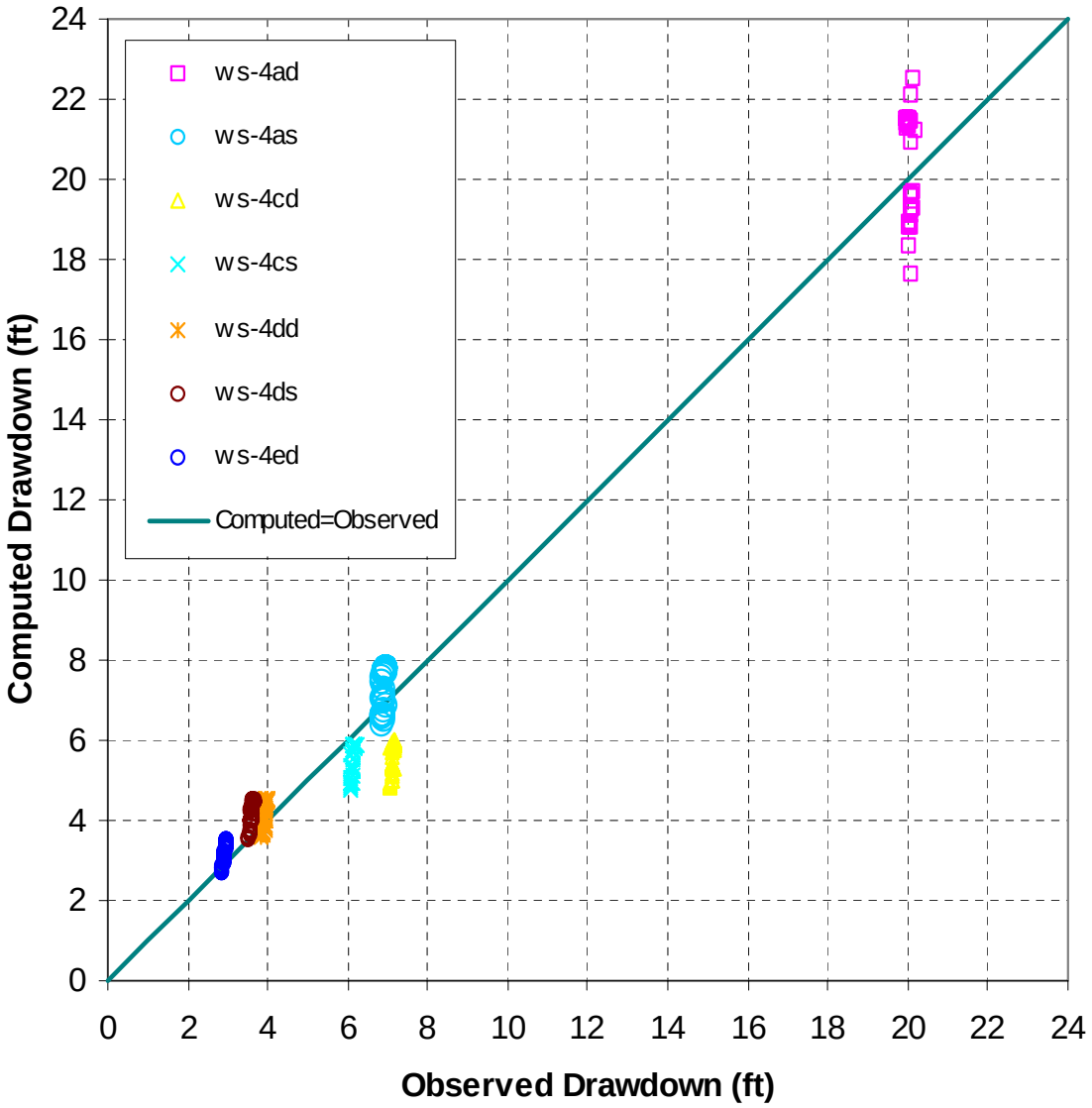


Figure A2-20. Observed vs Computed Drawdown for Long-term Pumping Test at WS-4.

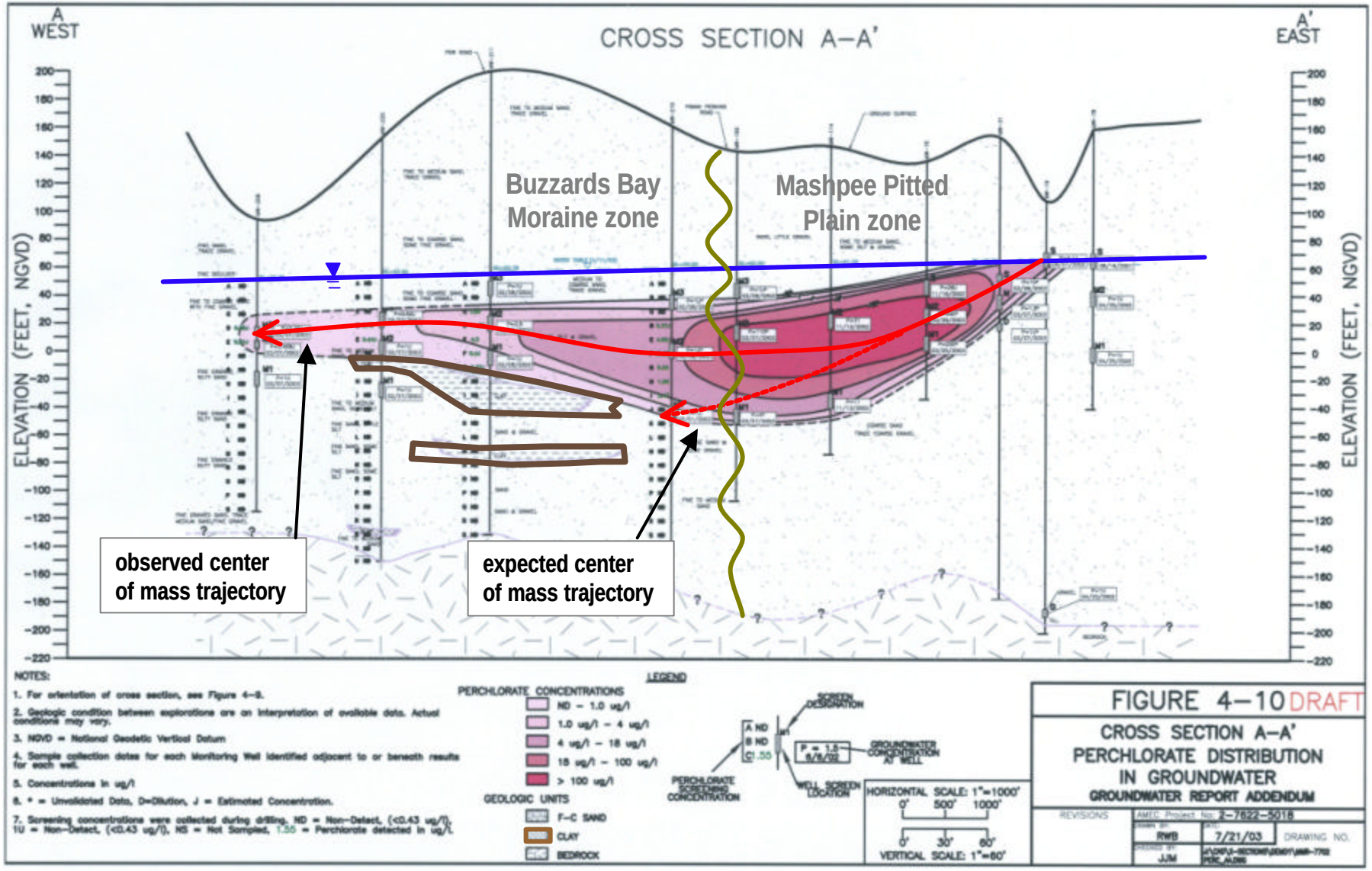
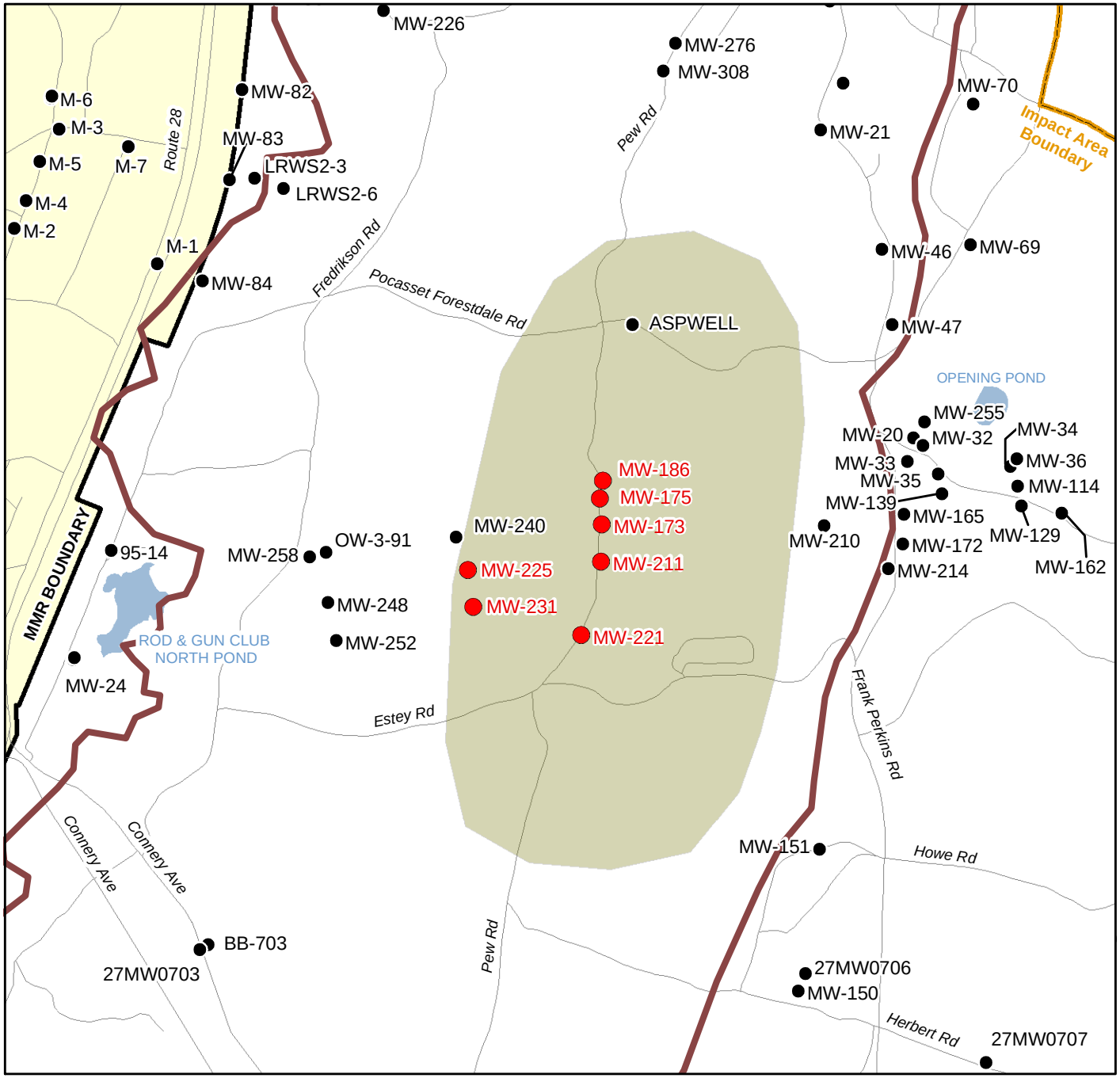


Figure A3-1. Conceptual Hydrostratigraphic Model and Interpreted Perchlorate Plume (adapted from Figure 4-10 of the Groundwater Report Addendum (AMEC, 2003d))

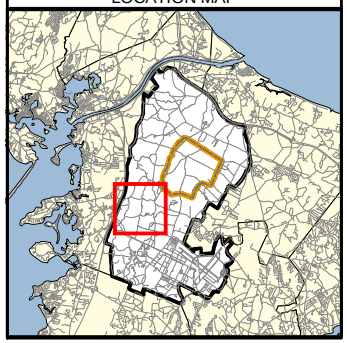


Impact Area Groundwater Study Program

LEGEND

- Existing Monitoring Wells
- Borings where clay is encountered
- Interpreted extent of clay deposits
- Buzzards Bay Moraine Boundary

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Interpreted Lateral Extent of Clay Deposits
Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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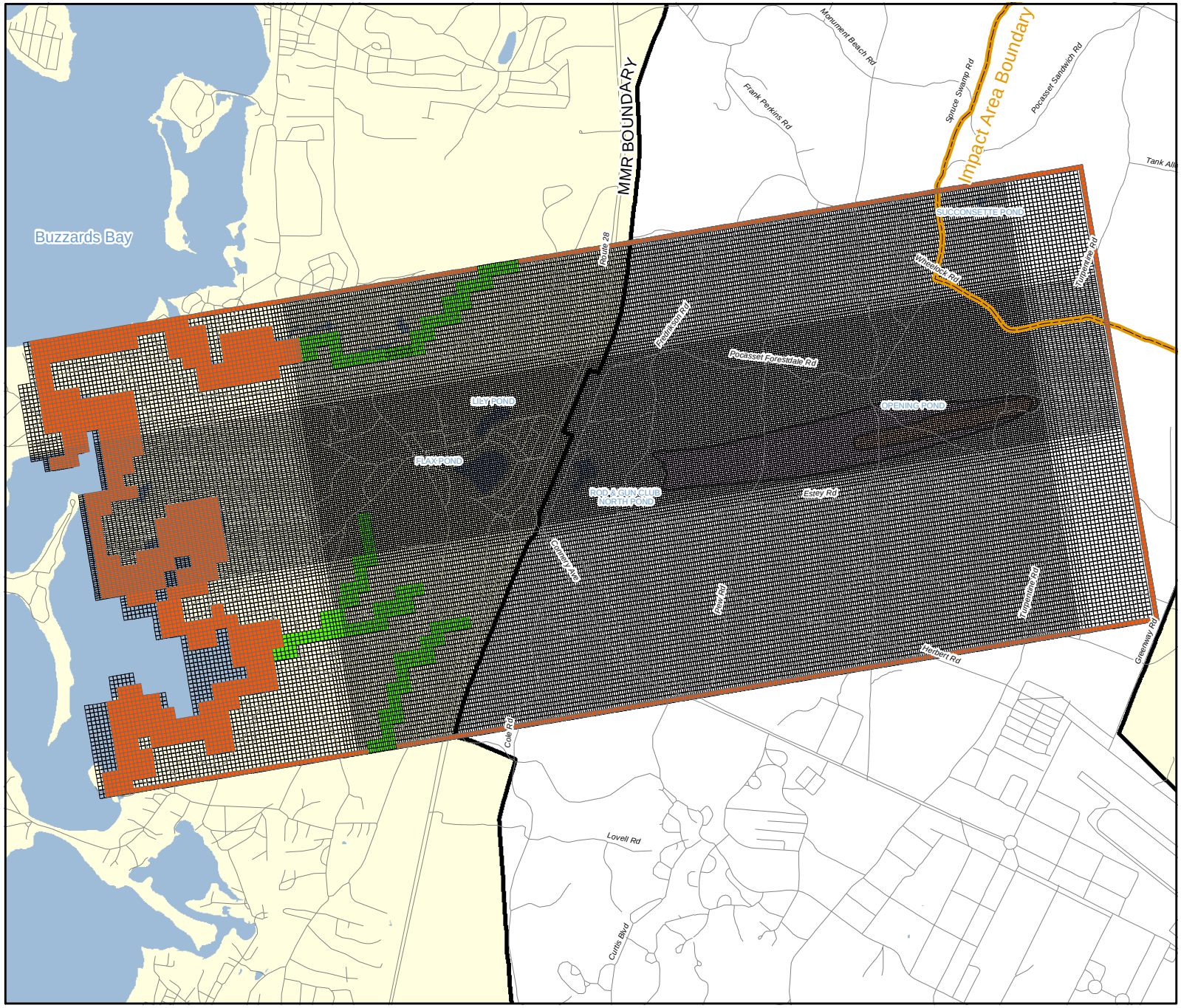
J:/mmr/ReportFigs2004/D8706/8706_FigA3-2.pdf
G:/MMR_COE/work/D8706/8706_FigA3-2.mxd
May 20, 2004 AP JBB

FIGURE
A3-2

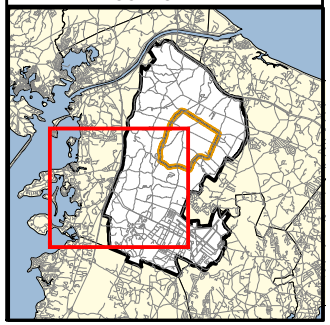


Impact Area Groundwater Study Program

LEGEND

- Drain
- General Head Boundary
- Perchlorate Plume Extent
- RDX Plume Extent

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Grid and Boundary Conditions

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 2,000 Feet

N

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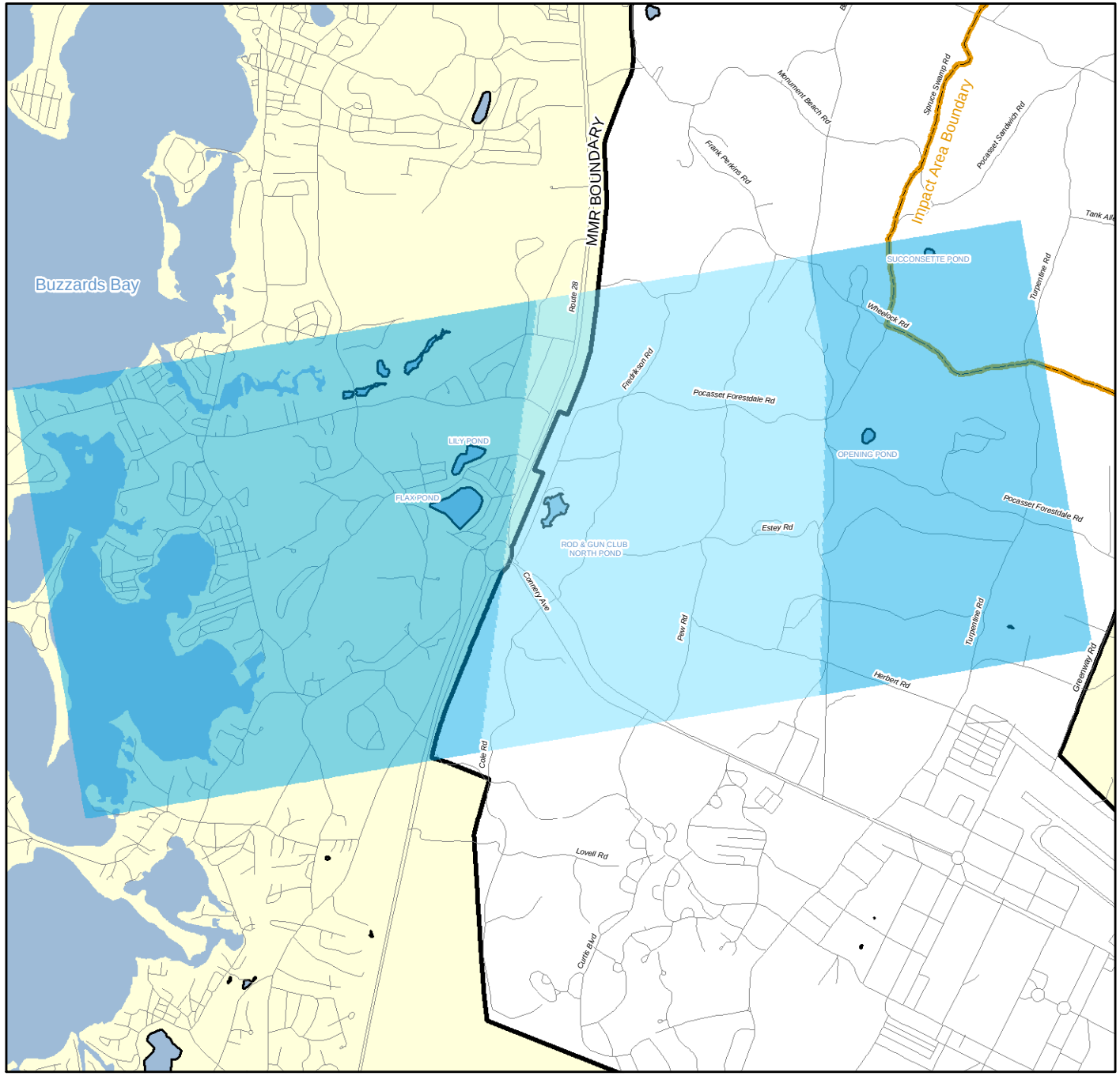
J:/mmr/ReportFigs2004/D8706/8706_FigA3-3.pdf
G:/MMR_COE/work/D8706/8706_FigA3-3.mxd
May 20, 2004 AP DNB JBB

FIGURE
A3-3



Impact Area Groundwater Study Program

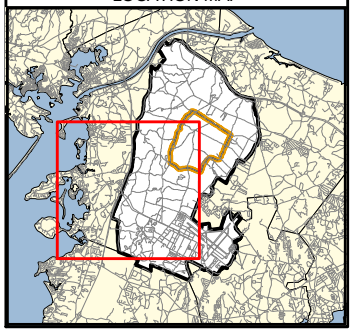
LEGEND

Recharge Rate (in/yr)

19

27

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Recharge Zonation

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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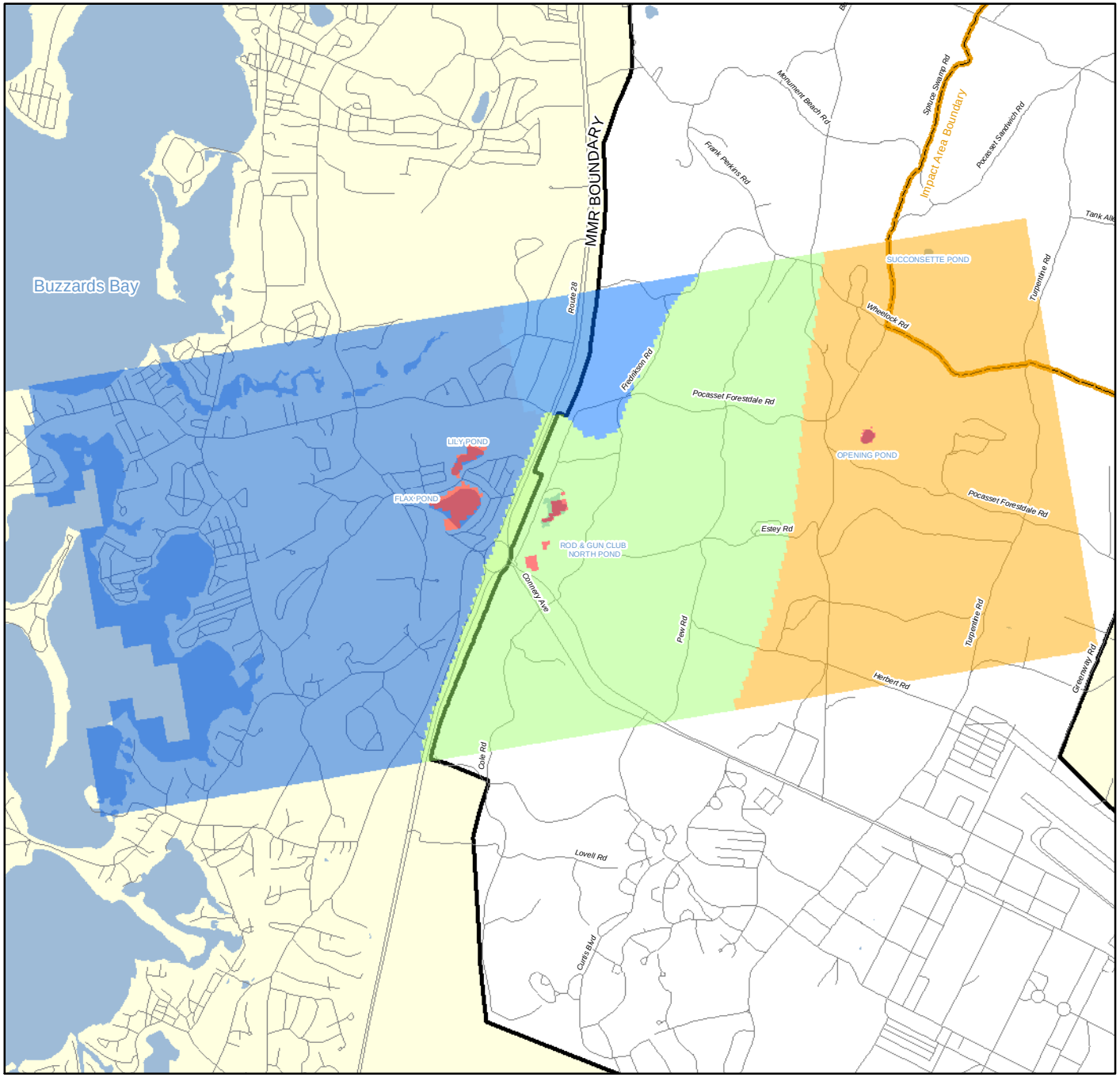
J:/mmr/ReportFigs2004/D8706/8706_FigA3-4.pdf
G:/MMR_COE/work/D8706/8706_FigA3-4.mxd
May 20, 2004 AP JBB

FIGURE

A3-4



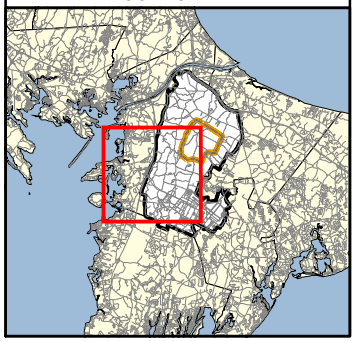
Impact Area Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

- 1
- 35
- 160
- 290
- 50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 1

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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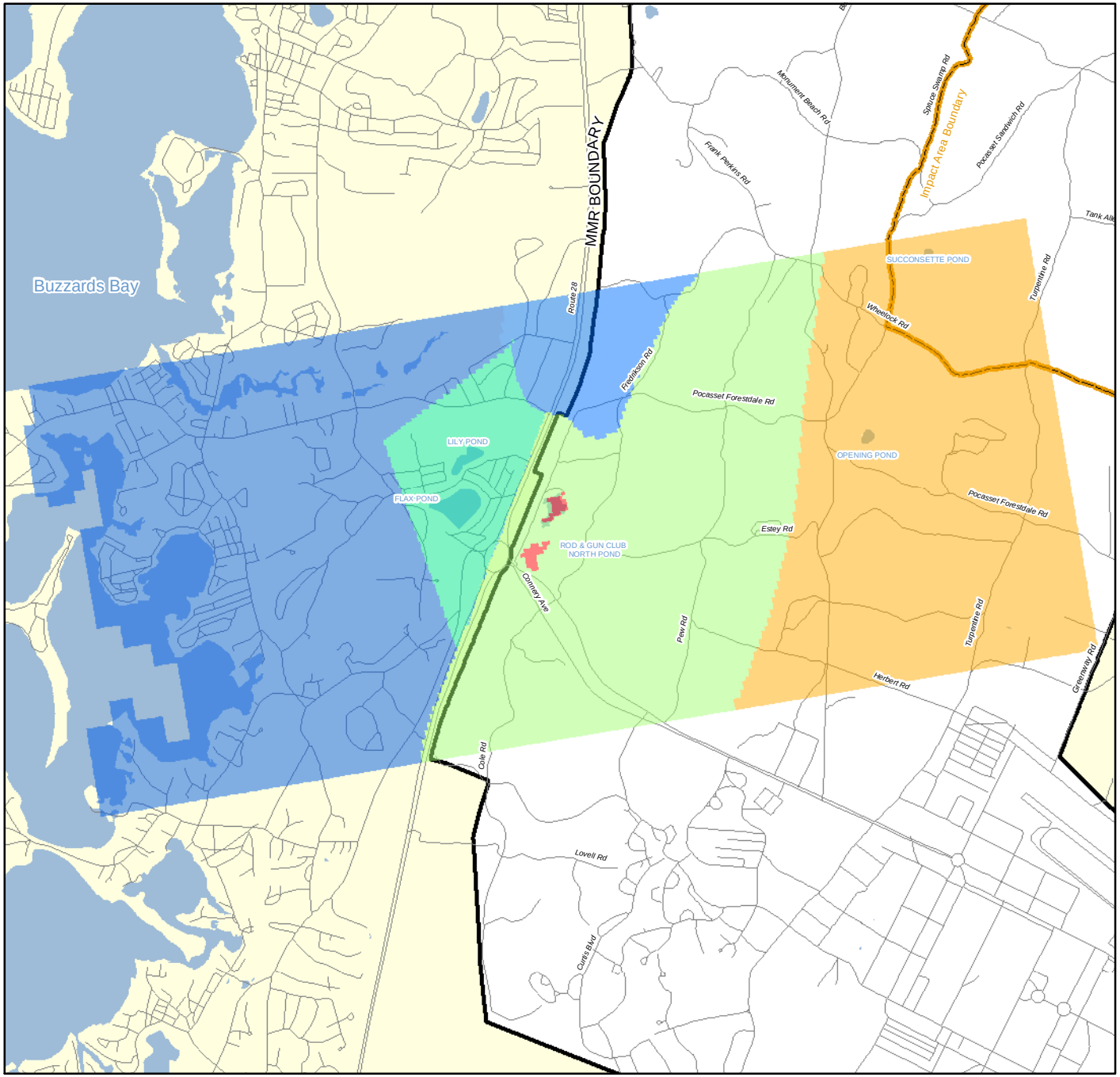
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5a.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-5a.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-5a



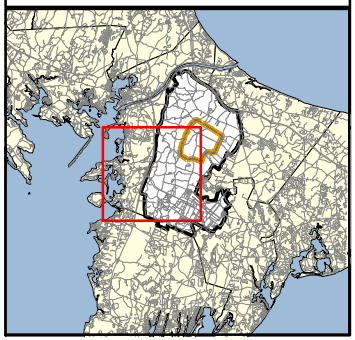
Impact Area Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

1	120
35	160
75	290
	50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 2

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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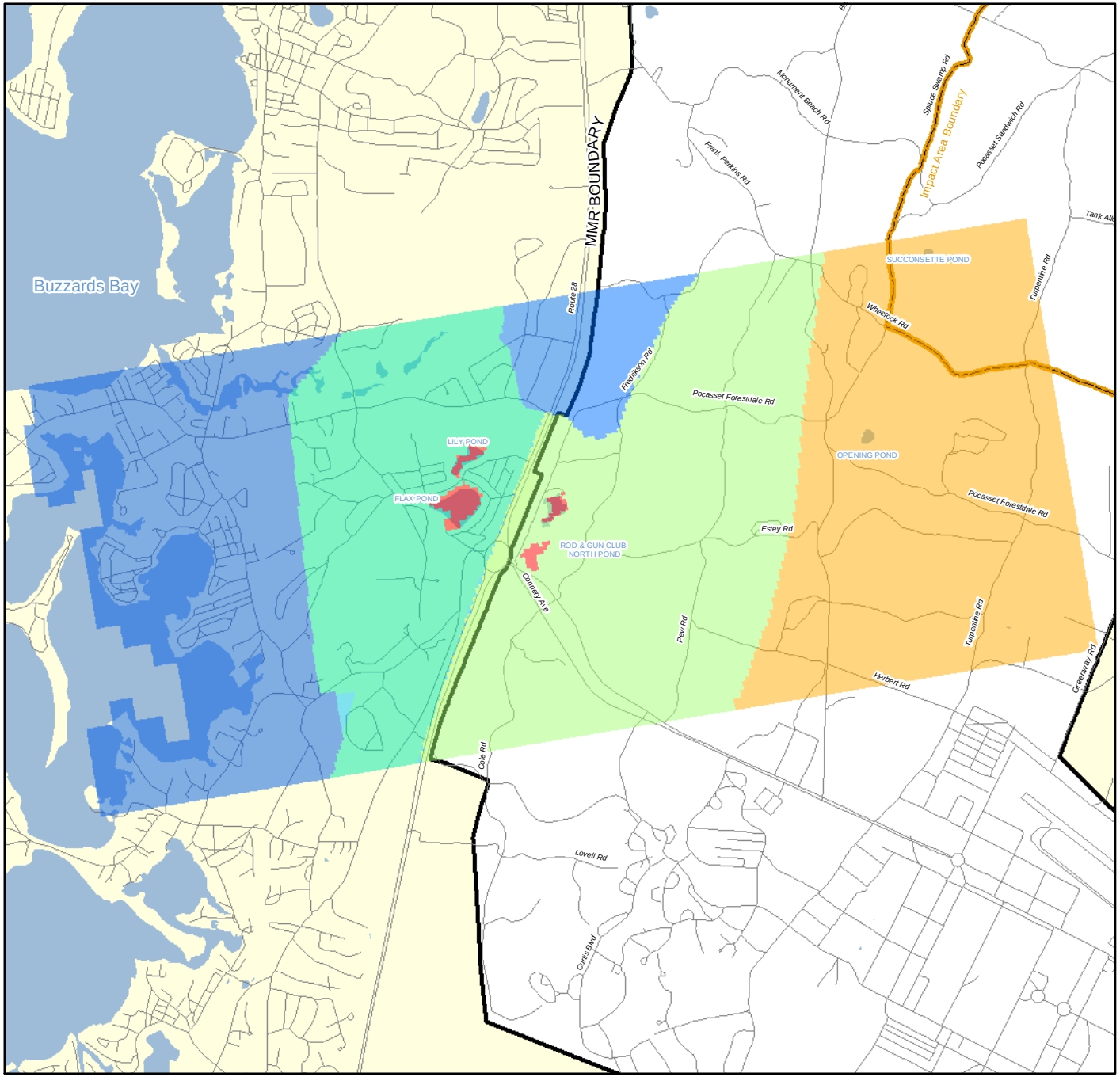
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5b.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-5b.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-5b



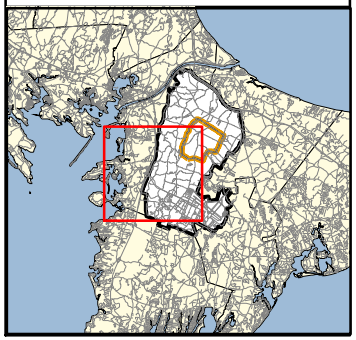
Impact Area Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

1	120
35	160
75	290
	50000

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 3

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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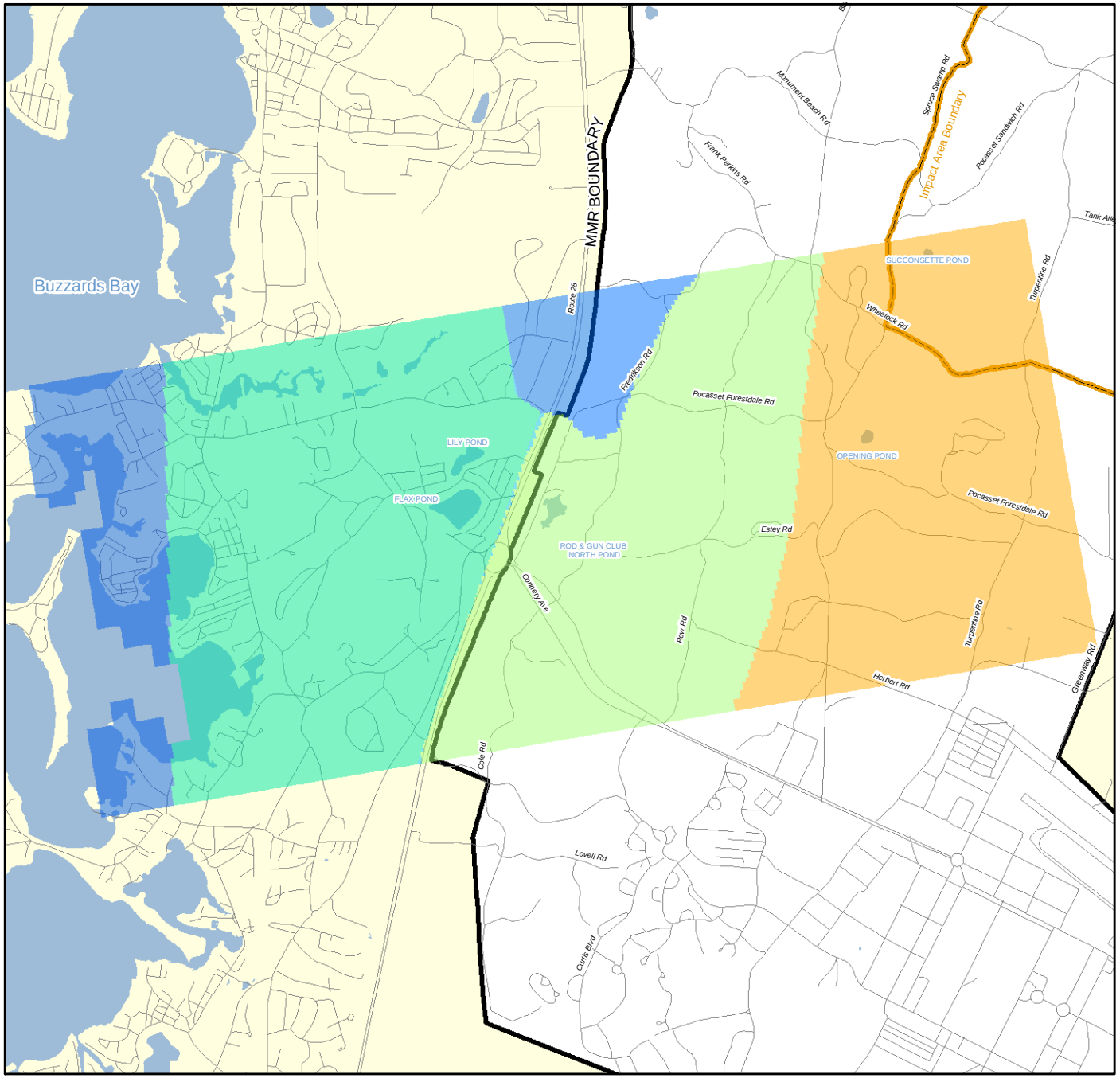
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5c.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-5c.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-5c



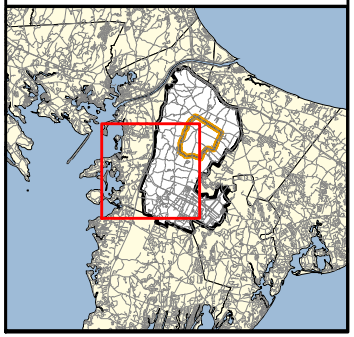
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

1	120
35	160
75	290

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 4

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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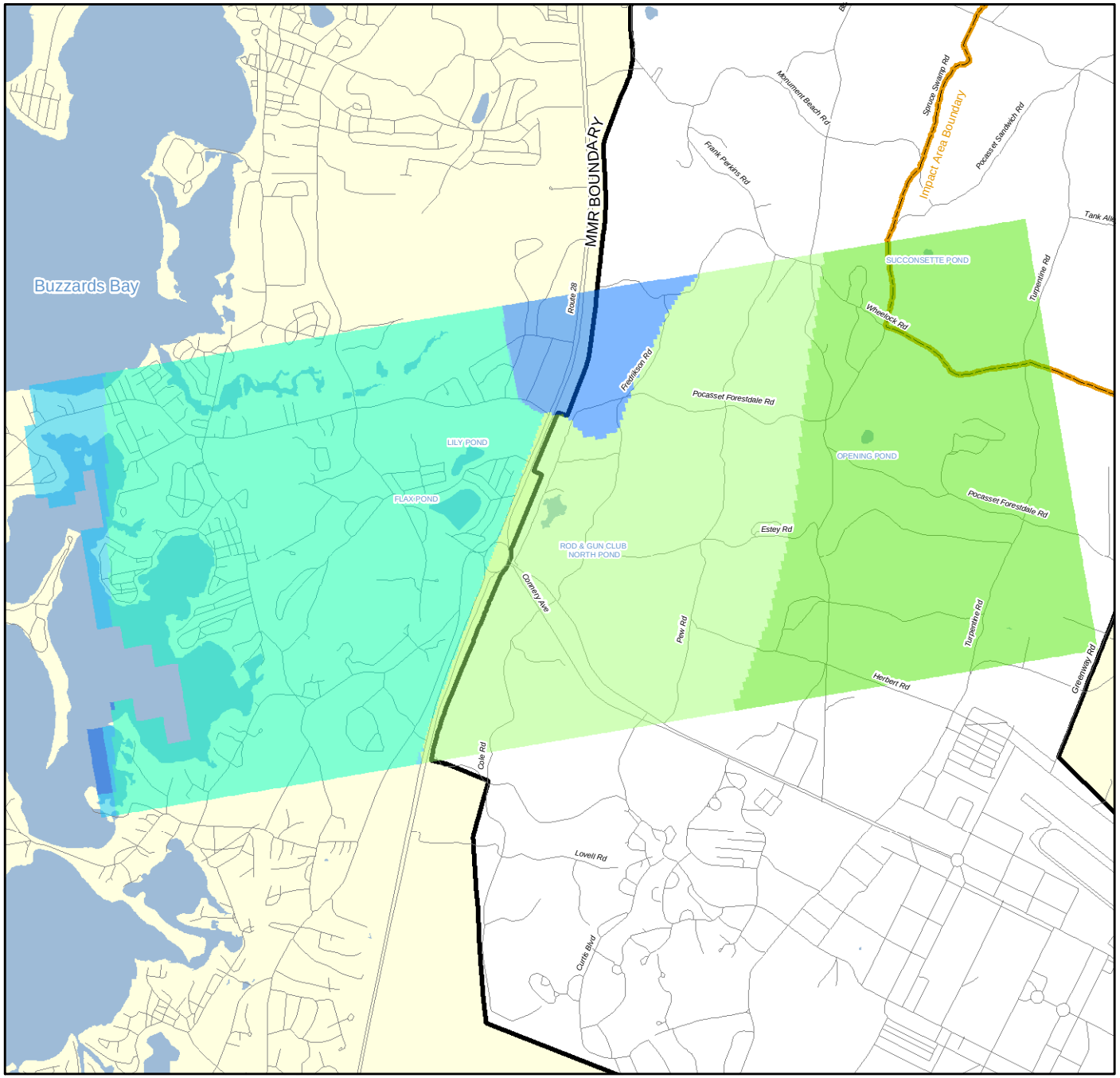
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5d.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5d.mxd
May 20, 2003 AP

FIGURE
A3-5d



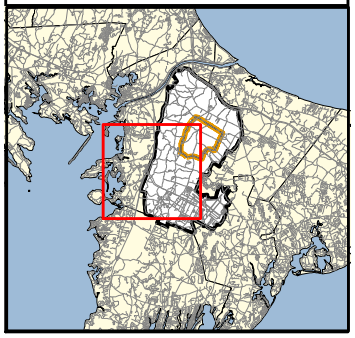
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

1	120
35	160
75	194

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 5

Revised Draft Feasiblity Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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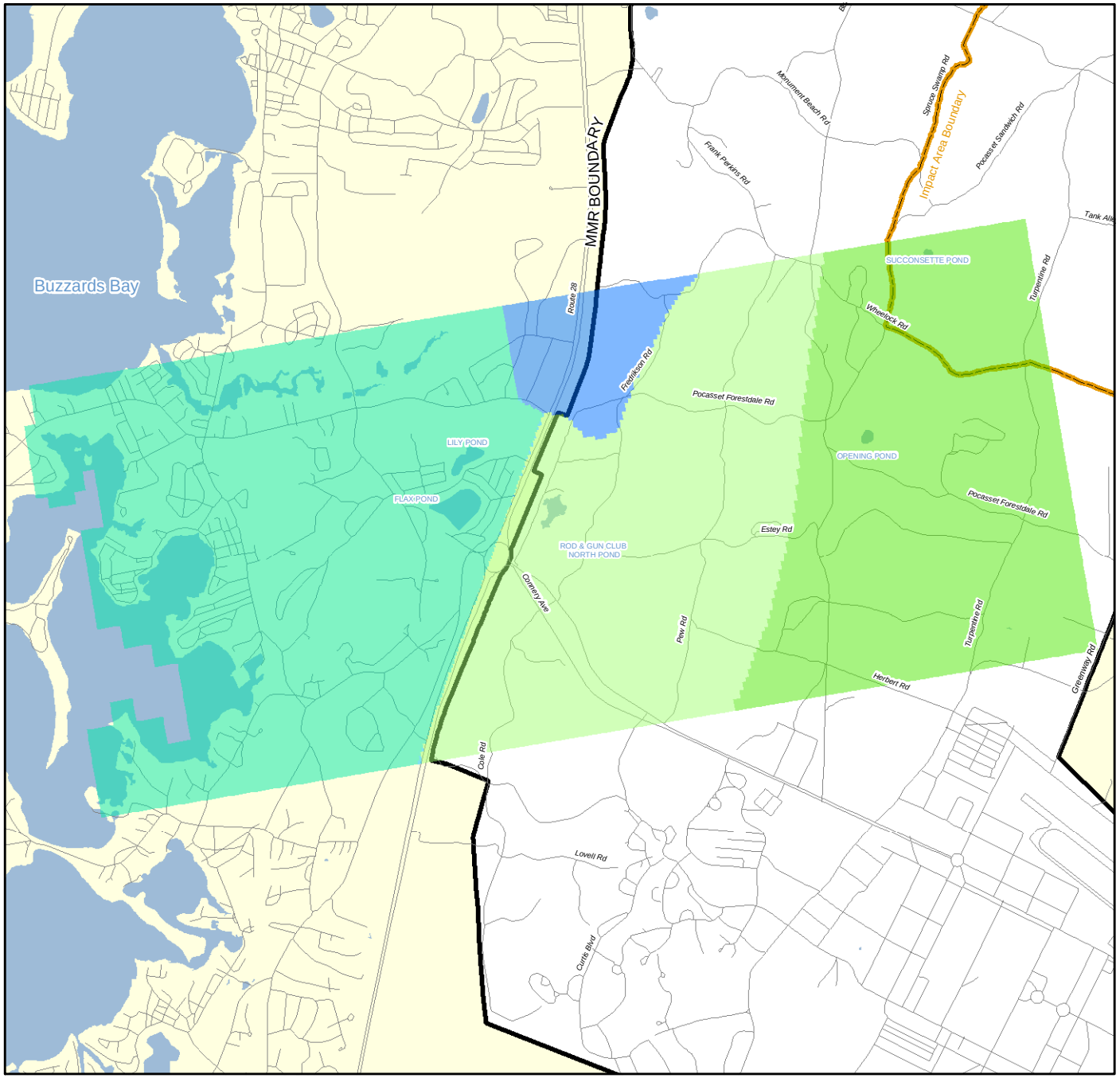
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5e.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5e.mxd
May 20, 2003 AP

FIGURE

A3-5e



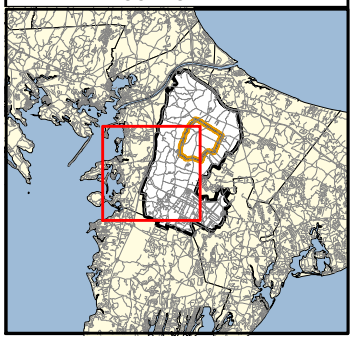
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

35	120
75	160
194	

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 6

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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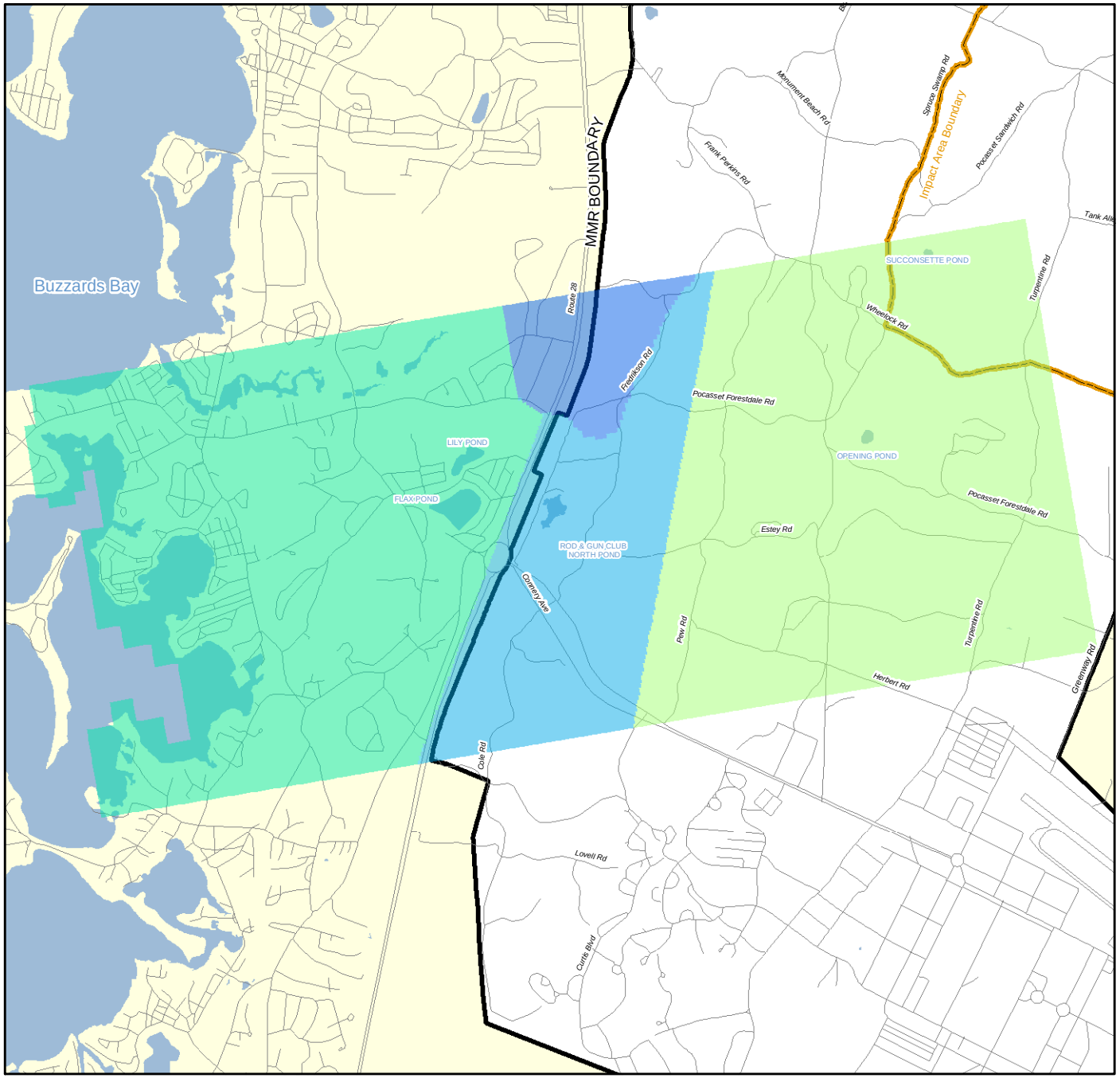
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5f.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5f.mxd
May 20, 2003 AP

FIGURE
A3-5f



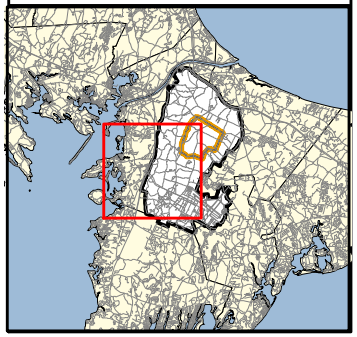
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

10	75
60	120
160	

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 7

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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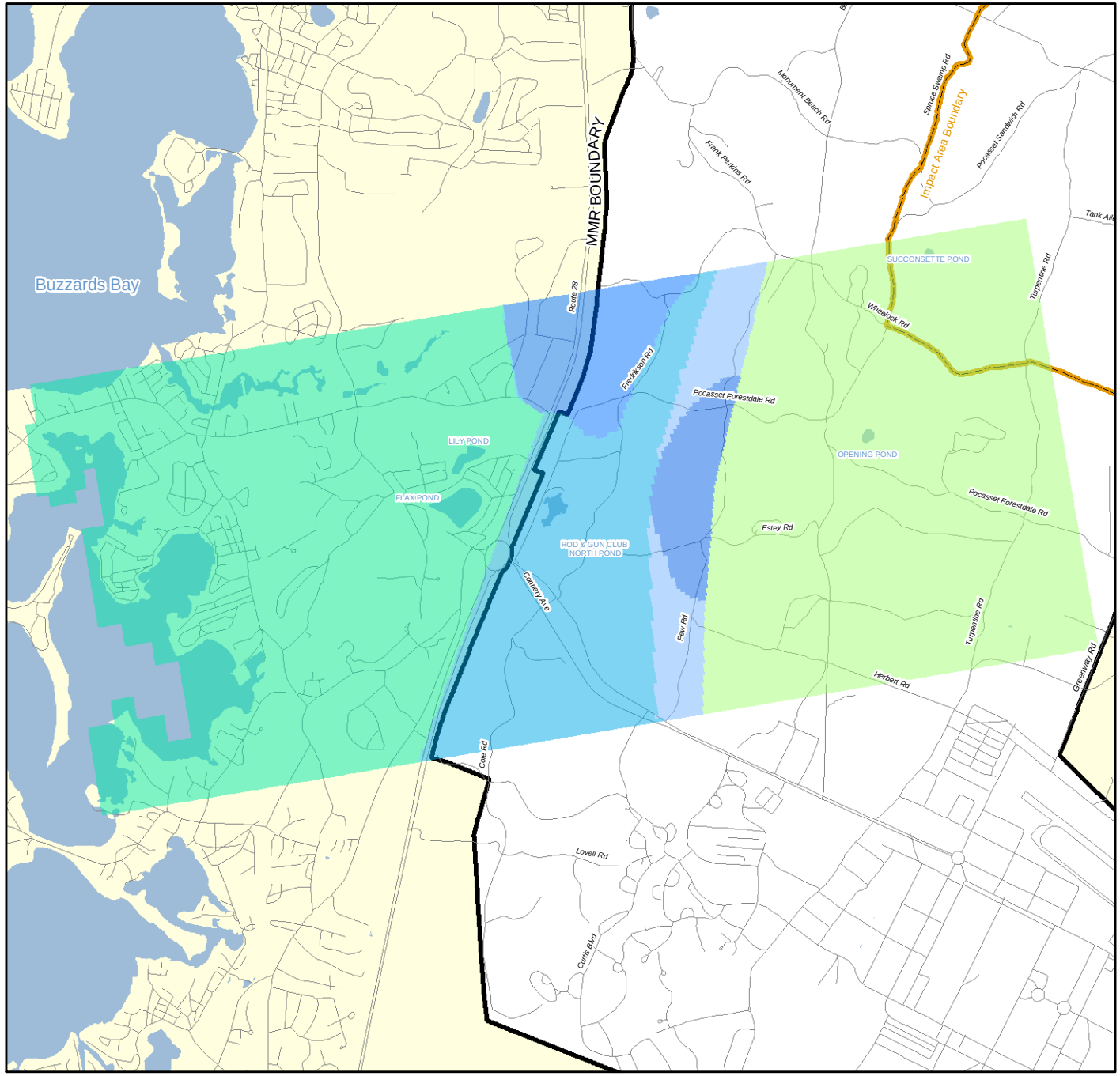
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5g.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5g.mxd
May 20, 2003 AP

FIGURE
A3-5g



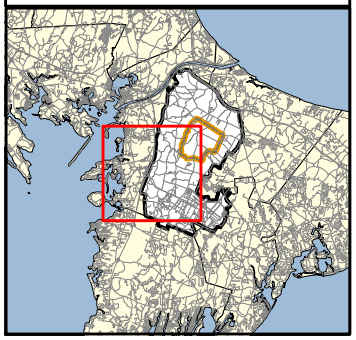
Impact Area Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0.5	60
10	75
40	120
	160

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 8

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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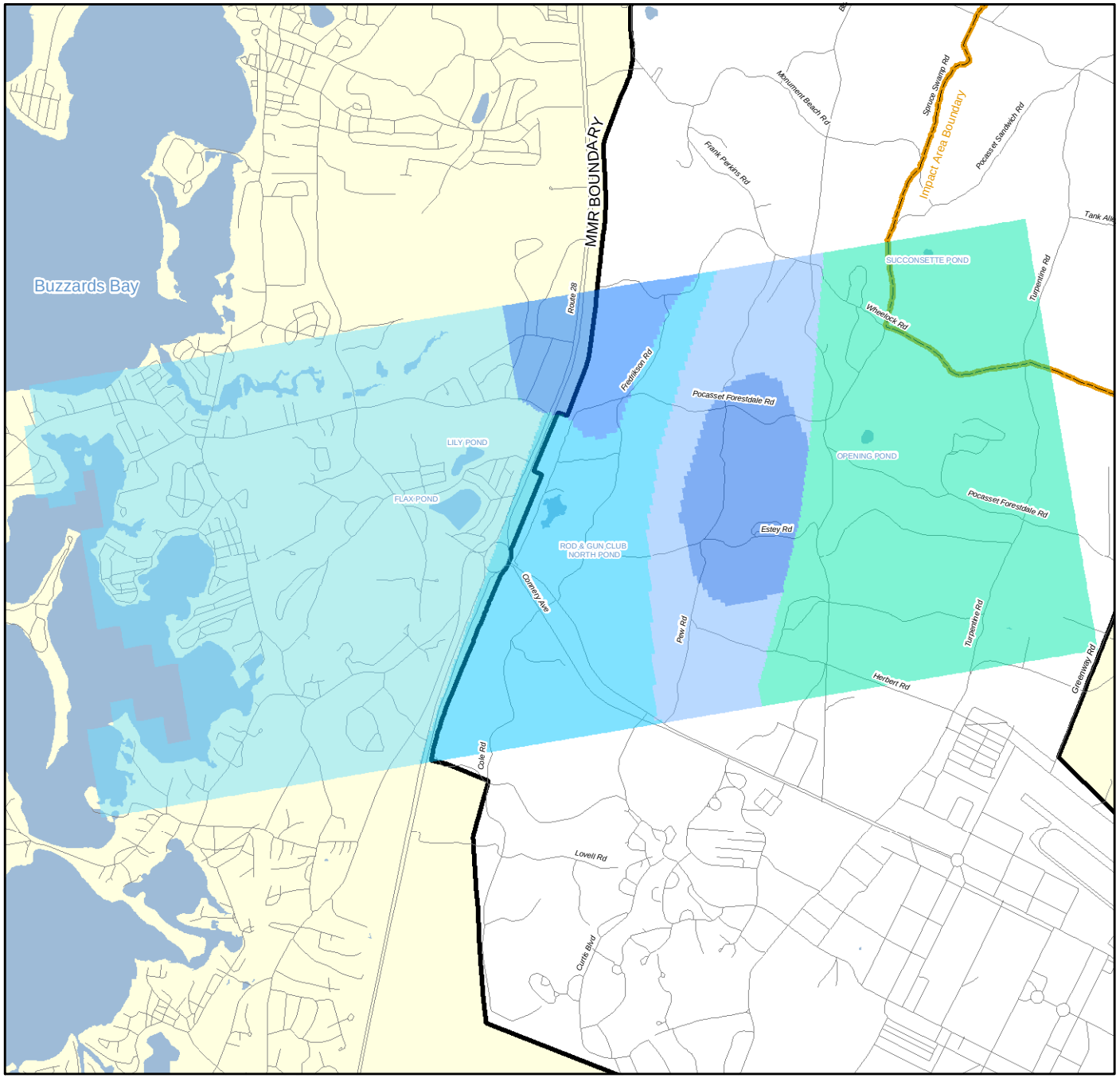
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5h.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5h.mxd
May 20, 2003 AP

FIGURE

A3-5h



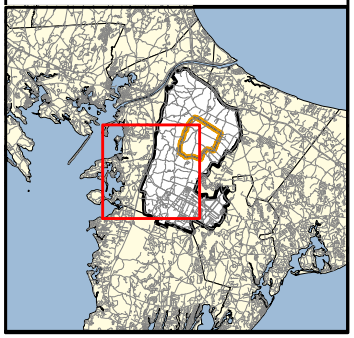
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0.5	50
10	60
40	90
	120

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 9

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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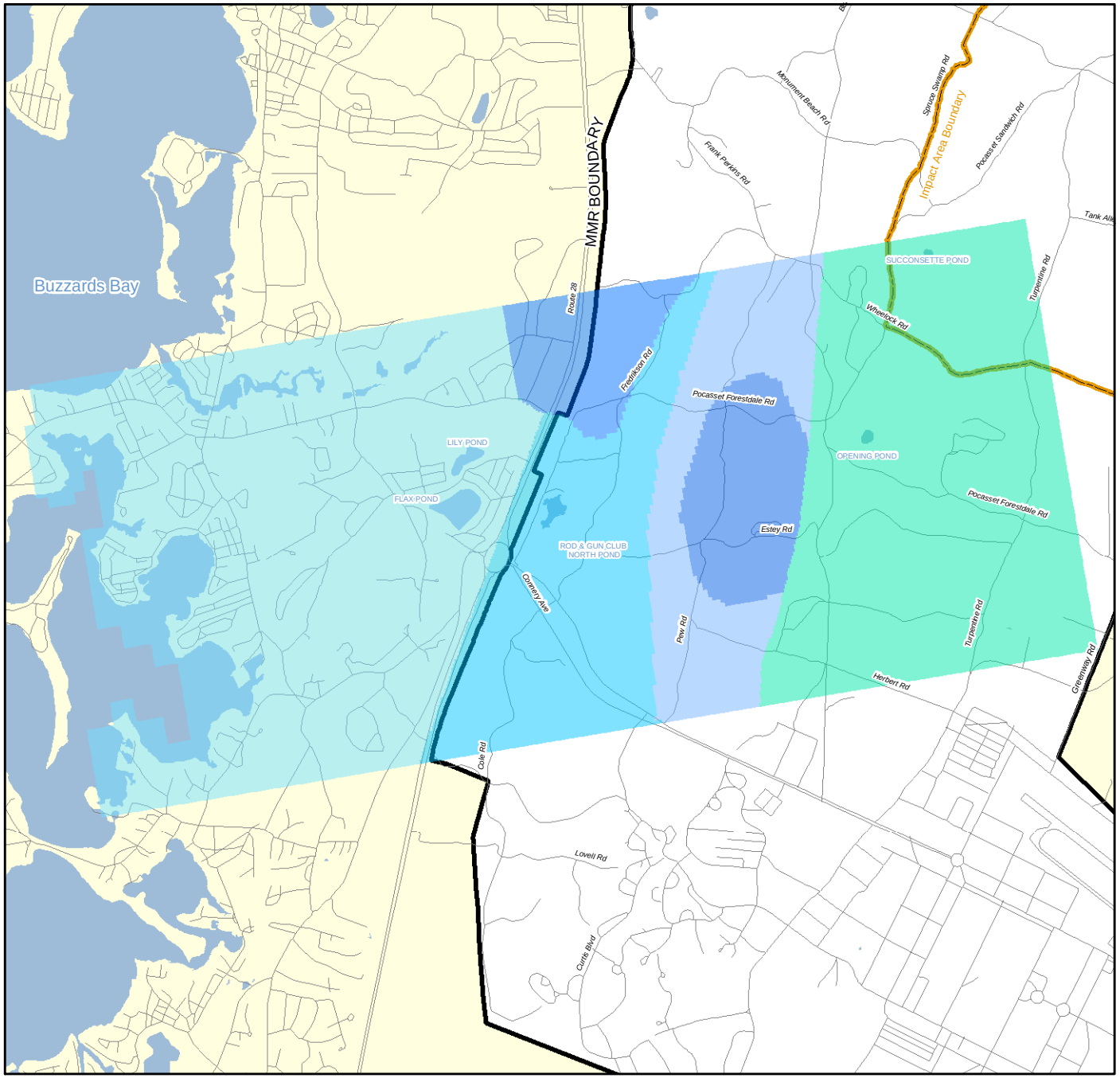
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5i.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5i.mxd
May 20, 2003 AP

FIGURE

A3-5i



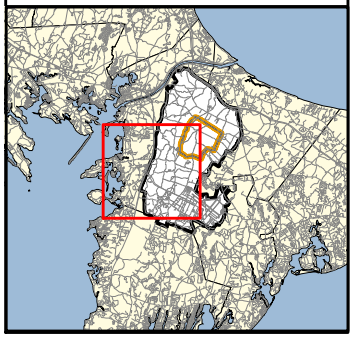
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0.5	50
10	60
40	90
	120

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zones Layer 10

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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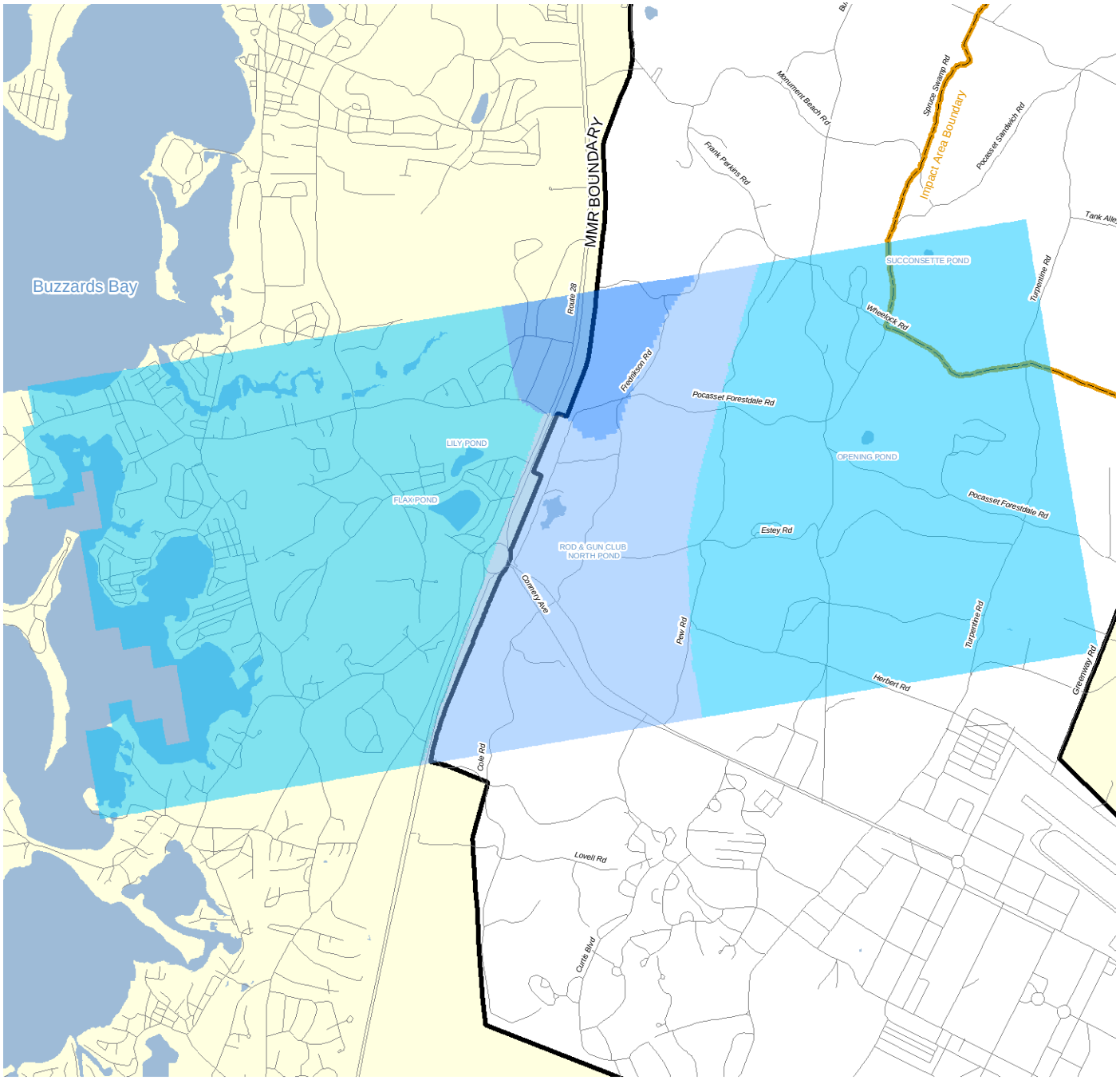
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5j.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5j.mxd
May 20, 2003 AP

FIGURE

A3-5j



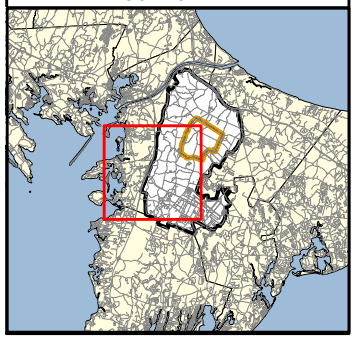
Impact Area Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

10 50
40 90
125

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 11

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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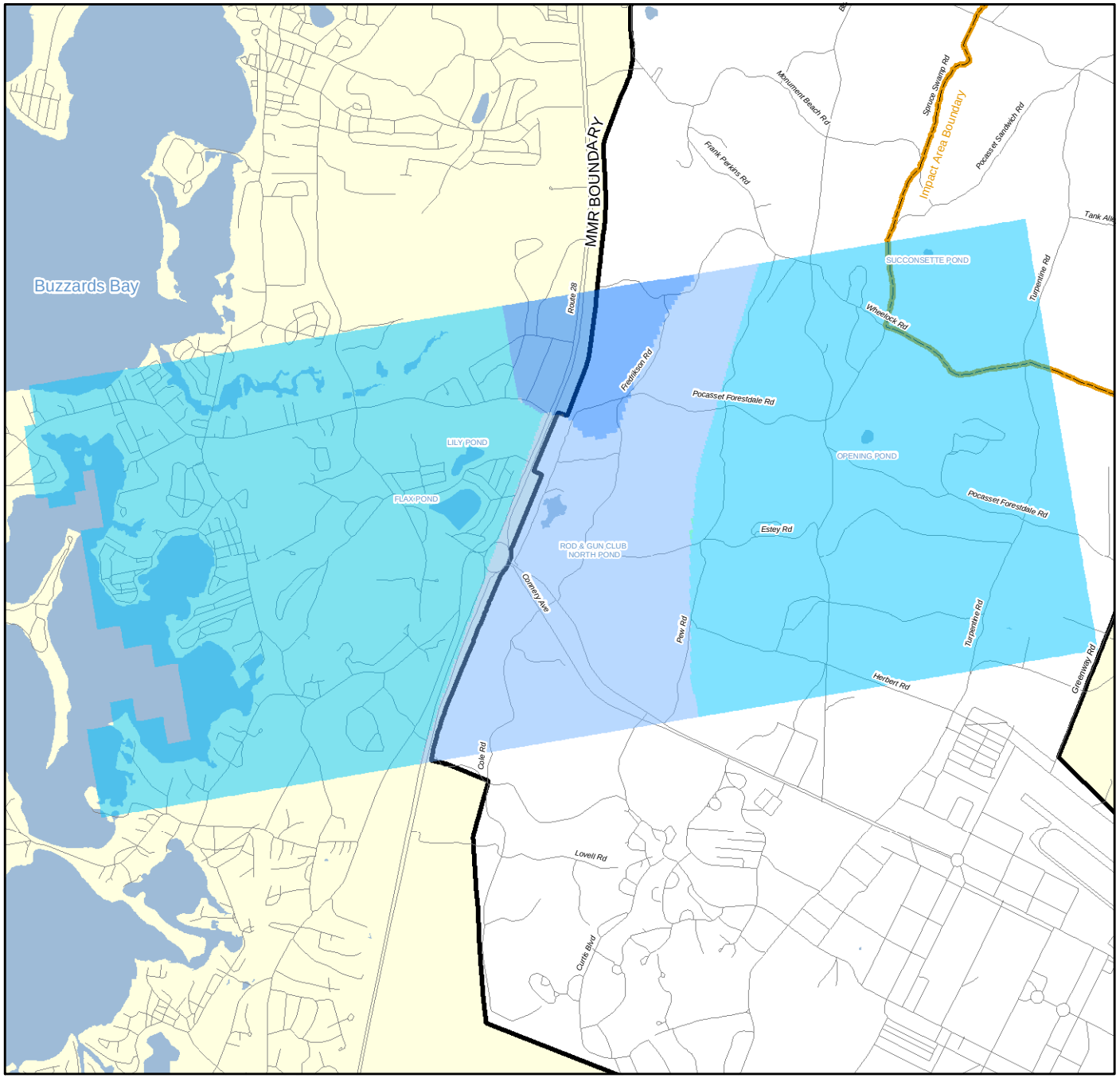
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5k.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5k.mxd
May 20, 2003 AP

FIGURE

A3-5k



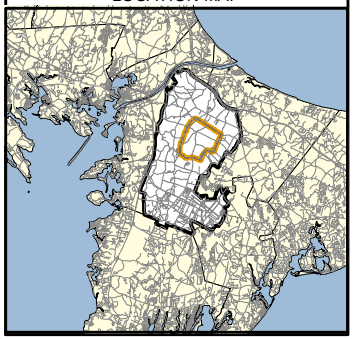
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

- 10
- 40
- 90
- 125

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 12

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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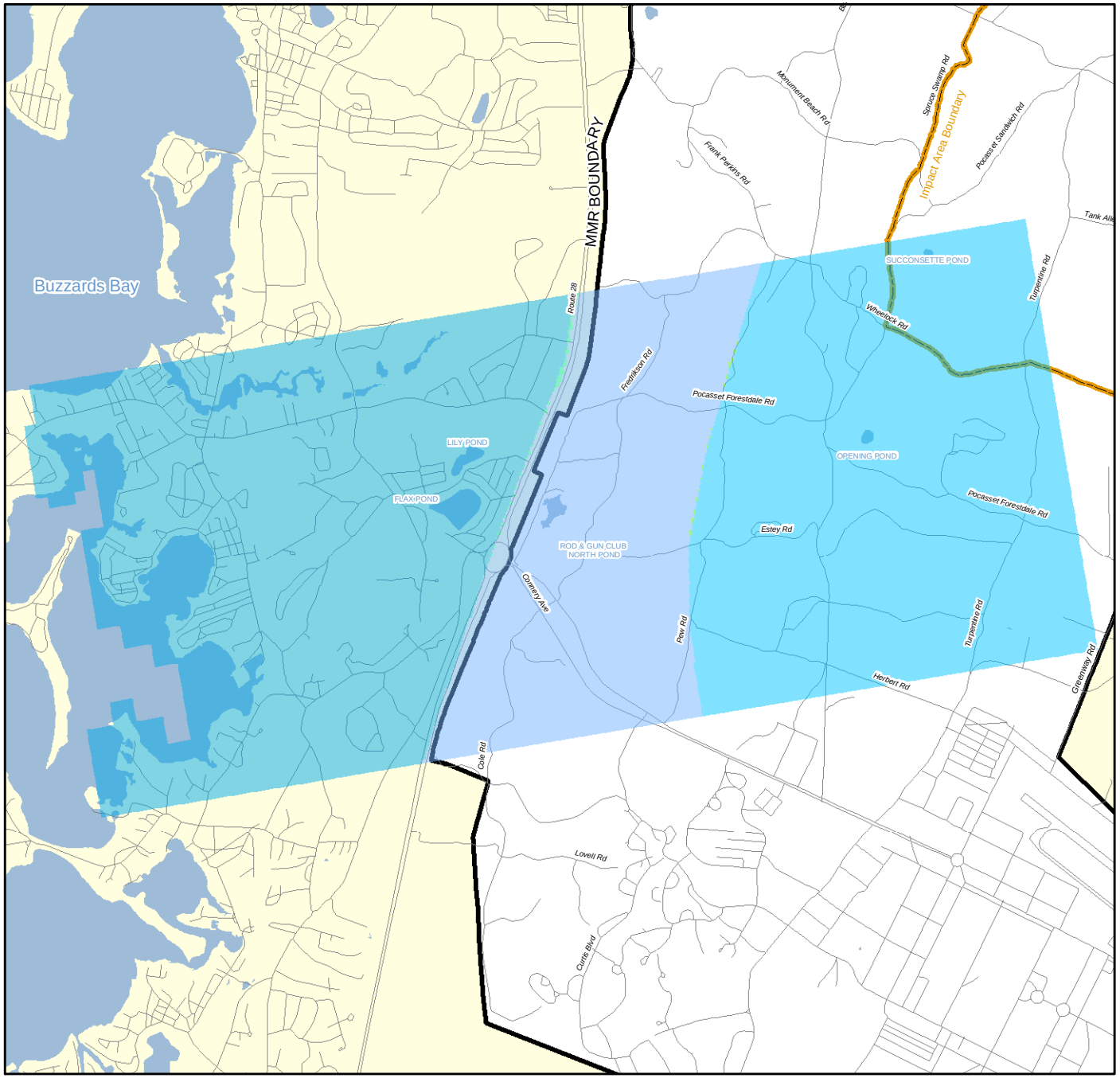
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5l.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5l.mxd
May 20, 2003 AP

FIGURE

A3-5l



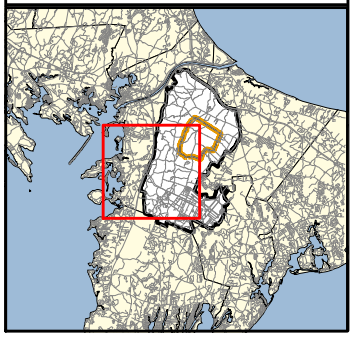
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

40 70
50 125
200

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 13

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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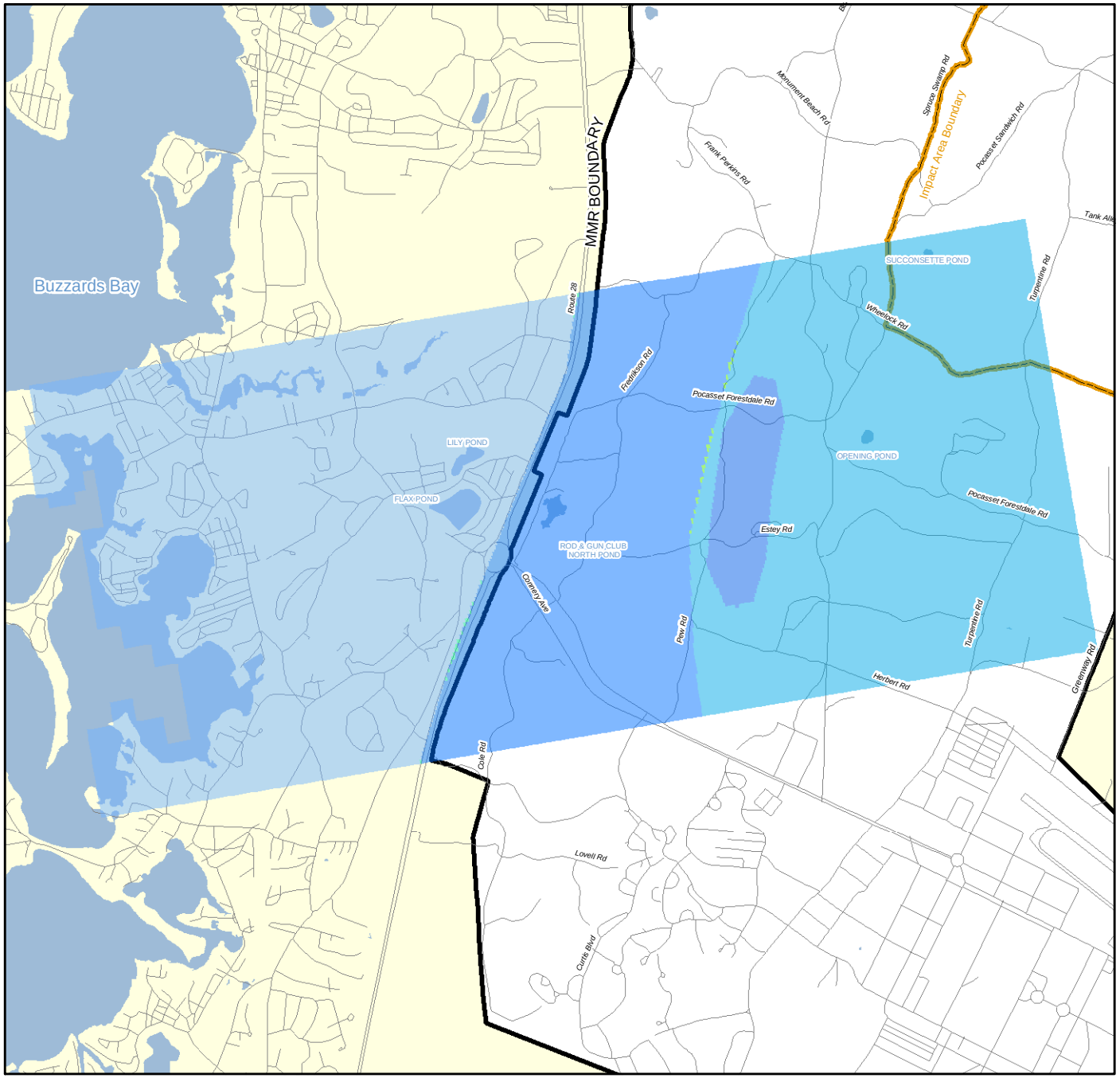
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5m.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5m.mxd
May 20, 2003 AP

FIGURE
A3-5m



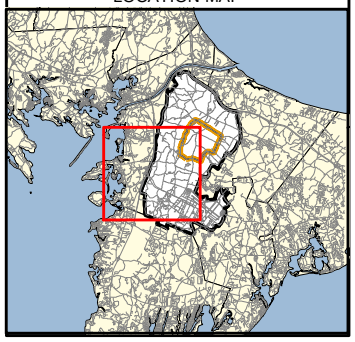
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

0.5	70
40	125
50	200

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 14

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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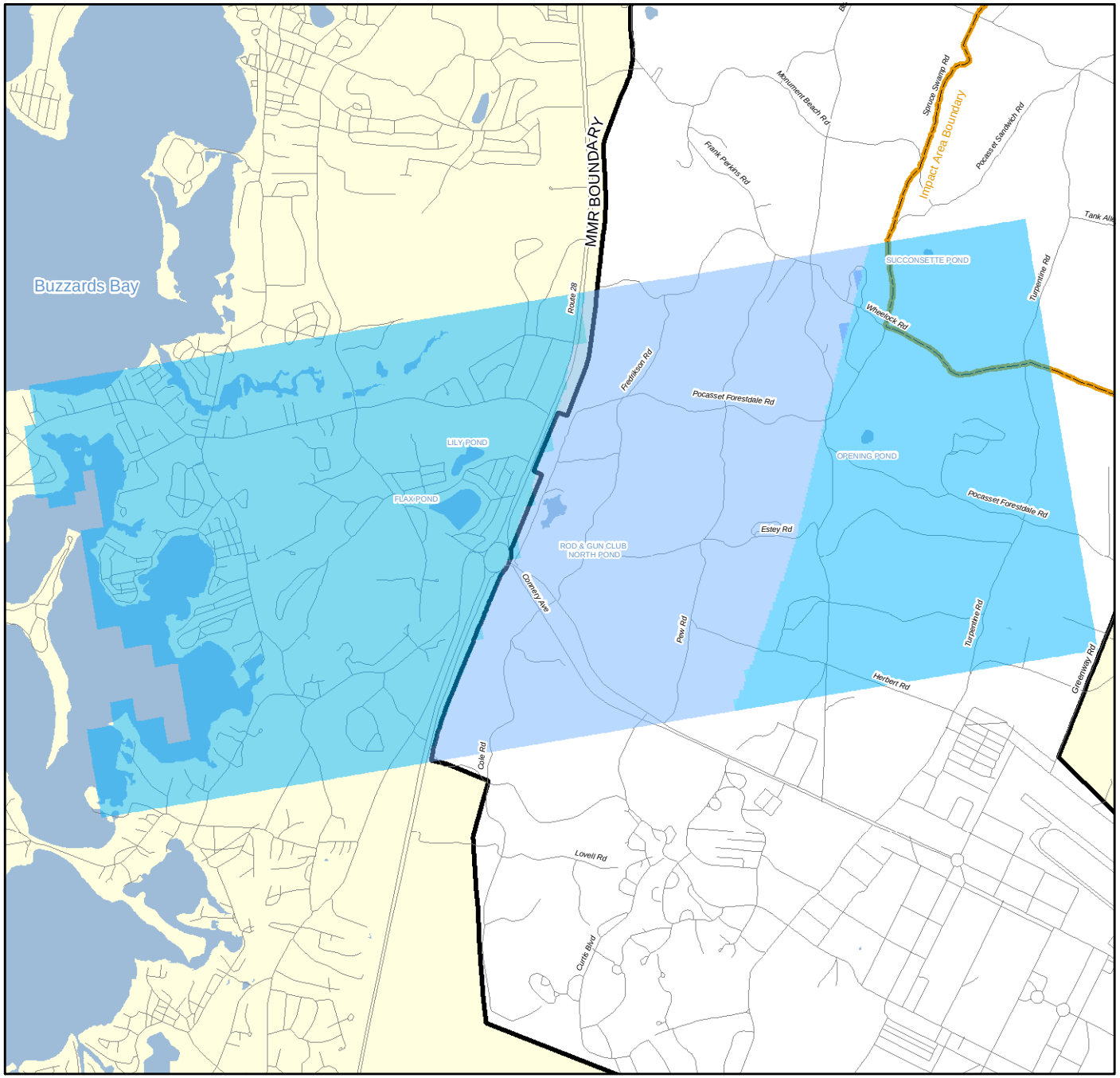
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5n.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5n.mxd
May 20, 2003 AP

FIGURE

A3-5n



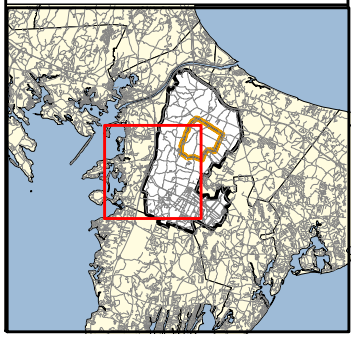
Impact Area
Groundwater Study Program

LEGEND

Hydraulic Conductivity (ft/day)

13
25
50
60
90

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 15

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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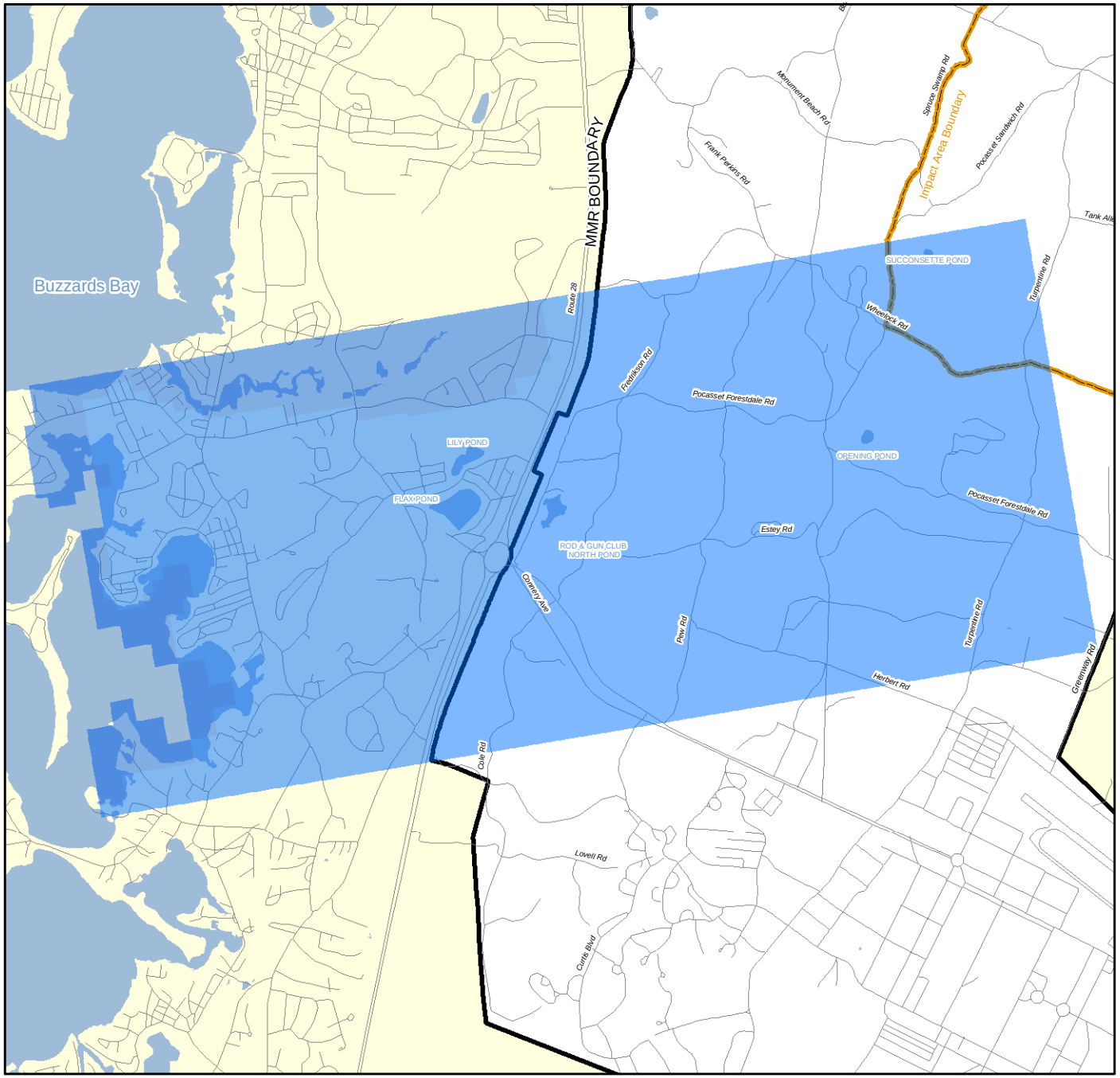
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5o.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5o.mxd
May 20, 2003 AP

FIGURE
A3-5o



Impact Area
Groundwater Study Program

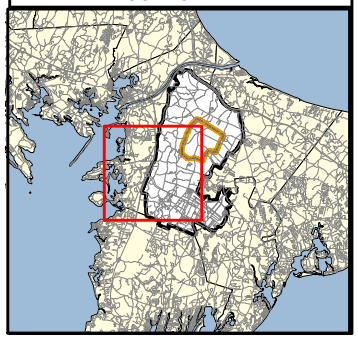
LEGEND

Hydraulic Conductivity (ft/day)

1

25

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 16

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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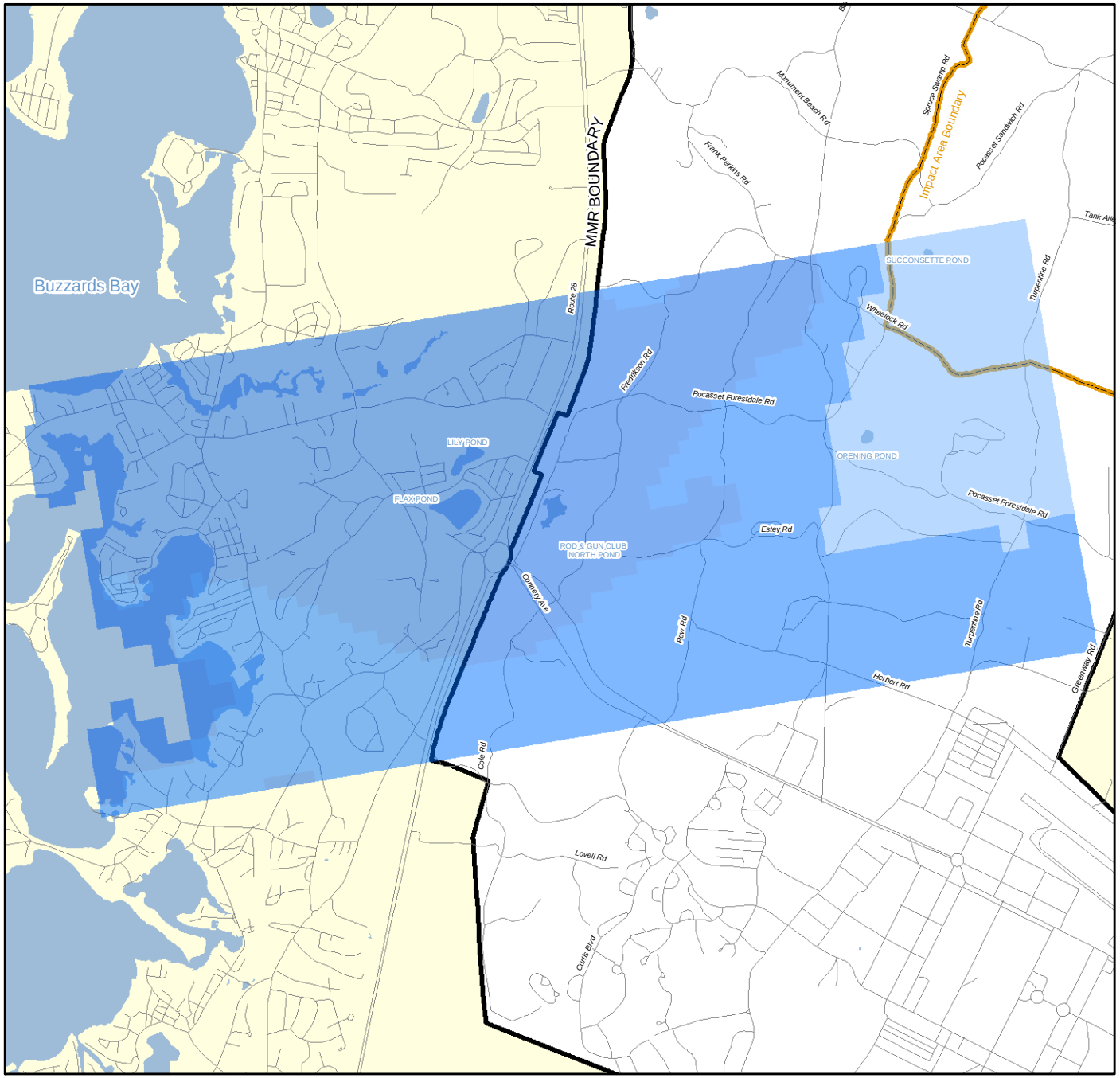
J:/mmr/ReportFigs2004/D8706/8706_FigA3-5p.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5p.mxd
May 20, 2003 AP

FIGURE

A3-5p



Impact Area
Groundwater Study Program

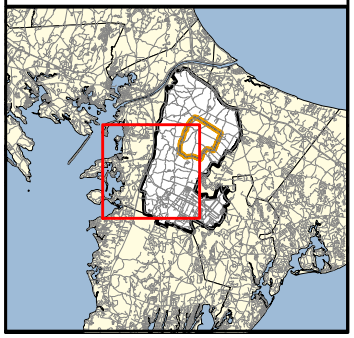
LEGEND

Hydraulic Conductivity (ft/day)

1 13

25

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Demo 1 Subregional Model Calibrated Hydraulic Conductivity Zonation Layer 17

Revised Draft Feasiblity Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA3-5q.pdf
G:/MMR_COE/work/D8706/8706_FigA3-5q.mxd
May 20, 2003 AP

FIGURE

A3-5q

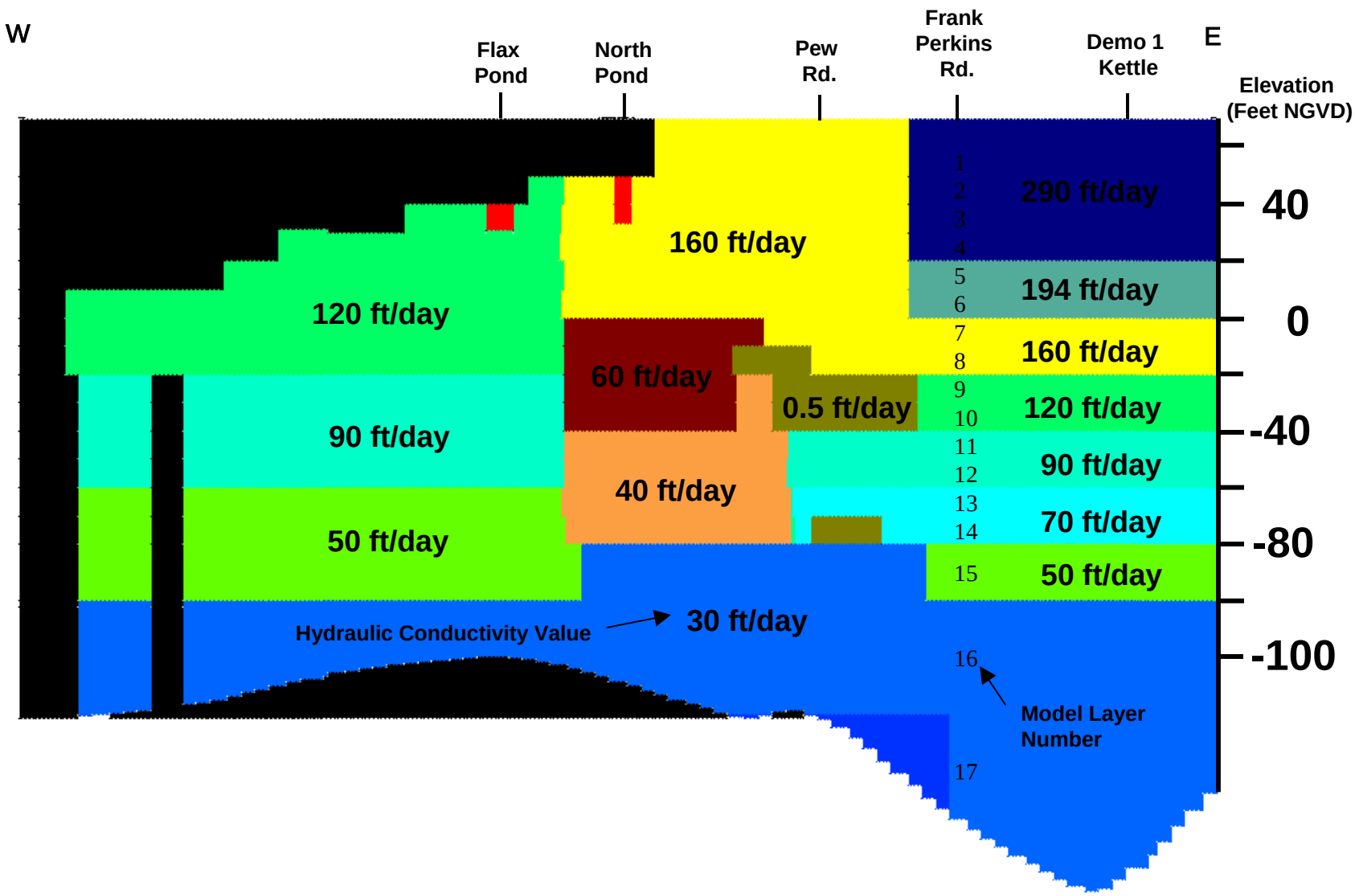
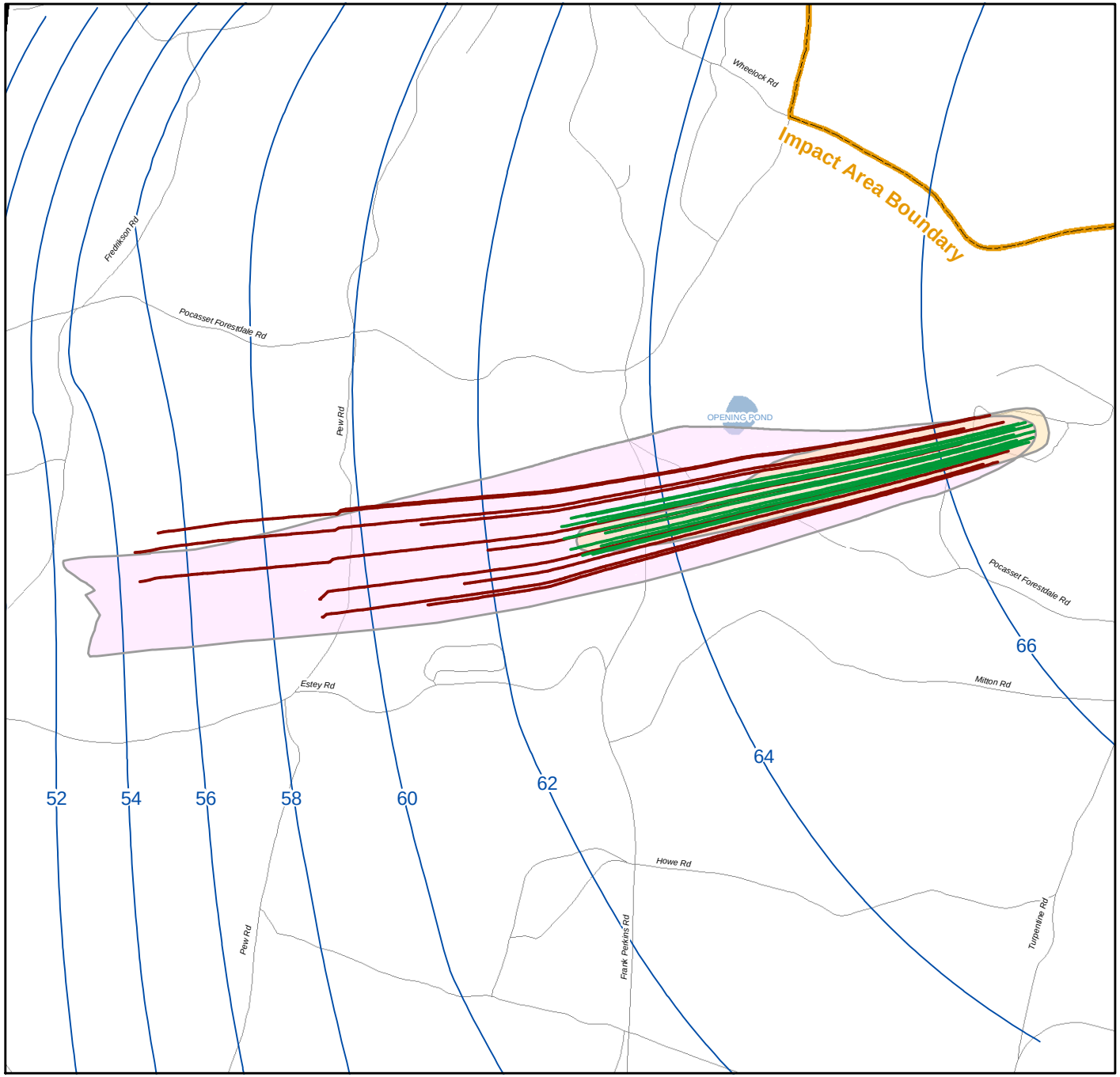


Figure A3-6. East-West Cross-Section Through Final Calibrated Hydraulic Conductivity Zonation

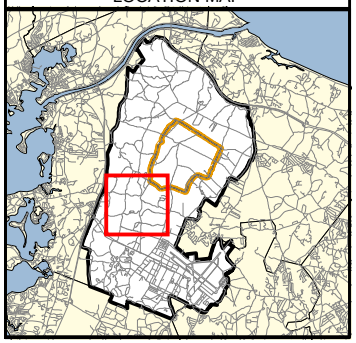


Impact Area
Groundwater Study Program

LEGEND

- RDX Plume Extent
- Perchlorate Plume Extent
- 30 Year Particle Tracks from the Kettle Bottom
- 50 Year Particle Tracks from the Downgradient Kettle Flank
- Modeled Watertable Contours (2 ft)

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of 30 Year and 50 Year Forward Particle Tracks from the Demo 1 Kettle Depression

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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FIGURE
A3-7

J:/mmr/ReportFigs2004/D8706/8706_FigA3-7.pdf
G:/MMR_COE/work/D8706/8706_FigA3-7.mxd
May 20, 2004 AP JBB

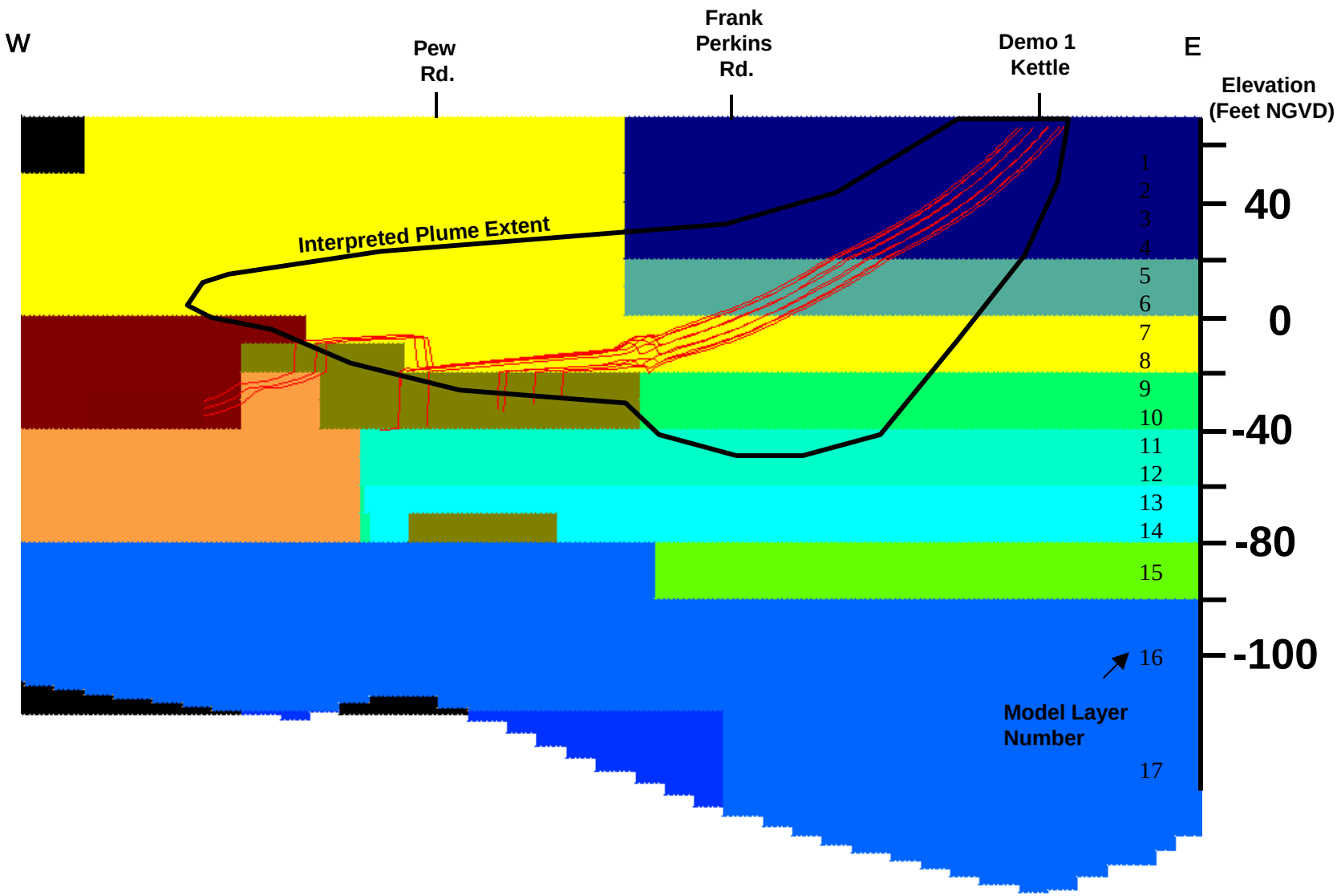
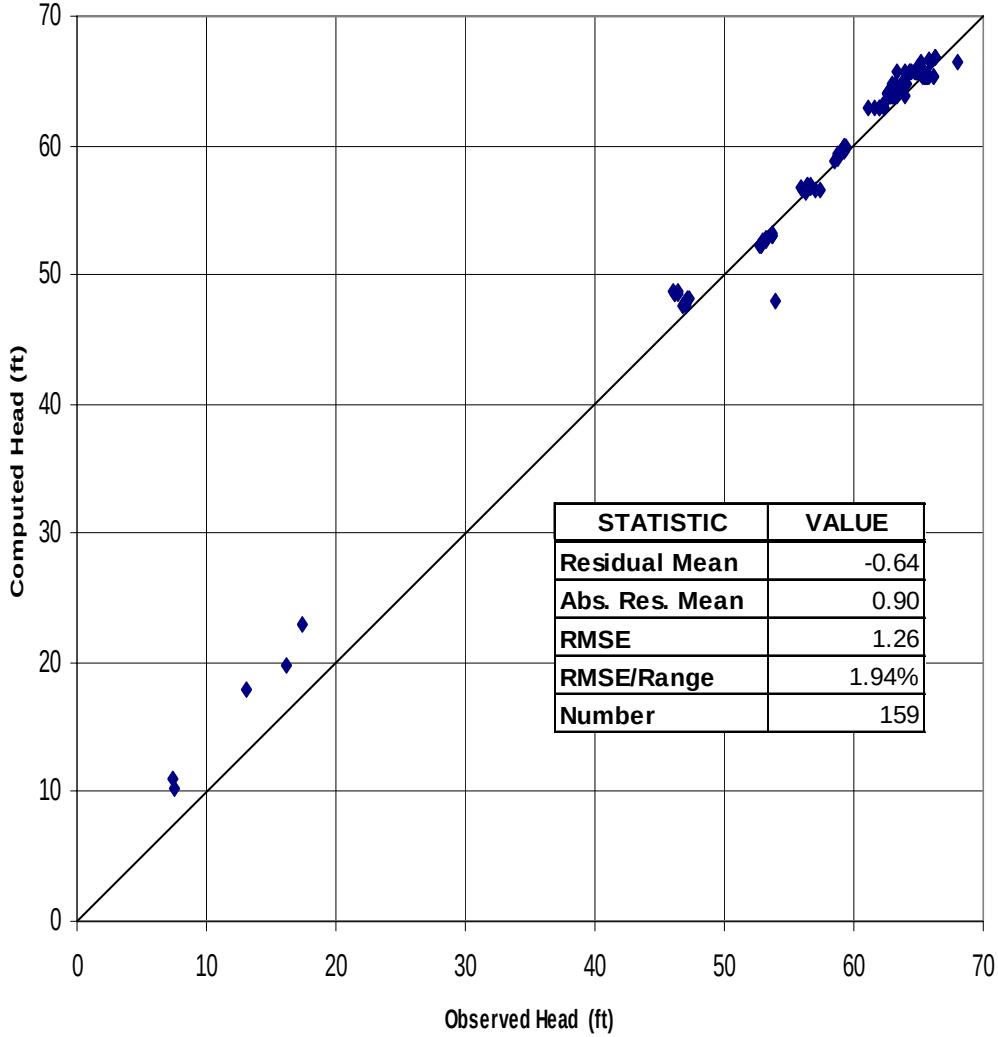


Figure A3-8. East-West Cross-section of 50 Year Forward Particle Tracks from Kettle Area



STATISTIC	VALUE
Residual Mean	-0.64
Abs. Res. Mean	0.90
RMSE	1.26
RMSE/Range	1.94%
Number	159

Figure A3-9. Observed vs. Computed Year 2000 Groundwater Elevations for the Demo 1 Subregional Model

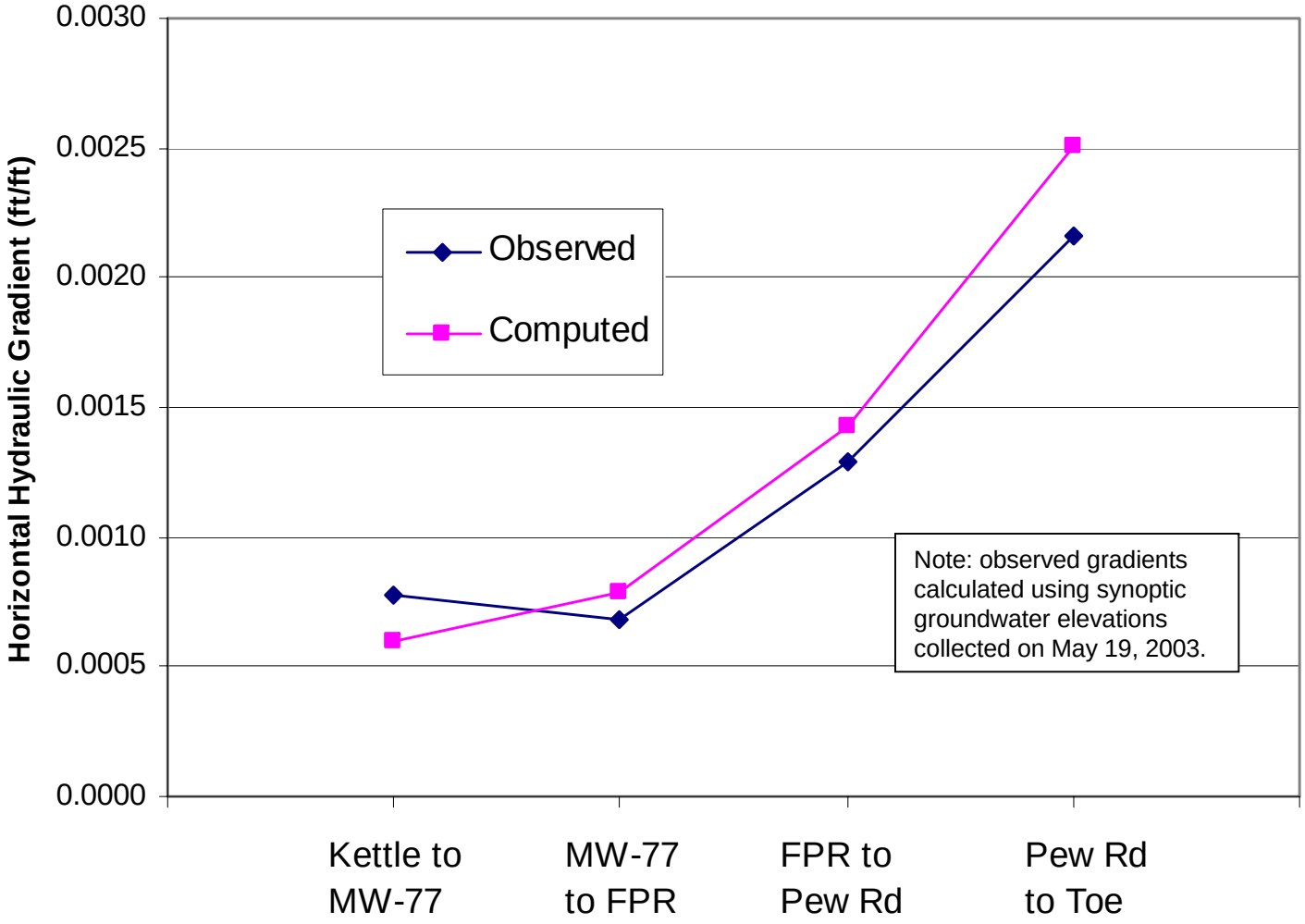
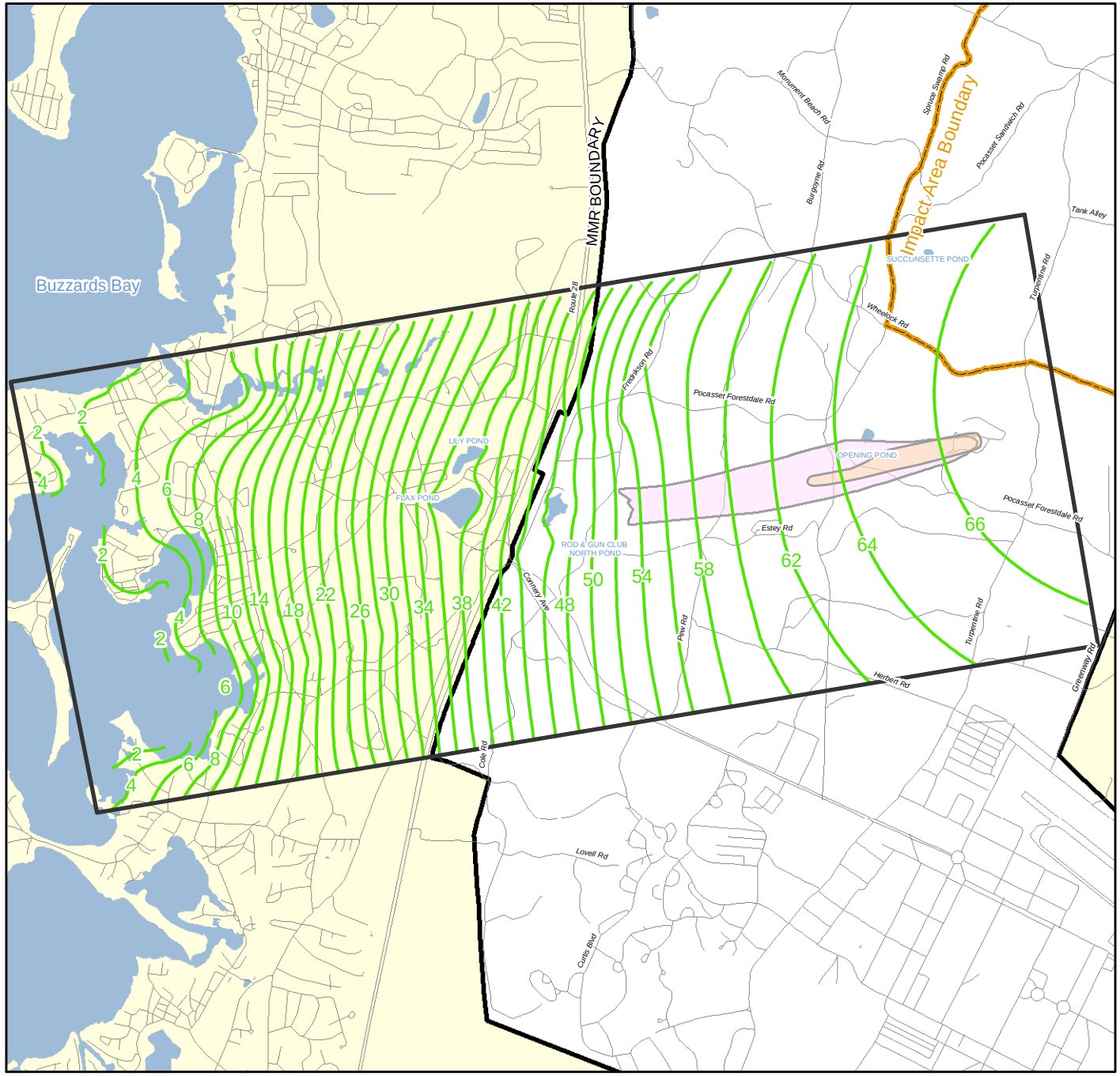


Figure A3-10. Observed vs. Computed Horizontal Hydraulic Gradients.

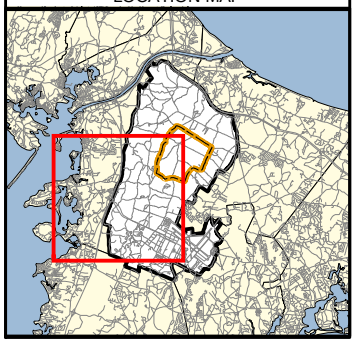


Impact Area Groundwater Study Program

LEGEND

- RDX Plume Extent
- Perchlorate Plume Extent
- Modeled Watertable Contours (2ft)
- Subregional Model Boundary

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Final Calibrated Watertable Contours for the Demo 1 Subregional Model

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 0.5 Miles

N

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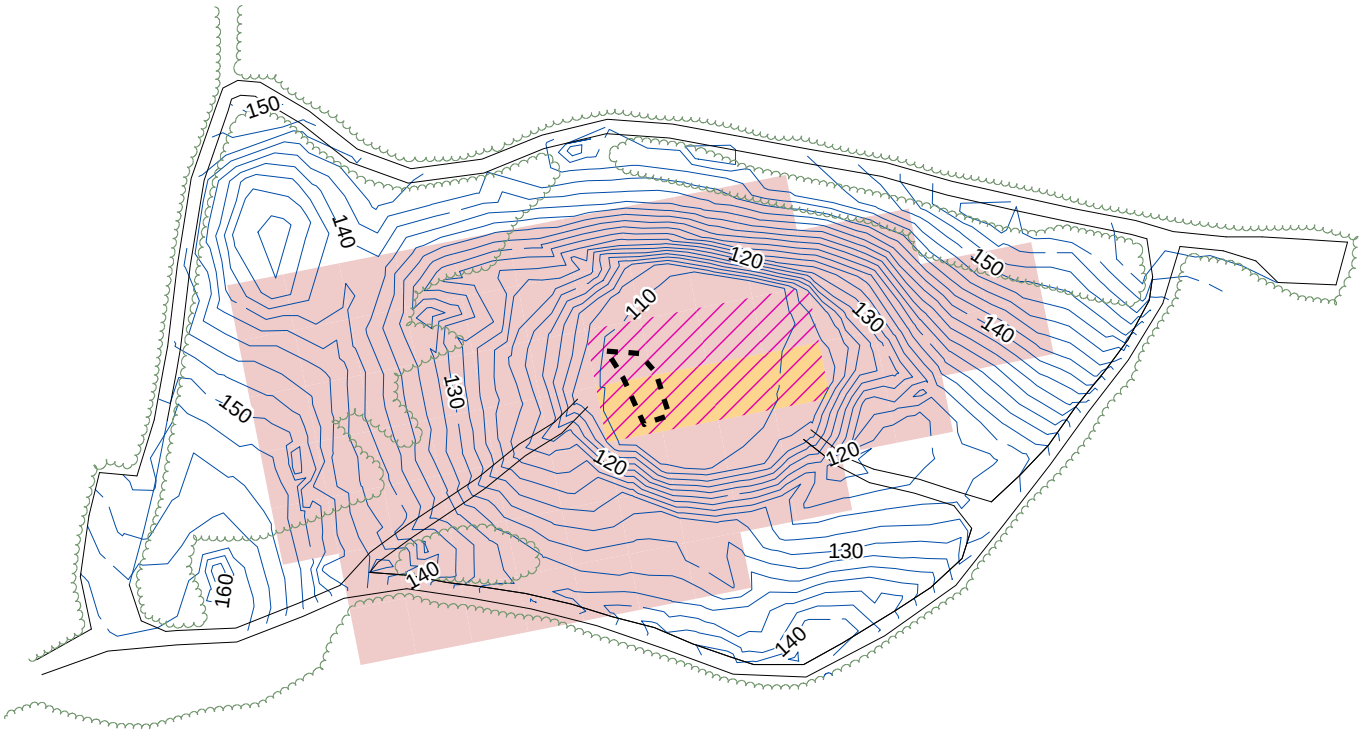
J:/mmr/ReportFigs2004/D8706/8706_FigA3-11.pdf
G:/MMR_COE/work/D8706/8706_FigA3-11.mxd
May 20, 2004 AP JBB

FIGURE
A3-11



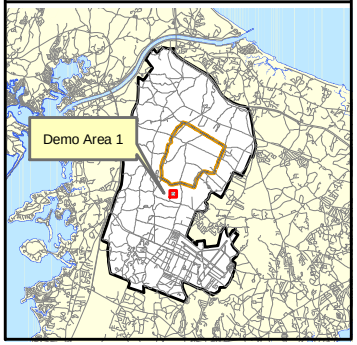
Impact Area
Groundwater Study Program

LEGEND

- RDX Source Zone
- Low-level Perchlorate Source Zone
- High-level Perchlorate Source Zone
- Topographic Elevation Contours*
- Treeline
- Wet Area

* In Feet Above Mean Sea Level

LOCATION MAP



NOTES & SOURCES

Basemap data from US Geological Survey 7 1/2 minute Topographic Maps. Source: MassGIS
Contours from TF Moran Surveyors, 2000

TITLE

Calibrated Source Zones for Perchlorate and RDX within Demo 1 Kettle Depression

Revised Draft Feasiblity Study
Demo 1 Groundwater
Operable Unit

0 150 Feet

N

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FIGURE

A3-12

G:/MMR_COE/work/D8706/8706/FigA3-12.mxd
J:/MMR/ReportFigs2004/D8706/8706_FigA3-12.pdf
May 20, 2004 KEA JBB

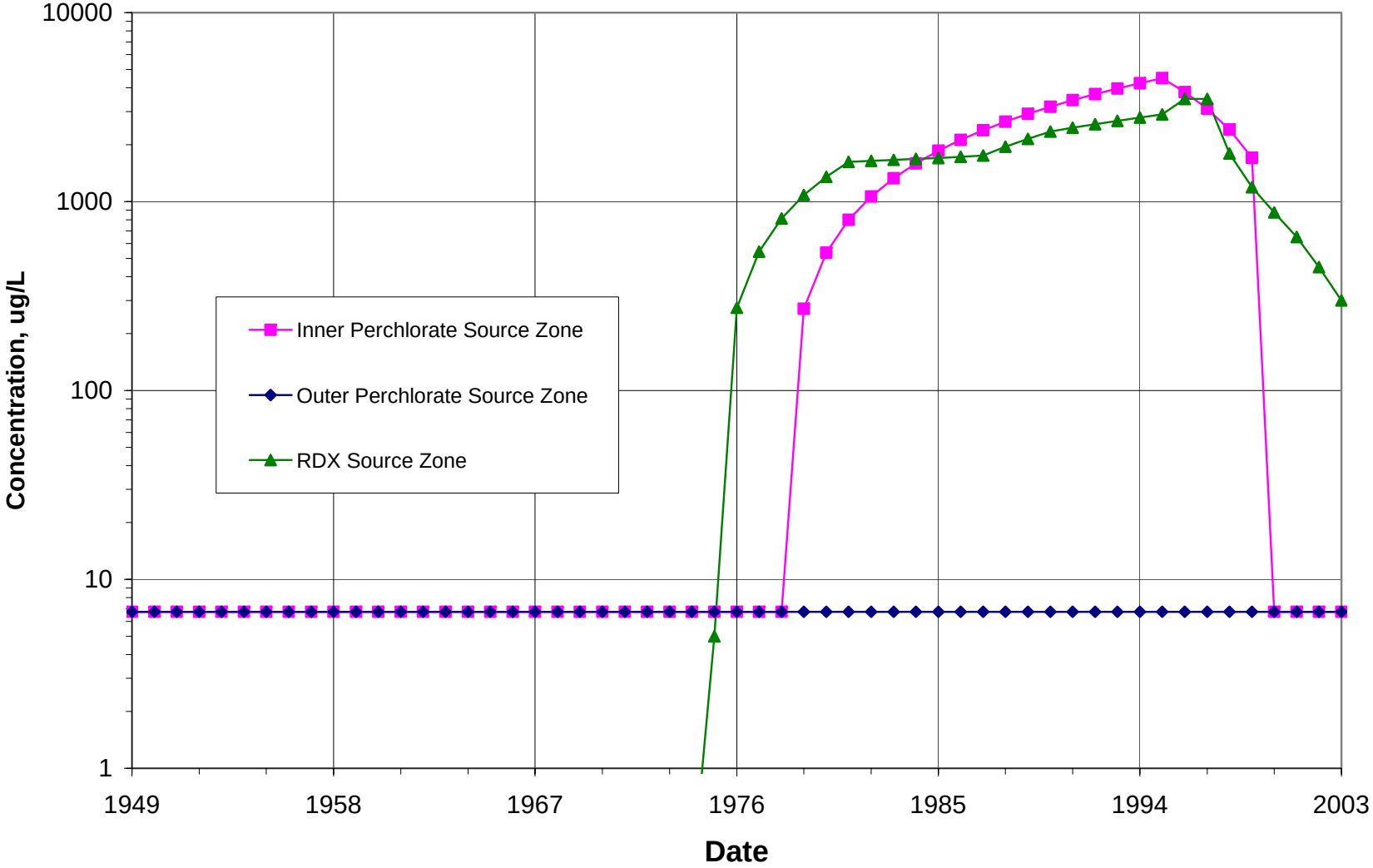
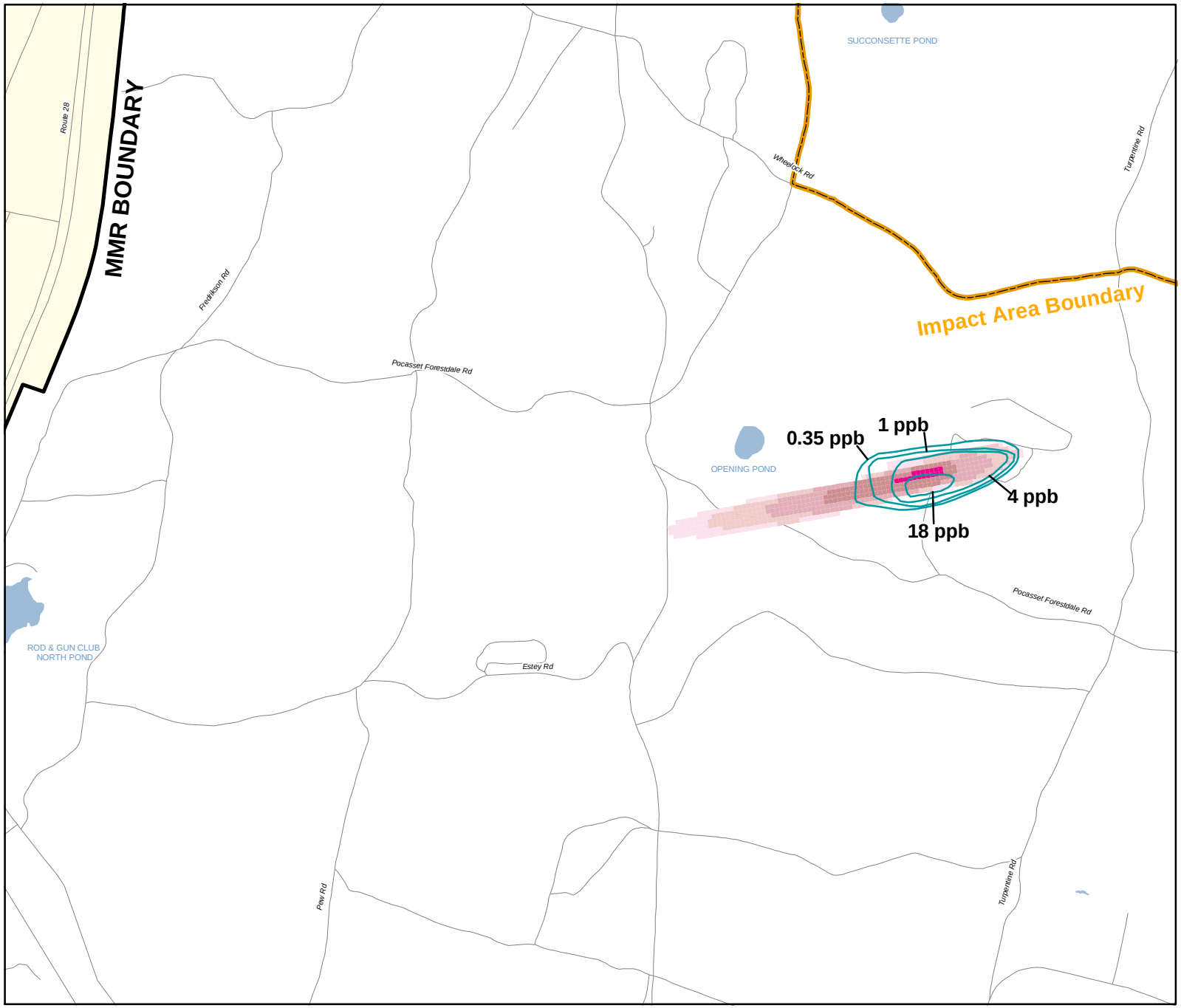


Figure A3-13. Calibrated RDX and Perchlorate Source Loading Histories.



Impact Area
Groundwater Study Program

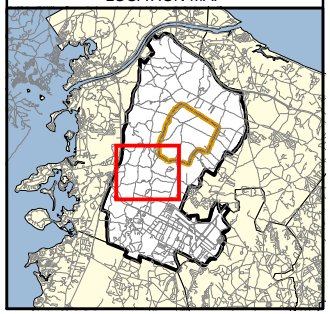
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 1

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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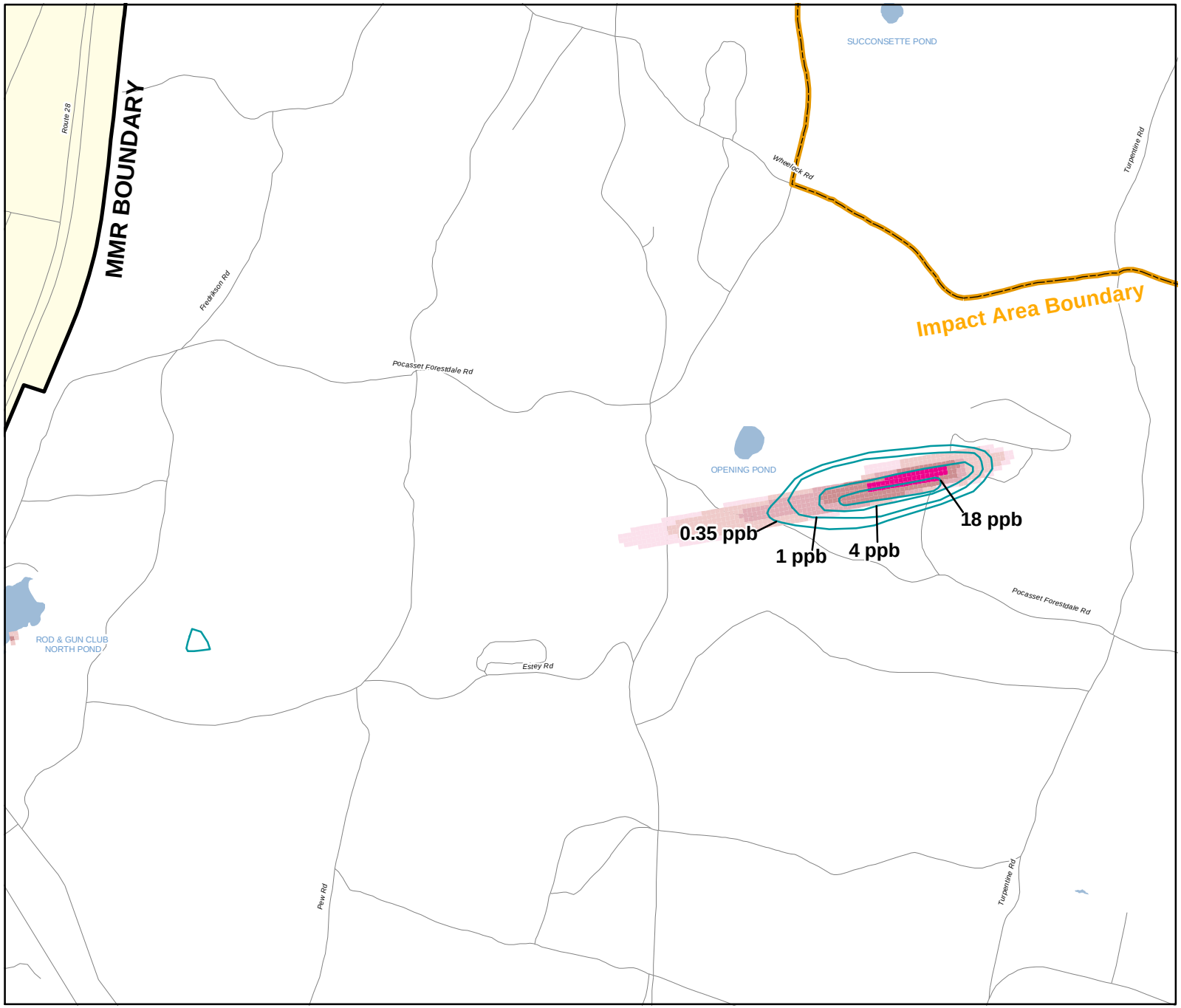
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14a.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14a.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14a



Impact Area
Groundwater Study Program

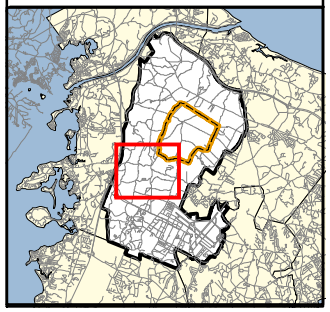
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 2

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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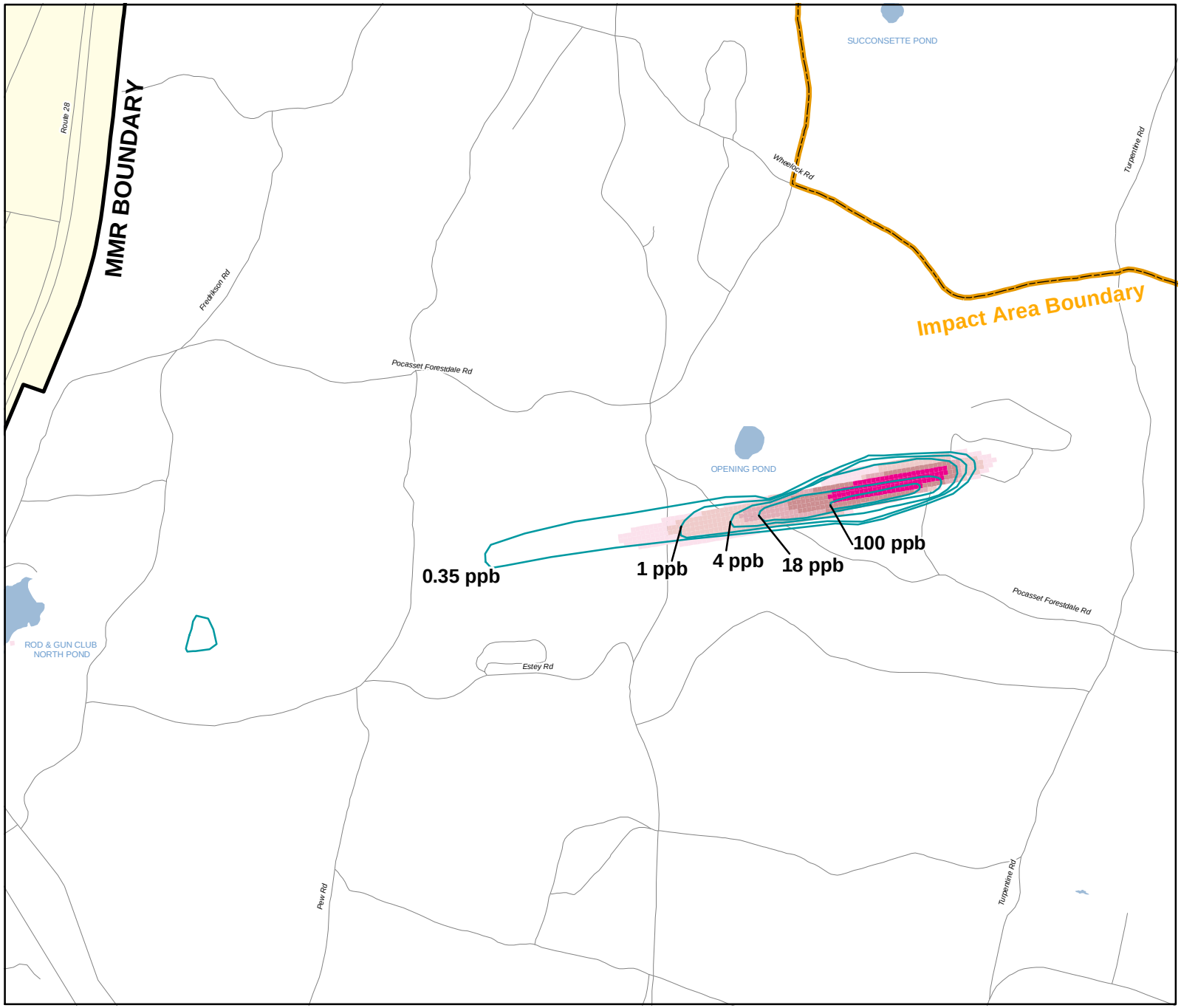
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14b.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14b.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14b



Impact Area
Groundwater Study Program

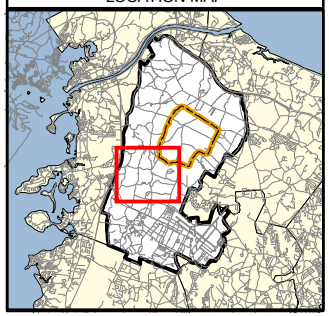
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 3

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA3-14c.pdf
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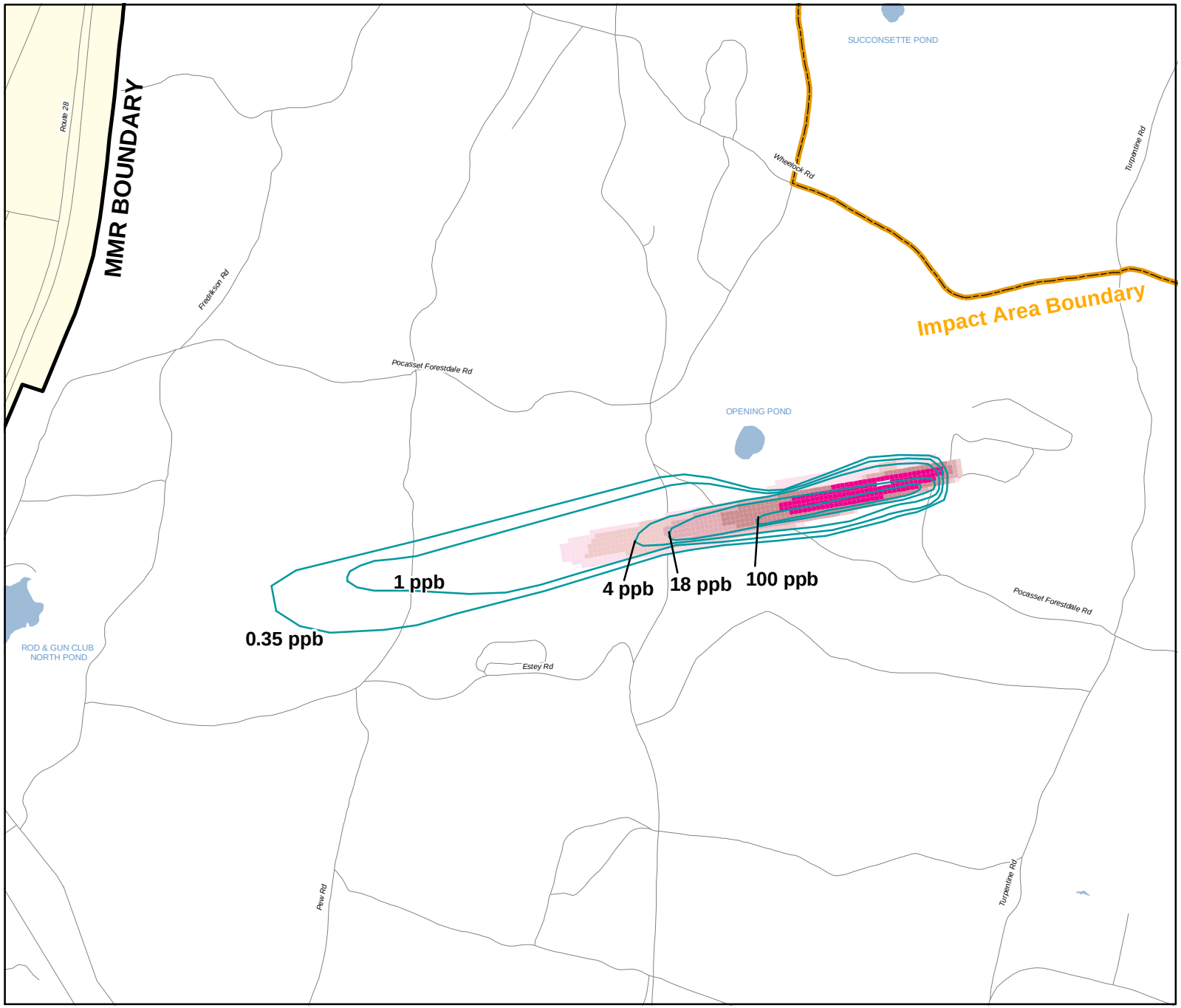
May 20, 2004 ALS JEP JBB

FIGURE

A3-14c



Impact Area
Groundwater Study Program

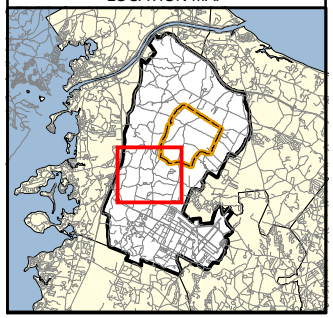
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 4

Revised Draft
Feasibilty Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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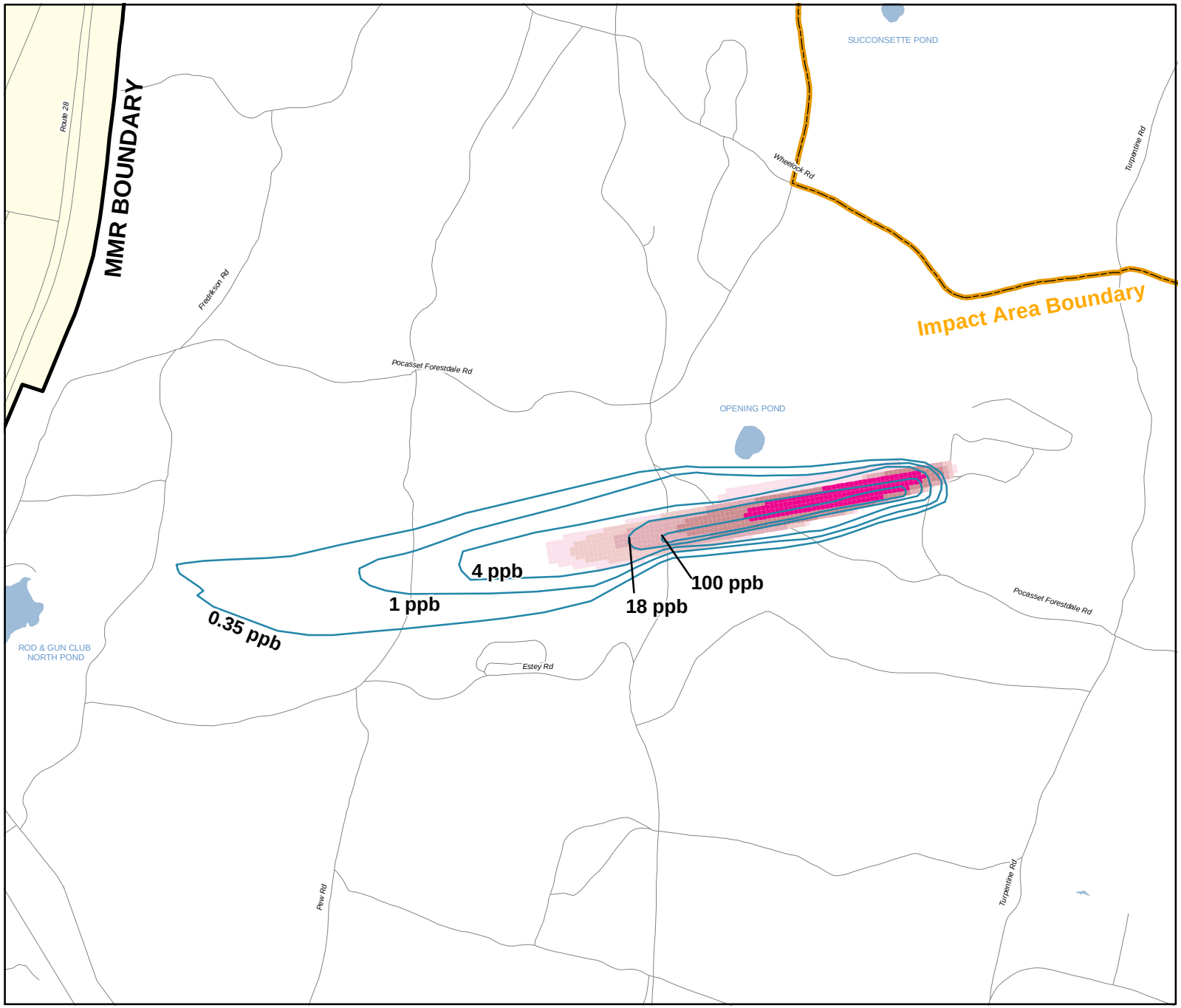
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14d.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14d.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14d



Impact Area
Groundwater Study Program

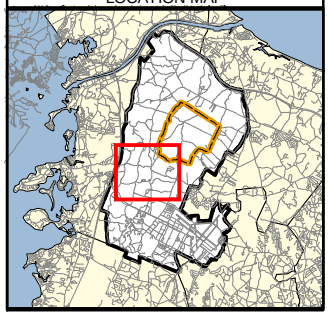
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 5

Revised Draft
Feasibilty Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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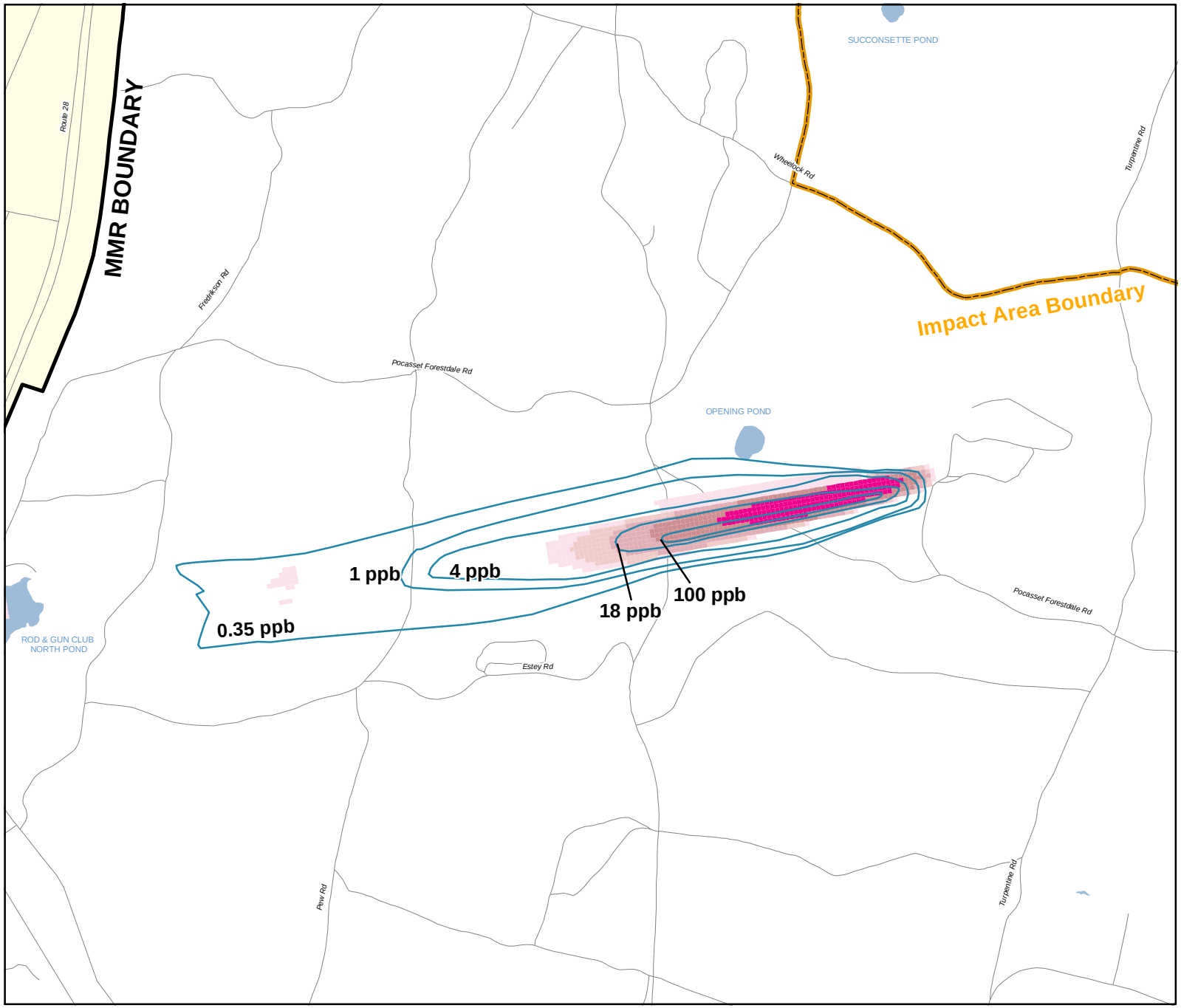
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14e.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14e.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14e



Impact Area
Groundwater Study Program

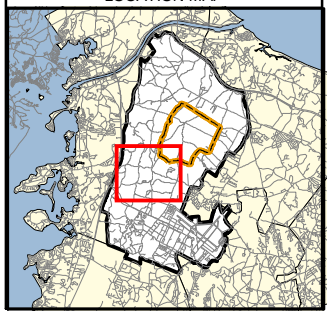
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 6

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA3-14f.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14f.mxd
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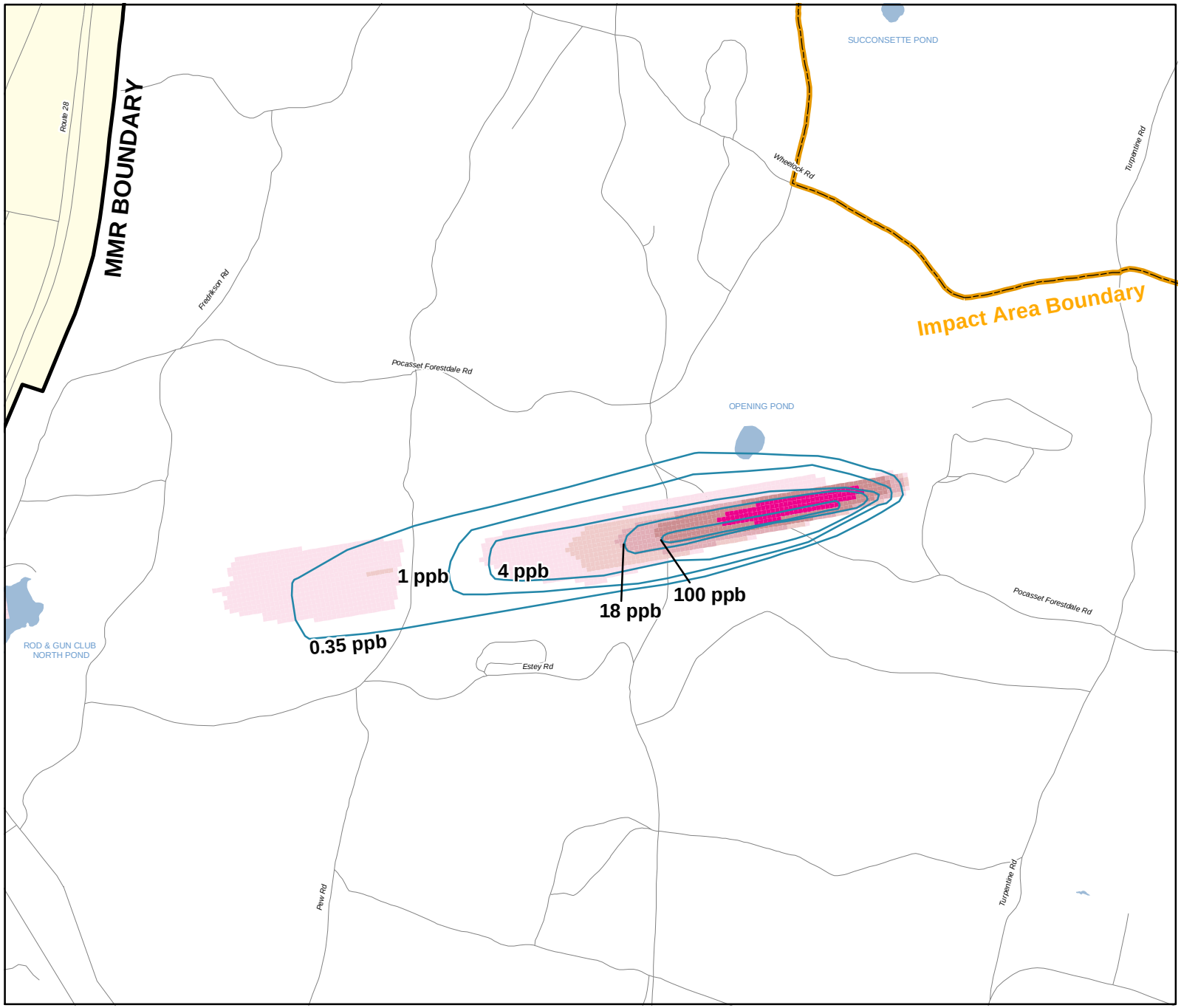
FIGURE
A3-14f



Impact Area
Groundwater Study Program

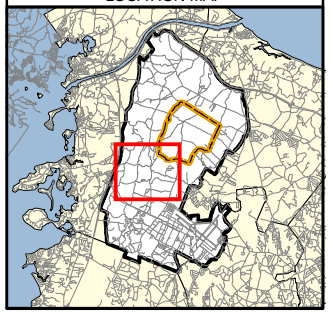
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 7

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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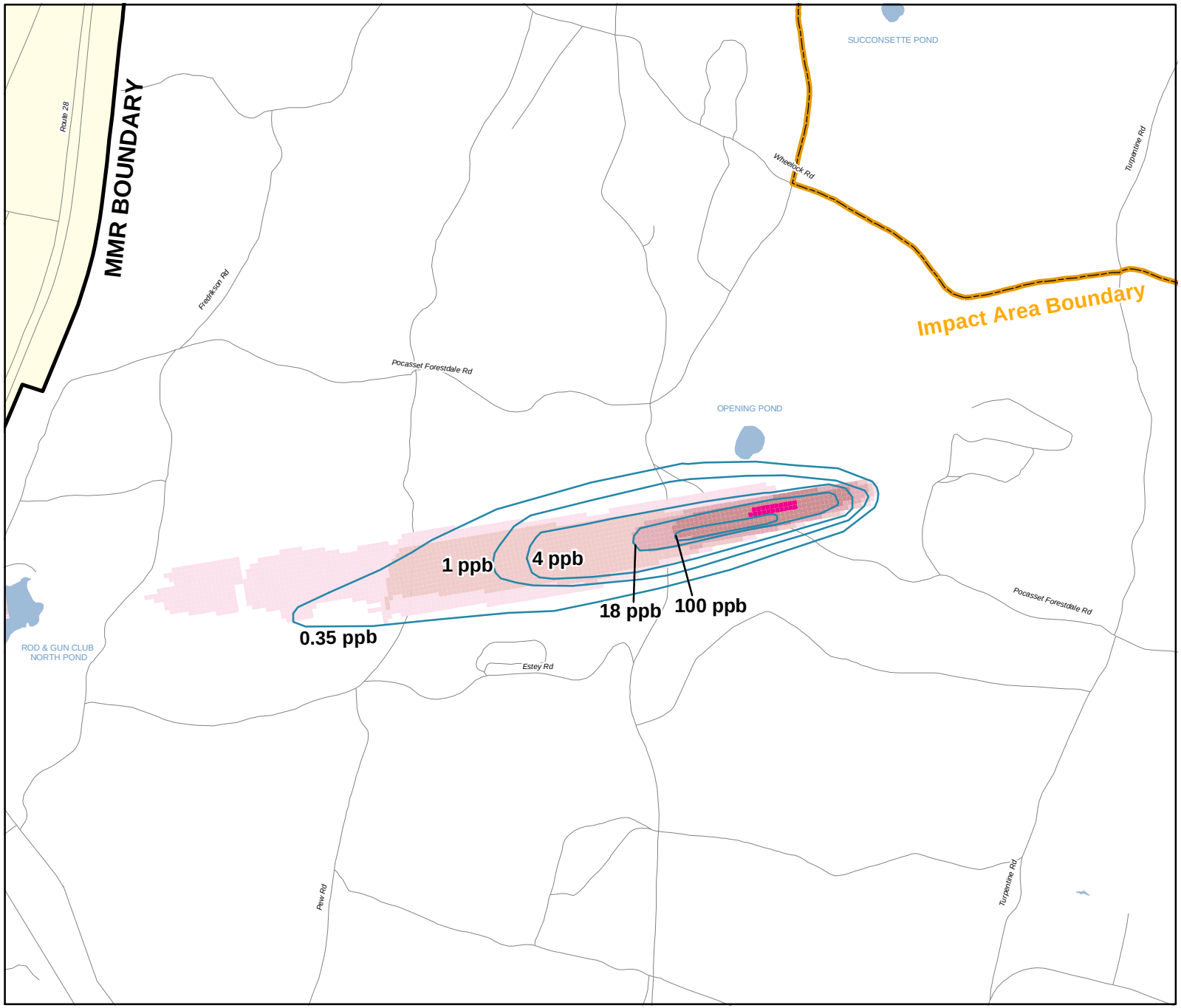
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14g.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14g.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14g



Impact Area
Groundwater Study Program

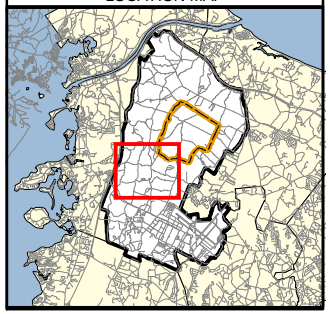
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 8

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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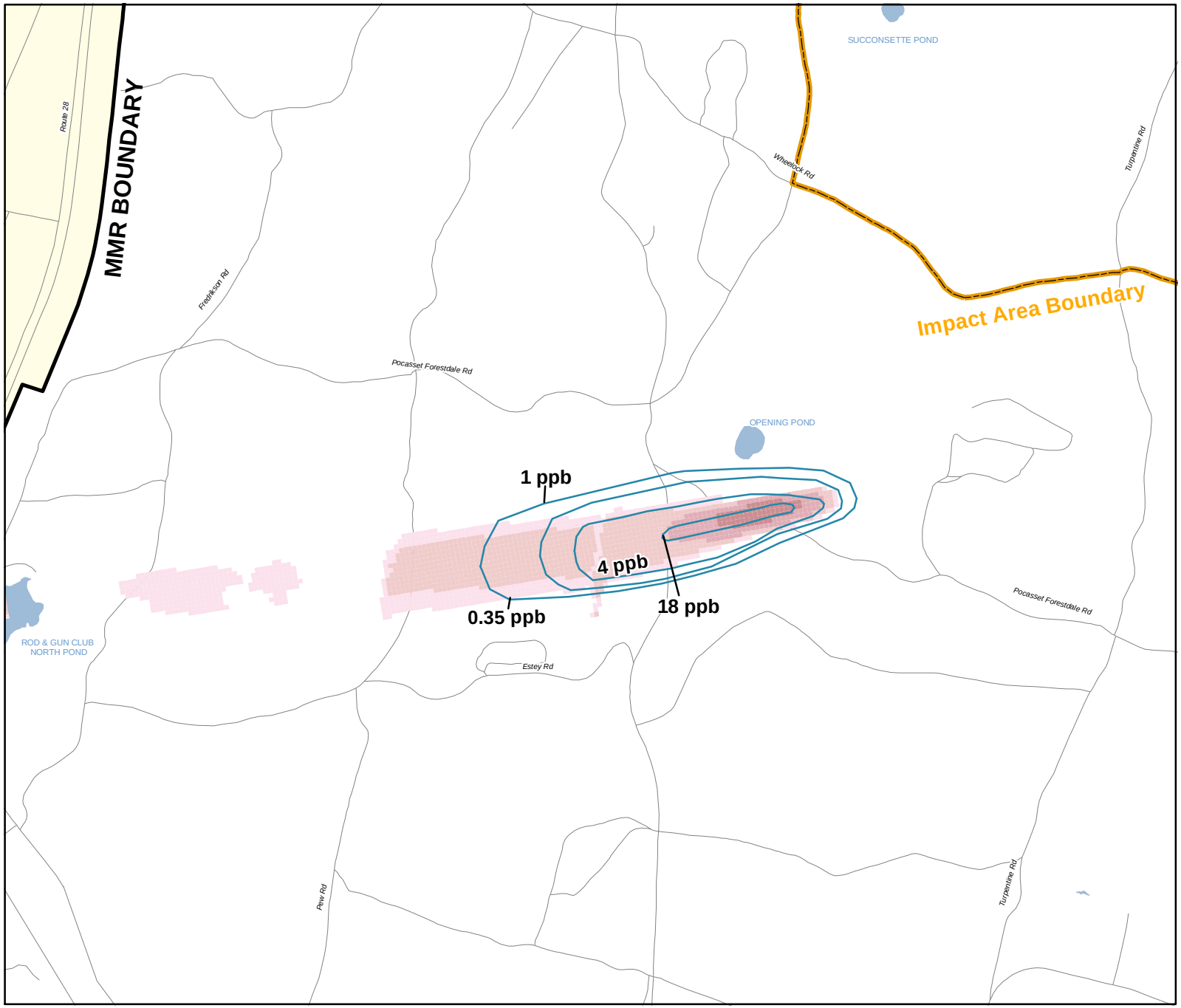
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14h.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14h.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14h



Impact Area
Groundwater Study Program

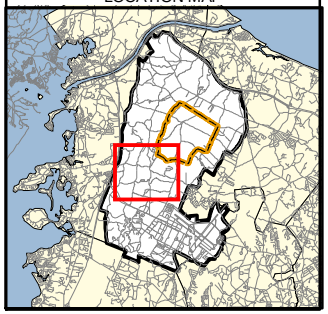
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 9

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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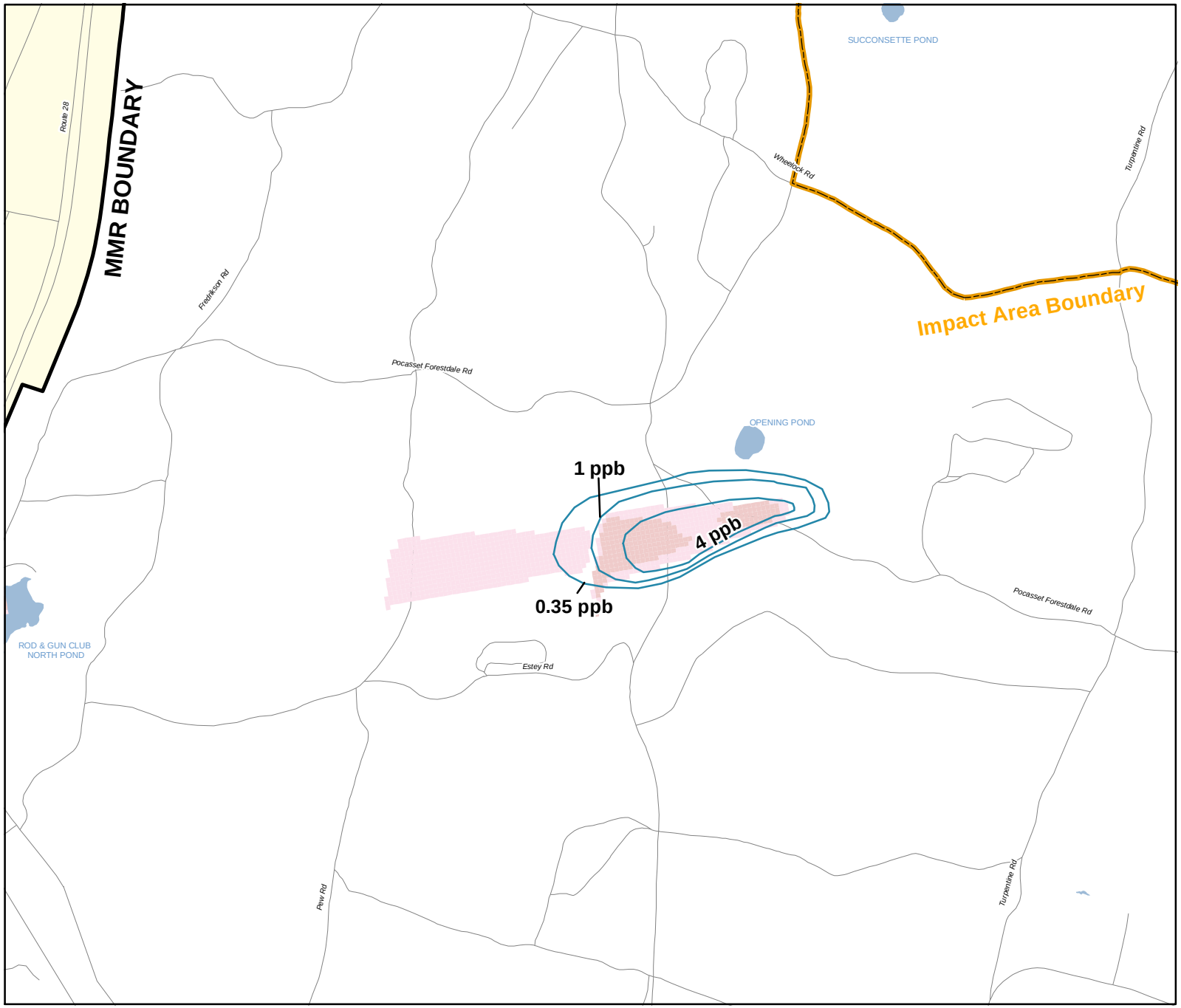
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14i.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14i.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14i



Impact Area
Groundwater Study Program

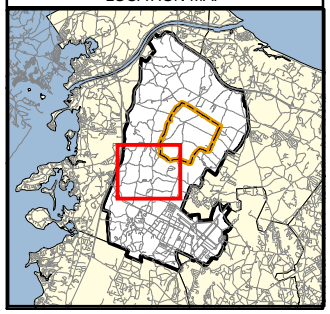
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 10

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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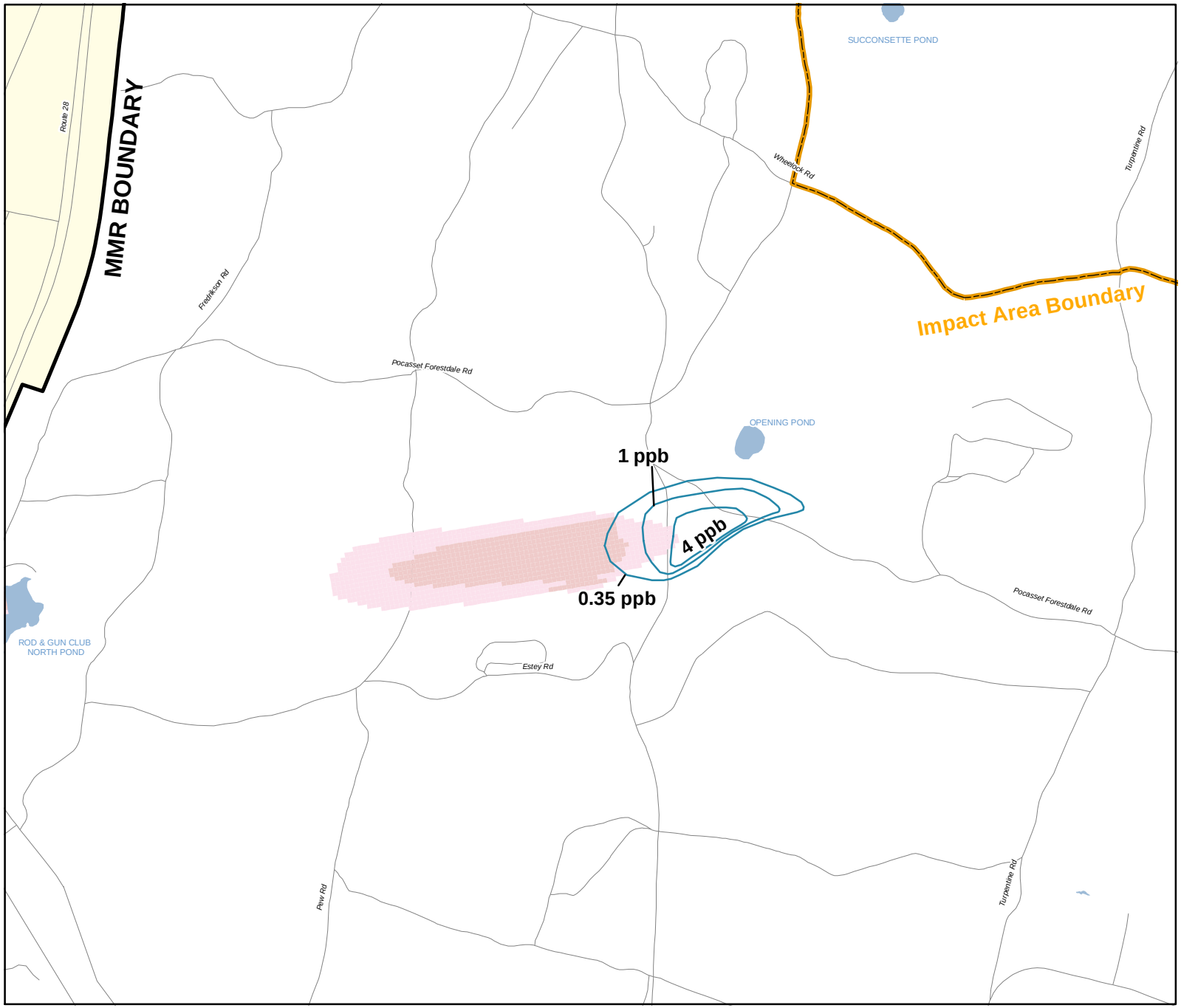
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14j.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14j.mxd
May 20, 2004 ALS JEP JBB

FIGURE
A3-14j



Impact Area
Groundwater Study Program

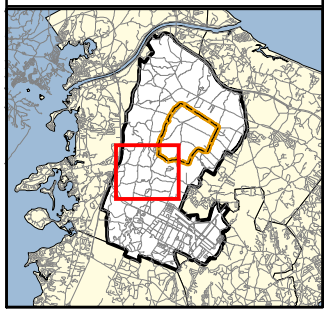
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 11

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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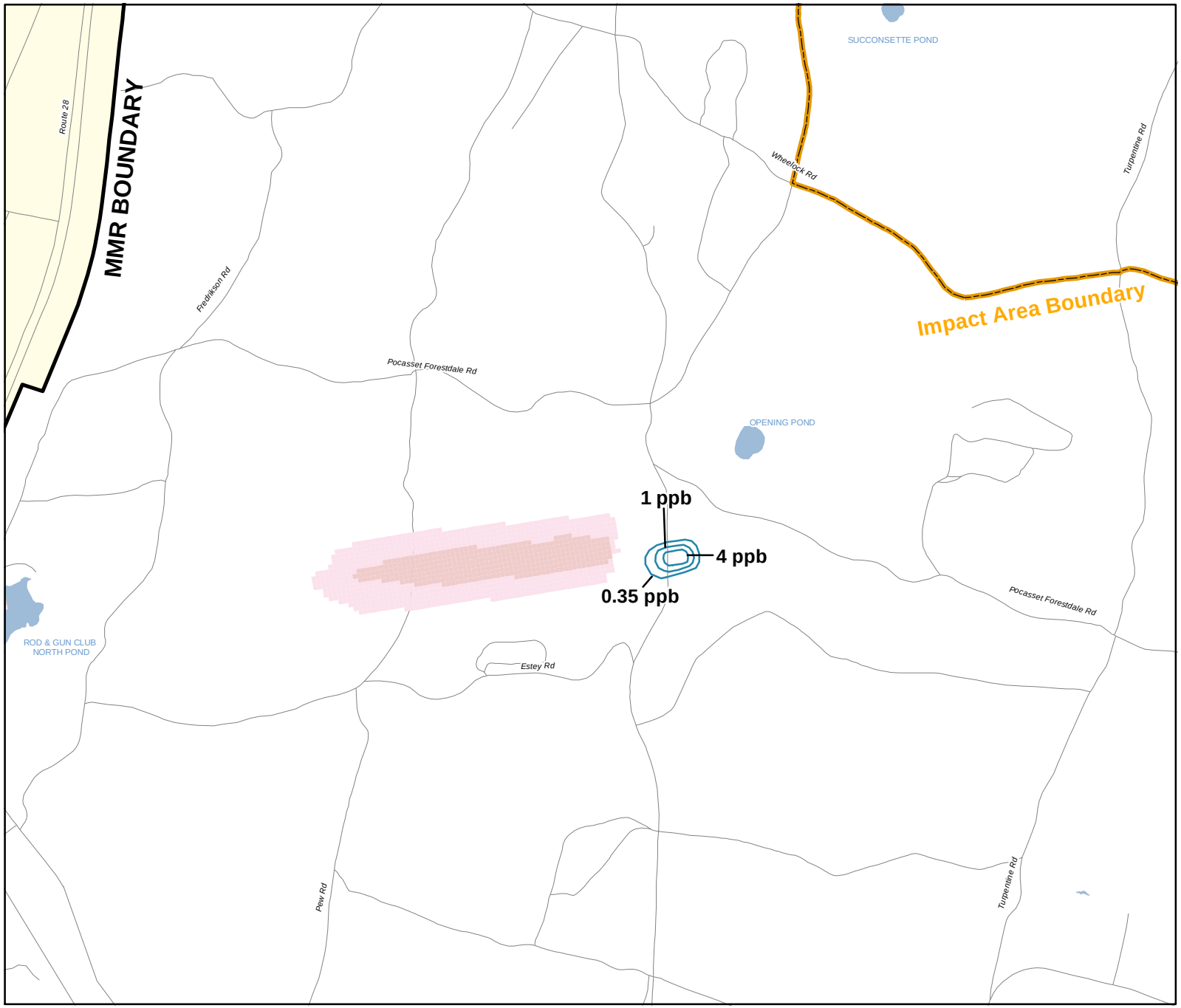
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14k.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-14k.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14k



Impact Area
Groundwater Study Program

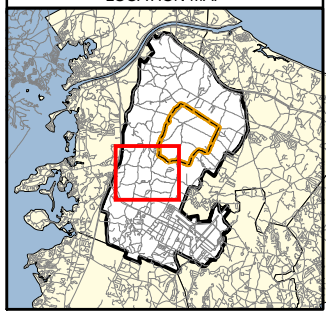
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.35- 1.00 ppb
- 1.01- 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed Perchlorate Plume Extent Layer 12

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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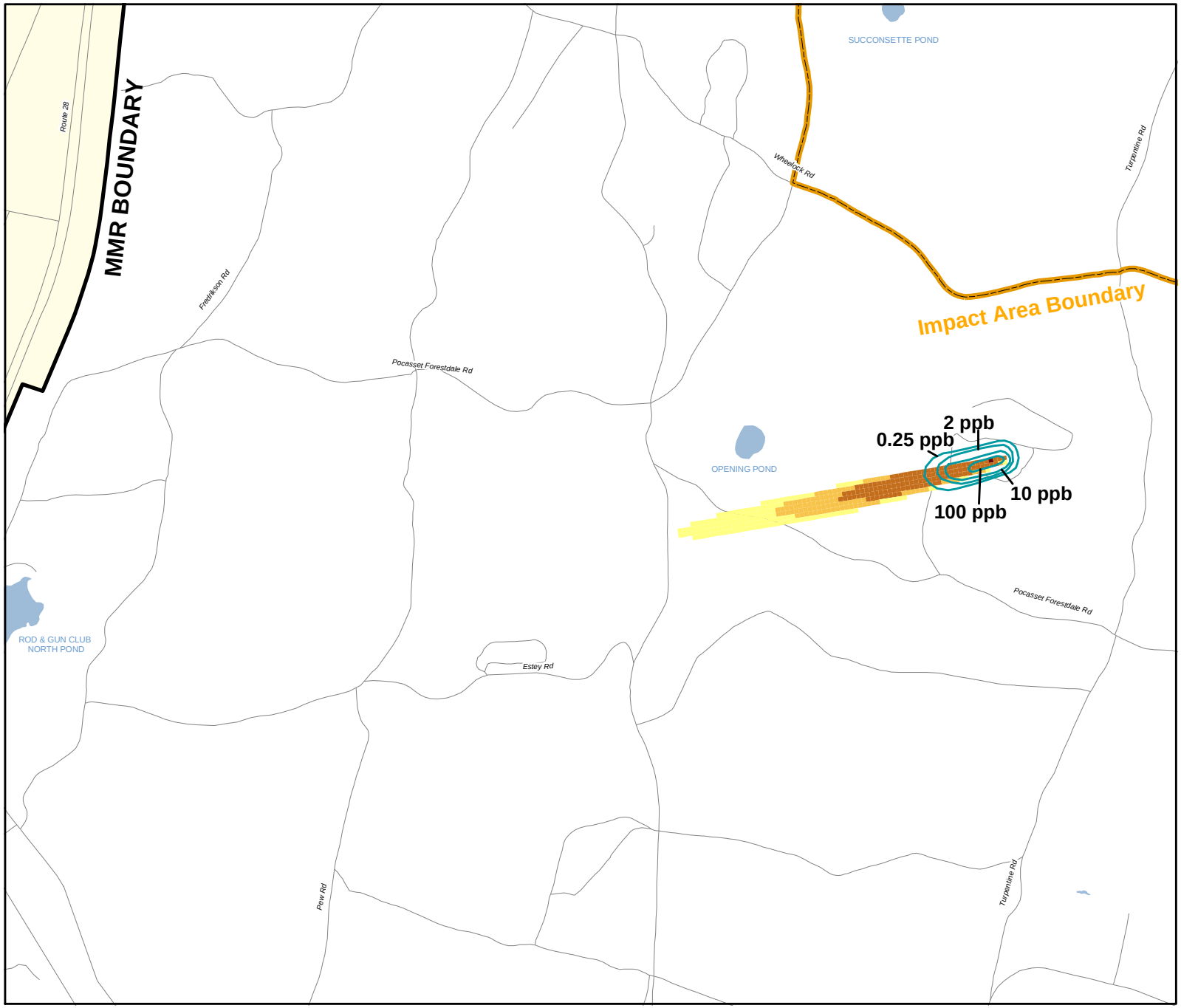
J:/mmr/ReportFigs2004/D8706/8706_FigA3-14l.pdf
G:/MMR_COE/Work/D8706/8706_A3-14l.mxd
May 20, 2004 ALS JEP JBB

FIGURE

A3-14l



Impact Area
Groundwater Study Program

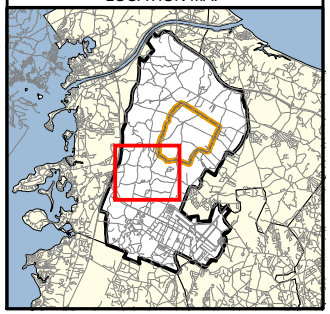
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 1

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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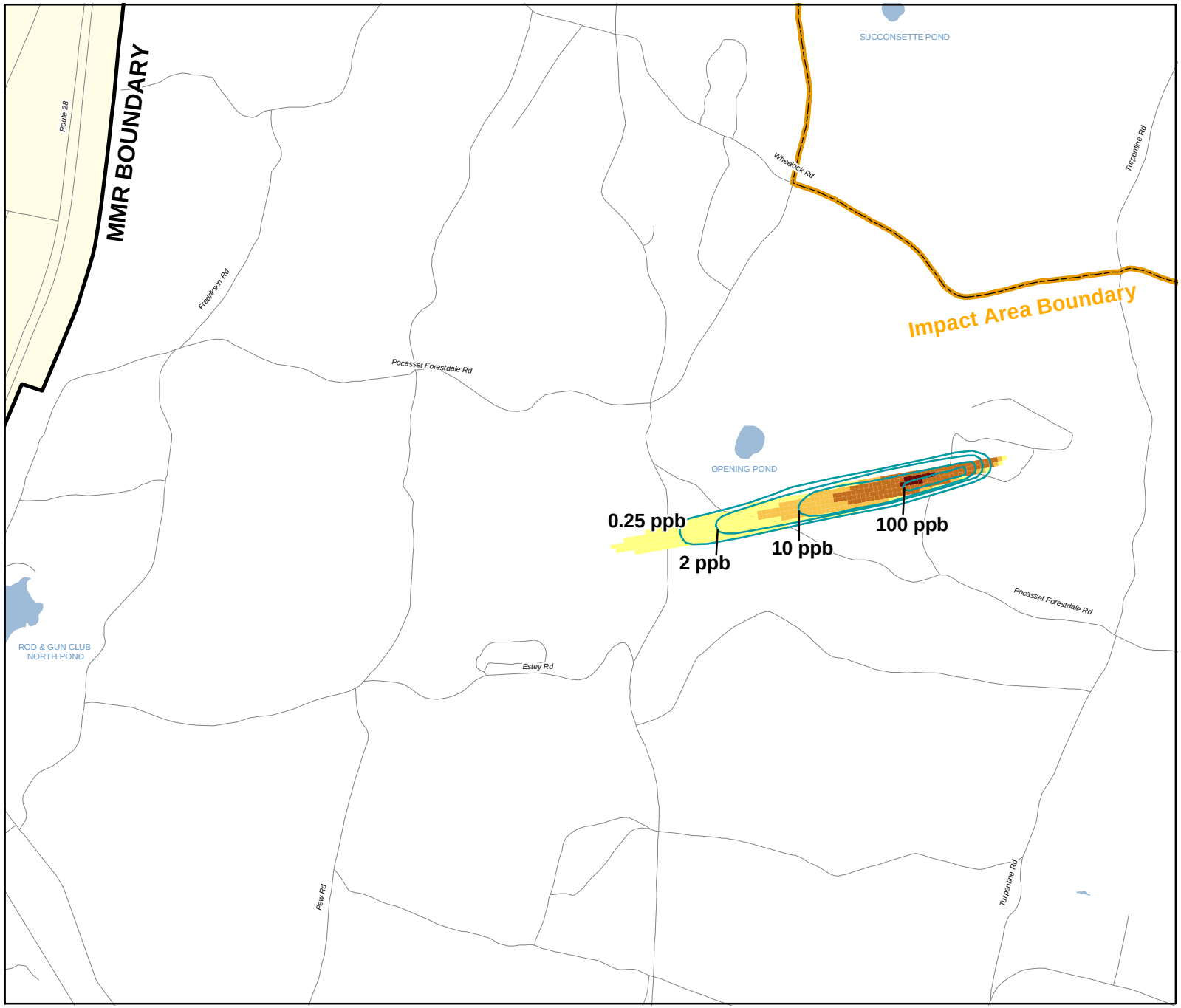
J:/mmr/ReportFigs2004/D8706/8706_FigA3-15a.pdf
G:/MMR_COE/Work2004/D8706/8706_FigA3-15a.mxd
May 20, 2004 AP JBB

FIGURE

A3-15a



Impact Area
Groundwater Study Program

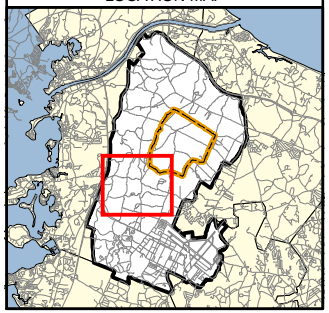
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 2

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA3-15b.pdf
G:/MMR_COE/Work2004/D8706/8706_FigA3-15b.mxd
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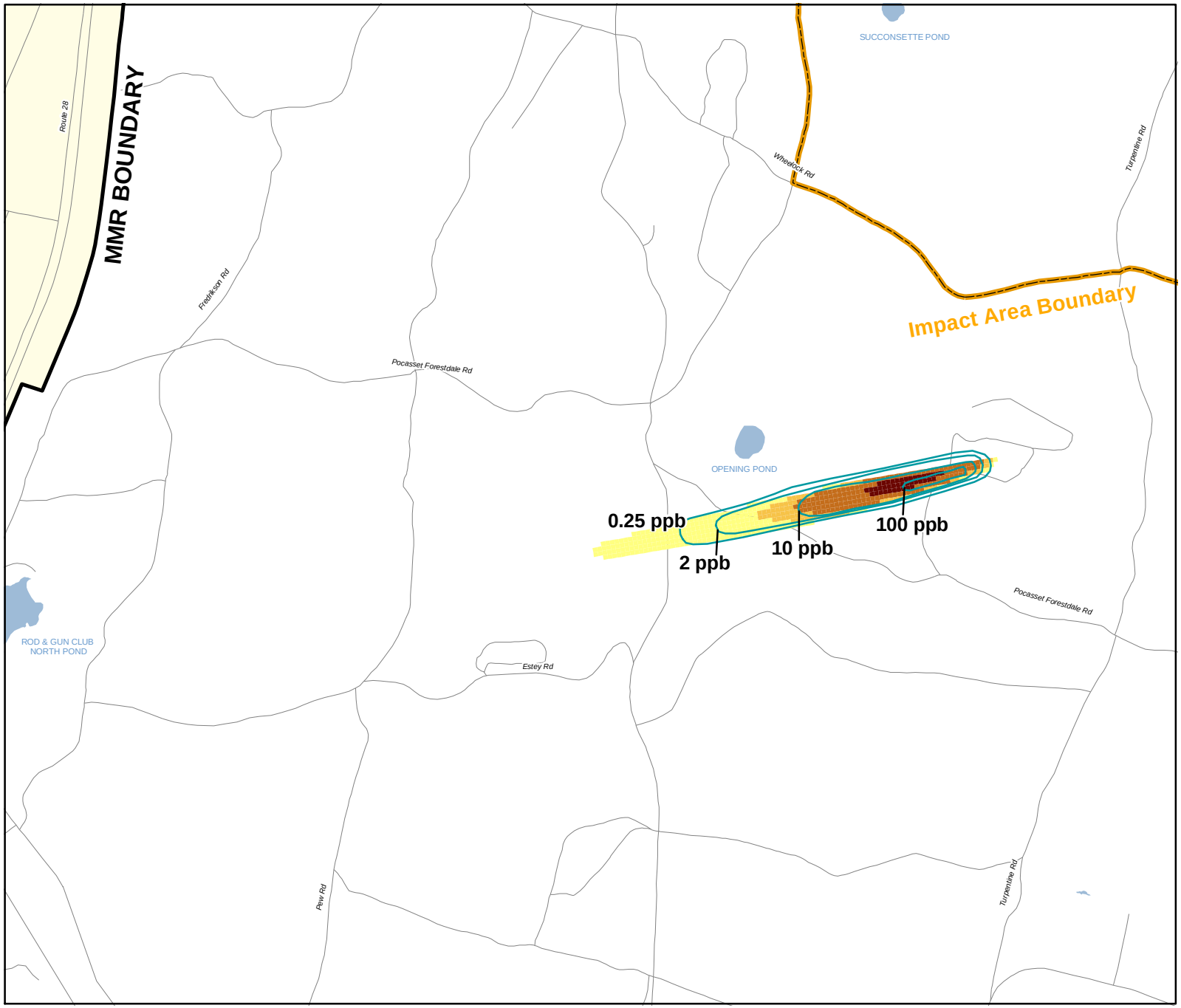
FIGURE

A3-15b



Impact Area
Groundwater Study Program

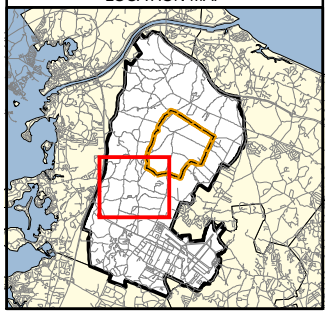
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 3

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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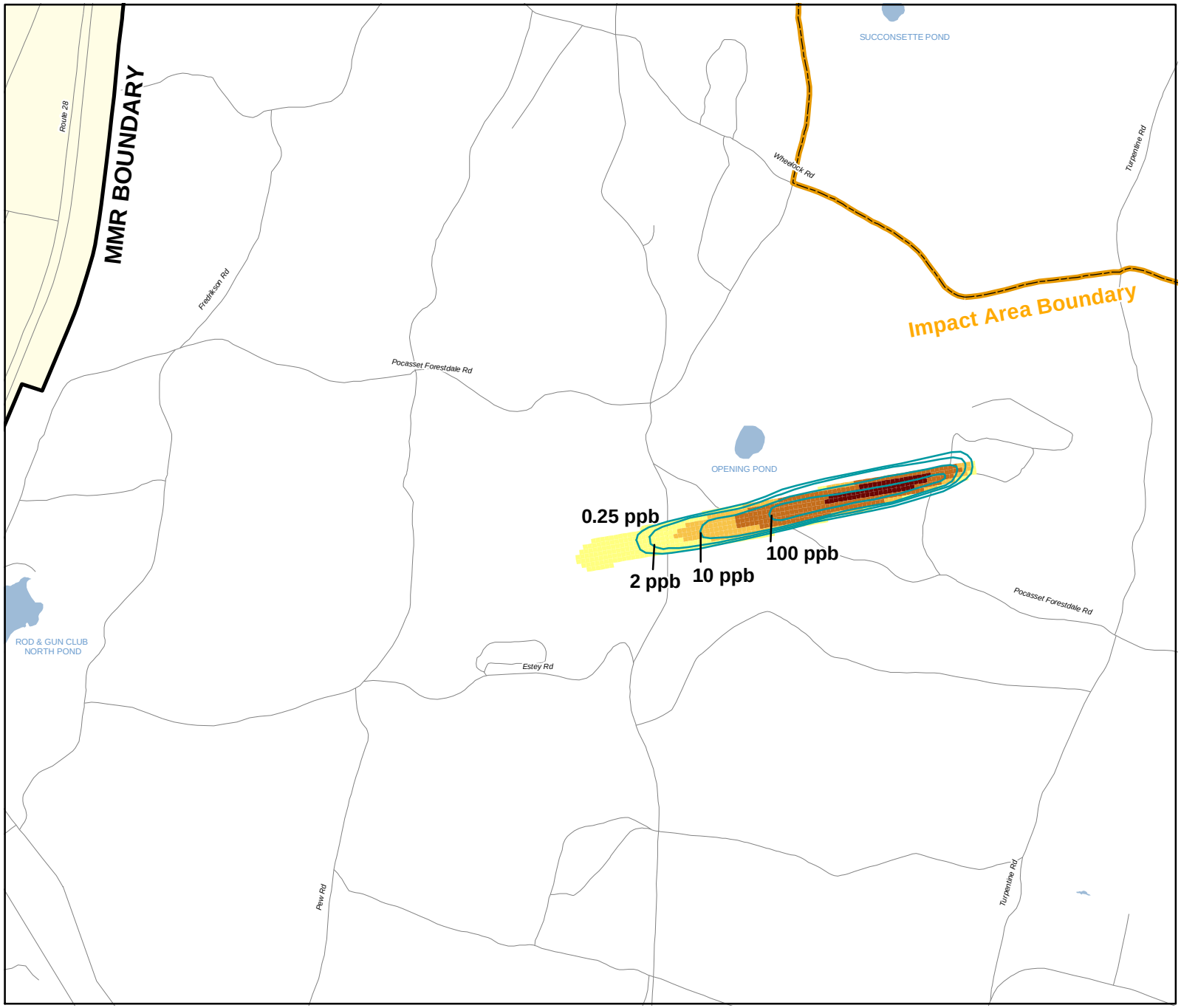
J:/mmr/ReportFigs2004/D8706/8706_FigA3-15c.pdf
G:/MMR_COE/Work2004/D8706/8706_FigA3-15c.mxd
May 20, 2004 AP JBB

FIGURE

A3-15c



Impact Area
Groundwater Study Program

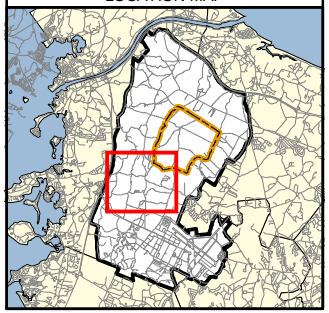
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 4

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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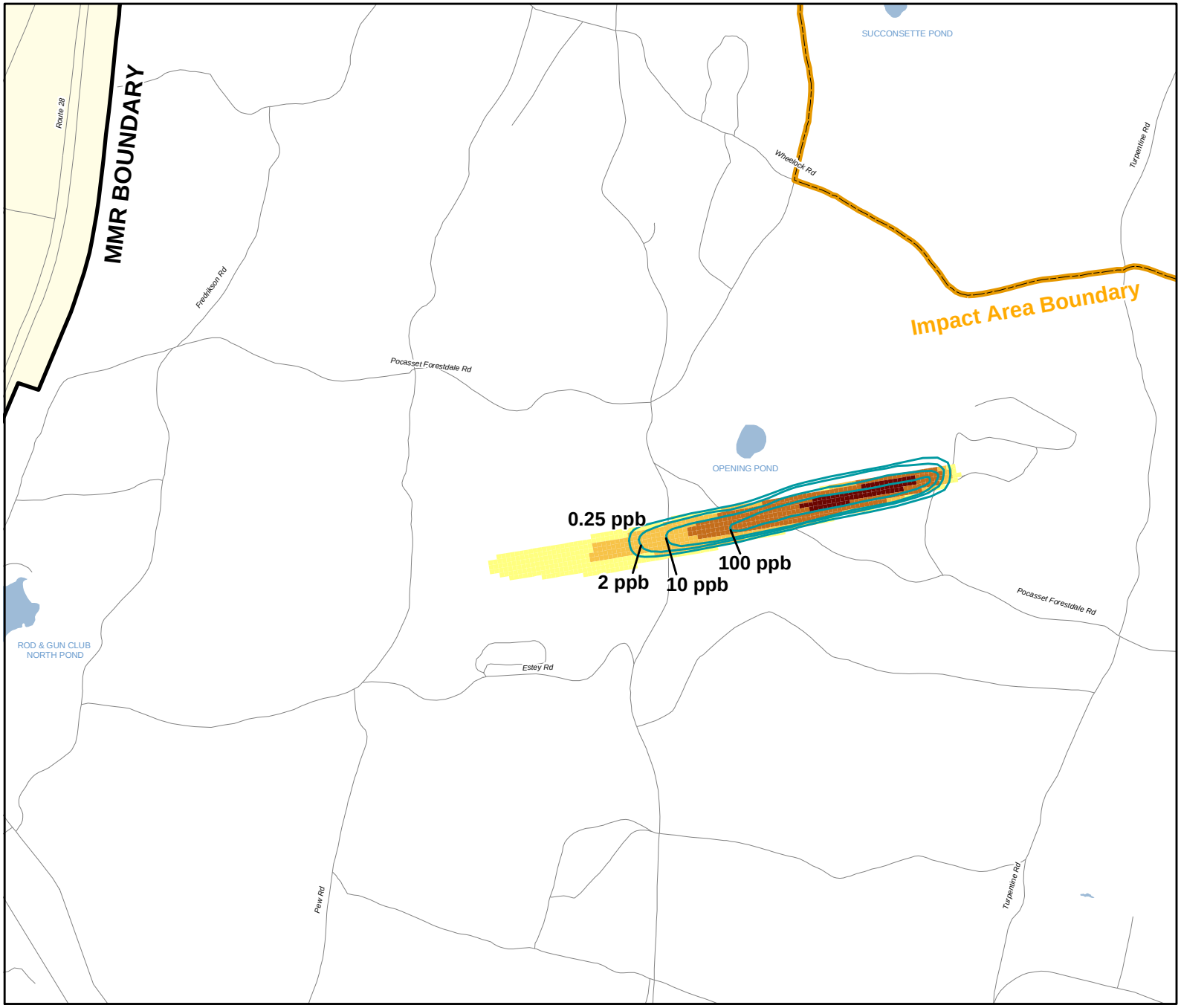
J:/mmr/ReportFigs2004/D8706/8706_FigA3-15d.pdf
G:/MMR_COE/Work/D8706/8706_FigA3-15d.mxd
May 20, 2004 AP JBB

FIGURE

A3-15d



Impact Area
Groundwater Study Program

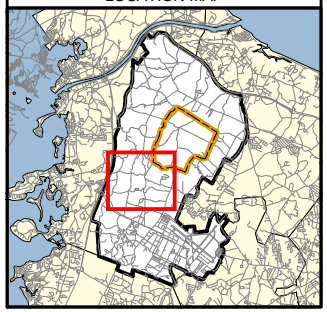
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 5

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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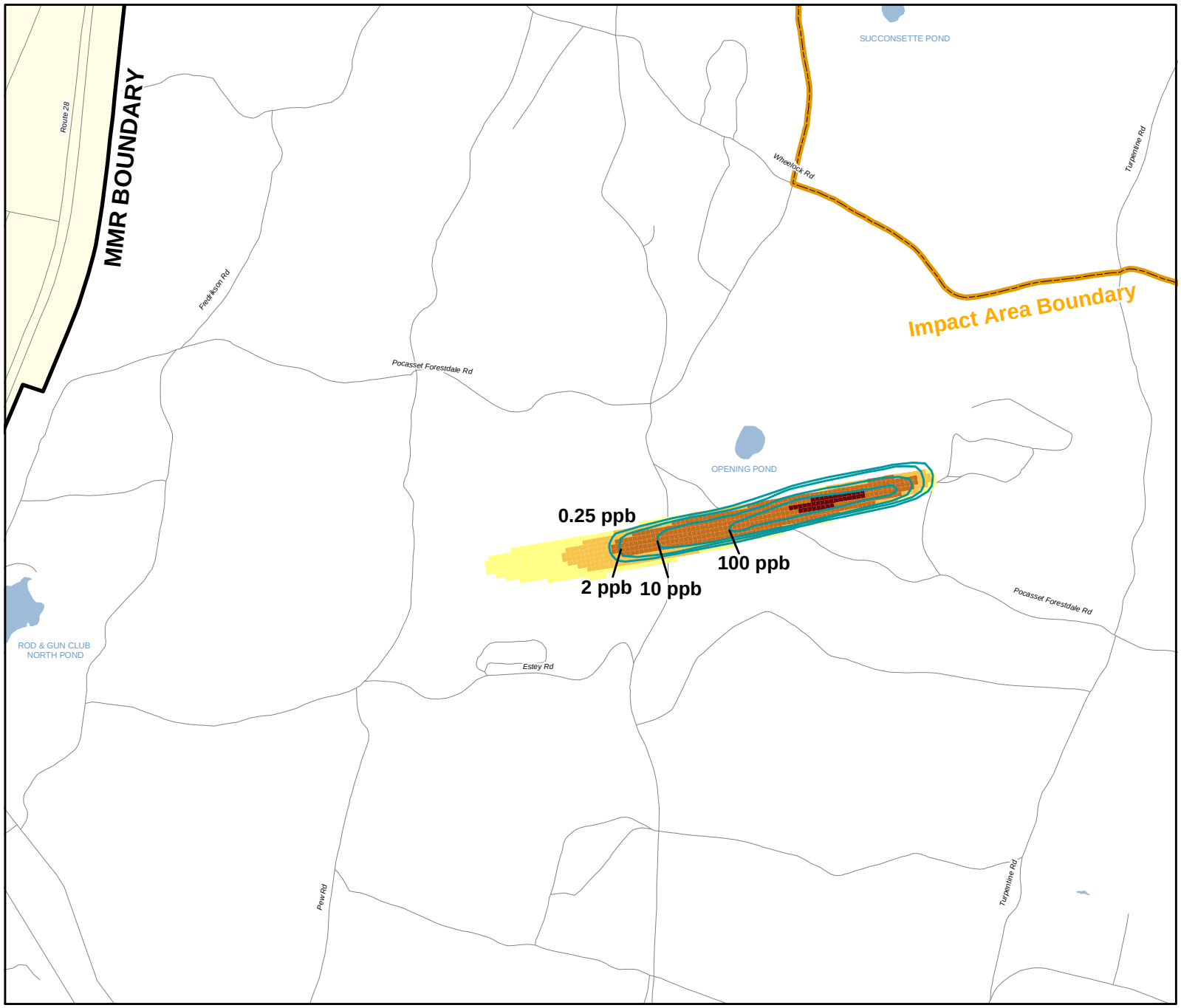
J:/mmr/ReportFigs2004/D8706/8706_FigA3-15e.pdf
G:/MMR_COE/Work2004/D8706/8706_FigA3-15e.mxd
May 20, 2004 AP JBB

FIGURE

A3-15e



Impact Area
Groundwater Study Program

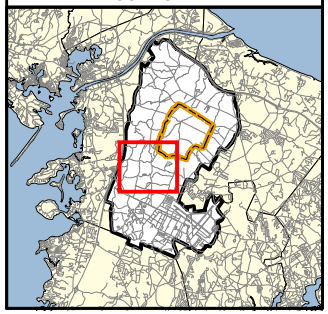
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 6

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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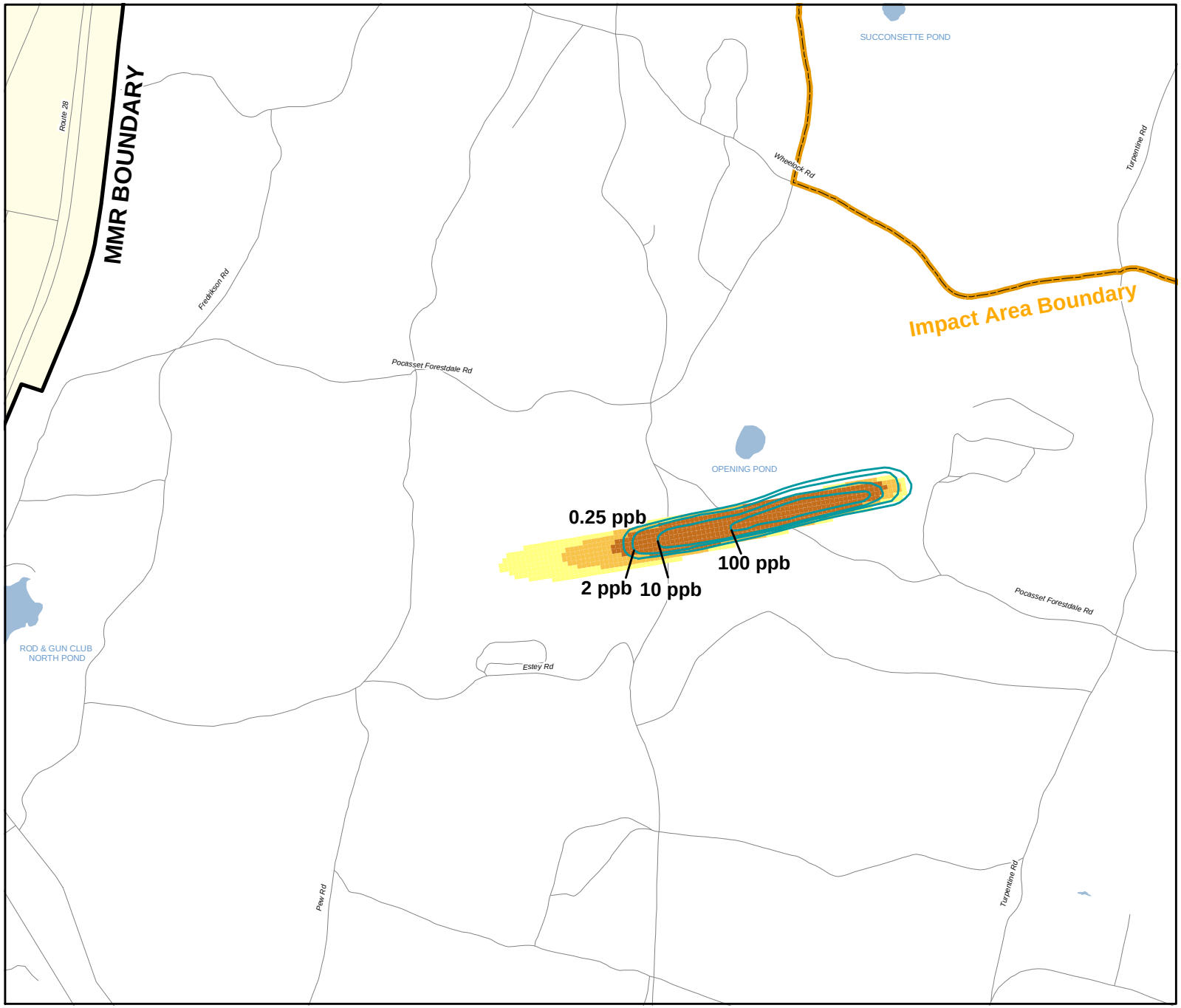
J:/mmr/ReportFigs2004/D8706/8706_FigA3-15f.pdf
G:/MMR_COE/work/D8706/8706_FigA3-15f.mxd
May 20, 2004 AP JBB

FIGURE

A3-15f



Impact Area
Groundwater Study Program

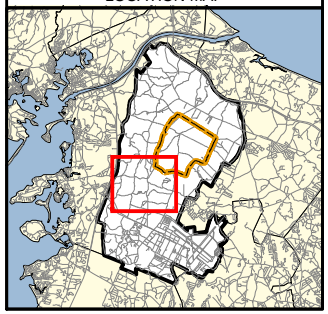
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 7

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA3-15g.pdf
G:/MMR_COE/work/D8706/8706_FigA3-15g.mxd
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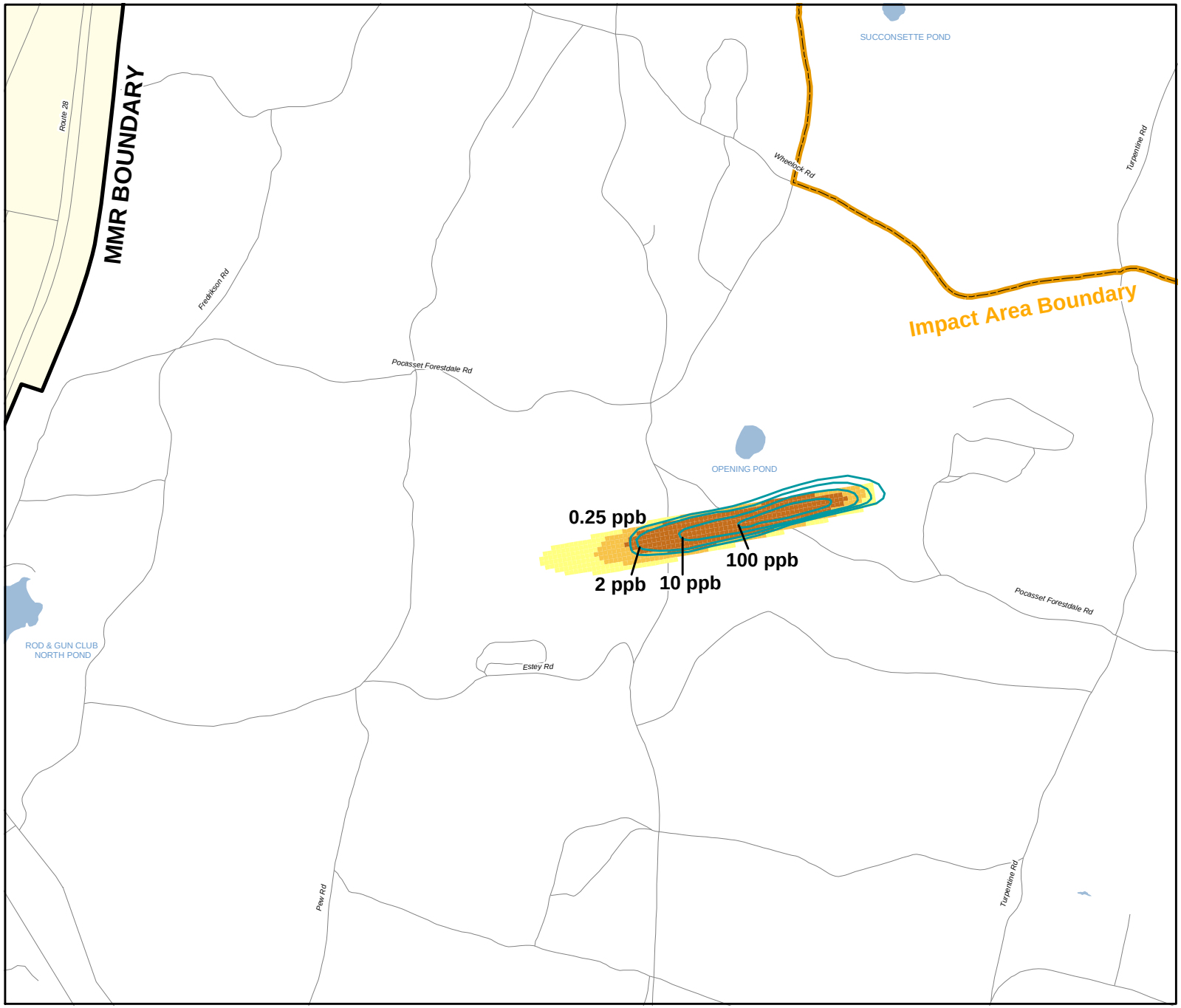
FIGURE

A3-15g



Impact Area
Groundwater Study Program

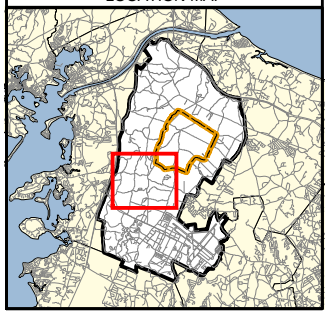
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 8

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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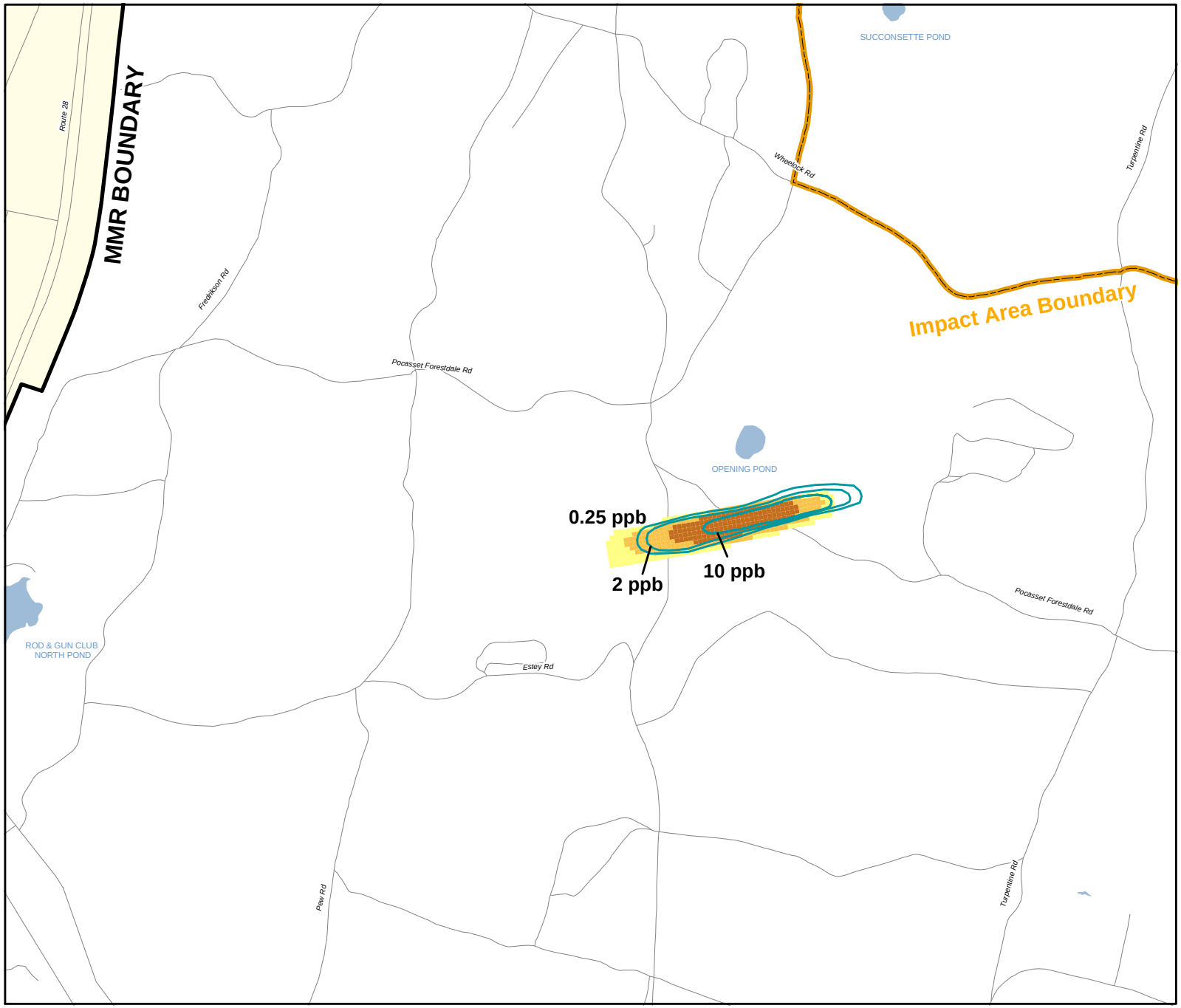
FIGURE

A3-15h



Impact Area
Groundwater Study Program

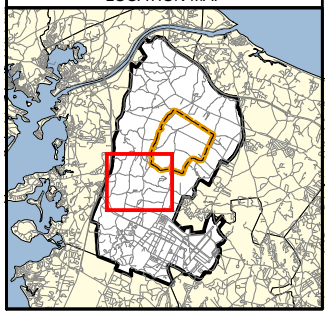
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 9

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA3-15i.pdf
G:/MMR_COE/work/D8706/8706_FigA3-15i.mxd
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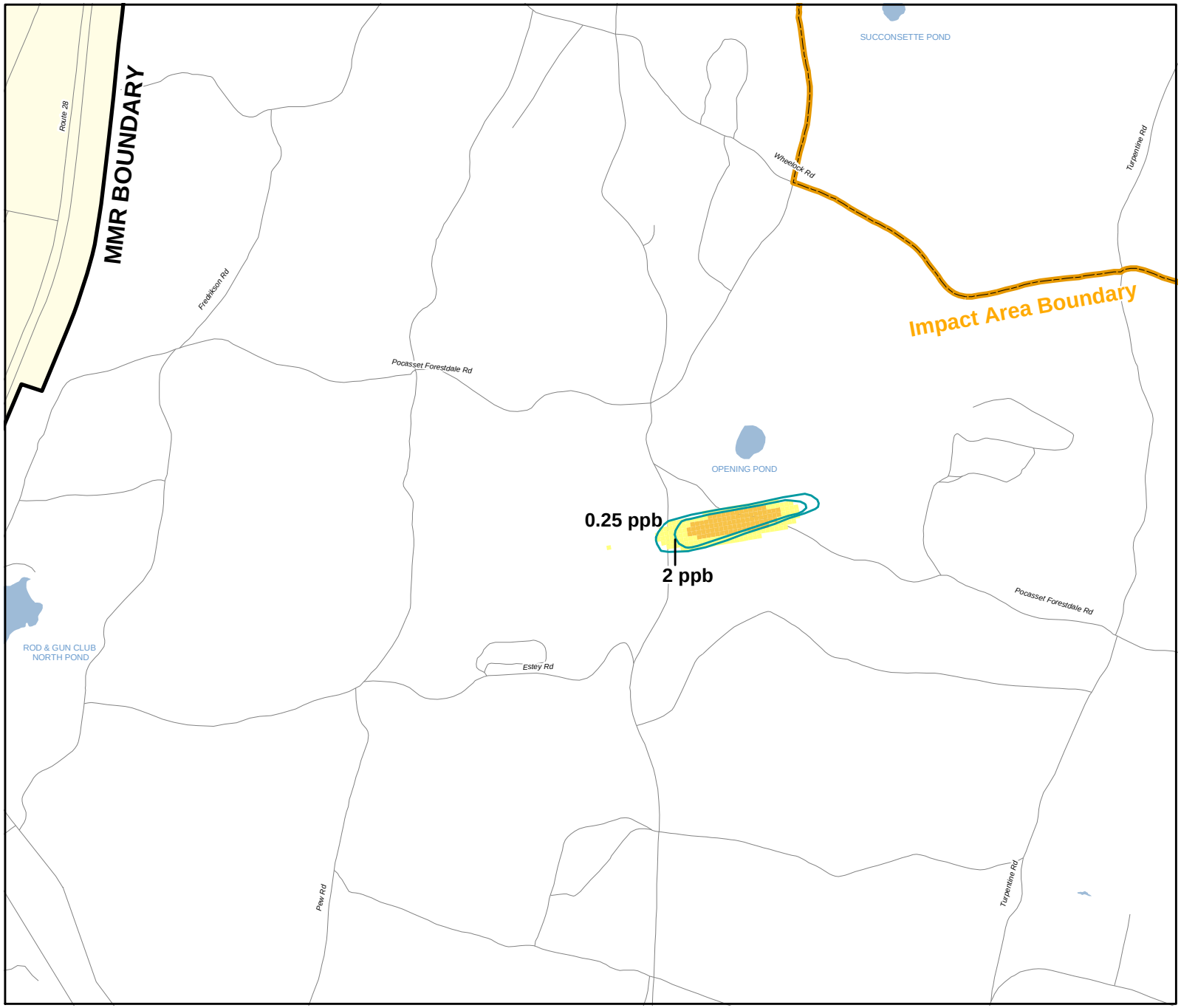
FIGURE

A3-15i



Impact Area
Groundwater Study Program

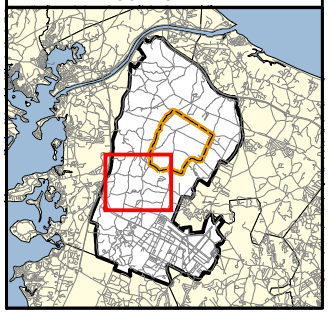
LEGEND

Observed Concentration Contours

Model Computed Concentrations

- 0.25 - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Comparison of Observed vs Computed RDX Plume Extent Layer 10

Revised Draft
Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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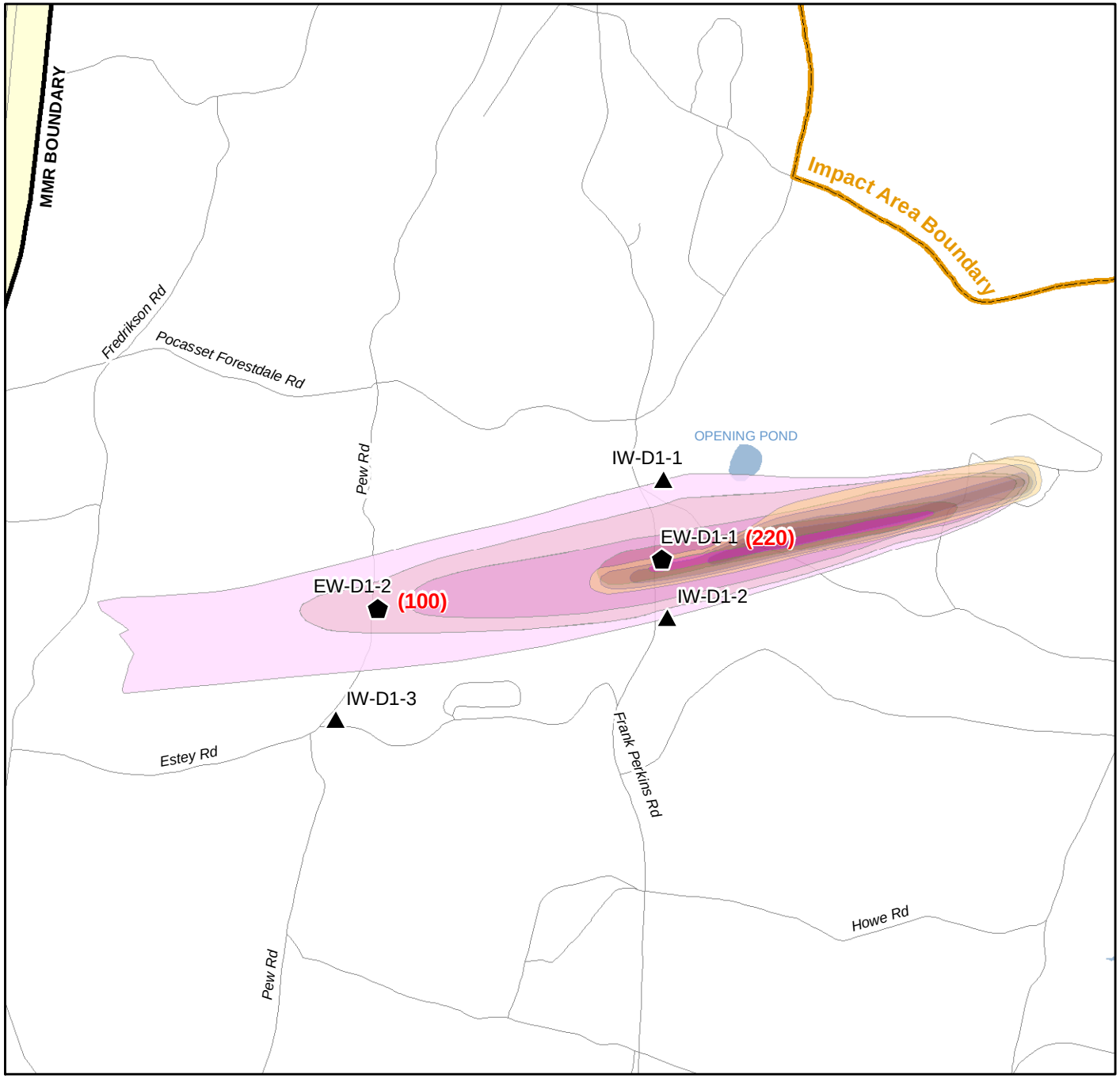
J:/mmr/ReportFigs2004/D8706/8706_FigA3-15j.pdf
G:/MMR_COE/work/D8706/8706_FigA3-15j.mxd
May 20, 2004 AP JBB

FIGURE

A3-15j



Impact Area Groundwater Study Program

LEGEND

- Existing Extraction Wells
- Existing Injection Wells
  (Pumping Rate - gpm)

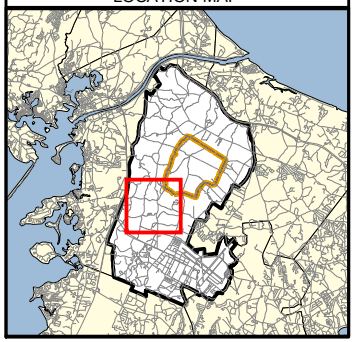
Perchlorate Plume Extents

- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Current RRA Extraction/Injection System Wellfield Design

Revised Draft Feasiblity Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA4-1.pdf
G:/MMR_COE/work/D8706/8706_FigA4-1.mxd
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FIGURE

A4-1

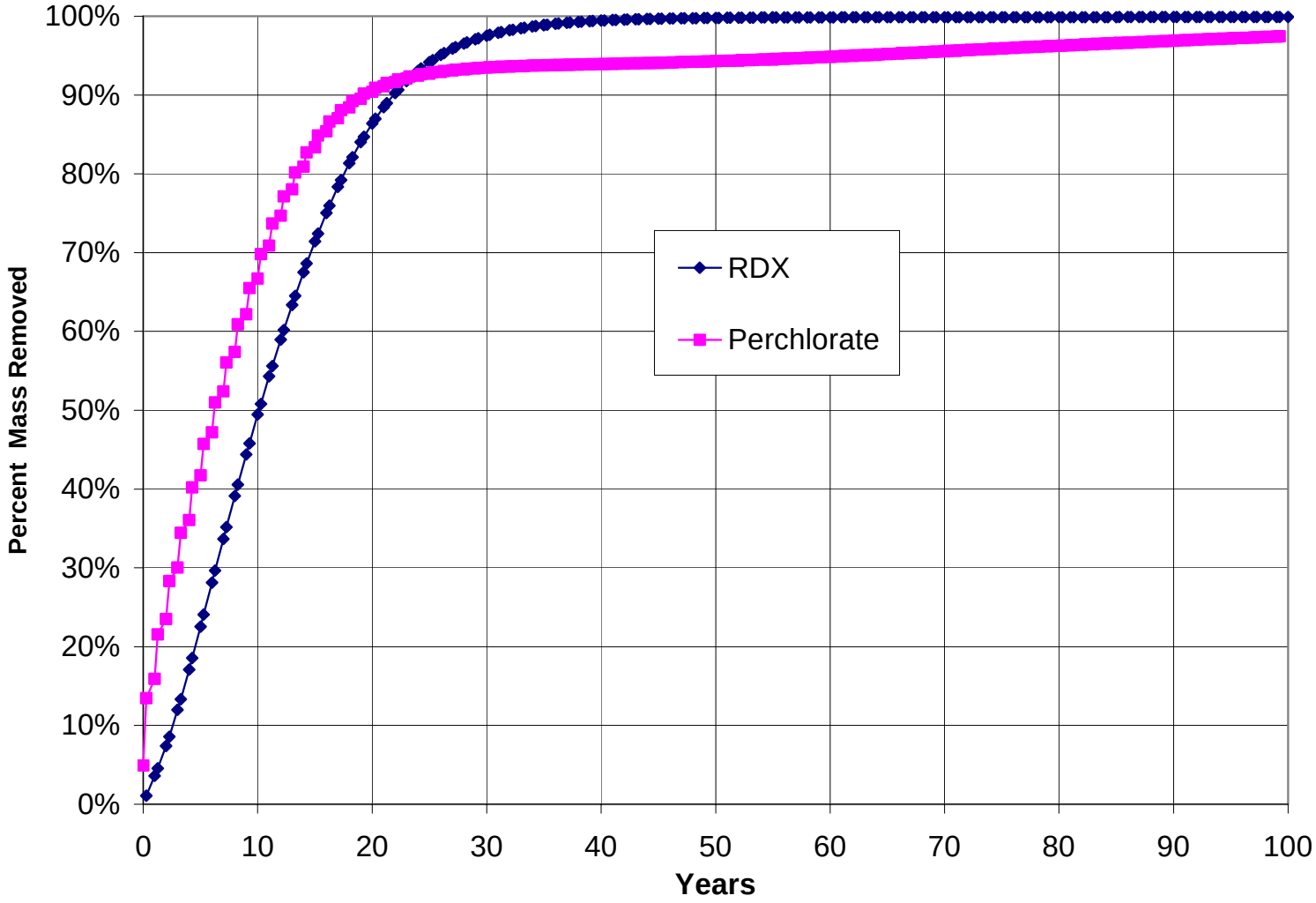


Figure A4-2. RRA System Mass Removal vs. Time.

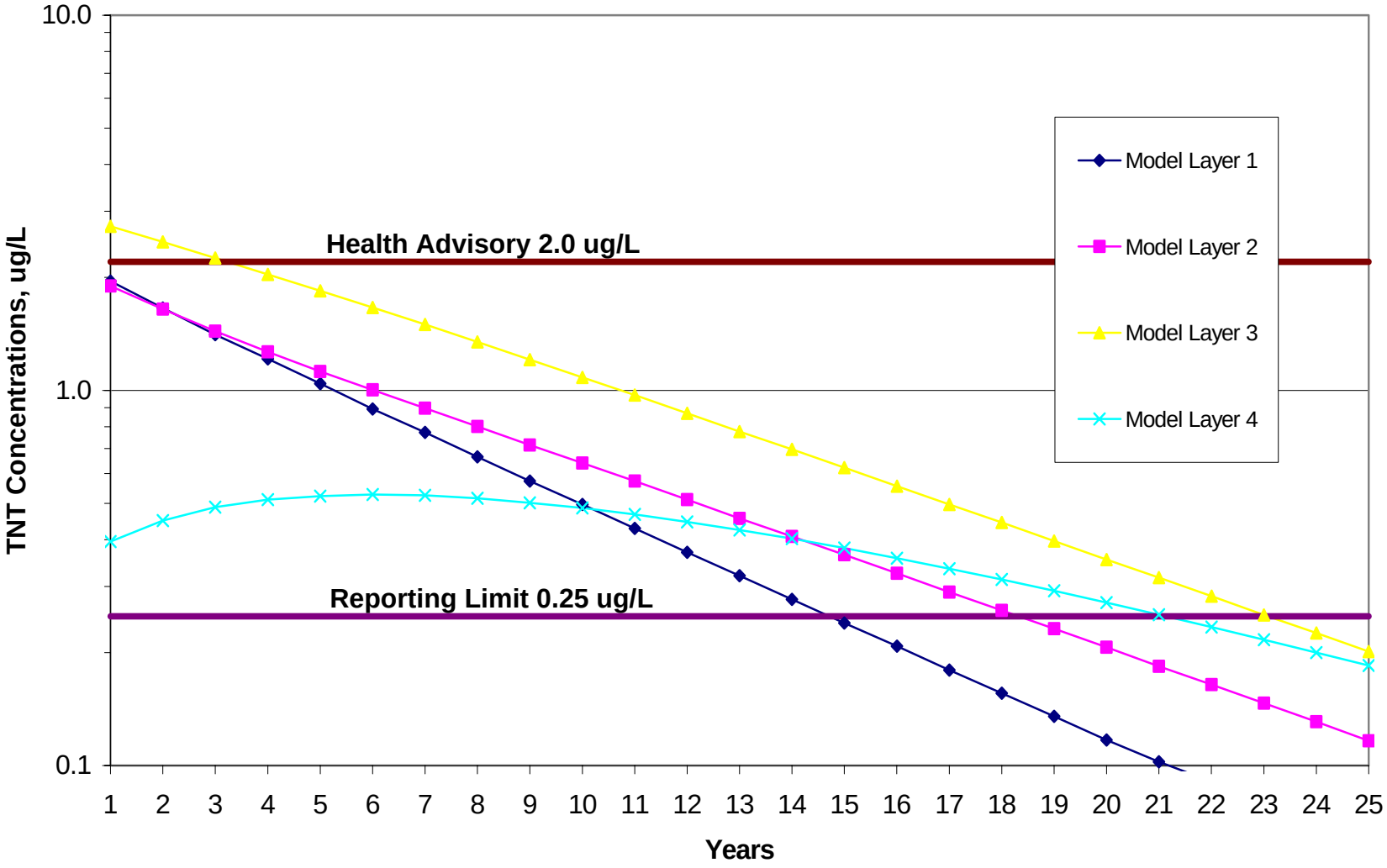
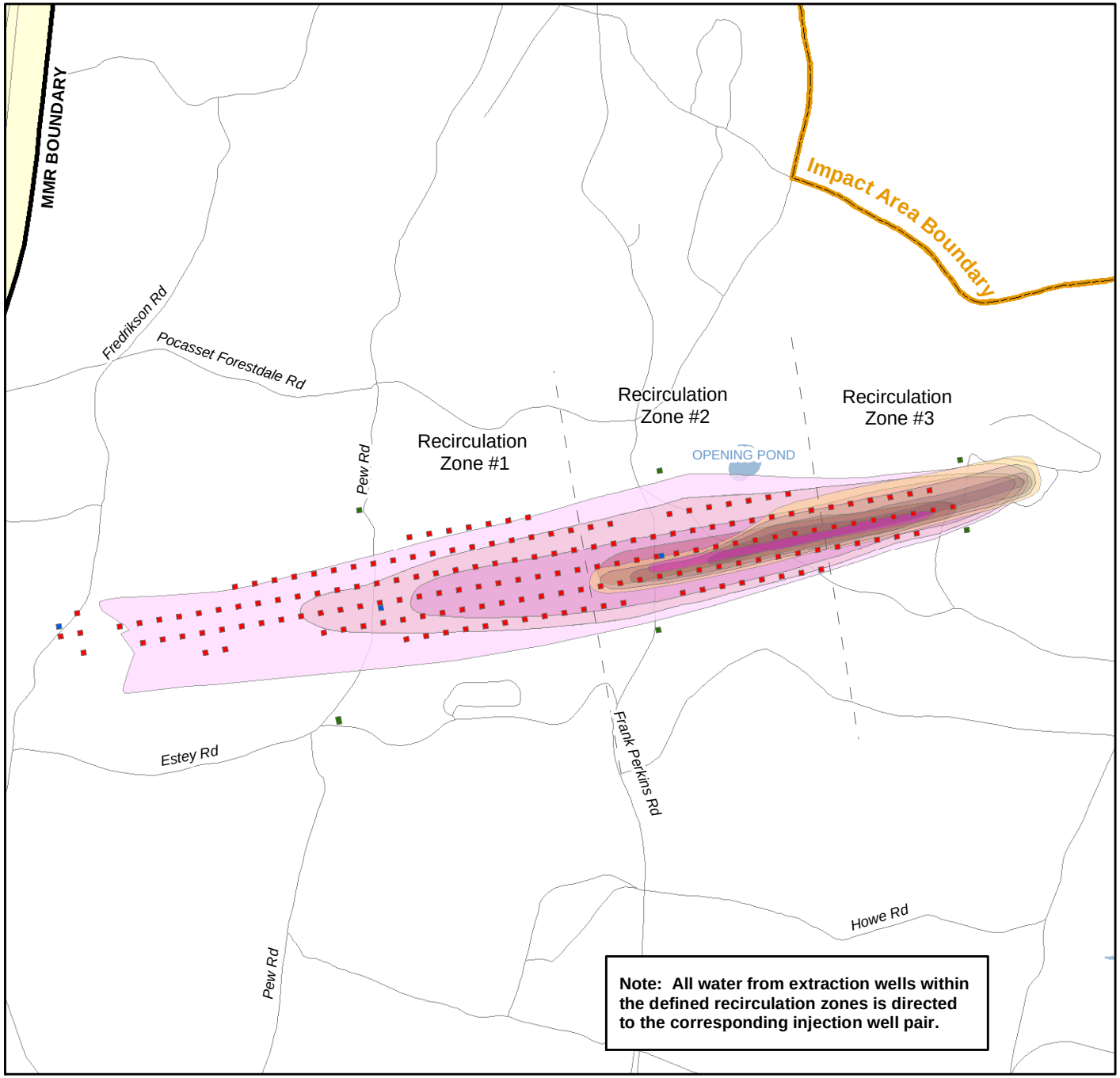


Figure A4-3. Decline in TNT Concentrations under RRA System Pumping.



Note: All water from extraction wells within the defined recirculation zones is directed to the corresponding injection well pair.

Impact Area Groundwater Study Program

LEGEND

- Potential Extraction Well Location
- Potential Injection Well Location
- Specified Extraction Well Location

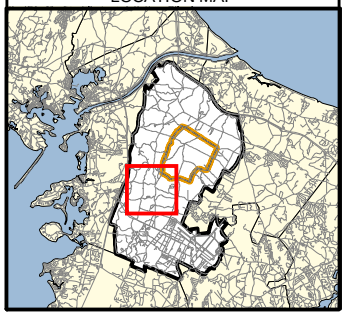
Perchlorate Plume Extents

- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Potential Extraction Well and Injection Well Locations

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA4-4.pdf
G:/MMR_COE/work/D8706/8706_FigA4-4.mxd
May 20, 2004 AP JBB

FIGURE

A4-4

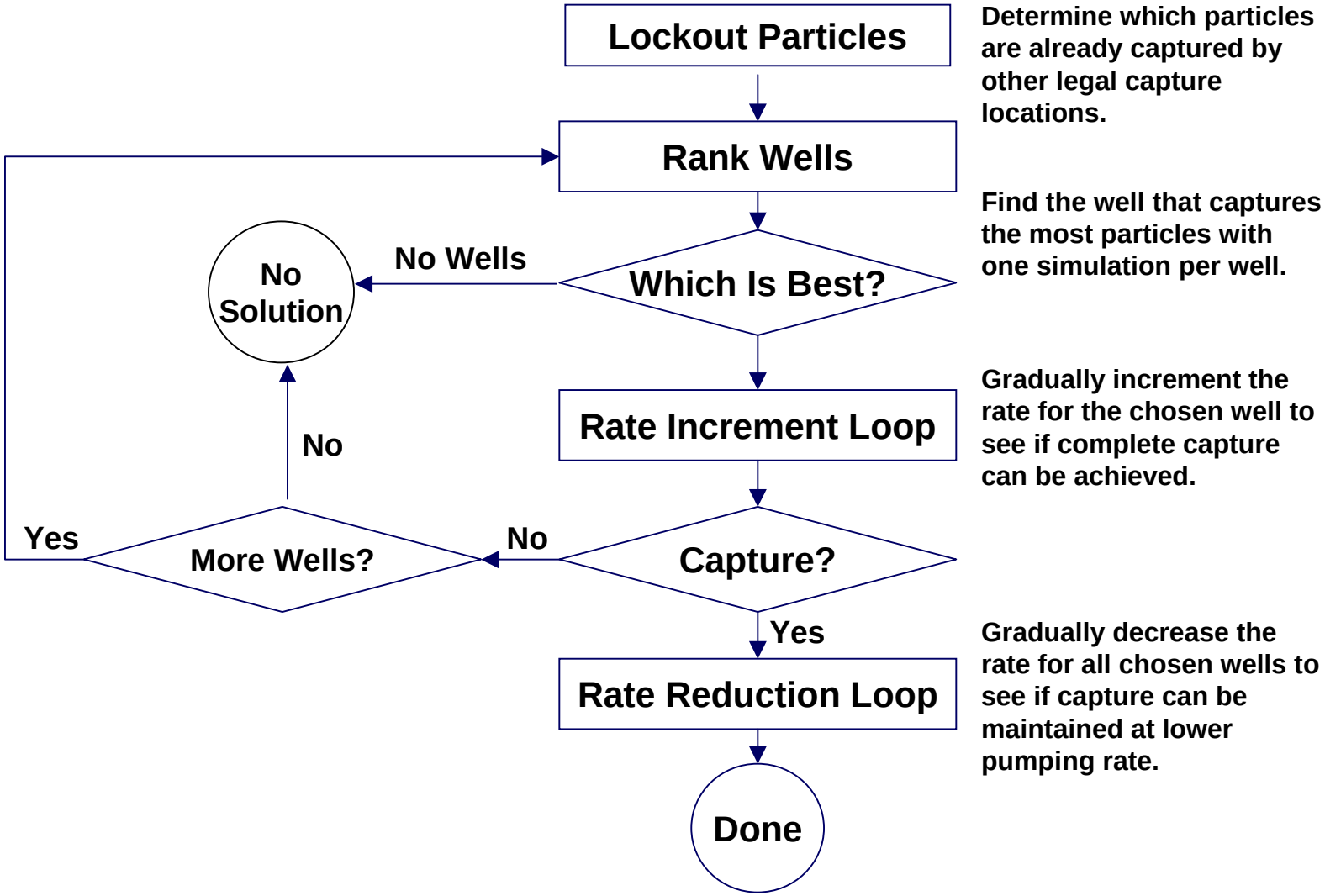


Figure A4-5. Flowchart for Brute Force PTO Algorithm

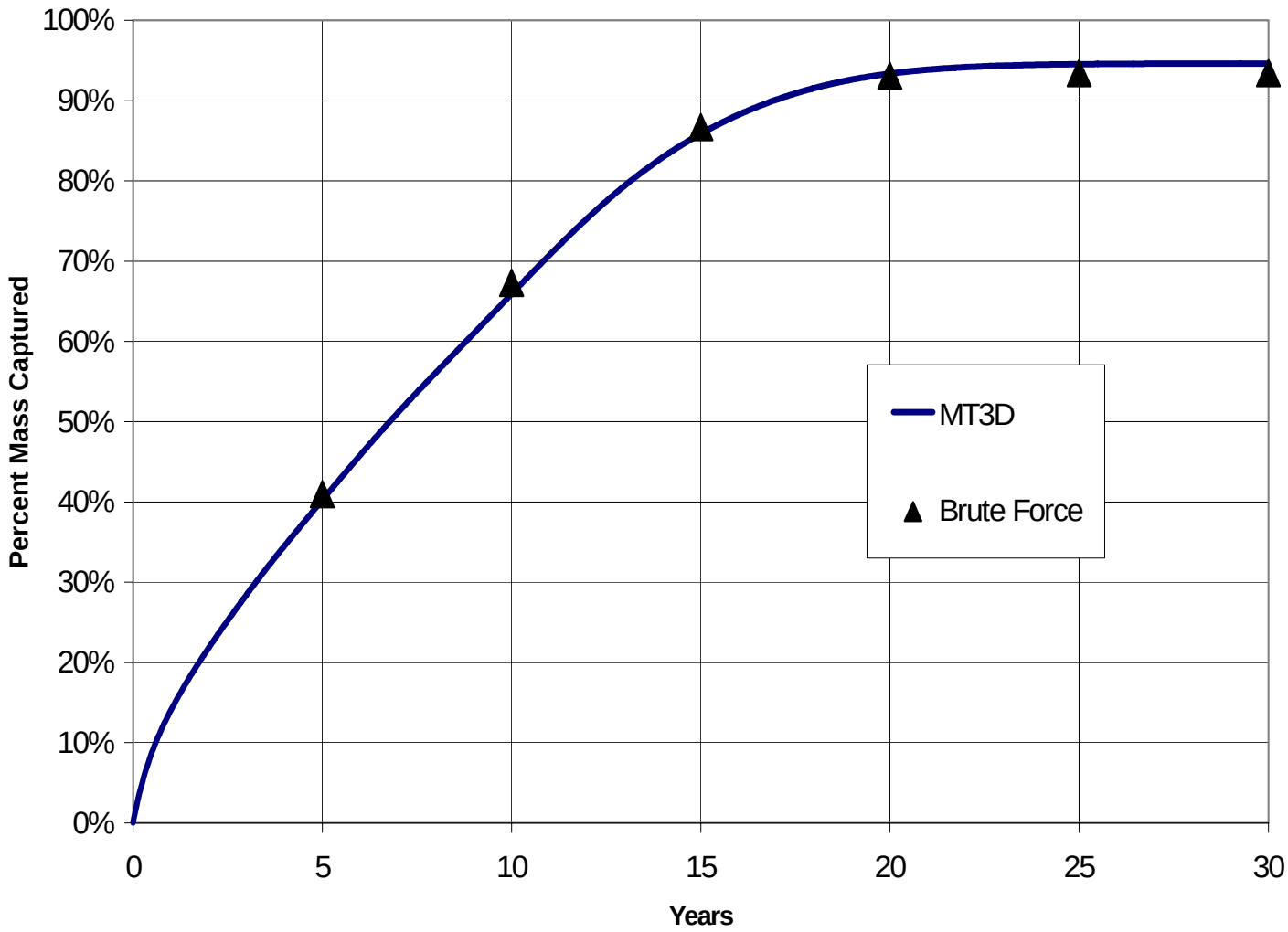
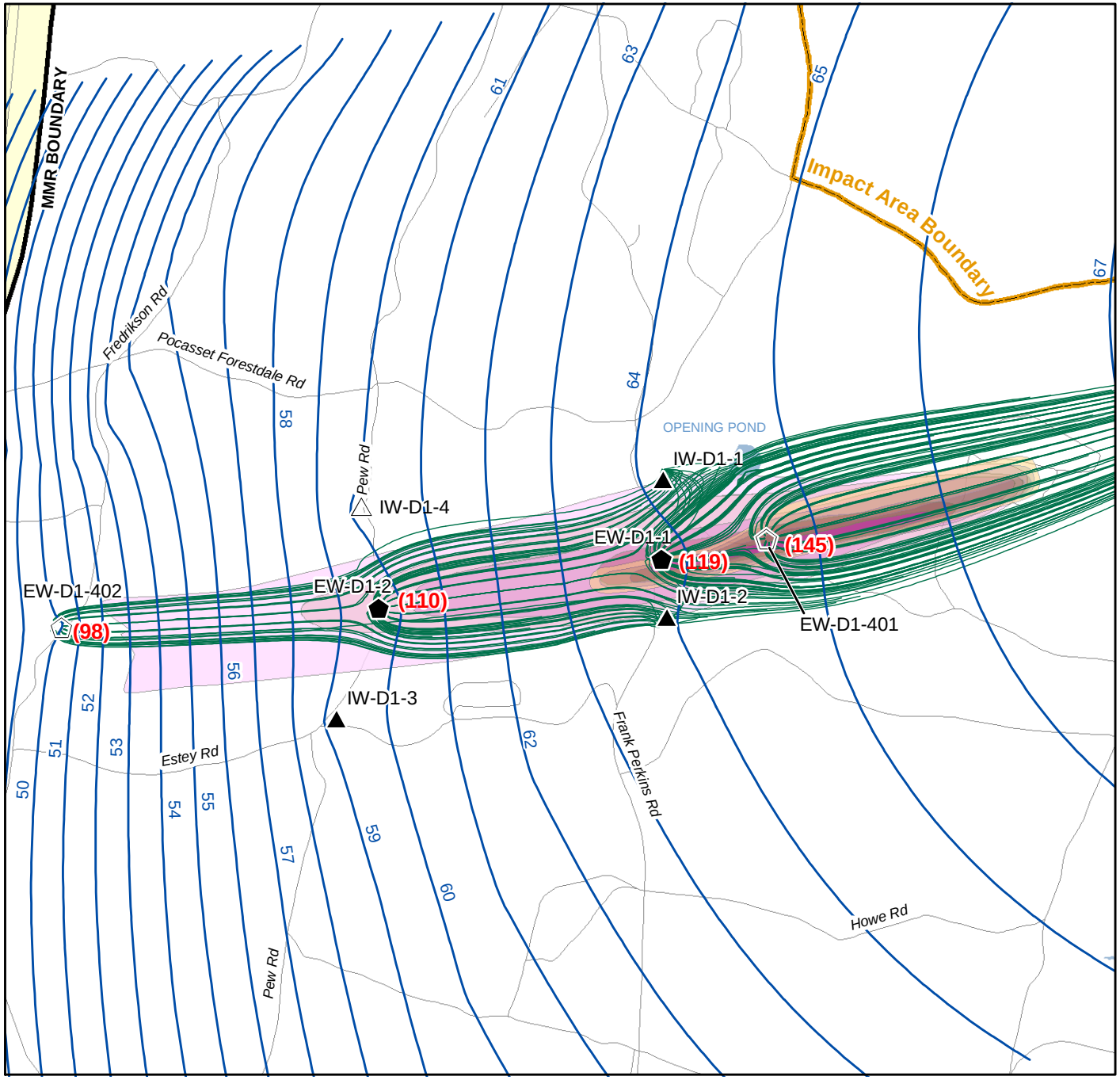


Figure A4-6. Comparison of Mass Capture Predictions for Brute Force and MT3D Methodologies.



Impact Area Groundwater Study Program

LEGEND

- Proposed Extraction Wells
- Existing Extraction Wells
- Proposed Injection Well
- Existing Injection Wells (Pumping Rate - gpm)

Perchlorate Plume Extents

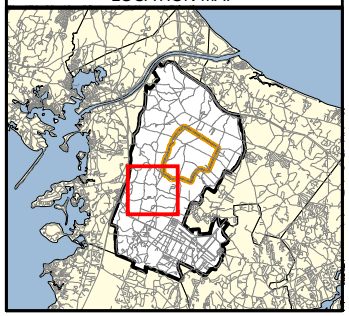
- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

- Groundwater Elevation Contours (1 ft)
- Capture Zones

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute Topographic Map Source: MassGIS

TITLE

Extraction/Injection Wellfield Design and Capture Zone: Background Alternative

Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA4-7.pdf
G:/MMR_COE/work/D8706/8706_FigA4-7.mxd
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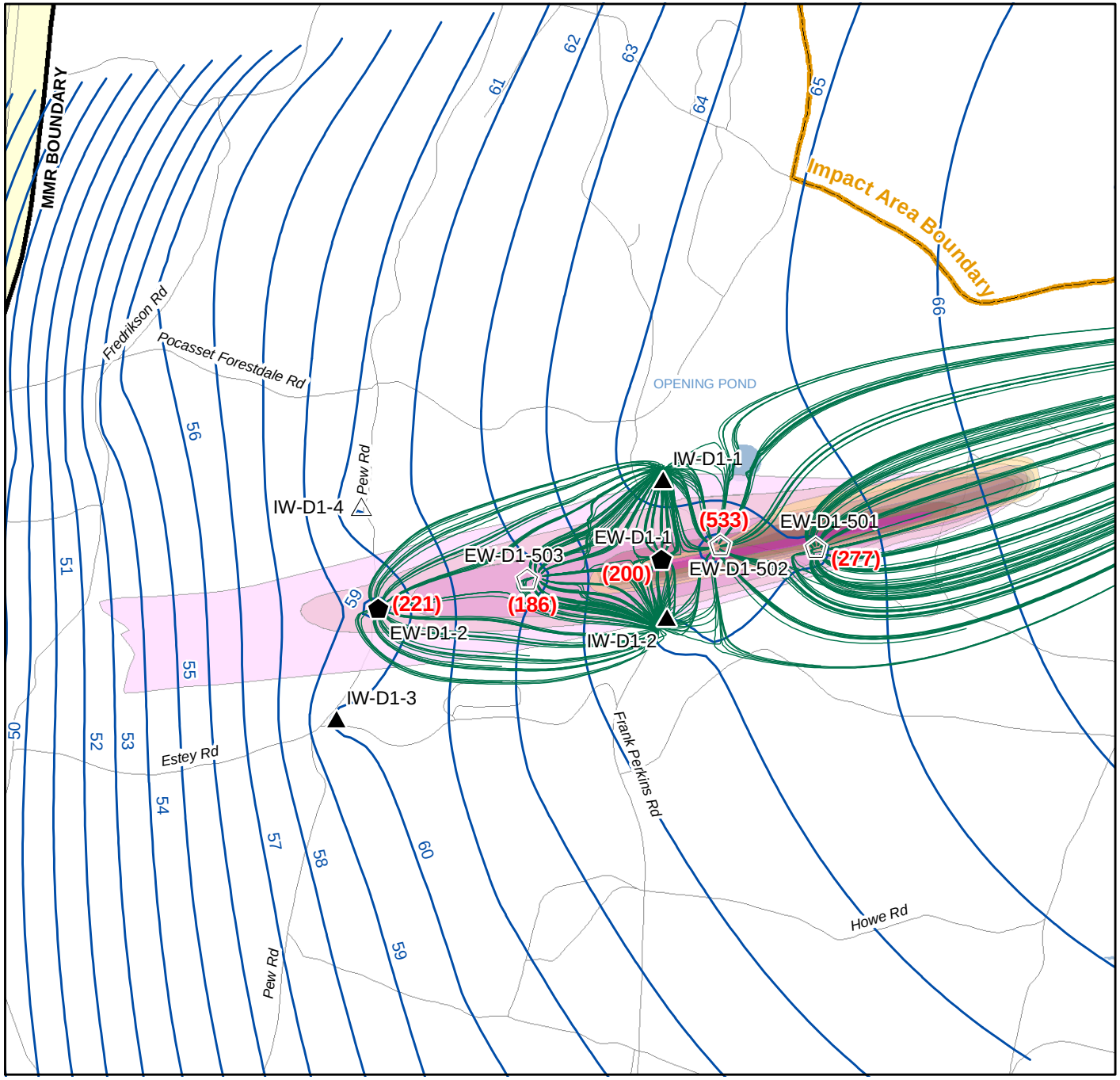
FIGURE

A4-7



Impact Area Groundwater Study Program

LEGEND

- Proposed Extraction Wells
- Existing Extraction Wells
- Proposed Injection Well
- Existing Injection Wells
- (Pumping Rate - gpm)

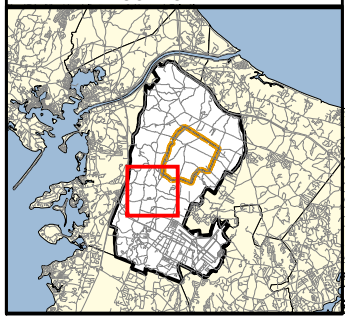
Perchlorate Plume Extents

- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb
- Groundwater Elevation Contours (1 ft)
- Capture Zones

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Extraction/Injection Wellfield Design and Capture Zone: 10-Year Alternative

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA4-8.pdf
G:/MMR_COE/work/D8706/8706_FigA4-8.mxd
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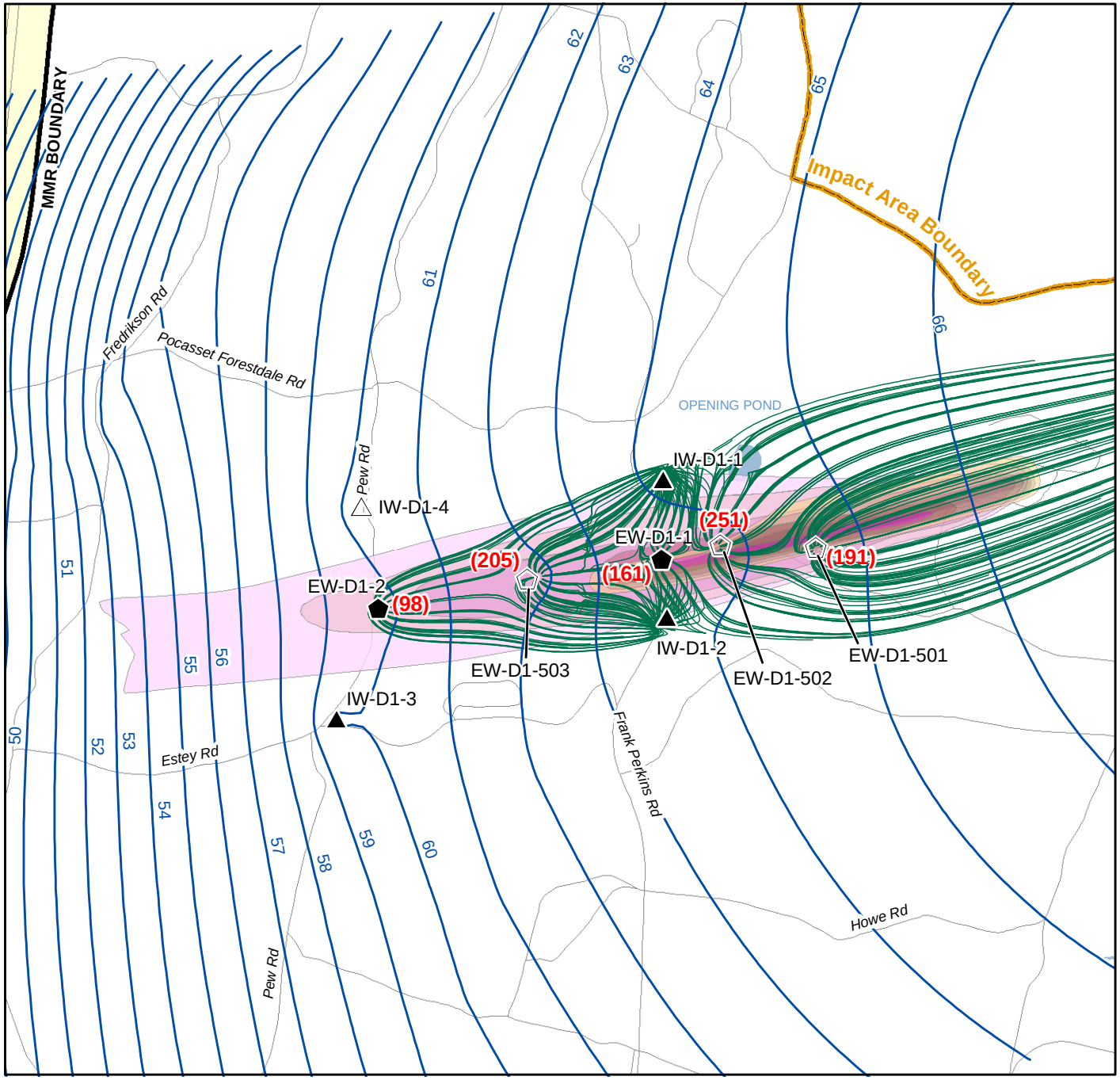
FIGURE

A4-8



Impact Area Groundwater Study Program

LEGEND

- Proposed Extraction Wells
- Existing Extraction Wells
- Proposed Injection Well
- Existing Injection Wells
- (Pumping Rate - gpm)

Perchlorate Plume Extents

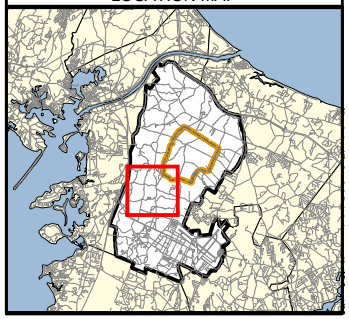
- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

- Groundwater Elevation Contours (1 ft)
- Capture Zones

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute Topographic Map Source: MassGIS

TITLE

Extraction/Injection Wellfield Design and Capture Zone: Additional Alternative A
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

0 1,000 Feet

N

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J:/mmr/ReportFigs2004/D8706/8706_FigA4-9.pdf
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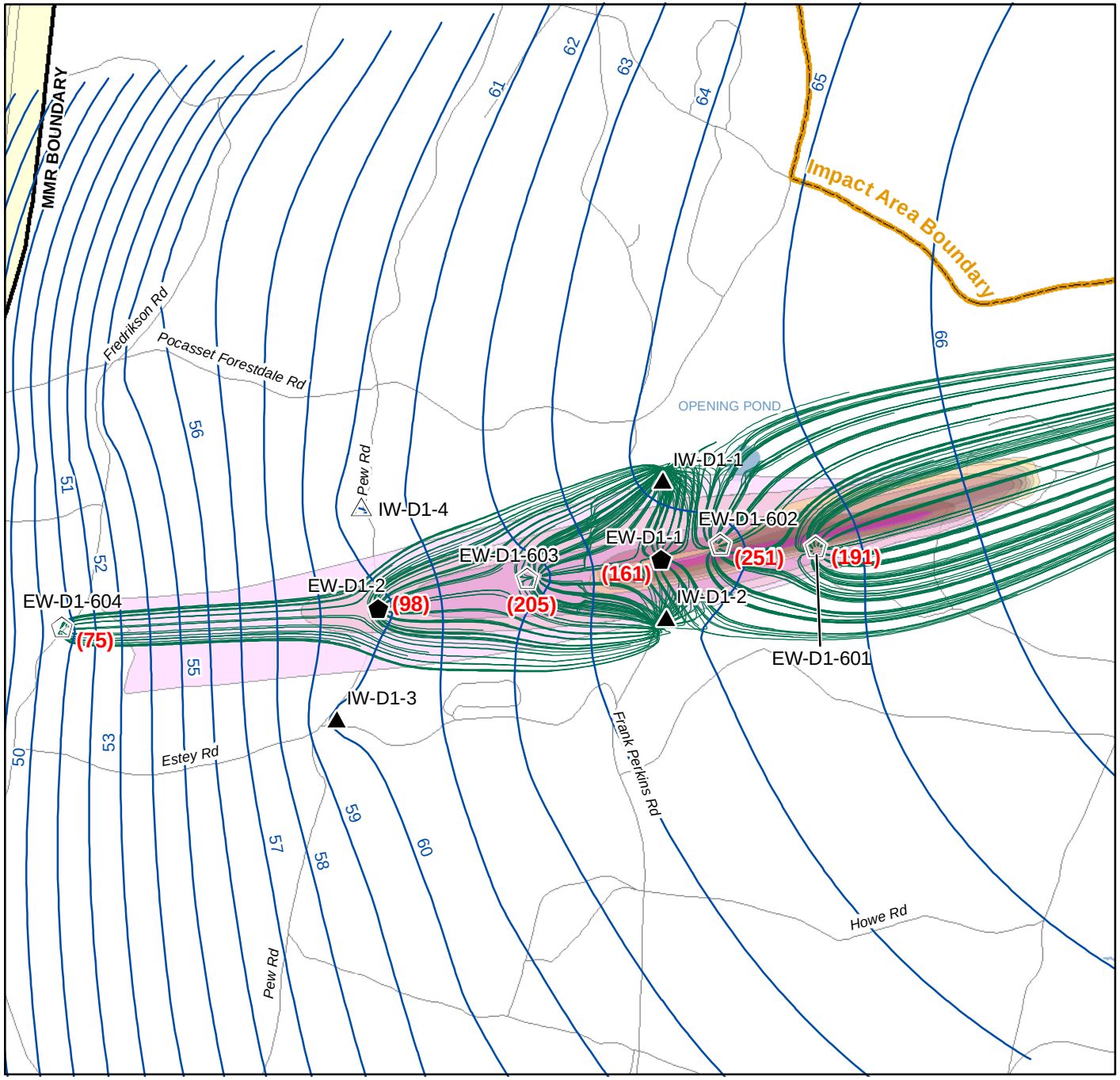
May 20, 2004 AP JBB

FIGURE

A4-9



Impact Area Groundwater Study Program

LEGEND

- Proposed Extraction Wells
- Existing Extraction Wells
- Proposed Injection Well
- Existing Injection Wells

(Pumping Rate - gpm)

Perchlorate Plume Extents

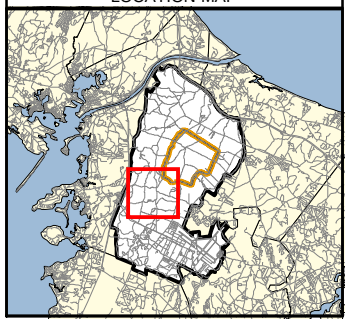
- 0.35 - 1.00 ppb
- 1.01 - 4.00 ppb
- 4.01 - 18.00 ppb
- 18.01 - 100.00 ppb
- 100.01 - 500.00 ppb

RDX Plume Extents

- ND - 2.00 ppb
- 2.01 - 10.00 ppb
- 10.01 - 100.00 ppb
- 100.01 - 500.00 ppb

- Groundwater Elevation Contours (1 ft)
- Capture Zones

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Extraction/Injection Wellfield Design and Capture Zone: Additional Alternative B

Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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FIGURE

A4-10

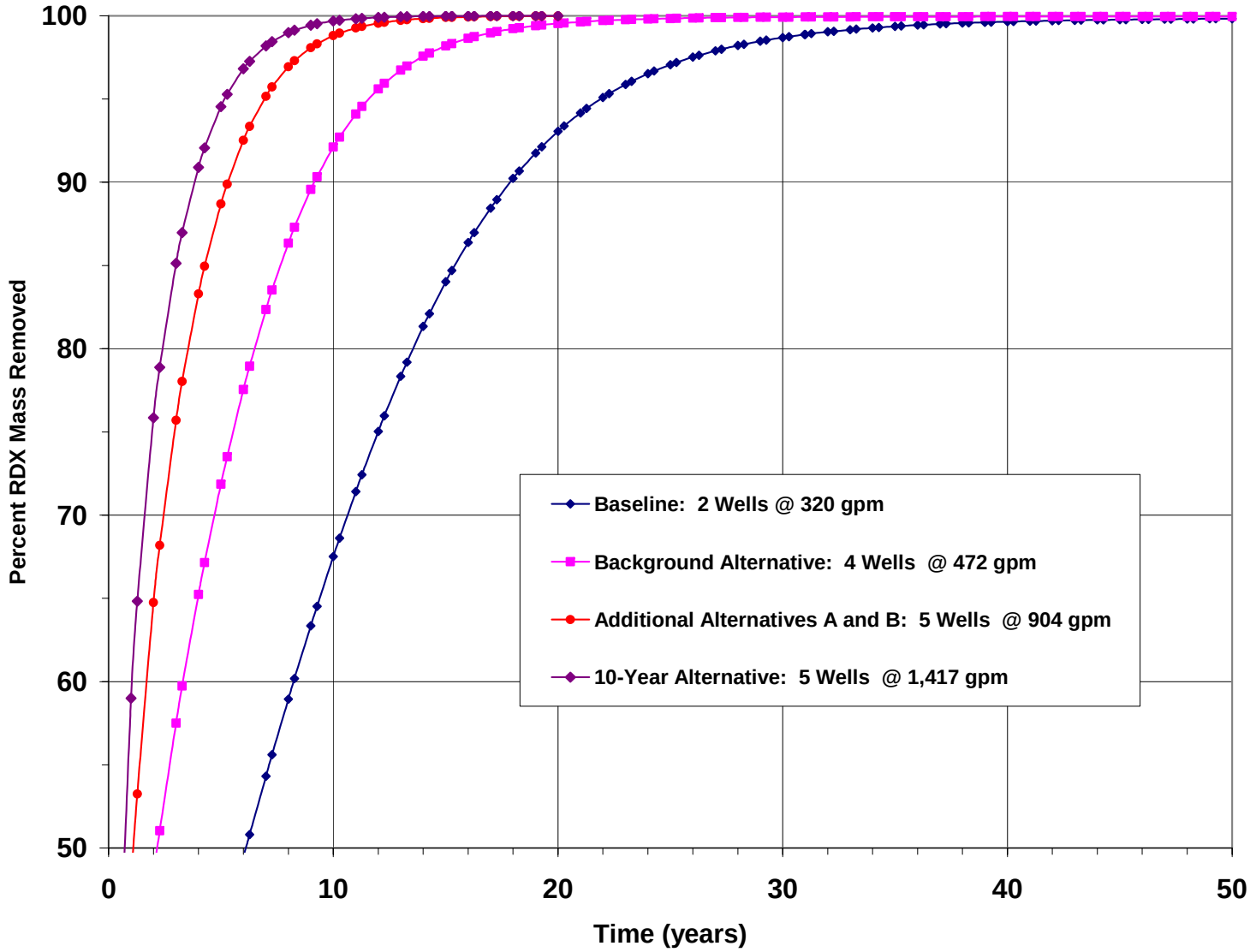


Figure A4-11. Comparative Graph of RDX Mass Capture vs. Time.

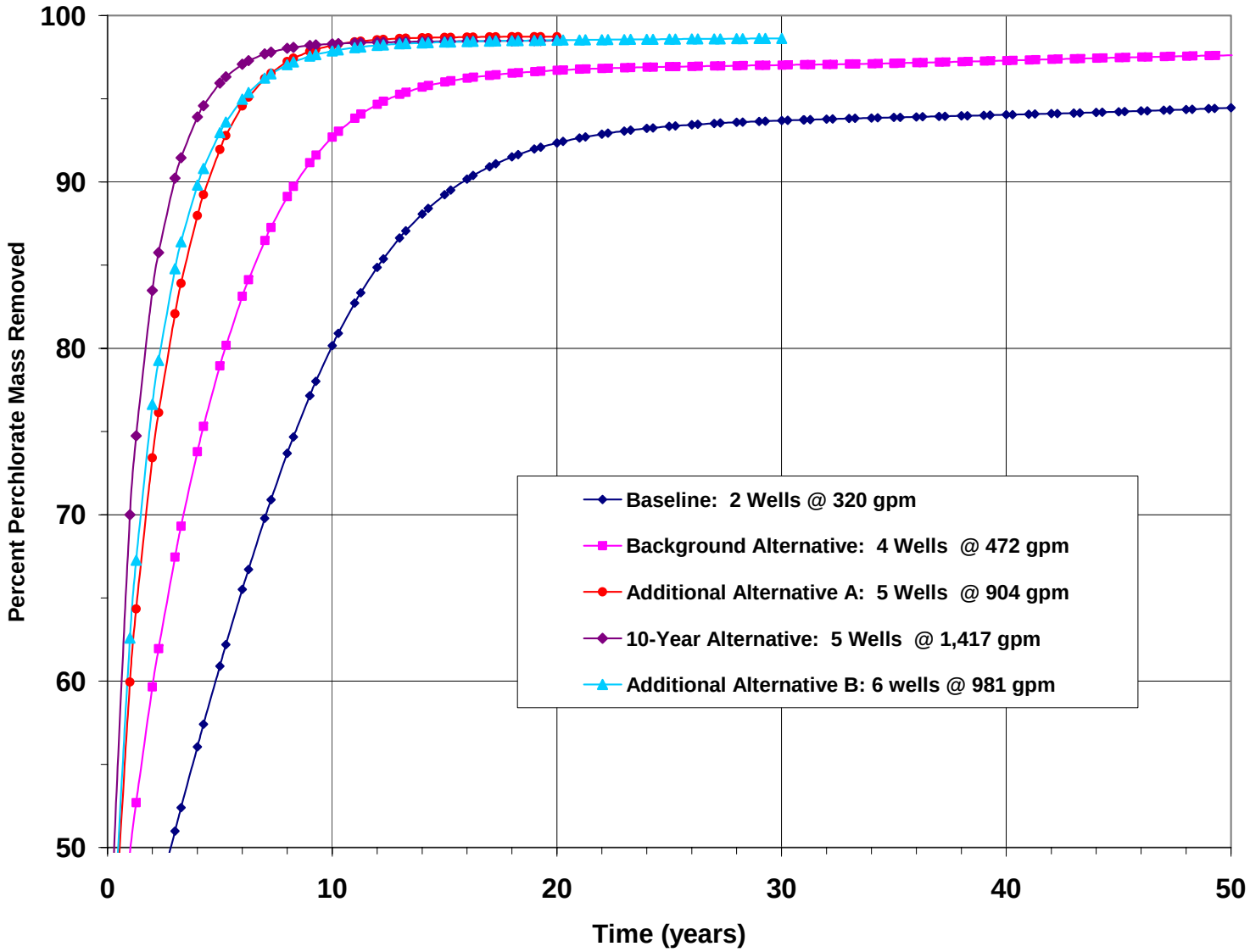
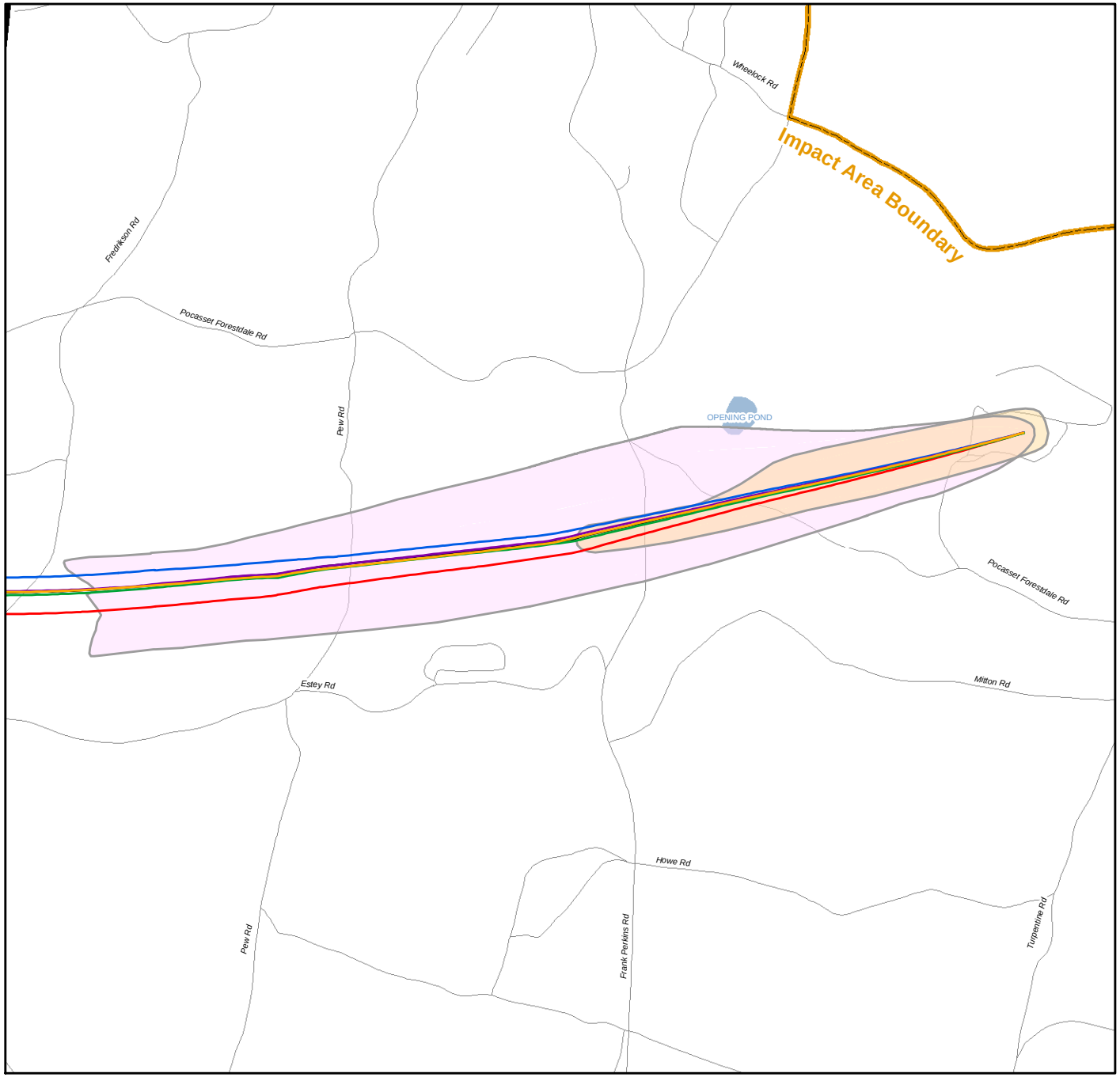


Figure A4-12. Comparative Graph of Perchlorate Mass Capture vs. Time.



Impact Area
Groundwater Study Program

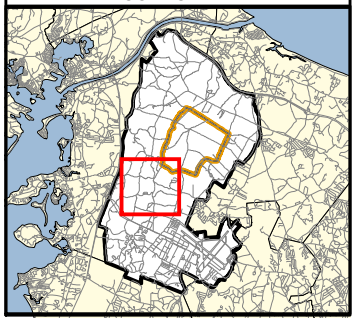
LEGEND

- RDX Plume Extent
- Perchlorate Plume Extent

Particle Tracks

- Baseline (calibrated by D1TMR Model)
- Hydraulic Condutivity Increased by 30%
- Hydraulic Conductivity Decreased by 30%
- Recharge Increased by 10%
- Recharge Decreased by 10%
- Clay Aquitard Hydraulic Conductivity Increased by 10x

LOCATION MAP



NOTES & SOURCES

Map Coordinates: NAD 83, UTM, Zone 19N, Meters
Basemap data from US Geological Survey 7 1/2 minute
Topographic Map Source: MassGIS

TITLE

Sensitivity of Plume Particle Trajectory to Selected Parameter Changes
Revised Draft Feasibility Study
Demo 1 Groundwater
Operable Unit

0 1,000 Feet

N

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May 20, 2004 AP JBB

FIGURE
A4-13

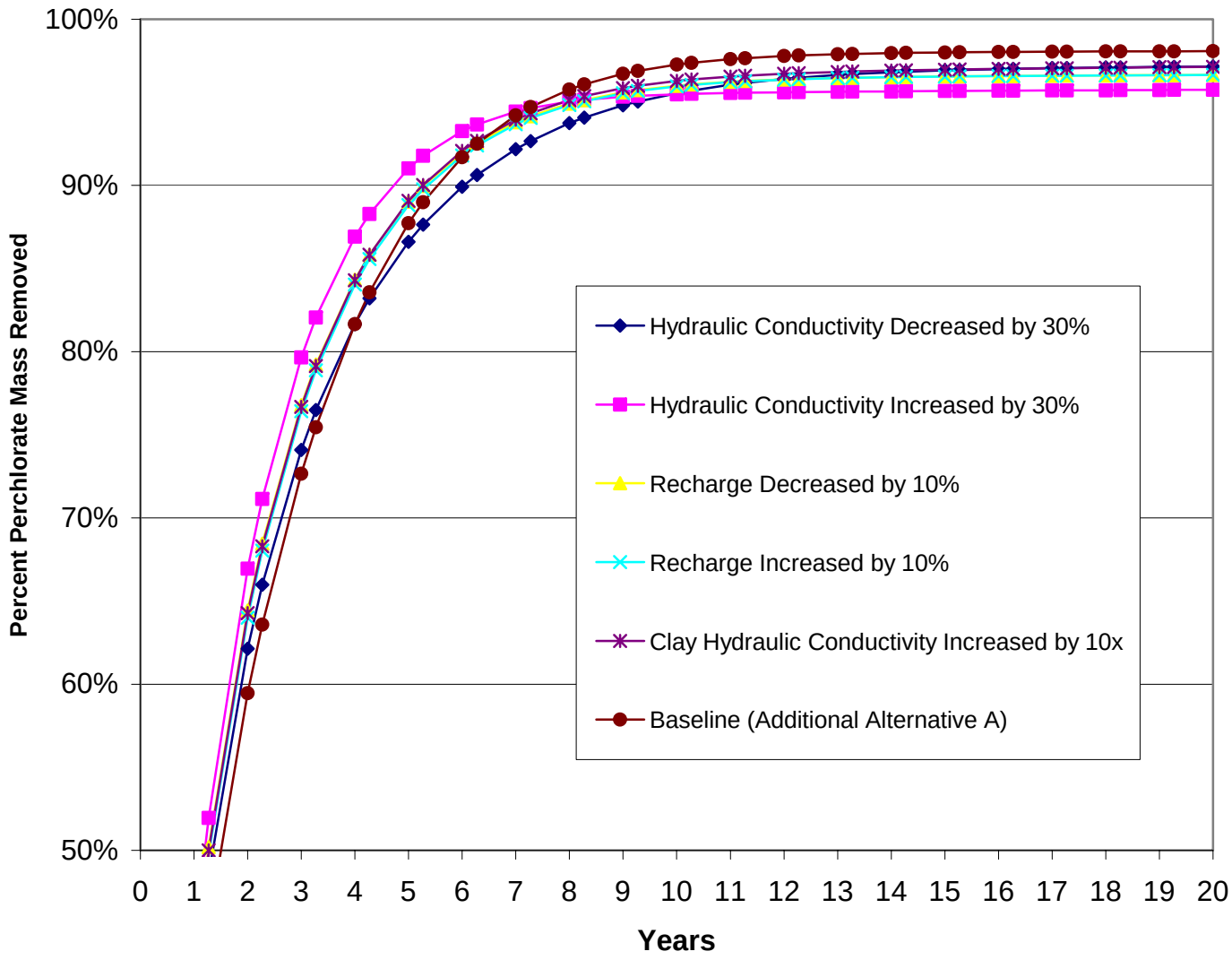

Figure A4-14. Comparison of Mass Capture Predictions for Selected Parameter Changes .

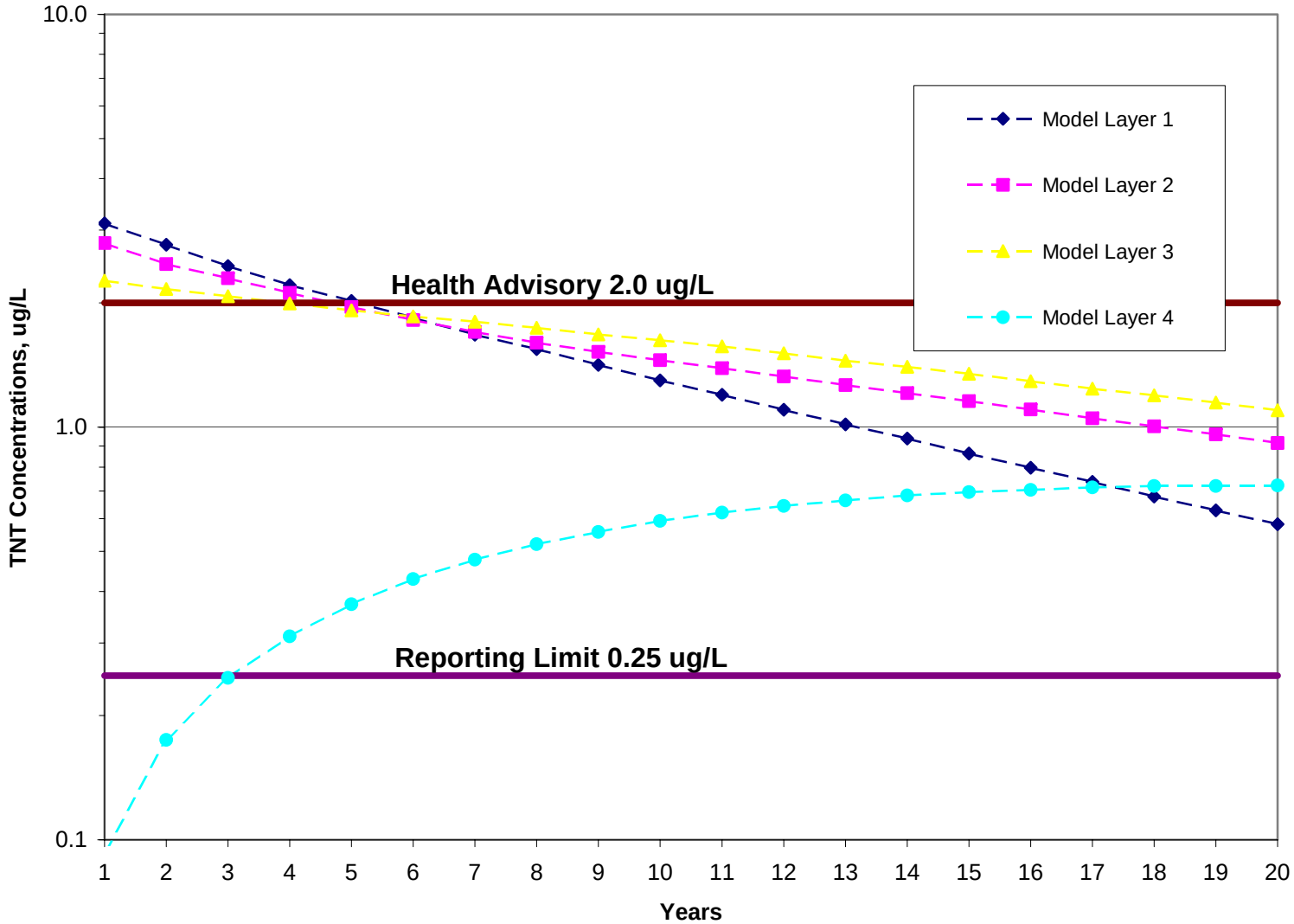

Figure A4-15. Decline in TNT Concentrations under RRA System Pumping with Biodegradation Half-life of 3650 Days.

Table A1-1
Previous Regional and Subregional Model Variants
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Model	Type	Description/Purpose	Date
MMR-5	Regional	Initial working model adapted from USGS 2000 regional model	05/14/2001
MMR-6	Regional	Revised hydraulic conductivities in Buzzards Bay Moraine.	06/13/2001
MMR-7	Regional	Updated bedrock elevations in Impact Area, Demo 1 and J Ranges areas.	06/29/2001
MMR-8	Regional	Improved representation of the Snake, Weeks, Wakeby and Mashpee Ponds.	07/17/2001
JR-8	Subregional	J-Ranges subregional model which includes FS-12 extraction system and improved pond representation.	07/31/2001
DEMO 1-4C	Subregional	Demo 1 subregional model for fate & transport calibration.	08/15/2001
DEMO 1-4R	Subregional	Demo 1 subregional model for remedial feasibility studies and optimization.	10/01/2001
DEMO 1-4N	Subregional	Demo 1 subregional model for No Action fate & transport simulation.	10/01/2001
TR_LOC5	Subregional	J-Ranges transient subregional model for initial transport analysis.	02/08/2002
TRANS16	Regional	Transient simulation intended to assess the significance of mound migration on fate and transport at the J Ranges and provide boundary conditions for a transient J Ranges subregional model.	02/08/2002
MMR-9	Regional	Revised bedrock elevations in the Monument Beach area.	03/05/2002
MMR-9D	Regional	Regional variant with refined grid in the Monument Beach area calibrated to a 5/16/02 synoptic water level survey.	08/21/2002
MMR-9D93	Regional	Variant of MMR-9D calibrated to 1993 (long-term average) conditions.	08/21/2002
JR8-0j	Subregional	J-Ranges steady-state subregional model pre-FS-12 with reduced pond-bottom permeability.	11/15/2002
JR8-0ka	Subregional	J-Ranges steady-state subregional model post-FS-12 with reduced pond-bottom permeability.	11/15/2002

Table A2-1
Vertical Discretization of Regional Model MMR-10
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Layer	Maximum Thickness (ft)	Layer Top Elevation (feet ngvd)	Layer Bottom Elevation (feet ngvd)
1	20	60	40
2	20	40	20
3	20	20	0
4	20	0	-20
5	20	-20	-40
6	20	-40	-60
7	20	-60	-80
8	20	-80	-100
9	40*	-100	-140
10	100*	-140	-240
11	260*	-240	-500

* partially absent where bedrock shallows

Table A2-2
Regional Bedrock Elevation Data
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)	WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)
00-1D	844658.5	259868.2	-50.5	81MW0001A	855574.9	237419.5	-185.4
00-4D	847311.3	259125.6	-49.5	81MW0003A	854896.7	235694.5	-179.2
00MW0524DE	865996.4	232694.7	-207.4	81MW0004A	855568.8	235806.5	-179.8
00MW0539	868118.5	233600.3	-222.0	81MW0005A	854336.5	235230.3	-160.5
00MW0541	867204.6	232832.0	-240.0	81MW0006A	853357.4	234277.0	-235.0
00MW0573AB	869991.9	233638.2	-218.8	81MW0007A	854138.1	233990.8	-186.5
00MW0581AB	865658.0	231689.0	-211.5	81MW0008A	852962.1	233372.6	-206.3
00MW0582AB	865768.0	230847.6	-223.8	81MW0009A	854834.0	234364.2	-170.8
00MW0583A	868211.5	229136.9	-254.3	81MW0010A	853404.2	232886.4	-235.5
00MW0584AC	869057.5	230335.5	-267.3	81MW0011A	852960.0	232371.2	-211.1
00MW0586AB	867177.9	232854.4	-244.9	81MW0012A	852385.8	232760.6	-207.9
00MW0587AB	870295.5	228166.0	-260.7	81MW0013A	851741.0	234950.0	-177.0
00MW0588AB	870005.4	226494.2	-257.0	82MW0001A	852785.9	238315.9	-143.0
00MW0589AB	863783.3	229647.6	-236.4	82MW0002A	851052.3	237960.9	-144.3
00MW0590AB	871934.8	229315.3	-236.3	82MW0003A	852362.7	237268.3	-125.9
00MW0591AC	868002.8	225506.5	-296.3	82MW0004A	853046.6	237173.6	-150.4
00MW0592AB	864304.1	226576.2	-262.0	82MW0005A	849752.7	235357.8	-235.1
00MW0605AC	866133.3	231991.6	-209.7	82MW0006A	850774.3	235686.0	-180.4
00MW0608AB	866603.8	230291.2	-227.3	82MW0008A	852204.5	234913.7	-193.8
00MW0609AB	865715.3	232073.6	-214.5	82MW0009A	849967.4	234527.1	-233.6
02-03	847016.2	259303.9	-65.7	82MW0012A	847432.6	233392.9	-203.6
02-04	846879.5	259898.9	-74.3	82MW0013A	848438.8	232693.4	-238.3
02-05	845967.7	257501.5	-79.9	82MW0014A	847169.0	233713.3	-245.9
02-07	848015.2	258976.3	-76.7	82MW0015A	846769.2	233063.5	-242.2
02-08	848096.2	258421.9	-72.9	90MW0079C	869762.4	250920.2	-132.8
02-09	848076.5	258008.0	-107.1	95MW0104	857984.1	214900.7	-273.1
02-10	848056.3	259398.0	-82.7	95MW0107AB	861841.5	234310.3	-189.9
02-12	844892.7	258737.4	-83.0	95MW0108AB	862085.7	233227.8	-182.9
02-13	844608.8	257906.7	-91.8	95MW0109AB	861809.4	232708.2	-202.6
02-15	848583.7	257070.0	-76.0	95MW0207AB	860403.6	227711.3	-236.4
02MW1258A	856599.8	235378.5	-186.8	95MW0208AB	859587.5	225451.6	-249.4
02MW1259A	855673.5	233350.2	-181.0	95MW0209AB	859838.4	229554.4	-206.1
03BH0002	863392.0	235264.0	-172.0	95MW0212AB	861789.8	226874.8	-231.6
03BH0003	863910.0	235128.0	-167.0	A1W263	892959.1	240892.2	-270.0
03EW2175	863333.7	235187.6	-167.6	A1W278	893066.5	235653.5	-300.0
03MW0055	859031.1	242797.3	-155.0	A1W314	903287.5	256848.6	-250.0
03MW0064	863279.9	233685.1	-175.0	A1W358	891496.0	224756.8	-430.0
03MW0084	858303.4	239520.5	-124.0	A1W361	891932.3	230335.9	-370.0
03MW0088	858712.3	236233.0	-238.0	A1W392	891512.8	252453.2	-200.0
03MW0093A	856396.1	239793.7	-126.4	A1W392	895056.3	256860.0	-220.0
03MW0094A	857831.9	238153.8	-141.2	BHW212	851002.0	265134.0	-176.0
03MW0095A	860448.3	235515.3	-174.6	BHW231	853797.1	255451.1	-140.0
03MW0096	861103.8	238388.0	-170.0	BHW421	855614.0	280267.0	-90.0
03MW0097	858176.1	243177.4	-171.8	control	799731.9	221664.9	-170.0
03MW0098	859728.1	236412.1	-194.0	control	805725.3	225159.0	-170.0
03MW0100A	857605.0	239634.0	-148.0	control	805737.0	214801.0	-220.0
03MW0101A	857997.0	239592.0	-158.0	control	805737.0	232860.0	-160.0
03MW0102AB	862091.0	234306.0	-195.0	control	809233.5	281240.1	-80.0

Table A2-2
Regional Bedrock Elevation Data
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)	WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)
03MW0103A	862356.2	233758.3	-174.8	control	810277.7	266369.6	-100.0
03MW0104AB	862625.6	234502.8	-172.7	control	810577.9	248746.6	-125.0
03MW0106AB	857478.9	242550.5	-169.6	control	811202.7	222546.6	-190.0
03MW0107AB	859402.8	244771.7	-187.3	control	813466.8	229401.9	-170.0
03MW0108A	858352.0	242094.8	-162.9	control	815589.8	251981.6	-125.0
03MW0109AB	860311.9	241697.5	-157.0	control	816803.6	286197.0	-80.0
03MW0110AB	859982.8	239258.3	-155.7	control	818200.2	240398.2	-160.0
03MW0111A	861443.9	239483.5	-174.7	control	818619.4	225760.1	-190.0
03MW0112AB	861451.8	243346.0	-167.2	control	819870.8	256990.7	-125.0
03MW0113AB	861698.0	236108.0	-228.0	control	820197.1	274718.0	-100.0
03MW0114AB	862885.0	236202.0	-196.0	control	820708.8	235641.5	-170.0
03MW0115	856775.0	238959.4	-125.8	control	823107.7	244989.9	-140.0
03MW0116AB	859064.5	239726.3	-181.9	control	823851.6	290893.0	-80.0
03MW0117AB	860626.5	237353.5	-179.3	control	824578.5	227902.5	-190.0
03MW0118AB	862473.7	238056.7	-187.1	control	825385.0	193709.0	-400.0
03MW0201DF	862936.3	235495.5	-174.3	control	825404.8	263669.4	-125.0
03MW0202BG	862824.3	235424.0	-180.3	control	826971.0	255529.7	-125.0
03MW0206BG	862904.9	235385.2	-176.8	control	827375.6	281631.5	-100.0
03MW0209CE	863163.7	235004.4	-182.3	control	828450.3	241881.0	-150.0
03MW0212CF	863061.0	234815.9	-176.5	control	829723.0	229444.9	-190.0
03MW0214AG	863106.4	234795.7	-175.0	control	830377.6	296110.7	-80.0
03MW2140A	856940.8	237190.1	-143.5	control	831344.0	202318.0	-320.0
03MW2143A	858798.3	238307.8	-195.3	control	831460.9	269513.3	-125.0
03MW2145A	861298.2	237319.7	-195.9	control	831490.0	188957.0	-400.0
03MW2146A	856134.3	241621.5	-162.4	control	832423.9	230516.1	-190.0
03MW2147A	858606.7	239905.8	-167.8	control	832695.6	246373.5	-140.0
03MW2148A	859424.1	239518.2	-146.4	control	833027.1	261895.4	-100.0
03MW2149A	860569.3	238818.4	-184.8	control	833500.0	212791.0	-260.0
03MW2150A	857731.1	241951.1	-156.3	control	835192.9	249368.5	-140.0
03MW2151A	858797.0	241380.4	-171.1	control	836668.2	232872.7	-190.0
03MW2152A	859693.4	240682.5	-146.0	control	838082.9	230558.9	-190.0
03MW2153A	861150.8	240135.0	-161.0	control	838208.7	287110.1	-100.0
03MW2160A	860290.8	237821.3	-180.6	control	838769.9	262312.8	-100.0
03MW2617AB	865930.7	231668.3	-204.5	control	839240.4	233815.3	-190.0
03MW2618AB	865818.4	231295.0	-215.3	control	839687.9	253112.2	-110.0
03MW2620AB	865642.7	230800.7	-203.3	control	840127.3	274835.4	-125.0
03MW2621AB	865010.9	229799.6	-215.2	control	840425.2	256425.0	-90.0
03MW2622A	864555.6	228976.1	-251.7	control	840537.0	199101.0	-300.0
03MW2623AB	862457.4	228338.7	-229.8	control	841598.4	232401.3	-190.0
27BH0024	848498.3	244142.4	-150.4	control	841935.5	259850.9	-80.0
27BH2210	848240.3	240108.9	-124.4	control	844641.5	236151.0	-150.0
27GB0007	846971.0	234866.0	-184.0	control	845405.6	227598.1	-173.0
27MW0025A	851931.0	240444.0	-155.7	control	845931.1	268835.9	-95.0
27MW0035Z	848501.0	243374.0	-134.0	control	847227.5	275252.8	-125.0
27MW0039Z	845553.0	241865.0	-136.0	control	847665.0	194385.0	-380.0
27MW0040Z	845919.0	242977.0	-167.0	control	847704.1	250144.5	-130.0
27MW0050B	842444.0	240013.0	-142.0	control	848519.7	291414.8	-100.0
27MW0054Z	843805.0	243534.0	-130.0	control	855275.0	231170.0	-170.0

Table A2-2
Regional Bedrock Elevation Data
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)	WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)
27MW0056	845085.0	244773.0	-150.9	control	855698.2	297806.5	-100.0
27MW0057	845337.0	245116.0	-150.0	control	858417.4	288303.3	-100.0
27MW0058	845337.0	245475.0	-152.0	control	874115.0	291814.0	-90.0
27MW0065	841224.0	245277.0	-211.0	control	884373.2	282531.5	-170.0
27MW0084	846429.0	244156.0	-157.0	control	888288.7	282270.7	-170.0
27MW0088	851261.2	245372.7	-152.0	control	892464.0	267514.0	-173.0
27MW0091A	843624.0	240569.6	-141.9	control	896511.4	288923.3	-125.0
27MW0092A	848322.1	239464.9	-118.7	control	897164.0	284879.5	-125.0
27MW0093	848070.7	242373.4	-126.1	control	899025.0	245617.0	-260.0
27MW0094A	848085.7	241588.4	-133.7	control	899382.8	296358.6	-125.0
27MW0101AB	849455.9	243242.0	-123.6	control	900031.0	237265.0	-293.0
27MW0102AB	849517.3	242200.3	-130.2	control	901420.0	228126.0	-408.0
27MW0105AB	848191.2	240087.4	-125.0	FSW0254	861620.0	231239.0	-232.0
27MW0106AB	848844.4	238926.9	-134.5	FSW232	840065.0	222505.0	-175.0
27MW0107AB	849768.5	241525.4	-138.8	FSW493	859603.6	215670.5	-260.0
27MW0108A	849535.7	244262.6	-129.4	GB001-GB002	853120.0	226666.0	-217.4
27MW0109AB	842577.2	241021.5	-136.1	GMW29B	867977.0	254056.0	-141.0
27MW0110A	848163.0	240580.5	-118.5	MIW013	875531.1	234967.3	-290.0
27MW040Z	845919.0	242977.0	-165.0	MIW026	876780.9	216735.0	-410.0
27MW0567E	844597.0	242075.0	-149.1	MIW049	879917.4	209470.5	-420.0
27MW2102A	848106.4	241562.6	-126.6	MIW087	879194.4	230510.2	-330.0
27MW2106A	848082.0	241112.7	-133.2	MW-10	861335.4	268239.2	-174.1
27MW2109A	848510.5	244139.2	-147.3	MW-105	862745.1	261780.8	-138.3
27MW2130AB	849382.0	242980.9	-121.5	MW-13	865938.7	256972.8	-162.8
27SB0605	842363.0	244938.0	-135.0	MW-140	868531.3	254325.8	-127.5
28MW0031AB	869548.1	230636.2	-259.2	MW-142	867104.4	253945.6	-125.7
28MW0032AB	865132.8	233697.0	-200.9	MW-143	867131.3	254099.6	-136.2
28MW0035AB	866245.0	232256.1	-214.5	MW-146	868618.0	254941.3	-133.8
28MW0583	865145.0	236241.0	-169.2	MW-147	867900.1	254844.0	-131.0
32MW2002	852192.9	231808.4	-194.3	MW-148	867701.8	254673.5	-125.5
32MW2003	852192.9	231808.3	-194.3	MW-15	858100.2	259848.7	-186.0
36BH1035	871835.3	239977.6	-193.9	MW-154	869506.7	256954.3	-155.2
36MW1010AC	872068.3	234895.7	-200.6	MW-16	865224.2	271410.2	-193.6
36MW1036AC	872114.2	238792.8	-233.0	MW-164	866701.3	258564.4	-139.7
36MW1037AC	872265.6	236715.8	-194.0	MW-166	866486.1	258328.1	-135.1
36MW1038A	872357.4	235573.0	-219.2	MW-170	870830.1	260063.7	-164.9
36MW1041BC	872650.2	235744.8	-211.1	MW-175	853892.6	253420.2	-141.6
58MW0010AB	860236.1	261035.7	-181.1	MW-176	856131.5	266600.1	-123.4
69MW1283B	853297.1	225494.1	-228.0	MW-18	873180.1	266384.7	-183.2
69MW1284AB	853237.5	224309.0	-246.0	MW-180	859583.8	265539.7	-135.8
69MW1290B	852899.3	223739.5	-235.0	MW-188	866925.1	258444.6	-147.6
69MW1293B	853649.1	224584.3	-227.5	MW-189	867055.8	257817.6	-141.7
69MW1296	853264.1	223257.1	-250.0	MW-19	860260.1	254304.8	-205.2
69MW1306AB	853147.9	221775.2	-219.0	MW-190	866635.1	257338.2	-132.2
69MW1310	853564.4	225028.1	-235.0	MW-191	866801.2	257990.5	-137.4
69MW1316	852430.7	225201.4	-220.1	MW-192	867191.8	259367.3	-143.4
69MW1400	853905.6	228951.7	-193.0	MW-199	857320.0	266615.1	-132.4
69MW1403-1405	854325.2	227787.5	-202.0	MW-2	862353.5	263212.2	-176.7

Table A2-2
Regional Bedrock Elevation Data
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)	WELL ID	X_NAD27	Y_NAD27	Elevation (ft ngvd)
69MW1407-1408	853691.8	229861.8	-170.0	MW-202	857887.7	267997.5	-127.9
69MW1410-1411	855008.6	229667.0	-169.0	MW-206	855719.5	267802.1	-116.2
69MW1414	854499.4	232074.0	-175.4	MW-207	856491.0	266603.2	-129.3
69MW1417	856323.9	234248.6	-145.5	MW-211	853901.4	252822.1	-129.9
69MW1419	854035.3	232296.9	-189.9	MW-212	856792.9	268238.9	-109.5
69MW1423	855908.0	235207.2	-146.6	MW-213	850594.8	258905.1	-150.5
69MW1502	849306.5	238633.8	-141.5	MW-216	855278.1	258329.2	-109.2
69MW1505AB	850310.7	238247.3	-174.7	MW-216	855284.7	258328.3	-109.2
69MW1508	854480.4	224299.3	-204.1	MW-219A	853122.3	261384.6	-145.4
69MW1509	847561.3	234811.0	-182.9	MW-221	853733.2	252122.3	-138.4
69MW1512	856504.0	232834.0	-129.9	MW-222	863627.9	263736.0	-123.2
69MW1514	849719.7	234180.3	-206.7	MW-224	864233.0	259247.2	-119.5
69MW1518	853331.4	236072.9	-165.4	MW-225	852647.8	252707.2	-143.7
69MW1522	850516.2	233624.7	-262.0	MW-226	851693.7	257970.0	-141.3
69MW1527	854184.0	238082.0	-117.7	MW-228	869650.5	257399.2	-145.8
69MW1530	858643.6	232679.9	-174.5	MW-229	868229.8	258928.0	-170.3
69MW1532AB	847755.0	233848.0	-206.0	MW-229	868241.1	258929.4	-170.1
69MW1534AB	848359.0	233244.0	-180.0	MW-230	868557.0	258451.3	-173.5
69MW1536AB	848673.0	232422.0	-165.0	MW-231	852708.0	252359.9	-137.4
69MW1537	854738.9	236975.0	-130.0	MW-234	868406.8	258565.1	-172.1
69MW1539	845910.0	233350.0	-175.0	MW-28M	864043.5	255655.8	-137.5
69MW1541	851323.7	235820.3	-159.0	MW-3	862470.2	264684.1	-174.7
69MW1542	845950.6	231574.9	-272.2	MW-47	856589.0	255141.5	-173.1
69MW1543	846876.8	231035.1	-152.8	MW-5	867575.2	263345.1	-181.0
69MW1544	846963.7	234240.8	-199.2	MW-57	873279.5	257890.5	-170.1
69MW1601A	844158.3	230634.8	-163.0	MW-7	862670.8	257638.9	-182.5
69MW1602A	843681.0	231556.5	-191.1	MW-80M	850468.9	258070.6	-136.6
69MW1603A	843273.4	232536.7	-174.8	MW-81	850679.3	259693.6	-167.6
80MW0002A	848934.8	231817.0	-217.5	MW-84M	850058.6	255362.6	-126.3
80MW0003A	848858.2	231103.2	-214.3	SDW258	881388.6	244360.6	-250.0
80MW0004A	846960.9	231774.7	-186.5	SDW277	875892.6	255149.0	-140.0
80MW0005A	845697.8	232383.0	-203.0	unknown	850328.6	200072.5	-310.0
80MW0006A	845640.7	231327.7	-216.2	unknown	852157.0	231903.0	-195.0
80MW0007A	845579.8	230527.6	-171.3	unknown	855614.0	280267.0	-90.3
80MW0008A	843530.1	231006.4	-180.2	unknown	866004.7	216453.7	-310.0
80MW0009A	844758.3	231959.6	-193.5	unknown	870557.1	228243.7	-260.0
80MW0010A	842779.4	231398.1	-201.8	USBH215083?	851002.0	265134.0	-175.6

Table A2-3
Prioritization of Regional Model Calibration Datasets
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Category	Name	Description	Date(s)	Rank
Plume Extents	Demo 1 RDX	present horiz. extent as of	Mar-03	1
		present vert. extent as of	Mar-03	1
	Demo 1 Perc	present horiz. extent as of	Mar-03	1
		present vert. extent as of	Mar-03	1
	Central Impact Area RDX	present horiz. extent as of	Mar-03	2
		present vert. extent as of	Mar-03	2
	Central Impact Area Perc	present horiz. extent as of	Mar-03	2
		present vert. extent as of	Mar-03	2
	SE Ranges	multiple RDX, perc, HMX extents	Mar-03	3
	LF-1	former maximum lateral extent	-	3
	CS-10	former maximum lateral extent	-	3
	FS-12	former maximum lateral extent	-	3
Water Levels	Monitoring Well water levels	AMEC 2000 Sampling Rounds	Jun-Dec 2000	4
		JE 2000 Sampling Rounds	Jun-Dec 2000	4
		Demo 1 current	2003	6
		CIA current	2003	6
		USGS Reported	1993	5
		AMEC 2000 Synoptic Round	Nov-00	7
		AMEC 2002 Synoptic Round	May-02	8
	Pump test drawdown response	PW-1	Jun-02	4
		Bourne #6 (formerly 2-88)	Mar-90	5
		WS-1	Jun-00	5
		WS-2	Jul-00	5
		WS-3	May-00	5
		WS-4	May-02	5
		Test Site 1	Sep-96	5
	Top-of-mound Locations	JE estimated	various	3
	Pond Water Levels	USGS Reported	1993	7
Flows	Stream gauging	USGS Reported	2002	8
		JE 2000 Stream Gauging	2000	9
Other	Radiometric isotope ages	USGS Reported H3/He	May-02	7
		USGS Reported Bomb H3	2000?	-
	Stable isotope profiles	USGS Reported for Snake Pond		-

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
00MW0511D	3	43.73	45.30	-1.57	90MP0060A	8	67.56	66.44	1.12
00MW0512A	5	45.43	46.78	-1.35	90MP0060B	7	59.82	61.59	-1.77
00MW0512C	3	45.28	46.78	-1.50	90MP0060D	5	67.43	66.42	1.01
00MW0512D	2	45.27	46.78	-1.51	90MW0001	2	68.36	67.61	0.75
00MW0514A	5	46.88	47.96	-1.08	90MW0002	1	68.54	67.61	0.93
00MW0514C	3	46.75	47.96	-1.21	90MW0003	3	67.27	67.24	0.03
00MW0514D	2	46.25	47.96	-1.71	90MW0004	4	67.82	67.49	0.33
00MW0515A	5	43.21	45.39	-2.18	90MW0005	5	67.45	67.25	0.20
00MW0515B	4	44.11	45.40	-1.29	90MW0007	5	68.19	67.61	0.58
00MW0515D	2	43.27	45.41	-2.14	90MW0010	1	67.26	66.75	0.51
00MW0516A	5	51.18	52.93	-1.75	90MW0011	2	67.14	66.75	0.39
00MW0516B	4	51.30	52.93	-1.63	90MW0015	4	67.31	66.76	0.55
00MW0517A	5	46.13	48.13	-2.00	90MW0017	4	67.04	67.00	0.04
00MW0519B	4	43.63	45.16	-1.53	90MW0019	4	68.19	67.73	0.46
00MW0521A	5	40.49	42.98	-2.49	90MW0020	4	67.06	66.80	0.26
00MW0521B	3	40.77	42.98	-2.21	90MW0021	4	68.51	67.97	0.54
00MW0521C	2	40.54	42.99	-2.45	90MW0022	4	61.59	67.80	-6.21
00MW0523C	2	42.82	44.18	-1.36	90MW0024	4	67.14	66.73	0.41
00MW0524A	9	40.83	42.85	-2.02	90MW0025	4	66.93	66.56	0.37
00MW0524B	6	41.20	42.86	-1.66	90MW0026	4	66.90	66.54	0.36
00MW0524C	5	40.40	42.86	-2.46	90MW0027	5	67.12	66.56	0.56
00MW0524E	1	40.58	42.93	-2.35	90MW0028	5	67.56	66.49	1.07
00MW0526A	6	39.45	41.76	-2.31	90MW0032	4	67.40	66.88	0.52
00MW0526B	4	38.66	41.77	-3.11	90MW0033	4	67.16	66.80	0.36
00MW0526C	2	38.64	41.71	-3.07	90MW0034	2	68.47	67.65	0.82
00MW0526X	3	38.72	41.82	-3.10	90MW0036	3	67.84	67.57	0.27
00MW0526Z	7	28.03	29.55	-1.52	90MW0040	6	66.91	66.40	0.51
00MW0527	3	46.12	47.07	-0.95	90MW0041	2	68.32	67.81	0.51
00MW0531	1	49.99	50.49	-0.50	90MW0042	4	66.46	66.25	0.21
00MW0537B	2	44.38	45.47	-1.09	90MW0047	6	67.42	66.23	1.19
00MW0538A	5	43.57	45.46	-1.89	90MW0048	3	67.11	66.56	0.55
00MW0542A	4	39.64	42.45	-2.81	90MW0049	8	67.31	66.51	0.80
00MW0542C	2	39.49	42.44	-2.95	90MW0050	4	67.25	66.38	0.87
00MW0544A	5	36.24	39.82	-3.58	90MW0053	6	66.72	66.30	0.42
00MW0544B	4	36.14	39.80	-3.66	90MW0054	5	67.66	67.22	0.44
00MW0545	2	44.09	44.98	-0.89	90MW0055	7	56.23	57.05	-0.82
00MW0547A	7	38.64	41.48	-2.84	90MW0056	7	39.95	41.59	-1.64
00MW0547B	4	43.53	44.44	-0.91	90MW0058	6	67.27	66.21	1.06
00MW0548A	8	43.38	44.33	-0.95	90MW0063	2	68.22	67.35	0.87
00MW0548B	4	43.15	44.34	-1.19	90MW0064	7	38.74	41.75	-3.01
00MW0549	7	53.10	55.86	-2.76	90MW0064A	2	66.39	66.04	0.35
00MW0550A	7	23.06	25.51	-2.45	90MW0066	6	67.23	66.14	1.09
00MW0550B	5	36.32	40.31	-3.99	90MW0066A	4	66.97	66.14	0.83
00MW0554A	8	35.10	40.26	-5.16	90MW0068	4	66.60	66.08	0.52
00MW0554B	6	35.35	40.38	-5.03	90MW0070	4	68.14	67.37	0.77
00MW0555B	6	36.07	40.21	-4.14	90MW0071	4	67.99	67.36	0.63
00MW0555C	6	36.04	40.19	-4.15	90MW0076	4	66.89	66.40	0.49
00MW0555D	9	36.04	40.08	-4.04	90MW0077	4	66.40	66.05	0.35
00MW0561	4	39.80	43.12	-3.32	90MW0078	4	66.96	66.27	0.69

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
00MW0562A	8	36.10	40.31	-4.21	90MW0079A	3	66.56	66.29	0.27
00MW0565	7	54.24	57.65	-3.41	90MW0079B	5	66.66	66.29	0.37
00MW0567	2	45.18	45.95	-0.77	90MW0079C	7	32.30	34.89	-2.59
00MW0568	2	37.01	41.39	-4.38	90MW0080	5	66.68	67.02	-0.34
00MW0570A	4	40.85	43.41	-2.56	90MW0081	2	66.74	66.50	0.24
00MW0570B	2	40.89	43.40	-2.51	90MW0083	2	66.92	66.14	0.78
00MW0572C	4	37.07	40.81	-3.74	90MW0084A	5	66.90	66.08	0.82
00MW0573B	8	35.72	40.08	-4.36	90MW0084B	2	66.72	66.09	0.63
00MW0574C	3	37.00	41.37	-4.37	90MW0085A	4	67.43	66.19	1.24
00MW0575B	4	38.13	41.97	-3.84	90MW0085B	2	67.38	66.20	1.18
00MW0576B	4	44.72	45.94	-1.22	90MW0086A	7	21.84	22.84	-1.00
00MW0576C	3	44.89	45.98	-1.09	90MW0086B	5	66.40	66.53	-0.13
00MW0577A	7	68.55	68.19	0.36	90MW0086C	4	66.73	66.53	0.20
00MW0577B	6	35.75	40.15	-4.40	90MW0086D	2	66.31	66.53	-0.22
00MW0578A	8	33.56	38.73	-5.17	90MW0087A	5	66.47	66.14	0.33
00MW0578B	6	33.46	38.52	-5.06	90MW0087B	2	65.98	66.14	-0.16
00MW0579A	9	35.67	40.81	-5.14	90MW0088A	6	66.46	66.01	0.45
00MW0579B	7	40.30	41.00	-0.70	90MW0088B	3	66.44	66.02	0.42
00MW0579C	5	35.60	40.85	-5.25	90MW0089A	8	65.16	65.87	-0.71
00MW0580A	10	41.01	43.08	-2.07	90MW0089B	6	66.33	65.88	0.45
00MW0580B	9	40.99	43.19	-2.20	90MW0089C	5	66.21	65.88	0.33
00MW0580C	6	41.19	43.38	-2.19	90MW0089D	4	66.25	65.88	0.37
00MW0580D	3	41.11	43.39	-2.28	90MW0089E	2	66.27	65.88	0.39
00MW0581A	10	40.05	42.99	-2.94	90MW0089F	1	66.26	65.88	0.38
00MW0581B	6	40.88	43.08	-2.20	90MW0090A	7	55.57	57.08	-1.51
00MW0582A	9	39.76	42.37	-2.61	90MW0090B	6	66.18	65.80	0.38
00MW0582B	2	40.15	42.38	-2.23	90MW0090C	5	66.30	65.80	0.50
00MW0583A	11	35.91	39.68	-3.77	90MW0090D	4	66.31	65.80	0.51
00MW0583B	9	36.30	39.69	-3.39	90MW0090E	3	66.30	65.80	0.50
00MW0584A	11	35.99	39.75	-3.76	90MW0090F	1	66.31	65.80	0.51
00MW0584B	9	35.76	39.81	-4.05	90MW0091A	7	32.83	33.83	-1.00
00MW0587A	9	31.76	34.99	-3.23	90MW0091B	6	66.44	65.98	0.46
00MW0587B	4	31.90	35.10	-3.20	90MW0091C	5	66.80	65.98	0.82
00MW0588A	6	30.36	33.04	-2.68	90MW0091D	4	66.28	65.98	0.30
00MW0589A	10	40.76	43.01	-2.25	90MW0091E	3	66.35	65.98	0.37
00MW0589B	8	40.86	43.16	-2.30	90MW0091F	1	66.34	65.98	0.36
00MW0589C	3	40.86	43.23	-2.37	90PZ1-B1	4	66.75	66.59	0.16
00MW0590A	10	29.30	32.46	-3.16	90PZ1-C1	1	68.79	66.57	2.22
00MW0590B	5	29.66	32.56	-2.90	90RIW0009	5	65.31	66.50	-1.19
00MW0591A	10	31.44	34.35	-2.91	90WT0003	1	68.79	67.99	0.80
00MW0591C	4	34.22	34.60	-0.38	90WT0004	1	68.47	67.94	0.53
00MW0592A	10	35.42	38.62	-3.20	90WT0005	1	68.95	67.53	1.42
00MW0592B	7	47.45	48.18	-0.73	90WT0006	1	68.63	68.04	0.59
00MW0605A	9	40.08	42.12	-2.04	90WT0008	1	67.76	66.58	1.18
00MW0605B	6	39.75	41.96	-2.21	90WT0010	1	66.74	66.37	0.37
00MW0605C	5	39.12	41.96	-2.84	90WT0013	1	70.60	67.95	2.65
00MW0605D	3	39.38	41.94	-2.56	91MW0313A	2	48.64	48.99	-0.35
00MW0606B	9	39.12	41.39	-2.27	91MW0313B	1	48.66	48.99	-0.33
00MW0607A	9	39.56	42.22	-2.66	91MW0313Z	3	48.66	48.98	-0.32

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
00MW0607B	6	40.14	42.26	-2.12	91MW0314B	1	47.12	47.68	-0.56
00MW0608A	10	38.49	40.78	-2.29	91MW0522A	6	43.88	44.52	-0.64
00MW0608B	9	38.31	40.75	-2.44	91MW0522B	4	44.00	44.48	-0.48
00MW0609A	8	40.11	43.09	-2.98	91MW0522C	3	43.86	44.48	-0.62
00MW0609B	4	40.71	43.14	-2.43	91MW0522D	1	44.00	44.49	-0.49
00MW0620A	6	38.95	40.96	-2.01	91MW0522Y	5	43.86	44.52	-0.66
00MW0620B	5	38.18	40.92	-2.74	95MW0104	6	11.38	12.81	-1.43
00MW0620C	4	38.09	40.82	-2.73	95MW0105	7	35.23	39.30	-4.07
00MW0621A	6	40.95	43.26	-2.31	95MW0109A	7	41.87	43.85	-1.98
02MW0001D	7	50.19	49.02	1.17	95MW0109B	5	44.79	44.79	0.00
02MW0003D	7	56.70	56.69	0.01	95MW0109C	3	44.82	44.77	0.05
02MW0006D	7	66.81	66.31	0.50	95MW0201	7	31.89	31.93	-0.04
02MW1201A	5	51.02	49.61	1.41	95MW0206A	9	35.52	38.40	-2.88
02MW1202A	5	51.52	49.79	1.73	95MW0206B	8	35.50	38.45	-2.95
02MW1202B	4	51.50	49.79	1.71	95MW0207B	5	37.31	39.81	-2.50
02MW1202C	3	51.52	49.79	1.73	95MW0208A	7	67.86	67.82	0.04
02MW1203A	4	51.74	49.98	1.76	95MW0208B	5	34.05	36.23	-2.18
02MW1204A	3	54.66	52.48	2.18	95MW0209A	6	40.20	41.93	-1.73
02MW1204B	2	54.47	52.49	1.98	95MW0209B	4	40.47	41.93	-1.46
02MW1205B	6	45.64	46.22	-0.58	95MW0210A	6	36.60	38.86	-2.26
02MW1205C	5	45.70	46.21	-0.51	95MW0210B	4	36.05	38.87	-2.82
02MW1205D	4	45.71	46.21	-0.50	95MW0211A	10	35.70	39.26	-3.56
02MW1208A	6	41.56	43.22	-1.66	95MW0211B	5	36.70	39.46	-2.76
02MW1209A	5	41.61	43.26	-1.65	95MW0212A	9	35.83	39.02	-3.19
02MW1251	9	41.48	43.44	-1.96	95MW0212B	6	35.82	39.06	-3.24
02MW1253	9	41.03	42.93	-1.90	95MW0214A	10	40.08	42.30	-2.22
02MW1257	7	49.30	49.97	-0.67	95MW0215A	9	40.03	42.11	-2.08
02OW0009C	6	42.02	44.02	-2.00	95MW1170A	9	39.96	43.29	-3.33
02OW0010B	5	41.88	44.01	-2.13	95MW1170B	7	48.22	48.06	0.16
02OW0010C	6	41.87	43.99	-2.12	95MW1171A	9	32.21	39.56	-7.35
02OW0015C	6	42.75	44.44	-1.69	95MW1171B	5	36.00	39.61	-3.61
02OW0016D	7	56.00	56.75	-0.75	95MW1172A	9	29.77	37.22	-7.45
02PZ0011C	6	42.60	44.16	-1.56	95MW1172B	5	33.24	37.38	-4.14
03MP0091A	10	44.59	45.43	-0.84	95MW1173A	9	26.88	31.53	-4.65
03MP0091B	9	44.64	45.38	-0.74	95MW1173B	6	29.69	31.59	-1.90
03MP0091C	8	44.60	45.28	-0.68	95MW1174A	7	36.44	39.43	-2.99
03MP0091D	6	44.36	45.18	-0.82	95MW1174B	6	33.96	37.25	-3.29
03MP0091E	4	44.37	45.16	-0.79	95MW1232A	9	29.11	31.23	-2.12
03MP0092A	10	44.25	44.97	-0.72	96SV0013	1	66.80	67.96	-1.16
03MP0092C	7	45.22	45.56	-0.34	98MW0001	1	51.44	51.79	-0.35
03MP0092E	4	44.13	44.81	-0.68	BOMW0007	4	29.25	28.79	0.46
03MW0008	1	66.19	65.15	1.04	BOMW0009	4	28.33	29.67	-1.34
03MW0014A	2	65.71	65.30	0.41	ECMWAMP01D	6	45.32	44.46	0.86
03MW0014B	1	65.70	65.30	0.40	ECMWAMP01M	4	45.44	44.44	1.00
03MW0018	1	65.74	65.31	0.43	ECMWAMP01S	3	45.38	44.43	0.95
03MW0024A	4	63.29	62.80	0.49	ECMWAMP02D	7	40.09	42.50	-2.41
03MW0028A	6	60.94	61.10	-0.16	ECMWAMP02M	4	44.97	44.41	0.56
03MW0028B	5	60.90	61.07	-0.17	ECMWAMP02S	4	45.32	44.42	0.90
03MW0028C	5	60.50	61.10	-0.60	ECMWAMP03	7	34.51	38.93	-4.42

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
03MW0029B	4	58.13	59.17	-1.04	ECMWAMP04	9	44.11	44.90	-0.79
03MW0029Z	8	58.20	59.18	-0.98	ECMWAMP05A	6	44.63	45.74	-1.11
03MW0030A	4	57.94	59.16	-1.22	ECMWAMP05B	3	44.48	45.72	-1.24
03MW0031	4	58.24	58.91	-0.67	ECMWAMP06A	6	45.95	45.19	0.76
03MW0032	5	58.19	58.98	-0.79	ECMWAMP06B	4	45.96	45.16	0.80
03MW0033	5	58.47	59.03	-0.56	ECMWAMP06C	3	45.83	45.14	0.69
03MW0034	5	58.34	58.92	-0.58	ECMWAMP07A	6	46.56	44.94	1.62
03MW0036	3	57.62	58.44	-0.82	ECMWAMP07B	5	46.07	44.92	1.15
03MW0037	7	67.62	67.35	0.27	ECMWAMP07C	3	46.02	44.87	1.15
03MW0038	1	50.64	49.43	1.21	ECMWBKR01D	6	15.29	16.69	-1.40
03MW0039A	5	56.16	52.61	3.55	ECMWBKR01M	4	15.29	16.59	-1.30
03MW0040B	5	56.05	54.43	1.62	ECMWEAP01	2	47.11	47.94	-0.83
03MW0041	4	54.03	52.11	1.92	ECMWEAP02	4	47.21	47.94	-0.73
03MW0041B	7	35.23	39.13	-3.90	ECMWJNP01D	5	34.08	41.31	-7.23
03MW0042B	4	55.06	53.81	1.25	ECMWJNP01M	4	35.73	41.28	-5.55
03MW0044	5	58.68	58.74	-0.06	ECMWJNP01S	3	35.77	41.27	-5.50
03MW0045	4	55.79	56.16	-0.37	ECMWJNP02D	6	34.27	40.98	-6.71
03MW0045Z	10	55.12	56.09	-0.97	ECMWJNP02M	5	35.89	40.94	-5.05
03MW0046	4	55.90	56.64	-0.74	ECMWLGP01D	5	28.19	26.09	2.10
03MW0046Z	9	55.82	56.63	-0.81	ECMWPTP01D	4	67.86	65.29	2.57
03MW0048	3	56.96	56.54	0.42	ECMWPTP01S	1	68.26	65.27	2.99
03MW0049	5	56.02	56.03	-0.01	ECMWRBP01D	7	46.51	46.86	-0.35
03MW0050	9	45.86	46.15	-0.29	ECMWSNP01	1	66.93	66.59	0.34
03MW0053	6	50.06	50.57	-0.51	ECMWSNP02D	4	69.86	66.59	3.27
03MW0054A	7	47.21	48.28	-1.07	ECMWSNP02S	2	69.87	66.58	3.29
03MW0054B	4	45.13	46.82	-1.69	ECMWSNP03D	4	69.79	66.42	3.37
03MW0056	5	56.39	56.76	-0.37	ECMWSNP03S	2	69.92	66.41	3.51
03MW0057A	10	47.41	48.12	-0.71	ECMWTRP01D	3	62.14	62.10	0.04
03MW0061	10	45.33	45.87	-0.54	ECMWTRP01S	1	62.74	62.10	0.64
03MW0064	10	44.47	44.98	-0.51	ECPZBKR01	4	24.10	25.02	-0.92
03MW0067	10	57.22	58.52	-1.30	ECPZEAP01	1	46.73	47.72	-0.99
03MW0070A	7	45.12	41.81	3.31	ECPZLJP01	2	39.29	40.82	-1.53
03MW0075	4	56.39	54.57	1.82	ECPZLJP02	2	38.21	39.91	-1.70
03MW0077	4	55.78	54.14	1.64	ECPZPLW01	2	42.44	43.68	-1.24
03MW0080	6	55.11	55.13	-0.02	ECPZPLW02	1	42.16	42.89	-0.73
03MW0081	5	56.21	53.72	2.49	ECPZSNP01	1	66.89	66.40	0.49
03MW0082	6	56.02	55.17	0.85	ECPZVP101	1	46.29	47.34	-1.05
03MW0086	4	54.27	51.18	3.09	ECPZVP102	4	46.42	47.34	-0.92
03MW0088	3	52.97	50.14	2.83	ECPZVP201	4	61.62	63.01	-1.39
03MW0089	4	53.37	50.59	2.78	ECPZVP203	1	61.46	62.99	-1.53
03MW0093A	8	55.72	53.46	2.26	ECPZWEP01	1	46.87	47.95	-1.08
03MW0093B	4	56.45	53.47	2.98	H1GB0007	10	33.43	38.40	-4.97
03MW0095A	9	49.40	49.34	0.06	MAMW0296I	7	54.64	57.78	-3.14
03MW0096	5	53.73	53.61	0.12	MAMW0511D	3	44.66	45.30	-0.64
03MW0097	4	57.43	58.27	-0.84	MAMW0512A	5	46.57	46.78	-0.21
03MW0099	6	54.89	52.72	2.17	MAMW0514C	3	47.27	47.97	-0.70
03MW0100A	8	55.45	54.10	1.35	MAMW0514D	2	47.28	47.97	-0.69
03MW0101B	5	55.30	54.33	0.97	MAMW0515A	5	44.63	45.39	-0.76
03MW0102B	7	52.44	55.21	-2.77	MAMW0515D	2	44.69	45.41	-0.72

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
03MW0103A	10	45.56	45.72	-0.16	MAMW0518A	4	45.11	45.22	-0.11
03MW0103B	9	45.59	45.72	-0.13	MAMW0518D	3	43.61	45.24	-1.63
03MW0103C	7	40.99	41.09	-0.10	MAMW0519B	4	44.78	45.16	-0.38
03MW0104A	10	46.05	46.67	-0.62	MW-100M1	3	65.77	65.85	-0.08
03MW0104B	6	45.99	46.84	-0.85	MW-100M2	2	65.91	65.86	0.05
03MW0105B	7	47.51	47.86	-0.35	MW-101M1	2	65.47	66.04	-0.57
03MW0106A	9	56.65	57.16	-0.51	MW-101S	1	65.97	66.05	-0.08
03MW0106B	3	56.79	57.19	-0.40	MW-102M1	7	25.21	26.30	-1.09
03MW0107B	4	59.92	60.44	-0.52	MW-102M2	5	57.26	58.39	-1.13
03MW0109A	8	56.85	57.79	-0.94	MW-102S	1	57.42	58.43	-1.01
03MW0109B	5	56.90	57.79	-0.89	MW-103M1	9	56.95	57.85	-0.90
03MW0111B	5	55.16	55.26	-0.10	MW-103M2	8	56.98	57.88	-0.90
03MW0112A	8	59.27	59.95	-0.68	MW-103S	1	56.95	57.95	-1.00
03MW0112B	6	59.36	59.97	-0.61	MW-104M1	2	64.80	65.58	-0.78
03MW0113A	10	49.81	49.96	-0.15	MW-104M2	1	64.96	65.58	-0.62
03MW0114A	9	48.61	49.87	-1.26	MW-104S	1	64.99	65.58	-0.59
03MW0114B	7	22.62	25.05	-2.43	MW-105M1	4	66.15	66.14	0.01
03MW0115	9	55.02	52.73	2.29	MW-105M2	2	66.30	66.15	0.15
03MW0116B	6	55.06	54.92	0.14	MW-106M1	2	66.26	66.08	0.18
03MW0117A	10	52.23	51.95	0.28	MW-106M2	1	66.30	66.09	0.21
03MW0117B	6	52.44	52.06	0.38	MW-107M1	2	67.71	67.31	0.40
03MW0118A	9	52.22	53.13	-0.91	MW-107M2	1	67.73	67.31	0.42
03MW0118B	5	52.81	53.17	-0.36	MW-108D	8	58.15	59.07	-0.92
03MW0202D	7	47.55	48.52	-0.97	MW-108M1	7	52.69	50.12	2.57
03MW0206F	9	46.99	48.21	-1.22	MW-108M2	7	44.81	44.84	-0.03
03MW0206G	10	46.49	48.11	-1.62	MW-108M3	6	58.13	59.08	-0.95
03MW0209C	8	45.81	47.42	-1.61	MW-108M4	5	58.09	59.10	-1.01
03MW0209D	9	45.91	47.33	-1.42	MW-109S	1	66.76	66.63	0.13
03MW0214A	5	45.66	47.08	-1.42	MW-10D	10	58.91	60.19	-1.28
03MW0214B	7	42.72	44.18	-1.46	MW-10M	7	29.17	31.10	-1.93
03MW0214F	10	45.12	46.94	-1.82	MW-10S	1	58.88	60.25	-1.37
03MW0214G	10	45.44	46.93	-1.49	MW-110M1	8	57.87	59.35	-1.48
03MW0224C	8	46.07	47.54	-1.47	MW-110M2	4	57.88	59.40	-1.52
03MW0224E	9	46.08	47.43	-1.35	MW-110M3	3	57.65	59.41	-1.76
03MW0603Y	7	39.79	41.94	-2.15	MW-111M1	5	62.28	64.06	-1.78
03MW2104A	8	52.36	58.38	-6.02	MW-111M2	3	62.27	64.06	-1.79
03MW2105A	9	55.73	58.24	-2.51	MW-111M3	2	62.27	64.06	-1.79
03MW2106A	9	56.98	57.79	-0.81	MW-112M1	3	64.88	65.19	-0.31
03MW2107A	6	51.47	54.47	-3.00	MW-112M2	2	64.74	65.19	-0.45
03MW2108A	6	53.85	54.34	-0.49	MW-113M1	5	63.63	65.04	-1.41
03MW2111A	7	30.71	32.41	-1.70	MW-113M2	3	64.86	65.04	-0.18
03MW2111B	5	54.22	57.09	-2.87	MW-114M1	5	63.70	64.34	-0.64
03MW2111C	3	54.59	57.08	-2.49	MW-114M2	2	63.71	64.34	-0.63
03MW2112A	9	55.68	56.94	-1.26	MW-116S	1	68.51	68.18	0.33
03MW2112B	6	56.05	56.96	-0.91	MW-117S	1	68.88	68.22	0.66
03MW2112C	4	56.00	56.96	-0.96	MW-118M1	2	68.63	67.96	0.67
03MW2113A	8	52.22	54.45	-2.23	MW-119S	1	68.94	68.21	0.73
03MW2113B	5	53.42	54.47	-1.05	MW-12	1	67.92	67.83	0.09
03MW2114A	8	46.98	58.38	-11.40	MW-120M1	8	68.39	68.20	0.19

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
03MW2114B	6	55.16	58.39	-3.23	MW-120S	1	68.35	68.21	0.14
03MW2115A	9	55.99	56.76	-0.77	MW-121S	1	68.91	68.21	0.70
03MW2115B	6	55.77	56.78	-1.01	MW-122S	1	68.64	68.20	0.44
03MW2117B	6	56.87	57.97	-1.10	MW-123M1	8	52.36	57.68	-5.32
03MW2119A	9	57.34	58.10	-0.76	MW-123M2	6	52.56	57.69	-5.13
03MW2119B	6	57.52	58.12	-0.60	MW-123S	1	52.45	57.75	-5.30
03MW2120A	6	54.11	50.92	3.19	MW-124M1	6	56.28	57.33	-1.05
03MW2122A	6	59.32	60.38	-1.06	MW-124M2	5	56.22	57.34	-1.12
03MW2123A	4	56.10	53.42	2.68	MW-124M3	2	56.20	57.37	-1.17
03MW2124A	7	44.48	43.99	0.49	MW-125M1	9	68.43	68.19	0.24
03MW2125A	8	53.93	53.98	-0.05	MW-125S	1	68.68	68.21	0.47
03MW2140A	4	52.71	50.66	2.05	MW-126M1	1	68.50	68.04	0.46
03MW2141A	4	50.94	49.83	1.11	MW-126S	1	68.52	68.04	0.48
03MW2143A	4	54.72	52.97	1.75	MW-127S	1	68.94	68.30	0.64
03MW2145A	6	52.29	52.04	0.25	MW-128M1	3	68.61	68.26	0.35
03MW2146A	3	56.25	55.22	1.03	MW-128M2	1	68.73	68.26	0.47
03MW2150A	7	41.68	44.32	-2.64	MW-128S	1	68.70	68.26	0.44
03MW2401A	10	49.48	48.41	1.07	MW-129M1	4	63.92	64.33	-0.41
03MW2401B	8	49.95	48.77	1.18	MW-129M2	3	63.91	64.33	-0.42
03MW2401C	3	48.46	48.80	-0.34	MW-129M3	2	63.92	64.33	-0.41
03MW2402A	7	50.34	49.42	0.92	MW-130D	10	68.59	68.14	0.45
03MW2403A	6	45.33	45.60	-0.27	MW-130M1	3	68.65	68.17	0.48
03MW2404A	4	48.98	49.31	-0.33	MW-130S	1	68.57	68.17	0.40
03MW2405A	8	49.08	49.97	-0.89	MW-131M1	9	68.50	68.03	0.47
03MW2406A	7	40.44	41.17	-0.73	MW-131M2	5	68.53	68.04	0.49
03MW2407A	7	45.58	47.07	-1.49	MW-131S	1	68.74	68.05	0.69
03MW2408A	9	52.20	51.26	0.94	MW-132M1	9	68.58	68.16	0.42
03MW2408B	7	47.04	45.24	1.80	MW-132S	1	68.80	68.18	0.62
03MW2409A	8	50.06	49.81	0.25	MW-136M1	1	68.79	68.24	0.55
03MW2410B	7	66.49	65.98	0.51	MW-136S	1	68.81	68.24	0.57
03MW2411A	8	45.22	46.06	-0.84	MW-137S	1	68.41	68.20	0.21
03MW2412A	9	45.69	46.77	-1.08	MW-139M1	6	63.13	63.73	-0.60
03MW2412B	8	45.88	46.81	-0.93	MW-139M1	6	62.74	63.73	-0.99
03MW2413A	10	45.23	46.77	-1.54	MW-139M2	4	63.17	63.73	-0.56
03MW2413B	9	45.58	46.80	-1.22	MW-139M2	4	62.71	63.73	-1.02
03MW2414B	7	34.14	37.24	-3.10	MW-139M3	2	63.18	63.73	-0.55
03MW2502A	7	66.42	66.03	0.39	MW-139M3	2	62.66	63.73	-1.07
03MW2503A	5	57.11	60.11	-3.00	MW-13D	7	52.07	51.29	0.78
03MW2602A	5	55.97	55.30	0.67	MW-13S	1	68.68	68.20	0.48
03MW2603A	5	55.06	55.30	-0.24	MW-13S	1	68.51	68.20	0.31
03MW2604A	8	55.70	54.12	1.58	MW-15D	10	63.62	64.35	-0.73
03MW2604B	5	55.77	54.13	1.64	MW-15S	1	63.87	64.30	-0.43
03MW2605A	6	55.70	54.11	1.59	MW-162M3	1	63.91	64.60	-0.69
03MW2605B	4	55.64	54.11	1.53	MW-165M1	6	62.99	63.29	-0.30
03MW2606A	5	56.30	53.47	2.83	MW-165M2	3	63.00	63.31	-0.31
03MW2607A	8	55.54	53.40	2.14	MW-165M3	1	63.01	63.32	-0.31
03MW2608A	5	58.69	60.20	-1.51	MW-16D	10	53.56	55.34	-1.78
03MW2609A	8	50.51	51.11	-0.60	MW-16S	1	54.10	55.47	-1.37
03MW2611A	7	42.96	44.43	-1.47	MW-172M1	7	62.68	63.22	-0.54

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
03MW2612A	7	53.97	52.16	1.81	MW-172M2	6	62.68	63.22	-0.54
03MW2613A	7	66.05	65.98	0.07	MW-172M3	3	62.73	63.24	-0.51
03MW2613B	5	54.91	52.89	2.02	MW-173M1	6	59.14	57.87	1.27
03MW2614A	7	55.85	53.40	2.45	MW-173M2	5	59.31	57.88	1.43
03MW2614B	6	54.74	52.36	2.38	MW-173M3	4	59.33	57.89	1.44
03MW2615A	3	56.06	53.73	2.33	MW-175M1	8	59.13	57.86	1.27
03MW2617A	10	39.81	42.45	-2.64	MW-175M2	4	59.25	57.91	1.34
03MW2617B	6	40.01	42.39	-2.38	MW-175M3	3	59.26	57.92	1.34
03MW2618A	10	39.88	42.46	-2.58	MW-17D	10	56.09	58.26	-2.17
03MW2618B	7	49.10	49.33	-0.23	MW-17M1	6	56.19	58.29	-2.10
03MW2620A	10	39.74	42.46	-2.72	MW-17M2	4	56.64	58.32	-1.68
03MW2620B	6	40.47	42.61	-2.14	MW-17M3	3	57.74	58.34	-0.60
03MW2621A	10	39.66	42.26	-2.60	MW-17S	1	57.61	58.39	-0.78
03MW2621B	9	40.18	42.27	-2.09	MW-186M1	5	59.34	57.92	1.42
03MW2622A	10	39.26	41.55	-2.29	MW-186M2	4	59.32	57.93	1.39
03MW2623A	10	37.52	41.40	-3.88	MW-18D	10	59.64	61.54	-1.90
03MW2623B	7	46.22	45.63	0.59	MW-18M1	7	17.42	18.10	-0.68
03MW2624A	10	34.44	39.34	-4.90	MW-18M2	4	59.81	61.60	-1.79
03MW2624B	10	34.35	39.34	-4.99	MW-18S	1	60.07	61.61	-1.54
03MW2625A	10	34.57	38.97	-4.40	MW-19D	10	65.24	66.02	-0.78
03MW2625B	9	35.64	38.97	-3.33	MW-19S	1	65.89	66.08	-0.19
03UW0024A	1	65.58	65.24	0.34	MW-1D	9	66.97	66.71	0.26
03UW0024B	1	65.59	65.24	0.35	MW-1M1	5	67.69	66.74	0.95
03UW0024C	1	65.59	65.24	0.35	MW-1M2	2	67.03	66.74	0.29
03UW0024D	2	65.61	65.24	0.37	MW-1S	1	66.97	66.74	0.23
03UW0024E	1	65.61	65.24	0.37	MW-210M1	6	62.18	62.14	0.04
03UW0025A	1	65.61	65.29	0.32	MW-210M2	3	62.18	62.18	0.00
03UW0025B	1	65.72	65.29	0.43	MW-210M3	2	62.20	62.19	0.01
03UW0025C	1	65.60	65.29	0.31	MW-211M1	4	59.22	57.86	1.36
03UW0025D	1	65.58	65.29	0.29	MW-211M2	2	59.25	57.88	1.37
03UW0025E	2	65.63	65.29	0.34	MW-211M3	1	59.20	57.88	1.32
03UW0026-092	1	65.55	65.28	0.27	MW-214M3	3	62.65	63.03	-0.38
03UW0026-096	1	65.64	65.28	0.36	MW-21D	7	52.55	52.64	-0.09
03UW0026-100	1	65.68	65.28	0.40	MW-21M2	3	61.92	62.06	-0.14
03UW0026-106	1	66.12	65.28	0.84	MW-21M3	2	61.93	62.06	-0.13
03UW0027-098	1	65.59	65.23	0.36	MW-21S	1	61.66	62.08	-0.42
03UW0027-102	1	65.48	65.23	0.25	MW-221M1	5	58.72	57.36	1.36
03UW0027-108	1	65.43	65.23	0.20	MW-221M2	3	58.73	57.39	1.34
03UW0027-114	2	65.51	65.23	0.28	MW-221M3	1	58.72	57.40	1.32
03UW0027-120	2	65.53	65.23	0.30	MW-225M1	5	57.08	54.51	2.57
03UW0029-107	1	65.59	65.21	0.38	MW-225M2	3	56.46	54.54	1.92
03UW0029-111	1	65.62	65.21	0.41	MW-225M3	2	56.39	54.55	1.84
03UW0030-087	1	65.62	65.26	0.36	MW-231M1	6	57.43	54.64	2.79
03UW0030-096	1	65.37	65.26	0.11	MW-231M2	4	56.69	54.68	2.01
03UW0030-100	1	65.80	65.26	0.54	MW-231M3	1	56.64	54.70	1.94
03UW0030-106	1	65.54	65.26	0.28	MW-23D	8	55.82	57.24	-1.42
03UW0030-117	2	65.62	65.26	0.36	MW-23M1	6	56.35	57.25	-0.90
22MW0004	1	53.13	51.56	1.57	MW-23M2	4	56.22	57.27	-1.05
24MW0304A	1	49.16	49.47	-0.31	MW-23M3	2	56.35	57.29	-0.94

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
24MW0322	1	50.40	50.71	-0.31	MW-23S	1	56.18	57.30	-1.12
27GB0022	9	41.02	41.04	-0.02	MW-240M1	6	56.35	54.16	2.19
27GB0022A	7	54.12	57.56	-3.44	MW-240M2	2	56.05	54.21	1.84
27MW0010	2	63.99	63.73	0.26	MW-240M3	1	55.89	54.22	1.67
27MW0011C	2	58.41	61.81	-3.40	MW-248M1	7	52.96	50.10	2.86
27MW0011D	2	58.99	61.81	-2.82	MW-248M2	5	53.19	50.12	3.07
27MW0013A	3	55.31	61.81	-6.50	MW-248M3	3	53.16	50.15	3.01
27MW0015A	4	59.68	59.57	0.11	MW-25	1	65.92	66.03	-0.11
27MW0015B	2	59.67	59.57	0.10	MW-252M1	7	53.68	50.55	3.13
27MW0015C	1	59.67	59.57	0.10	MW-252M2	5	53.70	50.58	3.12
27MW0016A	4	59.13	59.37	-0.24	MW-252M3	3	53.72	50.61	3.11
27MW0016B	2	59.82	59.37	0.45	MW-255M1	6	63.12	63.67	-0.55
27MW0016C	1	59.50	59.37	0.13	MW-255M2	4	63.15	63.67	-0.52
27MW0017A	3	60.89	60.85	0.04	MW-255M3	2	63.09	63.68	-0.59
27MW0017B	2	61.06	60.85	0.21	MW-258M1	5	52.75	49.56	3.19
27MW0018A	5	61.09	60.89	0.20	MW-258M2	3	52.87	49.59	3.28
27MW0018B	3	61.05	60.89	0.16	MW-258M3	3	52.88	49.59	3.29
27MW0020A	4	59.00	59.20	-0.20	MW-26	1	65.50	65.69	-0.19
27MW0020B	3	59.08	59.20	-0.12	MW-27	1	67.39	67.29	0.10
27MW0020C	1	59.67	59.20	0.47	MW-28S	1	68.04	67.78	0.26
27MW0020Z	6	58.40	59.19	-0.79	MW-29	1	68.65	68.17	0.48
27MW0023A	4	54.53	53.38	1.15	MW-2D	10	65.08	65.11	-0.03
27MW0024A	6	53.43	52.69	0.74	MW-2M1	4	65.14	65.16	-0.02
27MW0025A	9	50.20	49.59	0.61	MW-2M2	2	65.20	65.16	0.04
27MW0026A	5	51.09	50.43	0.66	MW-2S	1	64.99	65.17	-0.18
27MW0026B	8	51.46	50.39	1.07	MW-30	1	68.82	68.04	0.78
27MW0027	6	46.12	45.73	0.39	MW-31D	3	64.99	65.75	-0.76
27MW0028B	4	46.99	46.29	0.70	MW-31M	2	65.17	65.75	-0.58
27MW0029	5	52.24	51.11	1.13	MW-31S	1	65.16	65.76	-0.60
27MW0031A	7	42.76	44.17	-1.41	MW-33D	5	62.56	63.43	-0.87
27MW0031B	4	56.41	56.36	0.05	MW-33M	4	62.63	63.44	-0.81
27MW0031C	2	56.34	56.33	0.01	MW-33S	3	62.63	63.46	-0.83
27MW0032	4	53.61	52.70	0.91	MW-34M1	4	64.01	64.32	-0.31
27MW0033	4	52.81	51.09	1.72	MW-34M2	3	63.27	64.32	-1.05
27MW0033A	6	54.63	51.02	3.61	MW-34M3	2	62.91	64.32	-1.41
27MW0035	5	44.06	41.82	2.24	MW-35M1	4	63.29	63.73	-0.44
27MW0035A	7	53.57	51.64	1.93	MW-35M2	1	63.32	63.74	-0.42
27MW0035Z	9	45.10	41.75	3.35	MW-35S	1	63.42	63.74	-0.32
27MW0037A	5	41.70	40.14	1.56	MW-36M1	4	63.84	64.38	-0.54
27MW0037Z	9	42.19	39.94	2.25	MW-36M2	3	63.71	64.38	-0.67
27MW0038A	7	58.41	60.24	-1.83	MW-36S	1	64.06	64.39	-0.33
27MW0039A	6	29.81	30.80	-0.99	MW-37M1	3	67.34	66.63	0.71
27MW0039Y	8	28.13	30.85	-2.72	MW-37M2	2	67.14	66.63	0.51
27MW0040	6	30.60	31.68	-1.08	MW-37M3	1	67.05	66.63	0.42
27MW0041	7	34.94	39.44	-4.50	MW-38D	7	64.99	65.28	-0.29
27MW0041A	10	32.05	31.90	0.15	MW-38M1	5	65.00	65.28	-0.28
27MW0045	9	27.76	30.13	-2.37	MW-38M2	4	65.01	65.28	-0.27
27MW0046	6	22.79	27.24	-4.45	MW-38M3	3	65.05	65.28	-0.23
27MW0047	5	28.29	31.57	-3.28	MW-38M4	1	64.90	65.28	-0.38

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
27MW0048	10	26.48	26.42	0.06	MW-38S	1	64.98	65.28	-0.30
27MW0050A	7	31.77	34.42	-2.65	MW-39M1	5	62.53	63.87	-1.34
27MW0052	9	15.70	19.79	-4.09	MW-39M2	2	62.61	63.87	-1.26
27MW0053	9	20.22	20.68	-0.46	MW-39S	1	61.98	63.87	-1.89
27MW0056	9	26.65	26.11	0.54	MW-3D	10	64.04	64.10	-0.06
27MW0058	9	28.72	26.67	2.05	MW-3M1	9	64.09	64.12	-0.03
27MW0059	9	16.13	19.30	-3.17	MW-3M2	7	54.87	56.89	-2.02
27MW0064A	8	9.02	12.27	-3.25	MW-3S	1	64.16	64.15	0.01
27MW0064B	5	8.84	12.07	-3.23	MW-40M1	1	67.48	67.07	0.41
27MW0065	10	7.56	10.56	-3.00	MW-40S	1	67.46	67.07	0.39
27MW0068	10	7.35	11.22	-3.87	MW-41M1	6	61.52	62.72	-1.20
27MW0073	6	45.32	43.36	1.96	MW-41M2	4	61.75	62.72	-0.97
27MW0084	9	35.16	33.11	2.05	MW-41M3	1	62.05	62.72	-0.67
27MW0088	5	52.33	50.45	1.88	MW-42M1	8	48.29	48.04	0.25
27MW0089	5	48.94	47.22	1.72	MW-42M2	7	56.66	56.33	0.33
27MW0091B	5	18.52	22.87	-4.35	MW-42M3	6	48.24	48.07	0.17
27MW0092A	9	41.26	42.24	-0.98	MW-43M1	5	60.73	62.87	-2.14
27MW0092B	5	40.97	42.27	-1.30	MW-43M2	4	60.93	62.87	-1.94
27MW0093	6	45.12	40.70	4.42	MW-43S	1	60.96	62.87	-1.91
27MW0094A	7	69.53	66.22	3.31	MW-44M1	3	66.48	66.45	0.03
27MW0094B	4	43.14	41.05	2.09	MW-44M2	1	67.08	66.45	0.63
27MW0101A	9	47.21	44.99	2.22	MW-44S	1	66.64	66.45	0.19
27MW0101B	5	47.06	45.05	2.01	MW-45M1	5	68.62	68.00	0.62
27MW0102A	7	42.91	44.14	-1.23	MW-45M2	1	68.58	68.01	0.57
27MW0102B	2	47.08	45.29	1.79	MW-45S	1	68.86	68.01	0.85
27MW0103A	4	54.27	53.51	0.76	MW-46D	7	56.29	56.23	0.06
27MW0103Z	6	54.45	53.47	0.98	MW-46M1	6	62.83	63.18	-0.35
27MW0105A	8	40.48	41.75	-1.27	MW-46M2	3	62.82	63.23	-0.41
27MW0105B	5	40.80	41.79	-0.99	MW-46M3	2	63.25	63.22	0.03
27MW0106A	8	42.40	43.23	-0.83	MW-46S	1	63.05	63.23	-0.18
27MW0106B	6	42.42	43.23	-0.81	MW-47M1	4	58.26	63.36	-5.10
27MW0107A	9	46.58	45.84	0.74	MW-47M2	3	58.18	63.37	-5.19
27MW0107B	3	47.26	45.90	1.36	MW-47M3	2	58.19	63.37	-5.18
27MW0108A	5	47.74	45.19	2.55	MW-48D	7	63.45	64.14	-0.69
27MW0108B	3	47.84	45.28	2.56	MW-48M1	5	59.72	61.47	-1.75
27MW0109A	9	12.68	17.51	-4.83	MW-48M2	4	59.82	61.49	-1.67
27MW0109B	5	13.76	17.48	-3.72	MW-48M3	2	59.80	61.50	-1.70
27MW0110A	8	38.68	41.53	-2.85	MW-48S	1	59.86	61.49	-1.63
27MW0113A	8	45.36	40.78	4.58	MW-49D	6	59.58	61.47	-1.89
27MW0568Z	9	13.09	17.31	-4.22	MW-49M1	5	60.11	61.47	-1.36
27MW0601A	5	46.40	45.84	0.56	MW-49M1	5	59.06	61.47	-2.41
27MW0602B	4	45.04	47.35	-2.31	MW-49M2	4	60.03	61.48	-1.45
27MW0602C	3	47.58	47.36	0.22	MW-49M3	2	60.03	61.48	-1.45
27MW0701A	5	57.10	56.36	0.74	MW-49S	1	60.06	61.48	-1.42
27MW0705	1	60.92	60.45	0.47	MW-50D	7	52.38	54.03	-1.65
27MW2061	1	60.61	60.72	-0.11	MW-50M1	5	56.32	57.24	-0.92
27MW2071	1	60.25	60.12	0.13	MW-50M2	4	56.32	57.25	-0.93
27MW2081	4	57.71	57.66	0.05	MW-50M3	2	56.47	57.26	-0.79
27MW2082	3	58.56	58.01	0.55	MW-50S	1	56.54	57.27	-0.73

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
27MW2083	3	58.97	58.48	0.49	MW-51D	7	34.74	38.66	-3.92
27MW2084	3	59.03	58.52	0.51	MW-51M1	5	56.30	57.06	-0.76
27MW2085	4	58.53	58.49	0.04	MW-51M3	2	56.32	57.11	-0.79
27MW2101A	9	39.69	40.97	-1.28	MW-52D	10	56.94	59.10	-2.16
27MW2109A	9	43.74	41.57	2.17	MW-52M1	8	56.72	59.10	-2.38
27MW2116A	8	43.89	40.41	3.48	MW-52M2	4	56.74	59.14	-2.40
27MW2117A	6	44.00	41.38	2.62	MW-52M3	4	57.84	59.12	-1.28
27MW2118A	5	44.37	41.40	2.97	MW-52S	1	58.33	59.22	-0.89
27MW2119A	9	40.55	41.13	-0.58	MW-53D	9	54.93	56.07	-1.14
27MW2120A	7	47.99	48.50	-0.51	MW-53M1	6	54.49	56.19	-1.70
27MW2130A	8	46.84	44.80	2.04	MW-53M2	4	54.69	56.18	-1.49
27MW2130B	4	46.81	44.86	1.95	MW-53M3	3	54.81	56.19	-1.38
27RFW0002A	3	59.70	59.45	0.25	MW-53S	1	54.37	56.22	-1.85
28MW0004	1	56.60	55.70	0.90	MW-54D	7	44.01	44.53	-0.52
28MW0006	1	54.82	54.79	0.03	MW-54M1	5	57.96	60.26	-2.30
28MW0006A	3	56.27	54.79	1.48	MW-54M2	4	57.87	60.27	-2.40
28MW0009	1	56.59	55.99	0.60	MW-54M3	2	58.20	60.34	-2.14
28MW0010	1	57.03	56.12	0.91	MW-54S	1	57.89	60.39	-2.50
28MW0011	1	56.01	55.29	0.72	MW-55D	7	39.98	41.93	-1.95
28MW0013	1	56.09	55.28	0.81	MW-55M1	5	58.21	60.85	-2.64
28MW0014	1	55.14	54.93	0.21	MW-55M2	4	58.10	60.85	-2.75
28MW0018A	6	48.90	49.40	-0.50	MW-55M3	2	58.47	60.91	-2.44
28MW0018B	4	48.72	49.41	-0.69	MW-55S	1	58.10	60.95	-2.85
28MW0020	2	50.32	50.33	-0.01	MW-56D	5	67.65	66.54	1.11
28MW0020A	5	50.51	50.33	0.18	MW-56M1	4	67.72	66.54	1.18
28MW0021	2	50.57	50.49	0.08	MW-56M2	3	67.32	66.54	0.78
28MW0022	1	50.21	51.39	-1.18	MW-56M3	2	67.60	66.54	1.06
28MW0023	1	49.62	51.01	-1.39	MW-56S	1	67.72	66.54	1.18
28MW0026B	2	51.04	51.50	-0.46	MW-57D	7	44.14	45.24	-1.10
28MW0027B	2	49.23	49.71	-0.48	MW-57M1	5	67.68	67.37	0.31
28MW0031A	8	34.93	39.45	-4.52	MW-57M2	3	67.57	67.37	0.20
28MW0031B	7	67.75	67.36	0.39	MW-57M3	2	67.78	67.37	0.41
28MW0031C	6	34.96	39.45	-4.49	MW-57S	1	67.76	67.37	0.39
28MW0031D	5	34.97	39.45	-4.48	MW-58S	1	68.66	68.19	0.47
28MW0032A	6	43.43	44.49	-1.06	MW-59M1	2	65.81	65.68	0.13
28MW0032B	4	43.57	44.48	-0.91	MW-59M2	1	65.83	65.68	0.15
28MW0033A	7	52.89	55.86	-2.97	MW-59S	1	65.69	65.68	0.01
28MW0033B	5	42.14	43.91	-1.77	MW-5D	10	66.19	65.95	0.24
28MW0033C	4	42.30	43.93	-1.63	MW-5M1	5	66.19	65.99	0.20
28MW0034A	8	41.53	43.19	-1.66	MW-5M2	3	66.29	65.99	0.30
28MW0034B	5	40.92	43.21	-2.29	MW-5S	1	66.35	66.00	0.35
28MW0035A	9	40.22	42.04	-1.82	MW-6	1	68.63	68.01	0.62
28MW0035B	6	40.13	41.88	-1.75	MW-63D	10	58.24	61.10	-2.86
28MW0035C	4	39.28	41.87	-2.59	MW-63M1	5	57.83	61.07	-3.24
28MW0037A	7	59.58	61.46	-1.88	MW-63M2	4	57.74	61.09	-3.35
28MW0037B	4	40.35	41.90	-1.55	MW-63M3	2	57.95	61.16	-3.21
28MW0102	1	57.58	57.68	-0.10	MW-63S	1	55.70	61.19	-5.49
28MW0107	2	56.21	56.15	0.06	MW-64M1	2	65.40	65.06	0.34
28MW0572	7	40.37	42.43	-2.06	MW-64M2	1	65.43	65.06	0.37

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
28MW0573	3	49.34	49.61	-0.27	MW-64S	1	65.14	65.06	0.08
28MW0574	2	50.27	50.57	-0.30	MW-67M1	6	39.20	45.13	-5.93
28MW0575	2	48.01	48.64	-0.63	MW-67S	2	41.21	45.21	-4.00
28MW0577B	4	51.39	51.65	-0.26	MW-68S	1	65.82	66.23	-0.41
28MW0580	2	53.68	53.64	0.04	MW-69S	1	63.63	64.20	-0.57
28MW0591E	5	48.73	49.17	-0.44	MW-70S	1	63.28	64.16	-0.88
28MW0591F	2	48.79	49.18	-0.39	MW-71M1	1	63.20	63.77	-0.57
28MW0592A	3	49.38	49.59	-0.21	MW-71S	1	63.23	63.77	-0.54
28MW0592B	2	49.38	49.59	-0.21	MW-72S	1	56.56	58.12	-1.56
28MW0592C	1	49.37	49.61	-0.24	MW-73S	1	68.03	66.03	2.00
28MW0593A	3	49.02	49.39	-0.37	MW-74M1	4	64.85	65.21	-0.36
28MW0593B	2	48.95	49.39	-0.44	MW-74M2	2	64.91	65.21	-0.30
28MW0593C	1	48.86	49.41	-0.55	MW-74M3	1	64.75	65.21	-0.46
28MW0594A	4	49.00	49.22	-0.22	MW-75M1	3	64.97	65.20	-0.23
28MW0594B	2	48.72	49.22	-0.50	MW-75M2	2	64.84	65.20	-0.36
28MW0594C	1	48.87	49.23	-0.36	MW-75S	1	64.78	65.20	-0.42
28MW0595A	3	49.20	49.30	-0.10	MW-76M1	3	63.28	65.18	-1.90
28MW0595B	2	49.30	49.30	0.00	MW-76M2	2	64.40	65.18	-0.78
28MW0595C	1	49.24	49.31	-0.07	MW-76S	1	63.96	65.18	-1.22
28MW0596	2	49.85	50.53	-0.68	MW-77M1	5	64.37	65.19	-0.82
28MW0597A	4	53.15	52.81	0.34	MW-77M2	2	64.83	65.19	-0.36
28MW0597B	2	52.82	52.81	0.01	MW-77S	1	64.38	65.19	-0.81
28MW0597C	1	53.12	52.80	0.32	MW-78M1	3	64.82	65.19	-0.37
28MW0598A	4	51.43	51.64	-0.21	MW-78M2	2	64.81	65.19	-0.38
28MW0598B	1	51.40	51.65	-0.25	MW-78M3	1	64.76	65.19	-0.43
28MW0903	1	57.02	55.92	1.10	MW-79M1	4	66.26	66.38	-0.12
28MW1124A	3	48.98	49.45	-0.47	MW-79M2	2	66.29	66.39	-0.10
28MW1130A	7	67.70	66.43	1.27	MW-79S	1	66.29	66.39	-0.10
28MW1130B	5	39.86	42.41	-2.55	MW-7D	10	67.85	67.32	0.53
28MW1131A	7	40.06	42.04	-1.98	MW-7M1	7	53.12	56.19	-3.07
28MW1132A	7	47.32	45.82	1.50	MW-7M2	3	67.83	67.36	0.47
28MW1132B	5	40.39	42.40	-2.01	MW-7S	1	68.12	67.37	0.75
28MW1133A	5	41.17	43.42	-2.25	MW-80D	7	57.82	60.24	-2.42
30MW0426B	1	48.88	49.30	-0.42	MW-80M1	6	47.33	45.87	1.46
30MW0428B	2	47.47	47.89	-0.42	MW-80M2	4	47.31	45.98	1.33
30MW0430	1	48.83	49.28	-0.45	MW-80M3	3	47.30	46.04	1.26
30MW0581A	9	44.49	44.75	-0.26	MW-80S	1	47.32	46.16	1.16
30MW0581B	8	44.54	44.68	-0.14	MW-81D	9	50.07	45.81	4.26
30MW0581C	5	44.55	44.55	0.00	MW-81M1	6	47.50	45.88	1.62
30MW0582A	9	43.88	44.43	-0.55	MW-81M2	4	48.25	45.99	2.26
30MW0582B	5	43.83	44.40	-0.57	MW-81M3	2	47.84	46.10	1.74
30MW0582C	3	43.82	44.40	-0.58	MW-81S	1	47.62	46.16	1.46
30MW0582D	2	43.78	44.40	-0.62	MW-82D	6	46.84	45.87	0.97
30MW0583A	9	42.75	44.23	-1.48	MW-82M1	5	46.98	45.94	1.04
30MW0583B	8	43.02	44.25	-1.23	MW-82M2	4	46.95	46.01	0.94
30MW0583C	5	43.10	44.27	-1.17	MW-82M3	3	46.97	46.09	0.88
30MW0583D	4	43.51	44.27	-0.76	MW-82S	1	47.02	40.00	7.02
30MW0583E	2	42.94	44.28	-1.34	MW-83D	7	62.31	62.02	0.29
30MW0584A	10	42.61	43.85	-1.24	MW-83M1	5	46.21	45.75	0.46

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
30MW0584B	8	42.63	44.00	-1.37	MW-83M2	4	46.36	45.83	0.53
30MW0584C	6	42.74	44.06	-1.32	MW-83M3	3	46.10	45.89	0.21
30MW0585A	6	39.99	42.10	-2.11	MW-83S	1	46.41	45.98	0.43
30MW0585B	4	39.76	42.10	-2.34	MW-84D	9	54.01	44.75	9.26
30MW0585C	4	39.96	42.10	-2.14	MW-84M1	6	47.02	44.74	2.28
32MW0004	7	31.73	37.61	-5.88	MW-84M2	5	47.24	44.81	2.43
32MW2000	9	40.78	43.00	-2.22	MW-84M3	3	47.19	44.93	2.26
32MW2001	9	40.25	42.66	-2.41	MW-84S	2	46.97	44.99	1.98
36MW0017	5	35.32	40.65	-5.33	MW-86M1	4	61.22	62.60	-1.38
36MW0131A	9	34.04	40.61	-6.57	MW-86M2	1	61.19	62.61	-1.42
36MW0131B	8	34.02	40.56	-6.54	MW-86S	1	61.20	62.61	-1.41
36MW0131C	5	34.22	40.55	-6.33	MW-87M1	4	62.42	63.59	-1.17
36MW0132A	9	32.74	38.75	-6.01	MW-87M2	2	62.42	63.60	-1.18
36MW0132B	8	32.48	38.47	-5.99	MW-87M3	1	62.40	63.60	-1.20
36MW0132C	5	31.50	38.34	-6.84	MW-88M1	5	62.00	63.35	-1.35
36MW0133	5	31.36	36.51	-5.15	MW-88M2	4	62.04	63.36	-1.32
36MW0135	10	32.77	38.74	-5.97	MW-88M3	2	62.00	63.37	-1.37
36MW0136	8	32.70	38.13	-5.43	MW-89M1	5	61.71	63.18	-1.47
36MW0137	6	36.88	42.81	-5.93	MW-89M2	4	60.70	63.19	-2.49
36MW0138	8	32.69	37.77	-5.08	MW-89M3	2	61.70	63.20	-1.50
36MW0139	6	37.26	43.03	-5.77	MW-90M1	2	66.65	66.58	0.07
36MW0140	8	37.65	41.54	-3.89	MW-90S	1	66.32	66.58	-0.26
36MW0141	9	41.23	44.19	-2.96	MW-91M1	3	66.81	66.43	0.38
36MW0142	8	42.03	45.15	-3.12	MW-91S	1	66.82	66.43	0.39
36MW0143	9	32.14	37.52	-5.38	MW-92M1	2	65.25	65.34	-0.09
36MW0501	7	66.69	66.28	0.41	MW-92S	1	65.12	65.34	-0.22
36MW0503A	8	46.19	48.67	-2.48	MW-93M1	3	66.66	66.24	0.42
36MW0503B	6	46.14	48.70	-2.56	MW-93M2	1	66.75	66.24	0.51
36MW0503C	4	46.14	48.72	-2.58	MW-94M1	2	63.94	65.08	-1.14
36MW0504	9	46.10	48.33	-2.23	MW-94M2	1	64.14	65.08	-0.94
36MW0601	9	53.52	55.27	-1.75	MW-94S	1	64.05	65.08	-1.03
36MW0603A	8	53.27	54.71	-1.44	MW-95M1	4	61.38	63.15	-1.77
36MW0603B	5	53.26	54.73	-1.47	MW-95M2	3	61.06	63.16	-2.10
36MW0604	8	52.65	54.27	-1.62	MW-95S	1	61.19	63.16	-1.97
36MW0653	7	53.01	50.59	2.42	MW-96M1	4	61.42	62.64	-1.22
36MW0654	7	49.50	50.93	-1.43	MW-96M2	2	61.56	62.65	-1.09
36MW1001A	9	31.51	38.09	-6.58	MW-96S	1	61.40	62.65	-1.25
36MW1001B	7	64.01	64.14	-0.13	MW-97M1	6	61.57	62.67	-1.10
36MW1003A	9	33.37	41.29	-7.92	MW-97M2	4	61.59	62.67	-1.08
36MW1010A	10	35.58	42.16	-6.58	MW-97M3	1	61.25	62.67	-1.42
36MW1010B	9	35.77	42.21	-6.44	MW-98M1	2	65.29	65.51	-0.22
36MW1010C	5	35.75	42.11	-6.36	MW-98S	1	65.51	65.51	0.00
36MW1011A	7	63.20	64.15	-0.95	MW-99M1	3	65.83	65.67	0.16
36MW1012A	9	33.09	39.96	-6.87	MW-99S	1	62.09	65.68	-3.59
36MW1012B	5	32.47	39.67	-7.20	OGDEN/MW-11	8	64.24	64.88	-0.64
36MW1012C	3	31.51	39.64	-8.13	OGDEN/MW-12	7	55.00	52.87	2.13
36MW1013A	9	34.24	39.89	-5.65	OGDEN/MW-16	8	54.12	55.36	-1.24
36MW1013B	7	54.43	55.78	-1.35	OGDEN/MW-17	8	57.47	58.27	-0.80
36MW1014A	6	33.93	40.88	-6.95	OGDEN/MW-18	8	60.41	61.59	-1.18

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
36MW1014B	3	32.27	40.82	-8.55	OGDEN/MW-48	1	59.26	61.49	-2.23
36MW1035	7	53.20	50.68	2.52	OGDEN/MW-53	1	53.98	56.24	-2.26
36MW1036A	10	51.17	53.27	-2.10	OGDEN/MW-54	1	57.58	60.39	-2.81
36MW1036B	9	51.77	53.39	-1.62	OGDEN/MW-55	1	57.77	60.96	-3.19
36MW1036C	7	40.84	42.88	-2.04	OGDEN/MW-5S	7	39.38	41.86	-2.48
36MW1037A	9	45.49	48.06	-2.57	SDW-261-0160/	1	59.43	60.29	-0.86
36MW1037B	9	45.33	48.04	-2.71	SM-4	8	65.99	66.19	-0.20
36MW1038A	10	39.96	44.35	-4.39	SMR-2	1	68.43	68.22	0.21
36MW1038B	9	39.88	44.45	-4.57	SMR-4	1	67.28	67.98	-0.70
36MW1038C	3	40.44	44.58	-4.14	USFW239010	1	44.05	44.48	-0.43
36MW1039A	10	45.56	48.04	-2.48	USFW239064	4	45.23	44.49	0.74
36MW1039B	8	45.50	48.11	-2.61	USFW239121	7	57.37	58.37	-1.00
36MW1039C	6	45.61	48.16	-2.55	USFW254072	4	43.30	44.18	-0.88
36MW1040A	10	41.07	44.52	-3.45	USFW254107	6	42.85	44.18	-1.33
36MW1040B	7	65.77	65.80	-0.03	USFW254140	8	43.32	44.17	-0.85
36MW1041A	9	41.27	45.03	-3.76	USFW262085	5	36.47	39.44	-2.97
36MW1041B	6	41.25	45.11	-3.86	USFW262109	7	58.17	59.07	-0.90
36MW1041C	5	41.08	45.12	-4.04	USFW262159	9	35.80	39.39	-3.59
36MW1042A	9	52.11	53.96	-1.85	USFW282049	4	33.94	35.90	-1.96
36MW1042B	7	46.43	47.05	-0.62	USFW300010	2	43.95	44.47	-0.52
36MW5037C	5	45.49	48.14	-2.65	USFW300050	4	44.10	44.50	-0.40
36PZ1002A	8	32.37	38.91	-6.54	USFW300073	5	44.09	44.52	-0.43
37MW0002	2	48.01	49.06	-1.05	USFW347020	1	45.64	45.69	-0.05
38MW0001	1	57.89	59.44	-1.55	USFW347046	3	45.25	45.62	-0.37
38MW0002	1	57.85	59.26	-1.41	USFW347067	4	45.41	45.65	-0.24
38MW0004	1	57.80	59.36	-1.56	USFW347116	6	45.58	45.65	-0.07
38MW0006	1	57.86	59.49	-1.63	USFW347145	8	45.35	45.63	-0.28
38MW0007	1	57.37	58.84	-1.47	USFW348043	3	42.15	43.75	-1.60
38MW0009	1	57.60	59.16	-1.56	USFW348073	5	42.14	43.73	-1.59
38MW0061	5	54.28	53.01	1.27	USFW348098	6	42.13	43.72	-1.59
38MW0063	5	53.78	52.84	0.94	USFW350064	5	32.36	34.91	-2.55
39MW0002	1	53.68	53.93	-0.25	USFW350110	7	35.56	40.17	-4.61
39MW0004	1	52.79	53.17	-0.38	USFW355079	4	32.99	35.32	-2.33
39MW0005A	2	52.77	52.88	-0.11	USFW356079	4	31.59	34.56	-2.97
58MW0002	1	64.46	65.60	-1.14	USFW356108	6	32.10	34.54	-2.44
58MW0005E	1	65.05	65.89	-0.84	USFW357079	4	32.40	34.18	-1.78
58MW0006E	1	65.49	65.92	-0.43	USFW357119	6	31.95	34.16	-2.21
58MW0007E	1	61.92	64.03	-2.11	USFW357139	7	43.72	44.65	-0.93
58MW0008E	1	62.41	64.39	-1.98	USFW358089	4	34.49	36.13	-1.64
58MW0009E	1	64.75	65.33	-0.58	USFW375055	5	23.33	24.53	-1.20
58MW0011E	1	65.14	65.28	-0.14	USFW375071	6	23.46	24.58	-1.12
58MW0017A	4	63.23	65.29	-2.06	USFW411122	7	45.21	44.47	0.74
58MW0017B	3	63.56	65.29	-1.73	USFW412078	5	32.62	33.85	-1.23
58MW0017C	1	63.64	65.30	-1.66	USFW412108	7	33.75	36.21	-2.46
63MW0002	2	44.35	45.10	-0.75	USFW418122	6	34.64	36.15	-1.51
69MW1261	7	37.77	40.00	-2.23	USFW433064	4	25.49	26.96	-1.47
69MW1262	7	66.40	66.53	-0.13	USFW433104	6	23.38	26.96	-3.58
69MW1267	6	39.24	41.32	-2.08	USFW433118	6	23.40	26.97	-3.57
69MW1268	6	45.41	45.97	-0.56	USFW436036	4	20.30	21.75	-1.45

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
69MW1271	7	54.73	52.35	2.38	USFW436076	6	20.23	21.84	-1.61
69MW1279A	5	31.67	34.45	-2.78	USFW443104	6	22.06	23.63	-1.57
69MW1279B	7	59.32	60.24	-0.92	USFW443117	6	22.08	23.63	-1.55
69MW1279C	9	31.73	34.51	-2.78	USFW443140	8	22.24	23.61	-1.37
69MW1281	8	43.01	44.70	-1.69	USFW459106	6	25.82	27.55	-1.73
69MW1282	8	42.87	44.36	-1.49	USFW460080	4	32.14	34.50	-2.36
69MW1284A	10	26.14	30.41	-4.27	USFW460120	6	32.16	34.48	-2.32
69MW1284B	10	26.57	30.41	-3.84	USFW470119	7	39.94	42.41	-2.47
69MW1285A	5	25.31	28.27	-2.96	USFW474080	4	29.14	31.13	-1.99
69MW1285B	10	25.57	28.85	-3.28	USFW474129	7	54.29	57.57	-3.28
69MW1286	10	22.87	25.64	-2.77	USFW474147	7	41.44	43.25	-1.81
69MW1288	10	25.33	27.66	-2.33	USFW484023	4	10.03	10.90	-0.87
69MW1289	10	26.03	29.42	-3.39	USFW487078	6	13.26	14.43	-1.17
69MW1290A	10	26.15	29.11	-2.96	USFW487112	8	13.32	14.47	-1.15
69MW1290B	10	26.38	29.11	-2.73	USFW497035	4	5.34	7.32	-1.98
69MW1291A	8	24.96	27.86	-2.90	USFW497052	4	5.25	7.32	-2.07
69MW1291B	9	25.32	27.99	-2.67	USFW497089	6	5.33	7.34	-2.01
69MW1292	9	27.72	30.80	-3.08	USFW497108	7	36.36	38.71	-2.35
69MW1293A	10	27.91	31.39	-3.48	USFW501102	6	17.23	16.56	0.67
69MW1293B	10	27.94	31.40	-3.46	USFW502087	5	23.68	24.56	-0.88
69MW1294	4	24.59	27.35	-2.76	USFW567136	7	57.65	59.07	-1.42
69MW1300A	4	23.16	25.51	-2.35	USSD316082	3	46.36	46.86	-0.50
69MW1300B	7	32.13	34.15	-2.02	WL01D	9	66.08	66.71	-0.63
69MW1302	7	40.49	41.94	-1.45	WL01M1	5	66.50	66.74	-0.24
69MW1303A	10	26.26	30.02	-3.76	WL01M2	2	66.13	66.74	-0.61
69MW1303B	10	26.40	30.03	-3.63	WL02M2	2	64.45	65.16	-0.71
69MW1304	10	27.19	30.75	-3.56	WL03D	10	63.55	64.10	-0.55
69MW1306A	8	19.51	25.06	-5.55	WL03M1	9	63.48	64.13	-0.65
69MW1306B	10	19.54	25.17	-5.63	WL03M2	7	39.35	41.31	-1.96
69MW1308	8	22.32	24.92	-2.60	WL05S	1	65.23	65.99	-0.76
69MW1310	10	29.13	32.24	-3.11	WL07D	10	66.44	67.32	-0.88
69MW1317A	10	26.07	29.71	-3.64	WL101S	1	66.08	66.06	0.02
69MW1318A	9	24.32	27.08	-2.76	WL102S	1	56.70	58.28	-1.58
69MW1412	8	45.18	45.79	-0.61	WL104S	1	64.93	65.58	-0.65
69MW1415	6	46.77	46.63	0.14	WL107M2	1	67.23	67.31	-0.08
69MW1416	6	36.76	39.37	-2.61	WL10M	7	45.40	46.77	-1.37
69MW1417	6	46.99	46.56	0.43	WL15D	10	62.95	64.35	-1.40
69MW1419	6	40.82	42.55	-1.73	WL16D	10	52.83	55.33	-2.50
69MW1420	8	49.06	47.42	1.64	WL17D	10	55.12	58.26	-3.14
69MW1421	6	49.47	47.43	2.04	WL17M3	3	54.77	58.33	-3.56
69MW1422	9	41.55	43.22	-1.67	WL21D	7	45.76	45.77	-0.01
69MW1423	6	48.27	47.58	0.69	WL21M1	5	57.92	62.04	-4.12
69MW1501	5	30.62	33.33	-2.71	WL21M2	3	57.94	62.07	-4.13
69MW1503A	7	35.50	40.76	-5.26	WL21M3	2	57.85	62.07	-4.22
69MW1503B	4	50.10	49.03	1.07	WL23D	8	55.01	57.23	-2.22
69MW1504	7	34.44	39.91	-5.47	WL23M2	4	55.30	57.27	-1.97
69MW1506A	9	44.79	45.84	-1.05	WL23M3	2	55.40	57.29	-1.89
69MW1506B	4	45.55	45.89	-0.34	WL31S	1	64.31	65.76	-1.45
69MW1509	7	55.12	56.70	-1.58	WL33S	3	62.14	63.46	-1.32

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
69MW1510A	6	41.99	44.61	-2.62	WL37M3	1	66.71	66.63	0.08
69MW1510B	3	43.67	44.61	-0.94	WL38M3	3	64.82	65.28	-0.46
69MW1511A	8	47.94	47.45	0.49	WL39M2	2	62.28	63.87	-1.59
69MW1514A	10	38.37	41.44	-3.07	WL41M2	4	61.71	62.72	-1.01
69MW1514B	7	29.49	34.17	-4.68	WL42M3	6	48.18	48.08	0.10
69MW1515	4	49.70	48.94	0.76	WL46M3	2	62.17	63.22	-1.05
69MW1516A	7	44.22	44.84	-0.62	WL50M3	2	56.04	57.26	-1.22
69MW1516B	5	41.98	44.34	-2.36	WL55M3	2	57.84	60.93	-3.09
69MW1517A	9	43.58	44.87	-1.29	WL59M2	1	65.47	65.68	-0.21
69MW1517B	6	43.63	44.88	-1.25	WL67S	2	41.17	45.21	-4.04
69MW1518	6	46.27	46.84	-0.57	WL70M1	7	52.47	54.68	-2.21
69MW1519	5	40.61	43.30	-2.69	WL71M1	1	62.89	63.77	-0.88
69MW1521B	4	50.67	49.39	1.28	WL74M2	2	64.16	65.21	-1.05
69MW1522A	10	38.61	41.64	-3.03	WL79M2	2	65.82	66.39	-0.57
69MW1522B	7	35.66	40.22	-4.56	WL80M2	4	46.12	46.00	0.12
69MW1523	9	46.12	46.36	-0.24	WL83M2	4	45.44	45.83	-0.39
69MW1524	8	34.51	37.59	-3.08	WL84S	2	45.69	44.97	0.72
69MW1525	8	43.54	44.79	-1.25	WL89M3	2	61.07	63.20	-2.13
69MW1526	7	5.26	7.35	-2.09	WL91M1	3	66.36	66.43	-0.07
69MW1527	8	51.15	49.77	1.38	WL94M2	1	64.14	65.08	-0.94
69MW1528	7	51.56	49.84	1.72	WL96S	1	61.45	62.66	-1.21
69MW1529	9	38.91	42.08	-3.17	WS-1	5	62.71	63.53	-0.82
69MW1531	6	44.63	45.17	-0.54	WS-1AD	6	62.64	63.53	-0.89
69MW1532A	10	34.42	38.78	-4.36	WS-1AS	2	62.62	63.53	-0.91
69MW1532B	7	53.00	56.03	-3.03	WS-1BD	5	62.63	63.53	-0.90
69MW1534A	10	35.19	39.01	-3.82	WS-1BS	1	62.64	63.53	-0.89
69MW1534B	7	41.03	44.78	-3.75	WS-1CD	5	62.67	63.57	-0.90
69MW1535	9	49.12	48.02	1.10	WS-1CS	1	62.68	63.57	-0.89
69MW1536A	10	34.51	38.58	-4.07	WS-1DD	5	62.67	63.58	-0.91
69MW1536B	7	56.35	57.22	-0.87	WS-1DS	2	62.67	63.58	-0.91
69MW1537	8	49.80	48.94	0.86	WS-1ES	2	62.76	63.65	-0.89
69MW1538	6	48.53	48.19	0.34	WS-2	7	31.66	36.40	-4.74
69MW1539	10	29.02	35.46	-6.44	WS-2BD	7	54.13	57.58	-3.45
69MW1540	9	31.54	35.68	-4.14	WS-2BS	2	54.56	57.66	-3.10
69MW1541	9	41.99	44.61	-2.62	WS-2CD	7	51.74	53.45	-1.71
69MW1542	8	28.80	34.76	-5.96	WS-2CS	2	54.18	57.74	-3.56
69MW1543	9	30.39	35.45	-5.06	WS-2DD	7	46.16	49.10	-2.94
69MW1544	10	32.87	37.99	-5.12	WS-2DS	2	54.55	57.65	-3.10
69MW1545A	9	25.24	31.81	-6.57	WS-2ED	7	61.08	62.02	-0.94
69MW1545B	6	25.31	31.99	-6.68	WS-2ES	2	54.45	57.87	-3.42
69MW1601A	9	24.61	30.98	-6.37	WS-3	7	14.13	18.72	-4.59
69MW1602A	10	24.06	30.11	-6.05	WS-3AD	7	29.18	31.10	-1.92
69MW1603A	10	23.22	29.08	-5.86	WS-3AS	4	52.91	55.85	-2.94
90JB0001B	2	66.71	65.94	0.77	WS-3BD	7	63.32	63.16	0.16
90JB0001C	4	66.66	65.94	0.72	WS-3BS	2	53.03	56.05	-3.02
90JB0001D	5	66.47	65.94	0.53	WS-3CD	7	42.24	43.90	-1.66
90JB0004A	3	66.39	65.79	0.60	WS-3CS	4	53.13	56.19	-3.06
90JB0004C	2	66.38	65.79	0.59	WS-3DD	7	58.17	60.83	-2.66
90JB0006B	5	67.43	66.13	1.30	WS-3DS	2	52.41	55.21	-2.80

Table A2-4
MMR-10 Groundwater Elevation Calibration Residuals
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
90MP0059B	6	67.92	66.95	0.97	WS-3ED	7	39.94	42.42	-2.48
90MP0059D	3	67.72	66.95	0.77	WS-3ES	3	52.47	54.68	-2.21

Table A2-5
Observed vs. Predicted Pond Elevations
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Pond Name	Observed Elevation* (ft NGVD)	Predicted Elevation (ft NGVD)	Residual
Ashumet Pond	44.7	44.4	0.3
Coonamessett Pond	35.8	35.9	-0.1
Crooked Pond	31.4	32.7	-1.3
Flax Pond	12.8	13.9	-1.1
Fresh Pond	19.1	18.3	0.8
Jenkins Pond	19.8	21.9	-2.1
Johns Pond	39.9	40.6	-0.7
Lawrence Pond	59.9	58.8	1.1
Long Pond	53	51.4	1.6
Mashpee Pond	57.1	58.2	-1.1
Moody Pond	44.1	43.5	0.6
Round Pond	21	22.8	-1.8
Santuit Pond	46	47.0	-1.0
Snake Pond	68	65.6	2.4
Spectacle Pond	63.4	62.4	1.0
Triangle Pond	62.4	61.7	0.7

* after Masterson et al (1998)

Table A2-6
Summary of Pump Test Calibration
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Pump Test Location	PW-1	WS-1	WS-2	WS-3	Test Site No. 1	Test Well 2-88 (4036000-06G)	WS-4
Geologic Zone	Mashpee Pitted Plain	Mashpee Pitted Plain/ Sandwich Moraine	Sandwich Moraine/ Mashpee Pitted Plain	Sandwich Moraine/ Mashpee Pitted Plain	Sandwich Moraine	Buzzards Bay Outwash	Buzzards Bay Moraine
Date of Test	June-01	June-00	July-00	May-00	September-96	March-90	May-02
Test Duration (days)	3	5	5	5	5	5	5
Number of Observation Wells	8	10	8	10	7	8	8
Flow Rate (gpm)	519	640	624	620	660	596	576
Estimated Hydraulic Conductivity (ft/day)	159	250	150	205	64	205	60*
Vertical Anisotropy Ratio	1:1	1.4:1	1.5:1	1.3:1	7:1	-	-
Required Change to MMR-10	reduce K and increase anisotropies above -60 ft NGVD	increase K above 0 ft NGVD and increase anisotropies above -40 ft NGVD	increase K throughout and reduce anisotropies above -100 ft NGVD	increase K throughout and reduce anisotropies above -100 ft NGVD	reduce K above 0 ft NGVD and increase K below 0 ft NGVD	increase K and reduce anisotropies below -30 ft NGVD	increase K and reduce anisotropies below -40 ft NGVD
Comment			strongly anisotropic layer indicated between 0 and -40 ft NGVD		drawdown response indicates permeable sand identified between 40 and -120 ft NGVD of limited lateral extent	strongly anisotropic layer indicated between -10 and -30 ft NGVD	well screened very close to bedrock, strongly anisotropic layer indicated between 0 and -40 ft NGVD
Reference	AMEC 2003b	Earth Tech 2000	Earth Tech 2000	Earth Tech 2000	Stone & Webster 1997	Whitman & Howard 1990	Haley & Ward 2003

* No formal test interpretation presently available, value is verbally reported estimate

Table A2-7
Comparison of Estimated and Modeled Groundwater Ages
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Sample Date	Screen Midpoint Elevation (ft ngvd)	Estimated Age* (yrs)	Modeled Age (yrs)	Difference (yrs)
MW-7M1	05/13/2002	-65.70	60.8	50.9	-9.9
MW-81M3	05/06/2003	22.85	13.3	4.3	-9.0
MW-5M2	05/07/2002	11.71	20.2	11.9	-8.3
58MW0010B	05/30/2002	-32.89	36.0	28.2	-7.8
90MW0022	06/03/2002	-9.40	24.8	19.7	-5.1
58MW0011D	05/29/2002	13.33	14.4	11.3	-3.1
MW-80M1	06/03/2002	-40.63	25.5	22.8	-2.7
MW-5M1	05/07/2002	-28.29	27.2	26.3	-0.9
MW-1M2	05/21/2002	24.53	9.6	8.8	-0.8
MW-33S	05/07/2002	14.98	12.5	11.7	-0.8
MW-1M1	05/20/2002	-35.89	30.8	30.9	0.1
MW-7M2	05/13/2002	4.30	13.7	14.4	0.7
MW-2M2	05/20/2002	34.88	4.5	5.9	1.4
MW-80M2	06/03/2002	-10.53	11.1	12.8	1.7
MW-47M3	06/04/2002	36.00	3.0	5.1	2.1
MW-80M3	06/03/2002	19.47	2.5	5.1	2.6
MW-23M3	05/21/2002	24.78	3.6	6.7	3.1
MW-23M2	05/21/2002	-8.22	11.4	16.4	5.0
MW-2M1	05/20/2002	-7.12	11.9	17.4	5.5
MW-33D	05/21/2002	-20.02	14.9	22.9	8.0
MW-18M1	05/28/2002	-70.68	31.1	52.6	21.5

* Preliminary age data provided to IAGWSP by USGS via email on 1-27-2003

> 5 year difference

> 10 year difference

Table A2-8
Observed vs. Predicted Streamflows
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Location	Observed Discharge* (cfs)	Predicted Discharge (cfs)
Backus River at Rt. 28	7	3.9
Bourne River at Rt. 28	4.2	2.2
Childs River at Barrows Rd.	12.9	3.4
Coonamessett River at Rt. 28	16.6	13.4
Mashpee River at Rt. 28	22.9	12.4
Quashnet River at Rt. 28	18.8	15.0
Santuit River at Old Kings Rd.	8.7	5.3
Lower Shawme Pond outlet	7	4.8
Pocasett River at County Rd.	3.8	0.2

* after Masterson et al (1998) with the exception of Lower Shawme Pond outlet and the Pocasett River provided by Don Walter, USGS - personal communication
cfs = cubic feet per second

Table A3-1
Zonal Averages of Hydraulic Conductivity (ft/day) from Pneumatic Slug Tests
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

	Geologic Zone		
Vertical Interval (ft NGVD)	**West of MW-225**	**Within Assumed Clay Lens Extent***	**East of MW-210**
60 to 0	118	101	173
0 to -40	119	40	207
<-40	41	193	145
Geometric Mean**	98	84	163
Range**	28-178	27-218	81-228

representative of MPP outwash
representative of BBM sands/gravels
representative of BBM silts/clays

Note: Data originally published in AMEC (2003d). Tabulated values represent the geometric mean of multiple screens tested in the specified interval.
* Assumed clay lens extent is shown in Figure A3-2.
** For all tests within the plan view zone

Table A3-2
Groundwater Elevation Calibration Residuals for the Demo 1 Subregional Flow Model
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual	Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
03MW0008	2	66.19	65.27	0.92	MW-225M2	6	56.46	56.97	-0.51
03MW0014A	4	65.71	65.45	0.26	MW-225M3	4	56.39	56.90	-0.51
03MW0014B	2	65.70	65.45	0.25	MW-231M1	12	57.43	56.57	0.86
03MW0018	2	65.74	65.45	0.29	MW-231M2	8	56.69	56.74	-0.05
03MW2623B	14	46.22	48.48	-2.26	MW-231M3	2	56.64	56.95	-0.31
03UW0024A	2	65.58	65.38	0.20	MW-240M1	12	56.35	56.35	0.00
03UW0024B	2	65.59	65.38	0.21	MW-240M2	4	56.05	56.60	-0.55
03UW0024C	2	65.59	65.38	0.21	MW-240M3	2	55.89	56.66	-0.77
03UW0024D	4	65.61	65.38	0.23	MW-248M1	14	52.96	52.72	0.24
03UW0024E	2	65.61	65.38	0.23	MW-248M2	10	53.19	52.73	0.46
03UW0025A	2	65.61	65.43	0.18	MW-248M3	6	53.16	52.80	0.36
03UW0025B	2	65.72	65.44	0.28	MW-252M1	14	53.68	53.14	0.54
03UW0025C	2	65.60	65.43	0.17	MW-252M2	10	53.70	53.05	0.65
03UW0025D	2	65.58	65.43	0.15	MW-252M3	6	53.72	53.06	0.66
03UW0025E	4	65.63	65.43	0.20	MW-255M1	12	63.12	64.19	-1.07
03UW0026-092	2	65.55	65.42	0.13	MW-255M2	8	63.15	64.19	-1.04
03UW0026-096	2	65.64	65.42	0.22	MW-255M3	4	63.09	64.19	-1.10
03UW0026-100	2	65.68	65.42	0.26	MW-258M1	10	52.75	52.33	0.42
03UW0026-106	2	66.12	65.42	0.70	MW-258M2	6	52.87	52.34	0.53
03UW0027-098	2	65.59	65.37	0.22	MW-258M3	6	52.88	52.34	0.54
03UW0027-102	2	65.48	65.37	0.11	MW-31D	6	64.99	66.17	-1.18
03UW0027-108	2	65.43	65.37	0.06	MW-31M	4	65.17	66.17	-1.00
03UW0027-114	4	65.51	65.37	0.14	MW-31S	2	65.16	66.17	-1.01
03UW0027-120	4	65.53	65.37	0.16	MW-33D	10	62.56	64.00	-1.44
03UW0029-107	2	65.59	65.35	0.24	MW-33M	8	62.63	64.00	-1.37
03UW0029-111	2	65.62	65.35	0.27	MW-33S	6	62.63	64.00	-1.37
03UW0030-087	2	65.62	65.41	0.21	MW-34M1	8	64.01	64.80	-0.79
03UW0030-096	2	65.37	65.41	-0.04	MW-34M2	6	63.27	64.80	-1.53
03UW0030-100	2	65.80	65.41	0.39	MW-34M3	4	62.91	64.80	-1.89
03UW0030-106	2	65.54	65.41	0.13	MW-35M1	8	63.29	64.24	-0.95
03UW0030-117	4	65.62	65.40	0.22	MW-35M2	2	63.32	64.24	-0.92
27MW0010	4	63.99	63.92	0.07	MW-36M1	8	63.84	64.85	-1.01
27MW0059	16	16.13	19.73	-3.60	MW-36M2	6	63.71	64.86	-1.15
27MW0065	17	7.56	10.24	-2.68	MW-36S	2	64.06	64.86	-0.80
27MW0068	17	7.35	11.06	-3.71	MW-46M1	12	62.83	63.78	-0.95
27MW0568Z	16	13.09	17.98	-4.89	MW-46M2	6	62.82	63.78	-0.96
27MW2085	8	58.53	58.76	-0.23	MW-46M3	4	63.25	63.78	-0.53
36MW1011A	14	63.20	64.34	-1.14	MW-46S	2	63.05	63.78	-0.73
MW-104M1	4	64.80	65.67	-0.87	MW-64M1	4	65.40	65.57	-0.17
MW-104M2	2	64.96	65.67	-0.71	MW-64M2	2	65.43	65.57	-0.14
MW-114M1	10	63.70	64.82	-1.12	MW-64S	2	65.14	65.57	-0.43
MW-114M2	4	63.71	64.82	-1.11	MW-68S	2	65.82	66.58	-0.76
MW-129M1	8	63.92	64.82	-0.90	MW-69S	2	63.63	64.55	-0.92
MW-129M2	6	63.91	64.82	-0.91	MW-70S	2	63.28	64.35	-1.07
MW-129M3	4	63.92	64.82	-0.90	MW-73S	2	68.03	66.43	1.60
MW-139M1	12	63.13	64.23	-1.10	MW-74M1	8	64.85	65.65	-0.80
MW-139M2	8	63.17	64.23	-1.06	MW-74M2	4	64.91	65.65	-0.74
MW-139M3	4	63.18	64.24	-1.06	MW-74M3	2	64.75	65.66	-0.91
MW-162M3	2	63.91	65.09	-1.18	MW-75M1	6	64.97	65.65	-0.68
MW-165M1	12	62.99	63.88	-0.89	MW-75M2	4	64.84	65.65	-0.81
MW-165M2	6	63.00	63.88	-0.88	MW-75S	2	64.78	65.65	-0.87
MW-165M3	2	63.01	63.88	-0.87	MW-76M1	6	63.28	65.64	-2.36
MW-172M1	14	62.68	63.81	-1.13	MW-76M2	4	64.40	65.64	-1.24
MW-172M2	12	62.68	63.81	-1.13	MW-76S	2	63.96	65.64	-1.68
MW-172M3	6	62.73	63.81	-1.08	MW-77M1	10	64.37	65.64	-1.27
MW-173M1	12	59.14	59.48	-0.34	MW-77M2	4	64.83	65.64	-0.81
MW-173M2	10	59.31	59.58	-0.27	MW-77S	2	64.38	65.64	-1.26
MW-173M3	8	59.33	59.87	-0.54	MW-78M1	6	64.82	65.65	-0.83
MW-175M1	15	59.13	59.53	-0.40	MW-78M2	4	64.81	65.65	-0.84
MW-175M2	8	59.25	59.92	-0.67	MW-78M3	2	64.76	65.65	-0.89
MW-175M3	6	59.26	59.92	-0.66	MW-79M1	8	66.26	66.73	-0.47
MW-186M1	10	59.34	59.68	-0.34	MW-79M2	4	66.29	66.74	-0.45
MW-186M2	8	59.32	59.97	-0.65	MW-79S	2	66.29	66.74	-0.45

Table A3-2
Groundwater Elevation Calibration Residuals for the Demo 1 Subregional Flow Model
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Well ID	Model Layer	Observed Groundwater Elevation (ft ngvd)	Computed Groundwater Elevation (ft ngvd)	Residual
MW-18M1	14	17.42	23.03	-5.61
MW-19D	17	65.24	66.45	-1.21
MW-19S	2	65.89	66.48	-0.59
MW-210M1	12	62.18	63.13	-0.95
MW-210M2	6	62.18	63.15	-0.97
MW-210M3	4	62.20	63.15	-0.95
MW-211M1	8	59.22	59.79	-0.57
MW-211M2	4	59.25	59.79	-0.54
MW-211M3	2	59.20	59.77	-0.57
MW-214M3	6	62.65	63.62	-0.97
MW-21M2	6	61.92	62.84	-0.92
MW-21M3	4	61.93	62.84	-0.91
MW-21S	2	61.66	62.85	-1.19
MW-221M1	10	58.72	58.95	-0.23
MW-221M2	6	58.73	59.37	-0.64
MW-221M3	2	58.72	59.26	-0.54
MW-225M1	10	57.08	56.52	0.56
MW-82D	12	46.84	47.62	-0.78
MW-82M1	10	46.98	47.67	-0.69
MW-82M2	8	46.95	47.74	-0.79
MW-82M3	6	46.97	47.79	-0.82
MW-82S	2	47.02	47.85	-0.83
MW-83D	14	62.31	62.83	-0.52
MW-83M1	10	46.21	48.55	-2.34
MW-83M2	8	46.36	48.60	-2.24
MW-83M3	6	46.10	48.65	-2.55
MW-83S	2	46.41	48.70	-2.29
MW-84D	16	54.01	48.01	6.00
MW-84M1	12	47.02	48.03	-1.01
MW-84M2	10	47.24	48.10	-0.86
MW-84M3	6	47.19	48.20	-1.01
WS-2ED	14	61.08	62.83	-1.75
WS-3BD	14	63.32	63.78	-0.46

Table A4-1
Comparison of Design Alternatives
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

			Design Details			Perchlorate Remediation			RDX Remediation		
Design Alternative	**Concentration Objectives**	**Time Objective (years)**	**Number of Extraction Wells**	**Total Extraction Rate (gpm)**	**Number of Injection Wells**	**Years to achieve RBC**	**Years to achieve* Background**	**% Mass Removed after 10 Years**	**Years to achieve RBC**	**Years to achieve Background**	**% Mass Removed after 10 Years**
No Action**	-	-	2	320	3	-	-	34.0	-	-	17.0
Baseline (RRA System)	-	-	2	320	3	25	35/>50	80.2	36	50	67.5
Background	Background	30	4	472	4	18	23/21	92.7	23	27	92.1
10 Year	Risk-based	10	5	1417	4	10	15	98.3	11	15	99.7
Additional: Alternative A	Risk-based	<20	5	906	4	13	15/20	98.3	14	16	98.8
Alternative B	Background	<20	6	981	4	13	15/17	97.9	14	16	98.8

* upgradient/downgradient of Pew Rd.

** RRA system operational for four years followed by system shutdown

Note: all percentages reflect cumulative mass removed including 4 years of RRA operation prior to startup of selected alternative

RBC = Risk-based Concentrations

Table A4-2
Summary of Extraction Well Screen Elevations and Pumping Rates for All Proposed Designs
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

Design Alternative	Well ID	Location	Model Layers	Top-of-Screen Elevation (ft ngvd)	Bottom-of-Screen Elevation (ft ngvd)	Screen Length (ft)	Pumping Rate (gpm)
Baseline (RRA System)	EW-D1-1	Frank Perkins Rd.	3-12	40	-60	100	220
	EW-D1-2	Pew Rd.	4-8	30	-20	50	100
Background	EW-D1-1	Frank Perkins Rd.	3-12	40	-50	90	119
	EW-D1-2	Pew Rd.	4-8	30	-20	50	110
	EW-D1-401	Pocasset-Forestdale Rd.	3-10	40	-30	70	145
	EW-D1-402	Fredrickson Rd.	6-8	10	-20	30	98
10 Year	EW-D1-1	Frank Perkins Rd.	3-12	40	-60	100	200
	EW-D1-2	Pew Rd.	4-8	30	-20	50	221
	EW-D1-501	E. of Pocasset-Forestdale Rd.	1-10	60	-40	100	277
	EW-D1-502	W. of Pocasset-Forestdale Rd.	2-12	50	-50	100	533
	EW-D1-503	Near MW-210	4-12	30	-50	80	186
Additional Alternative A	EW-D1-1	Frank Perkins Rd.	3-12	40	-60	100	161
	EW-D1-2	Pew Rd.	4-8	30	-20	50	98
	EW-D1-501	E. of Pocasset-Forestdale Rd.	1-10	60	-40	100	191
	EW-D1-502	W. of Pocasset-Forestdale Rd.	2-12	50	-50	100	251
	EW-D1-503	Near MW-210	4-12	30	-50	80	205
Additional Alternative B	EW-D1-1	Frank Perkins Rd.	3-12	40	-60	100	161
	EW-D1-2	Pew Rd.	4-8	30	-20	50	98
	EW-D1-601	E. of Pocasset-Forestdale Rd.	1-10	60	-40	100	191
	EW-D1-602	W. of Pocasset-Forestdale Rd.	2-12	50	-50	100	251
	EW-D1-603	Near MW-210	4-12	30	-50	80	205
	EW-D1-604	Fredrickson Rd.	6-8	10	-20	30	75

Table A4-3
Demo 1 Subregional Model Sensitivity Analysis
Revised Draft Feasibility Study
Demo 1 Groundwater Operable Unit

	Parameter Ranges		Water Level Calibration Statistics*	
Input Parameter Change	**Calibrated Value(s)**	**Adjusted Value(s)**	**Mean Error (ft)**	**Root Mean Squared Error (ft)**
Increase all calibrated hydraulic conductivity values by 30%	290 - 10 ft/d	380 - 13 ft/d	-1.25	1.15
Decrease all calibrated hydraulic conductivity values by 30%	290 - 10 ft/d	200 - 7 ft/d	-0.65	1.7
Increase calibrated recharge values by 10%	27 - 21 "/yr	30 "/yr	-0.45	1.39
Decrease calibrated recharge values by 10%	27 - 21 "/yr	24 "/yr	-0.64	1.18
Increase clay aquitard hydraulic conductivity by 10x	0.5 ft/d	5 ft/d	-0.84	1.26
Increase TNT biodegredation halflife 10x	365 days	3650 days	-	-

* Evaluated relative to Calibrated Model of Ambient Conditions - Mean Error = -0.64 ft, Root Mean Squared Error = 1.26 ft