APPENDIX A

GROUNDWATER MONITOR WELL NETWORK HYDROGRAPHS AND VOC CONCENTRATION CHARTS

APPENDIX A

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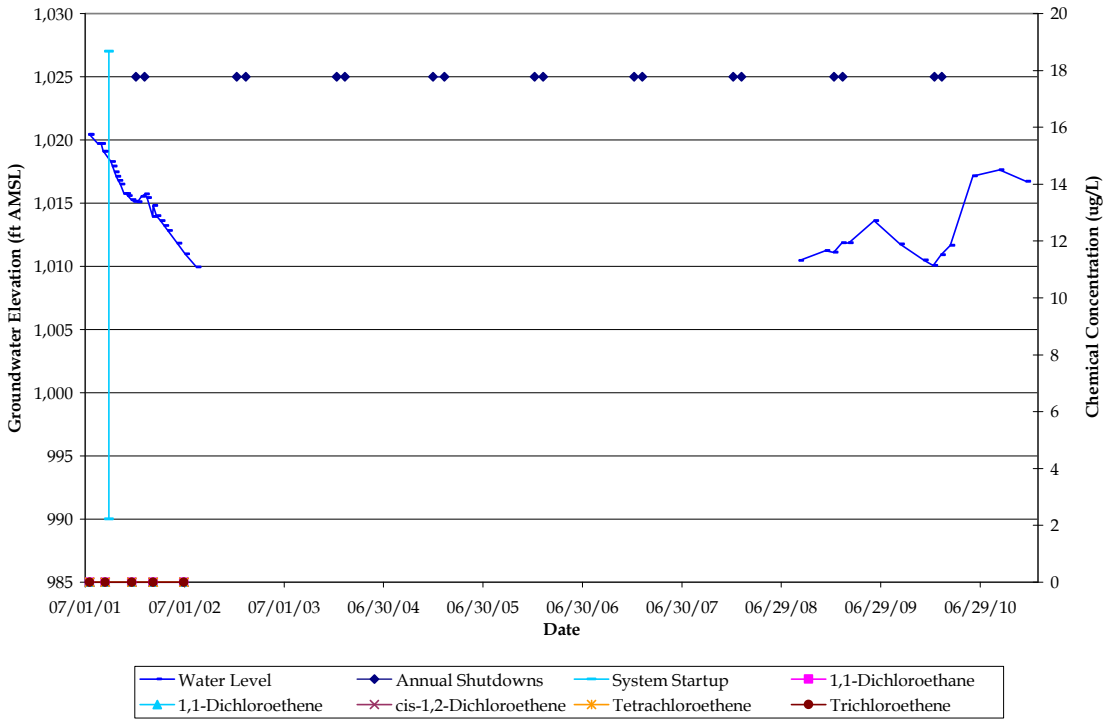
GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

AS02



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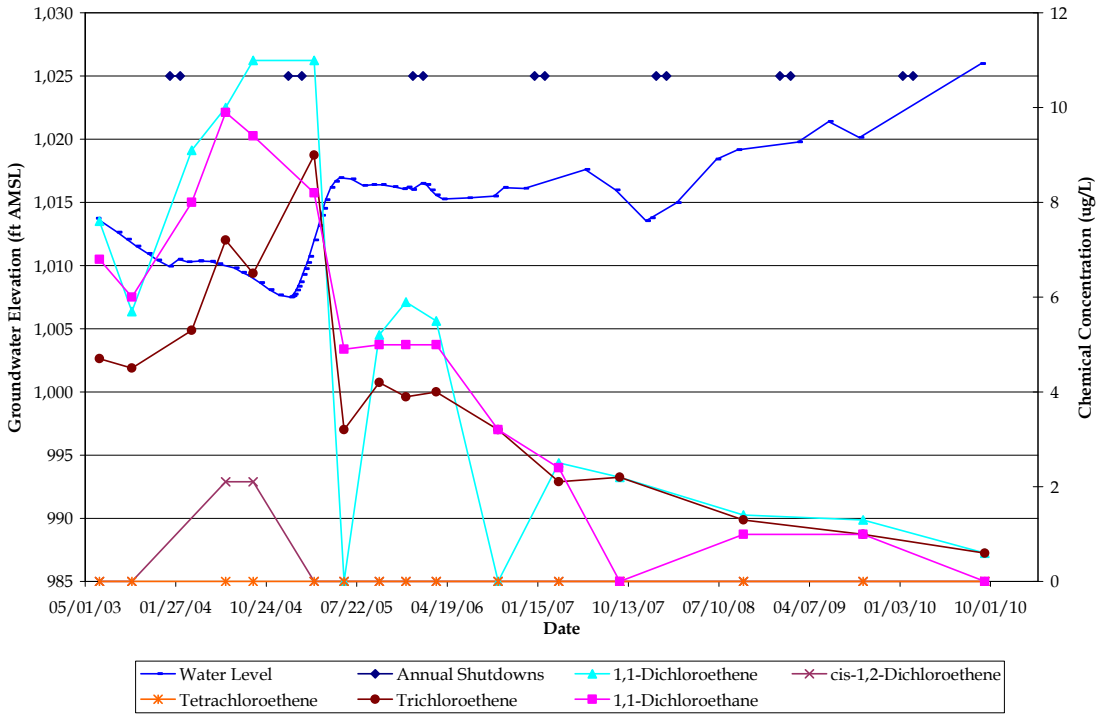
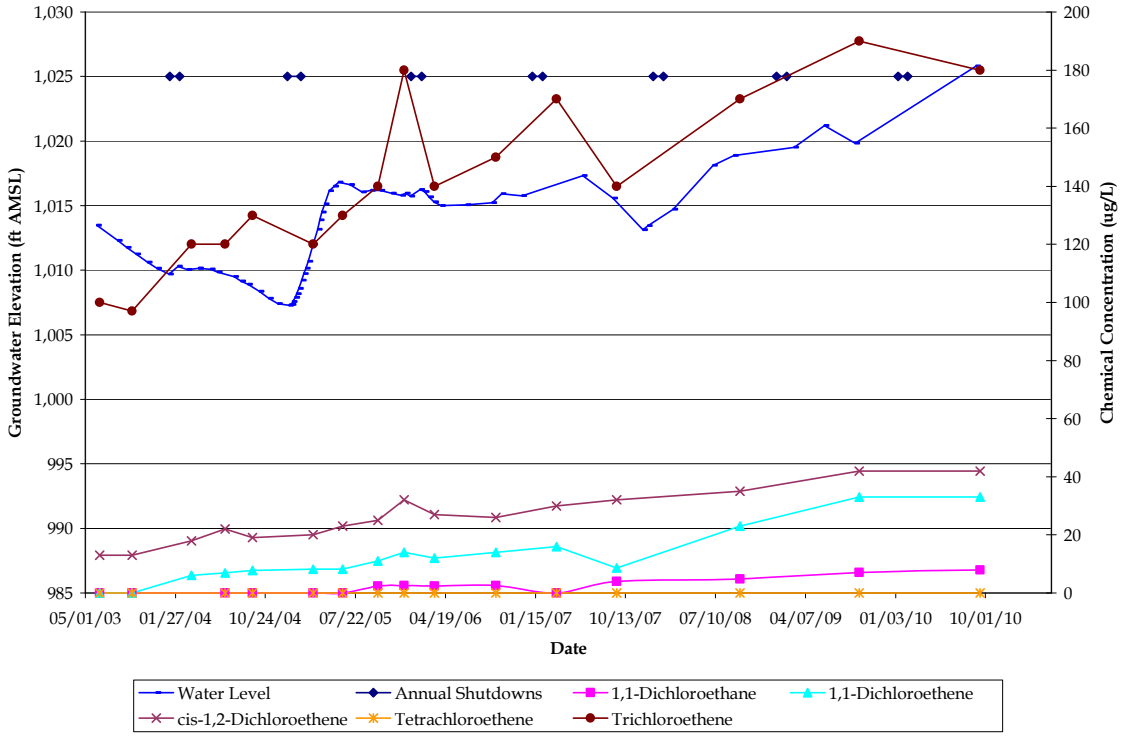


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

ASE76-B



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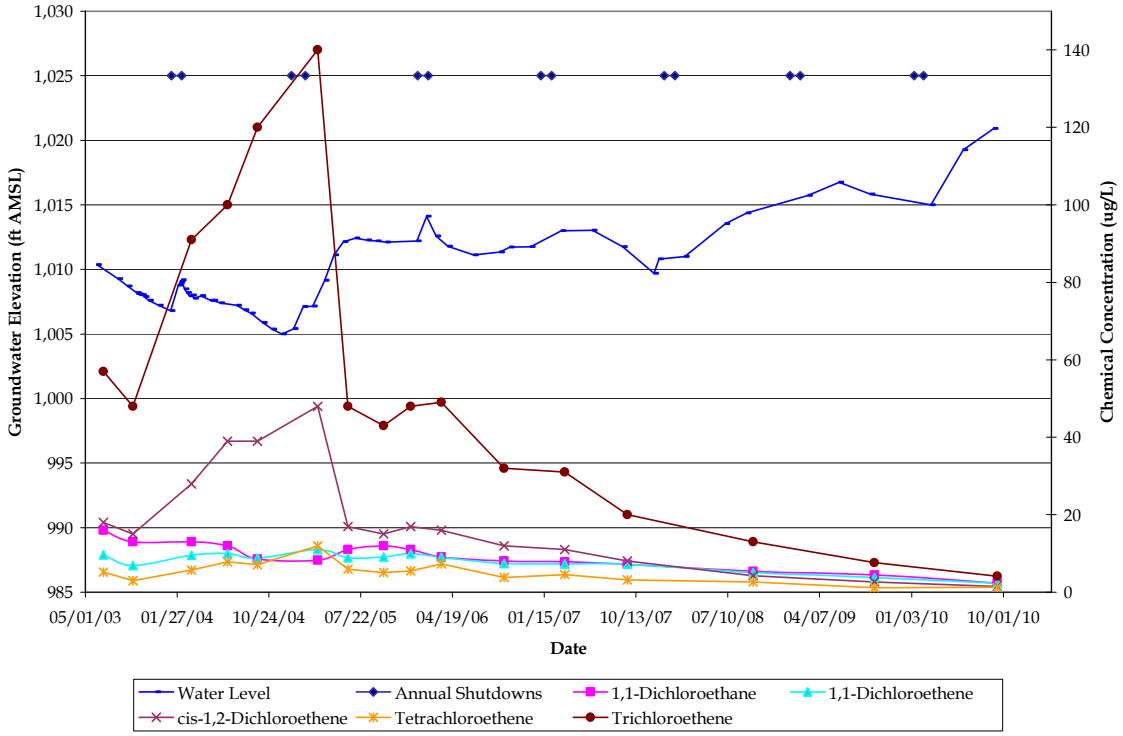
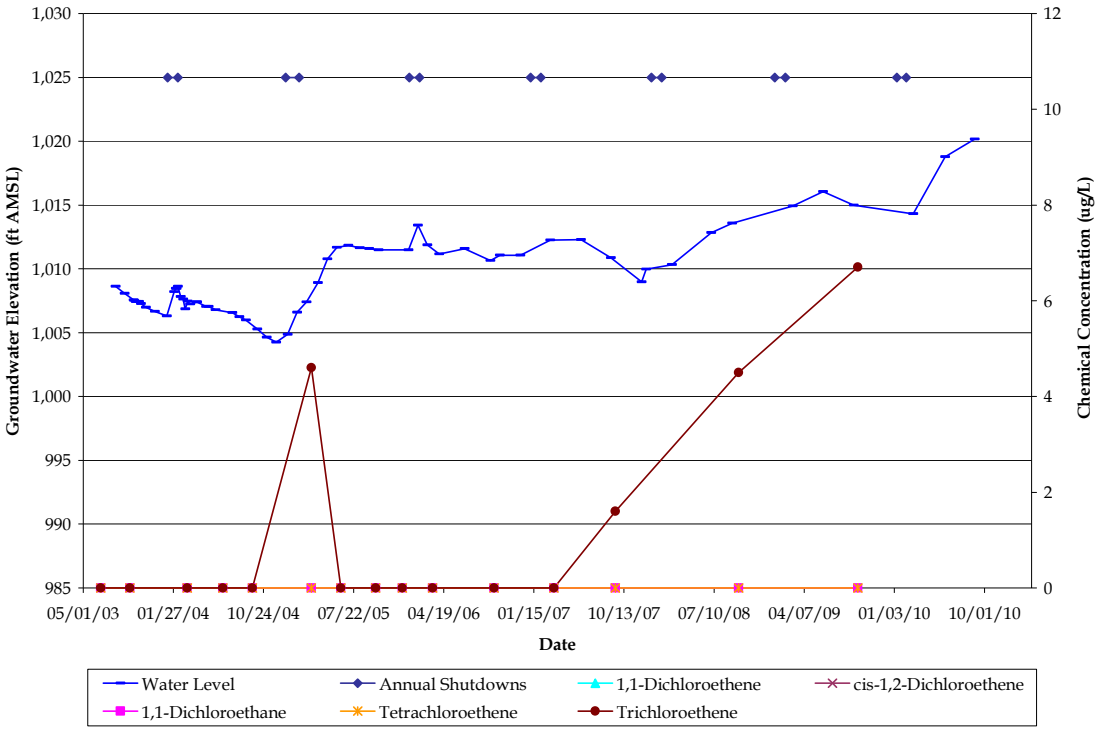


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

ASE77-B



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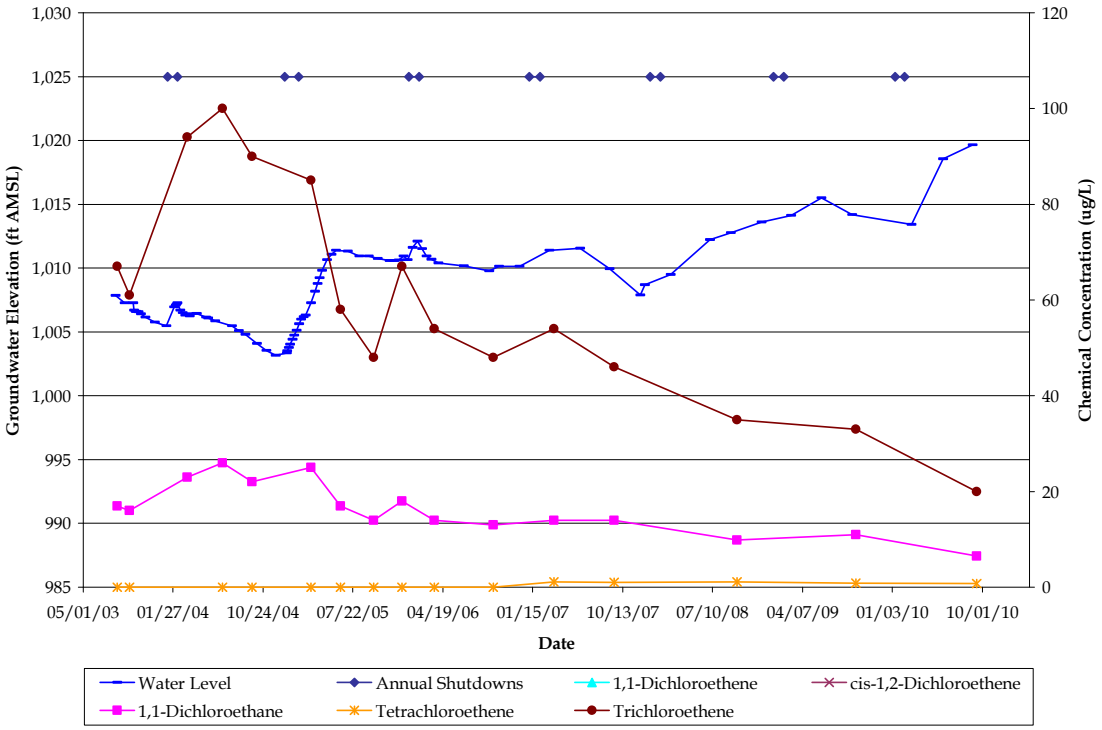

Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

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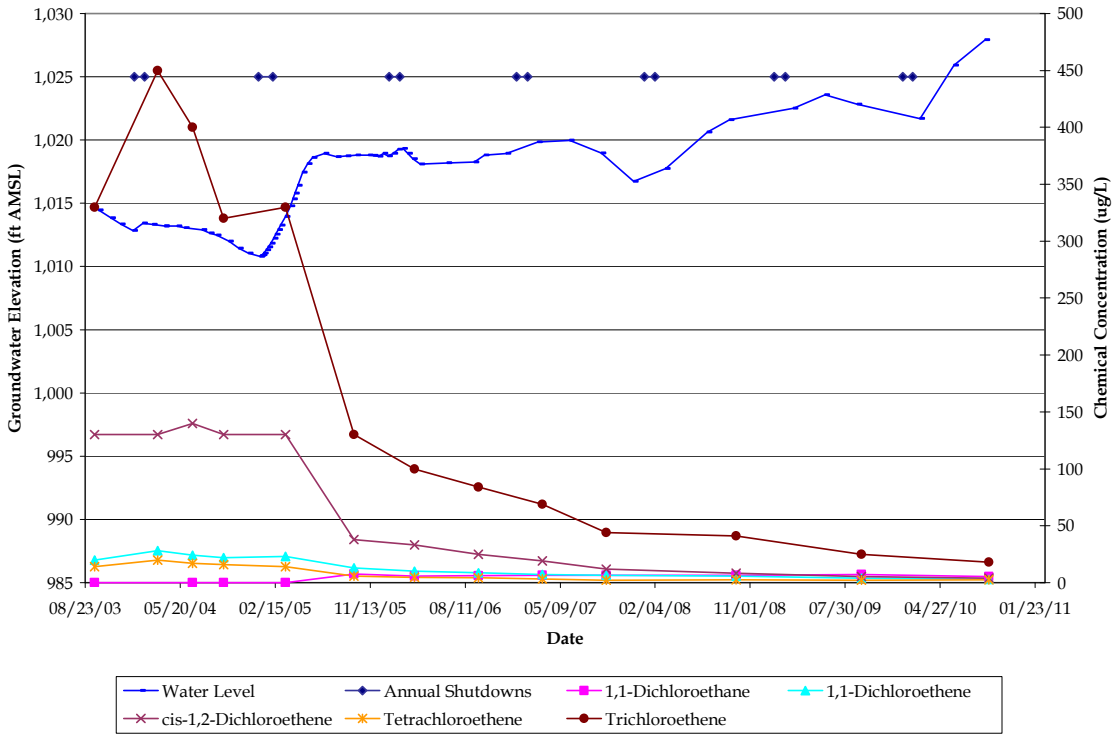

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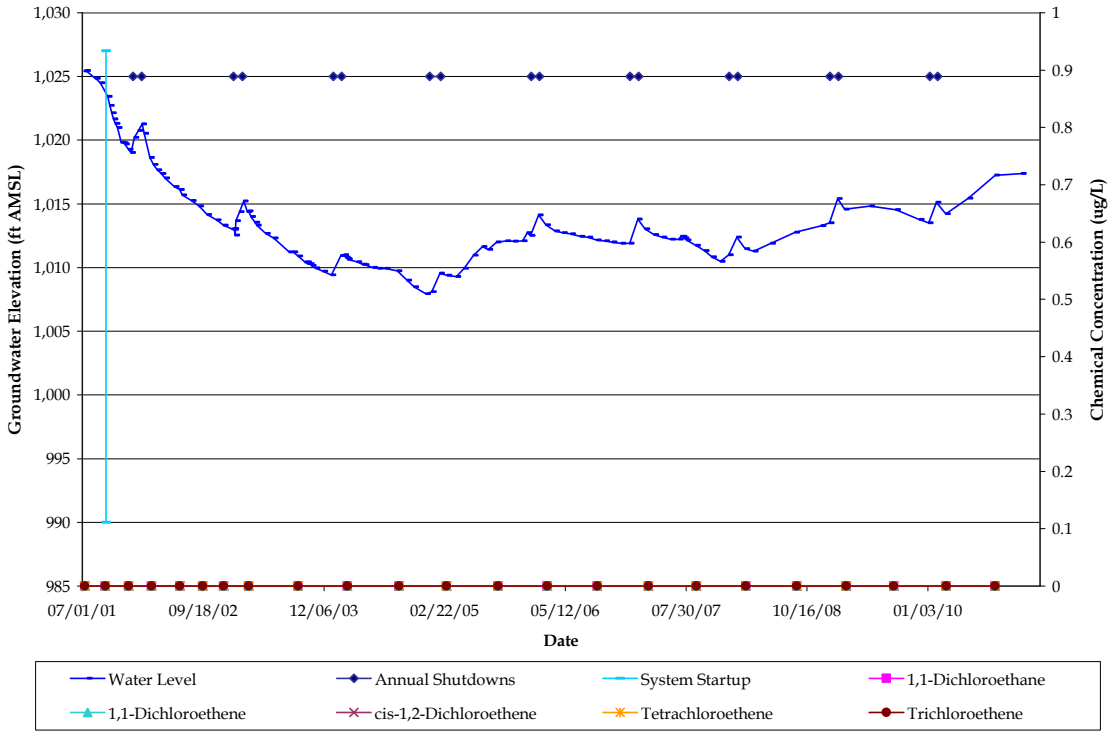
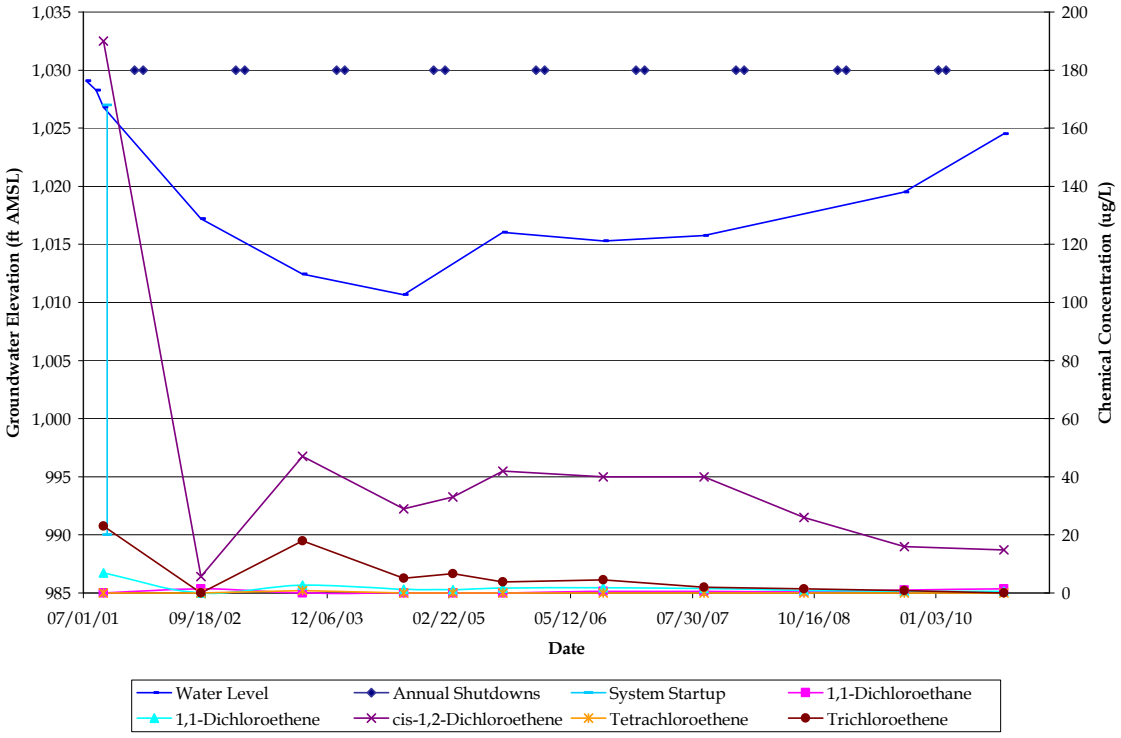


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

DM515-115



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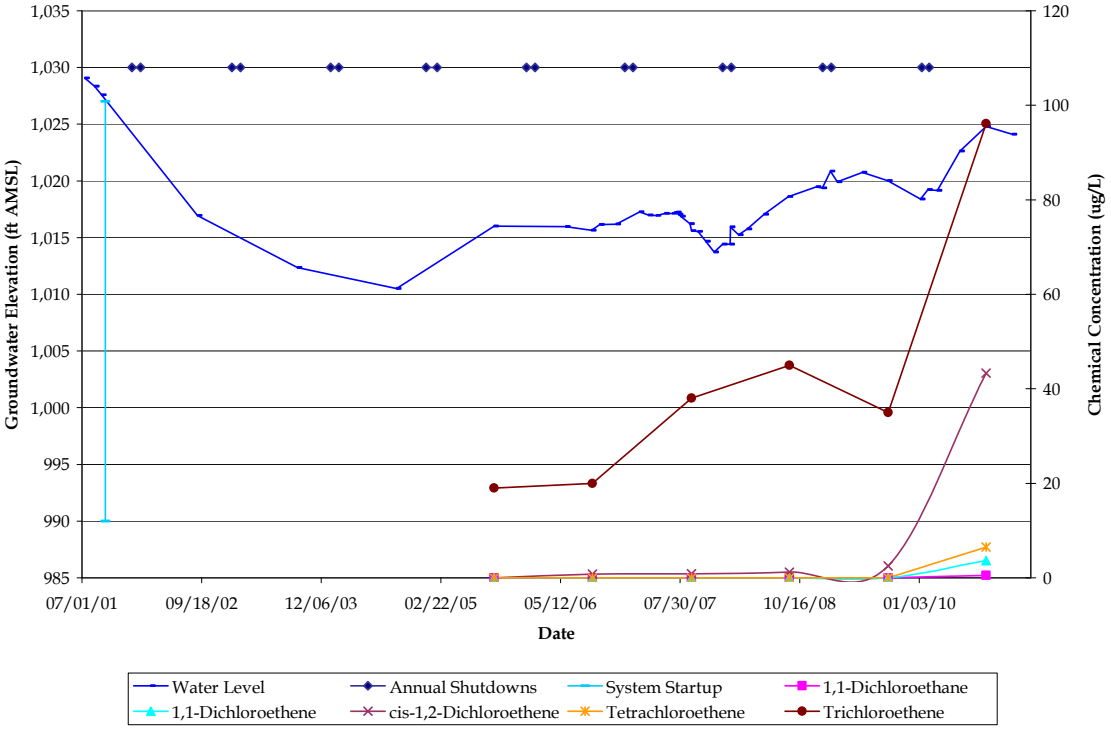
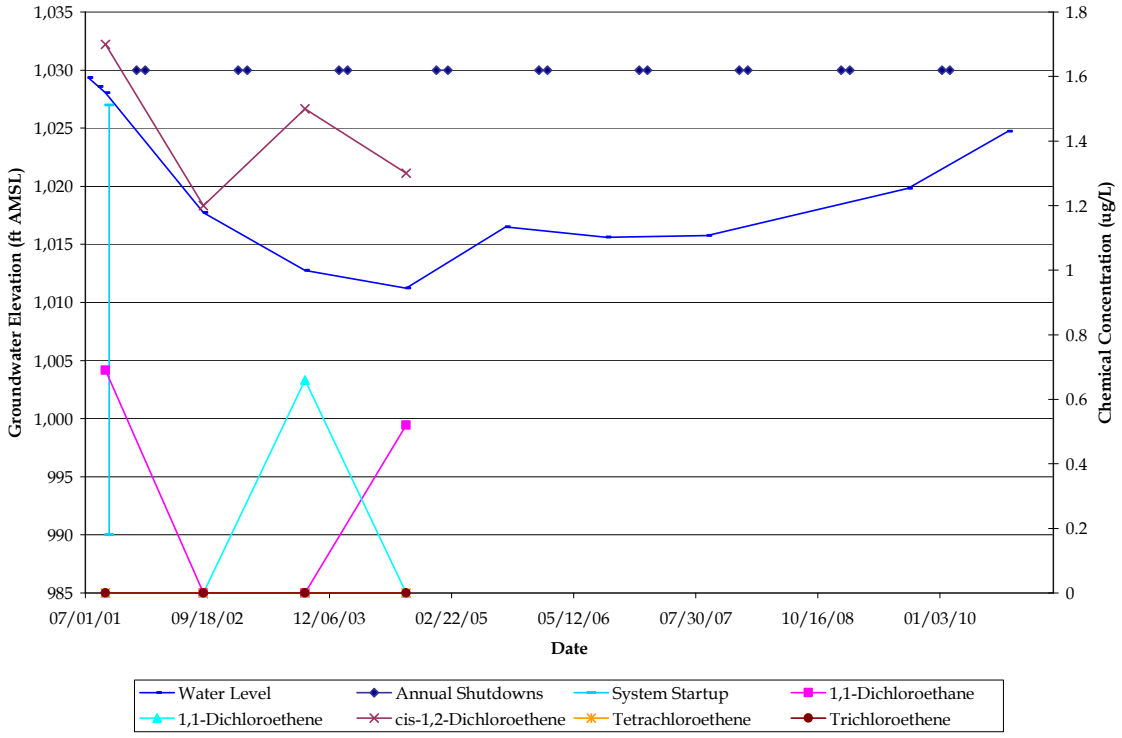


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

DM515-265



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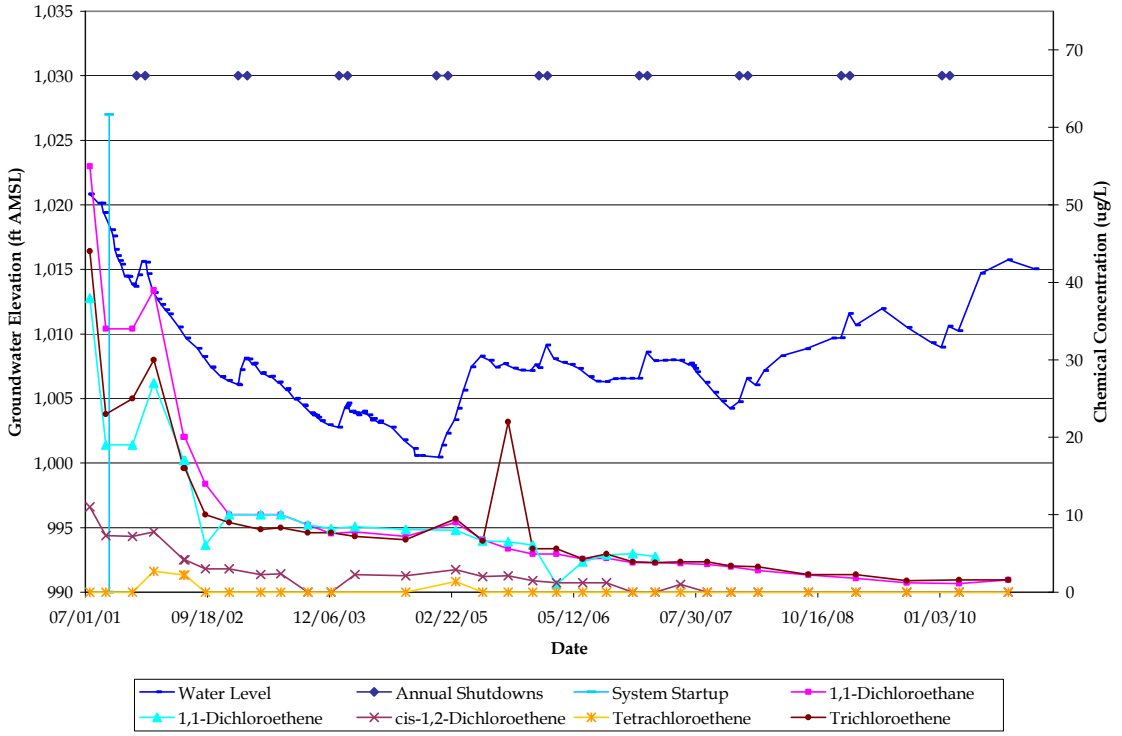
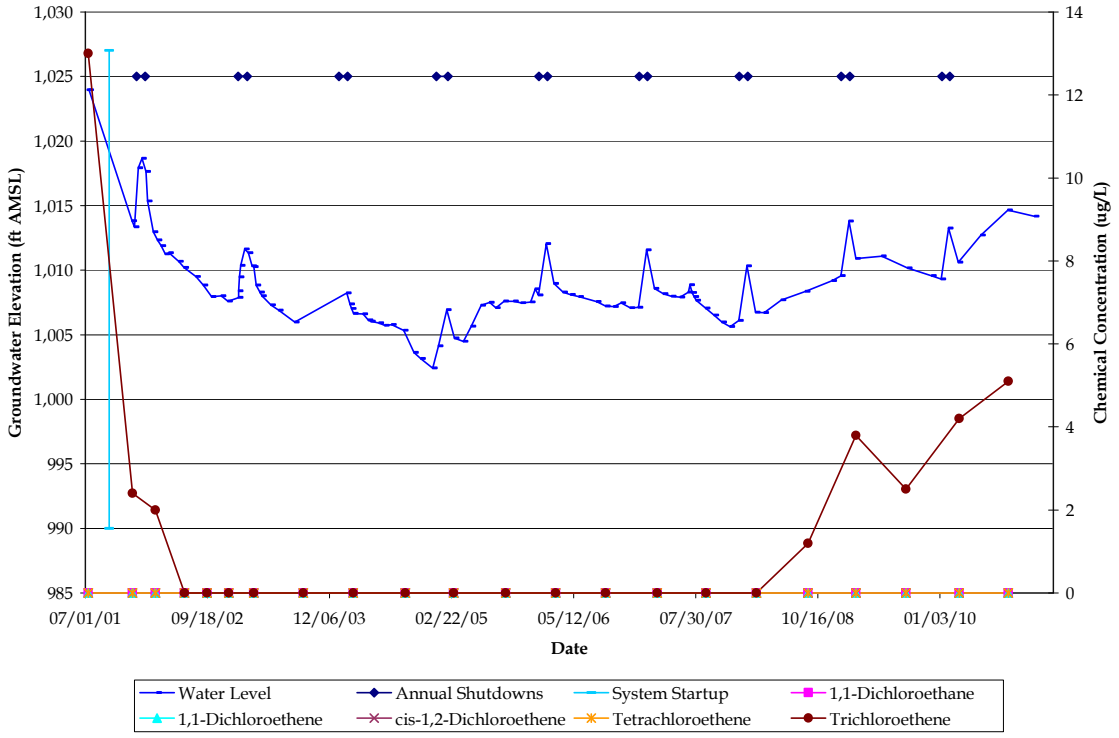


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW07



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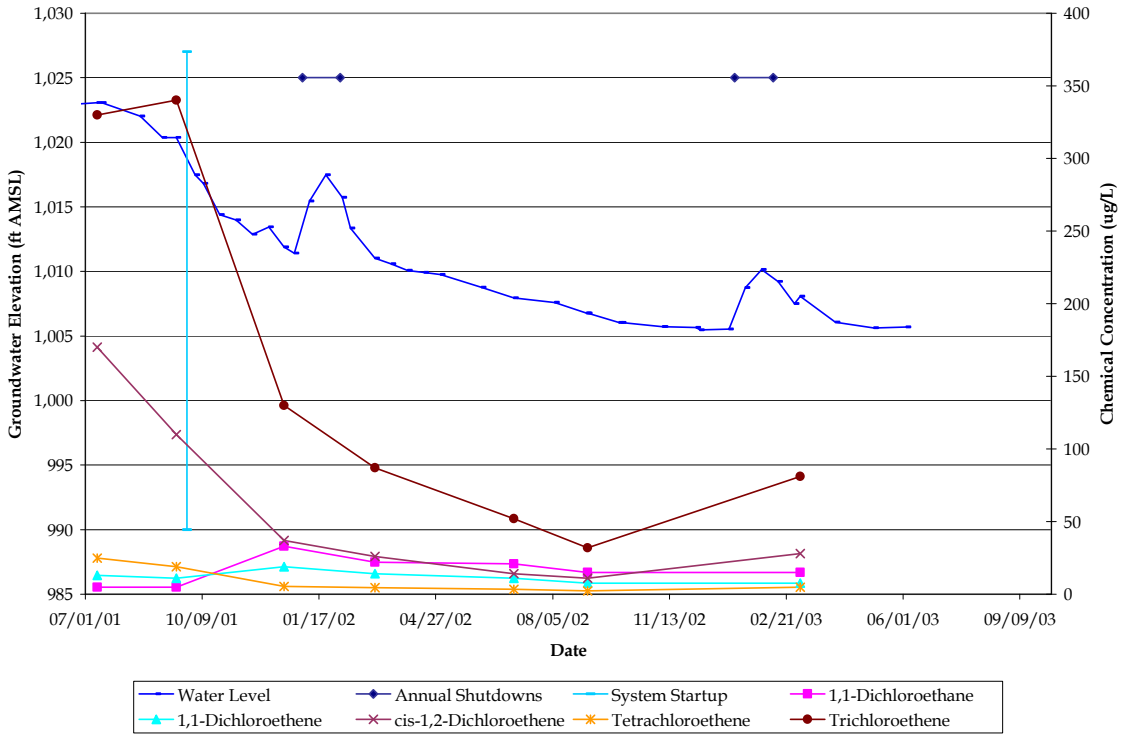
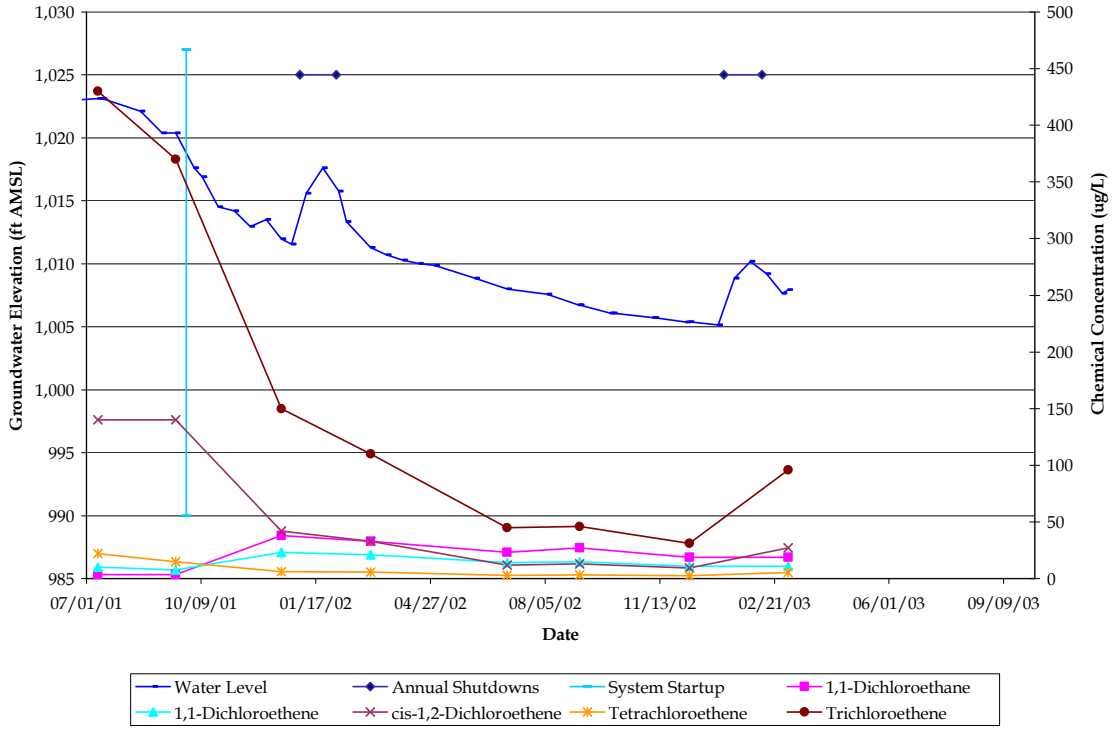


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW12-128



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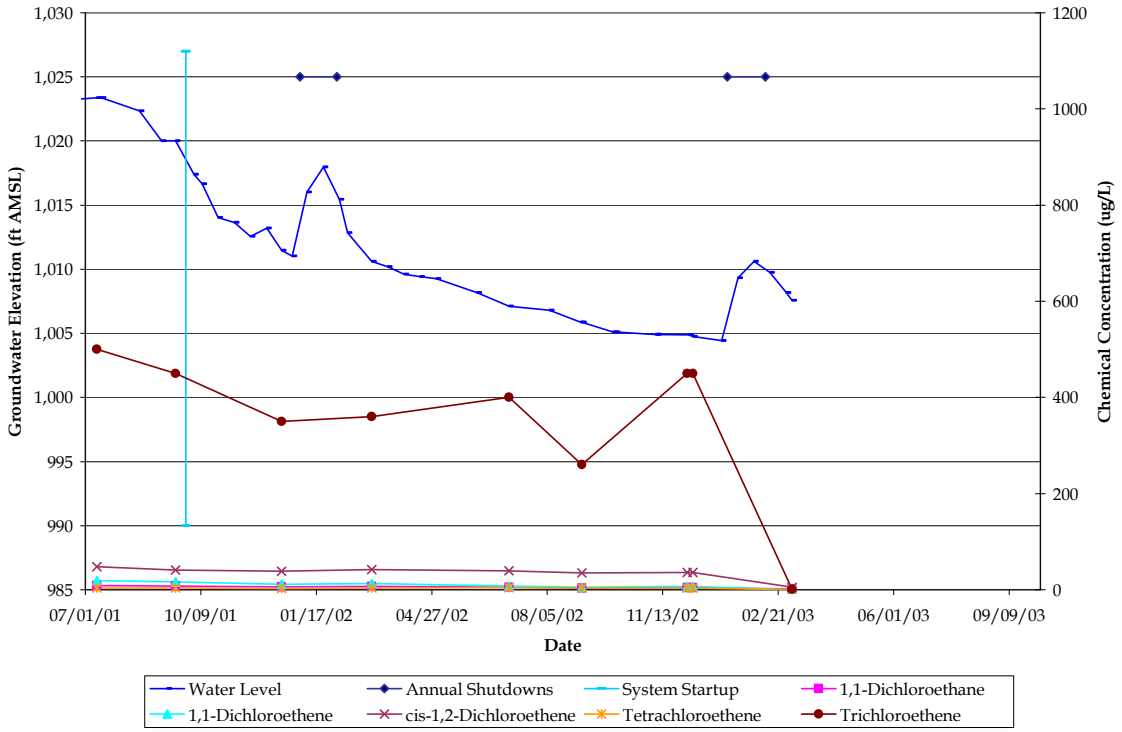
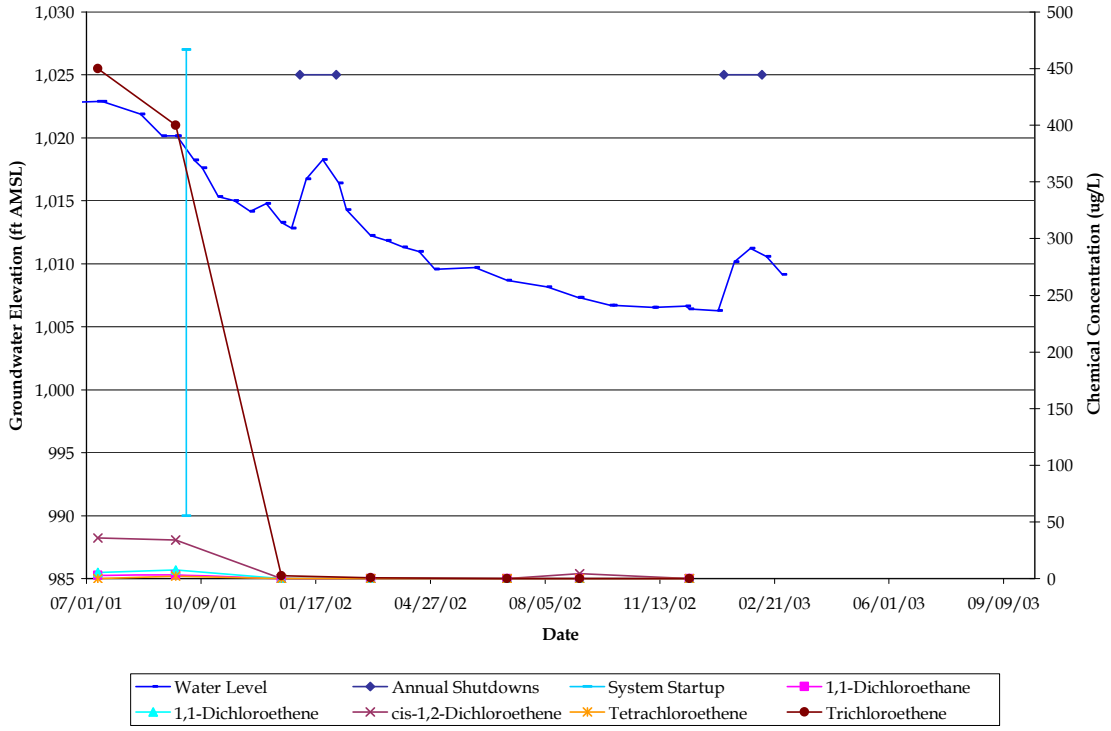


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW12-227



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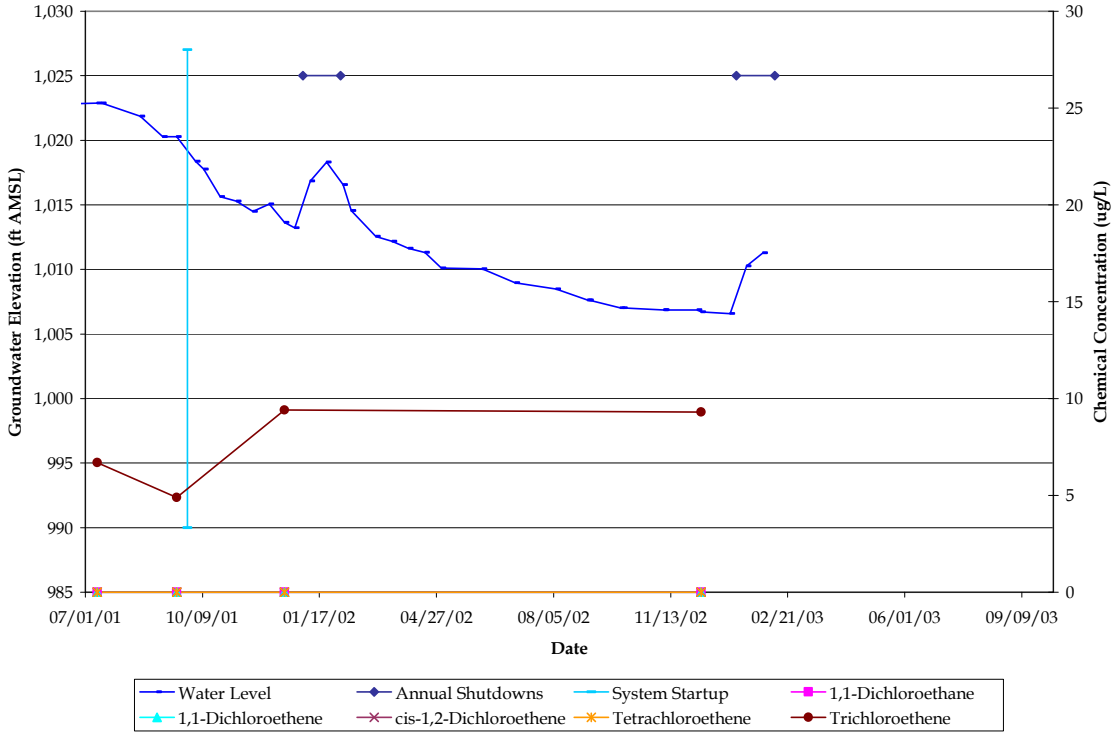
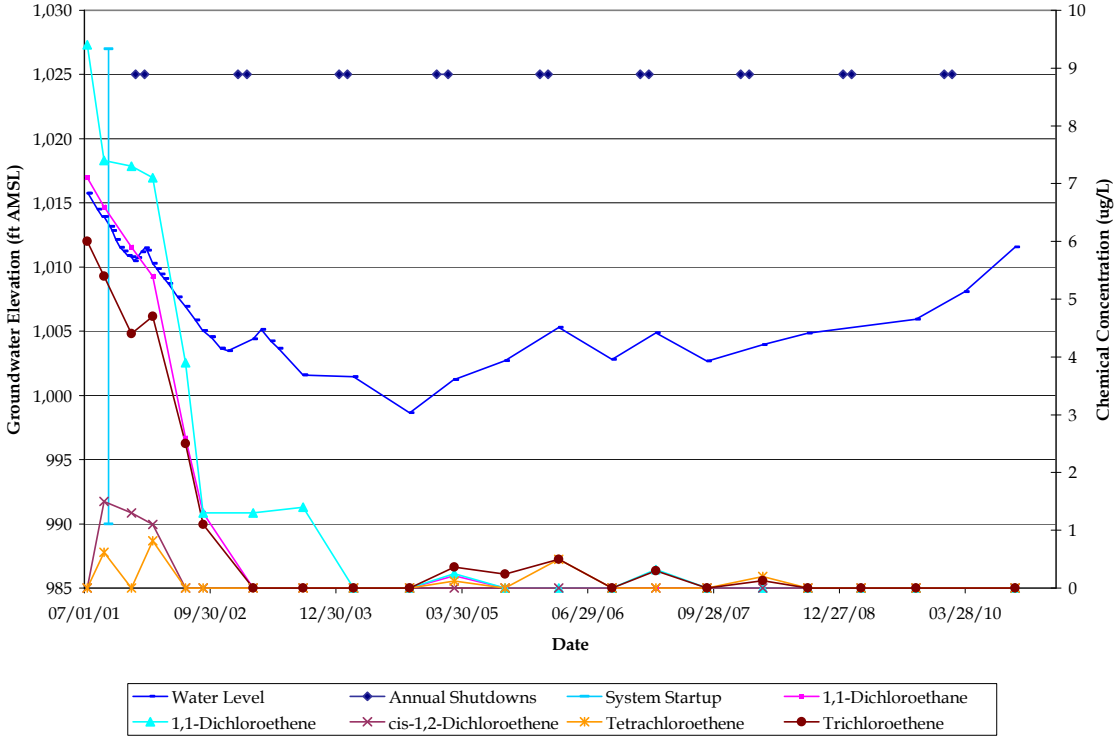


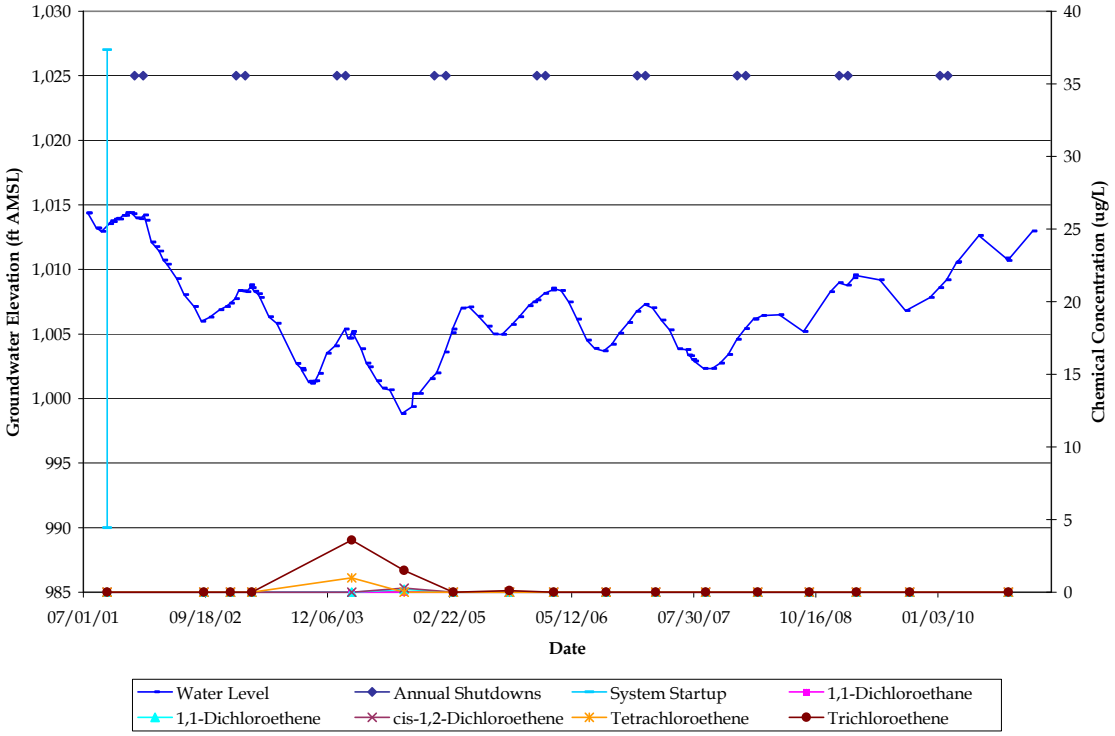
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW13-118



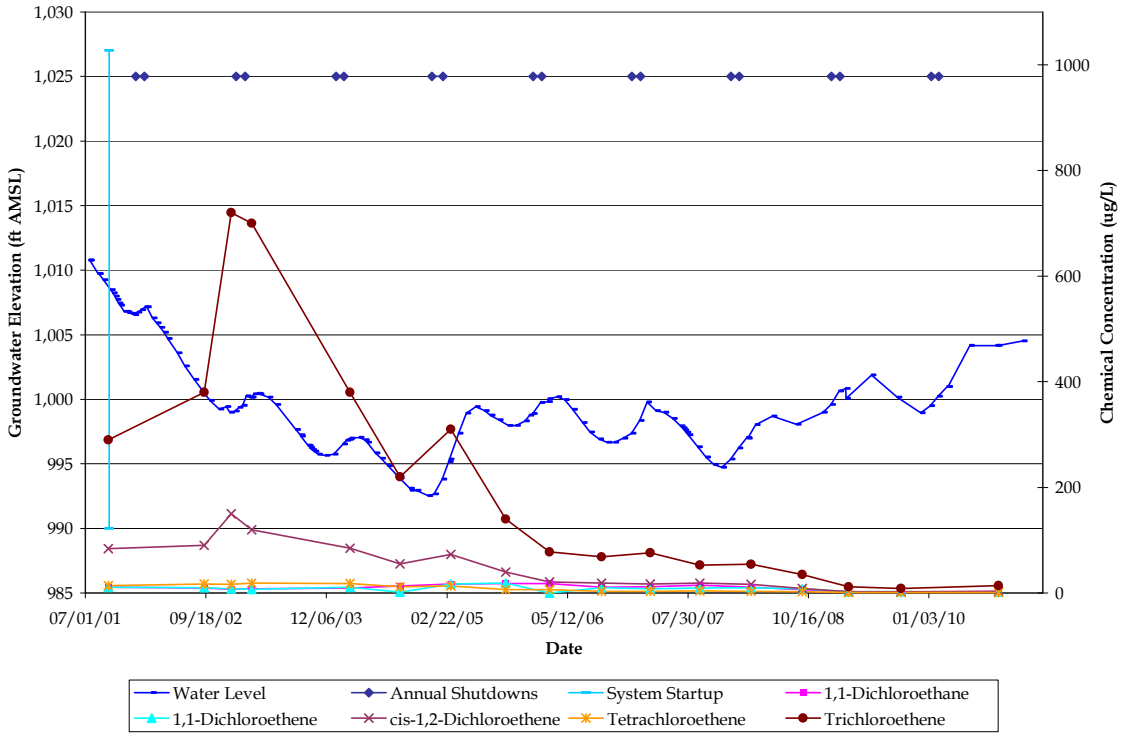
EW19-D



Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW19-S



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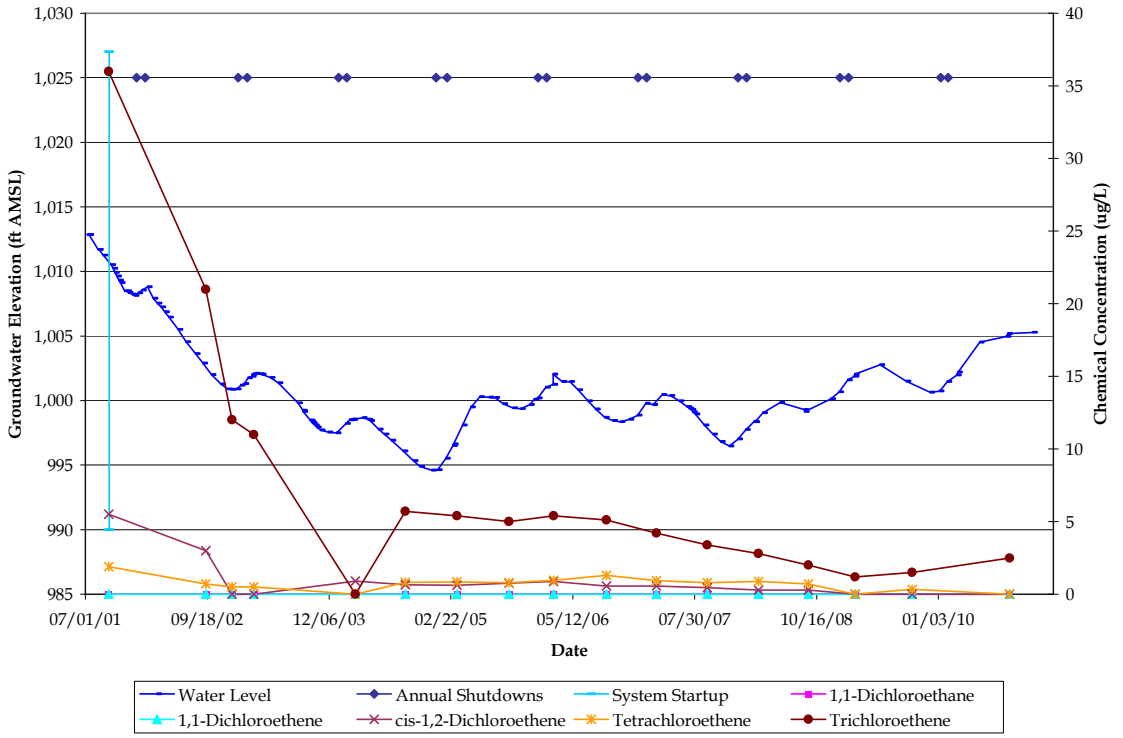
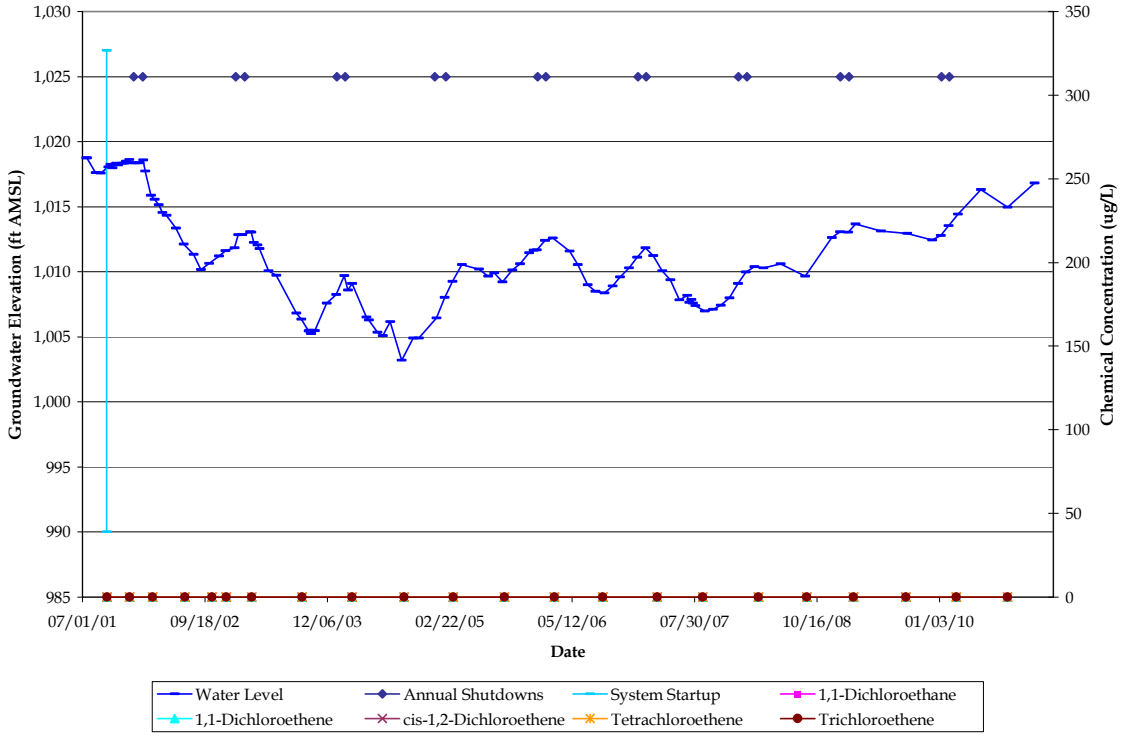


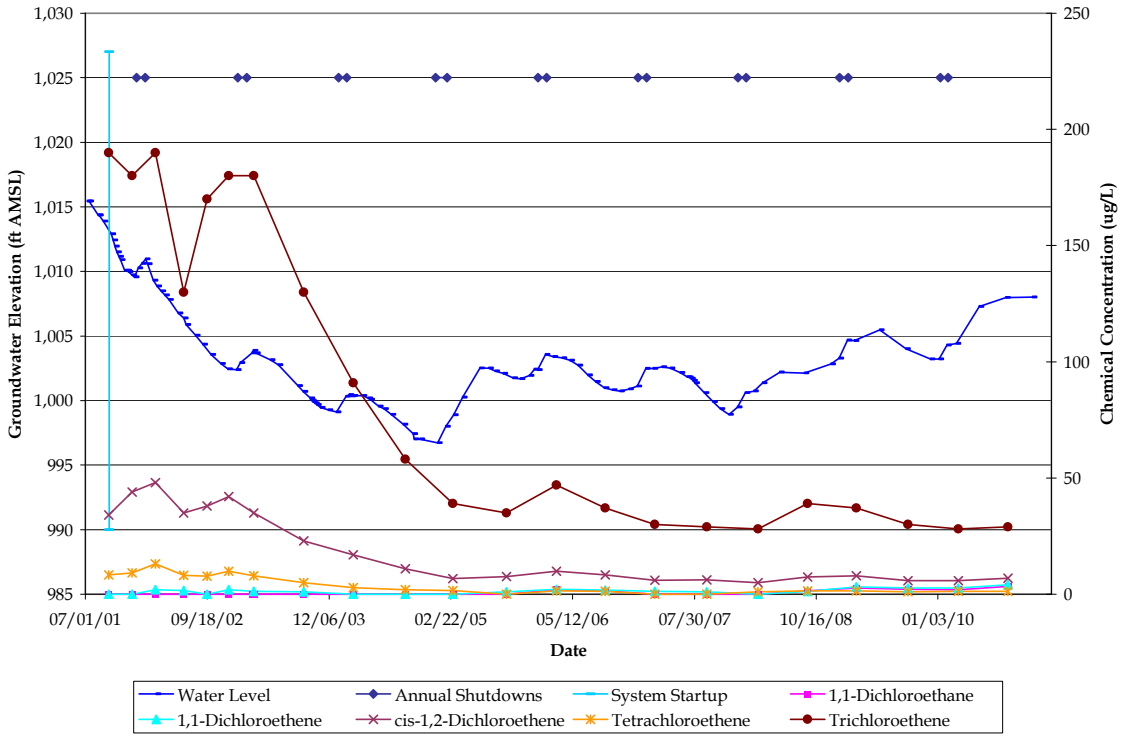
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW22-D



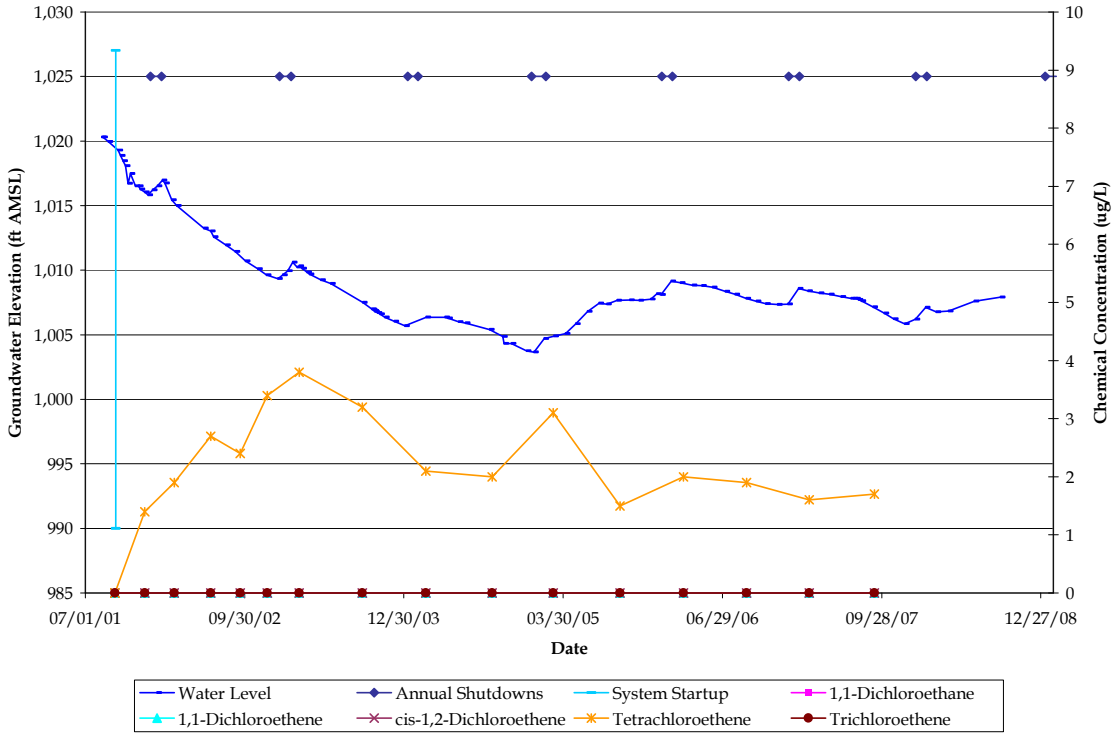
EW22-S



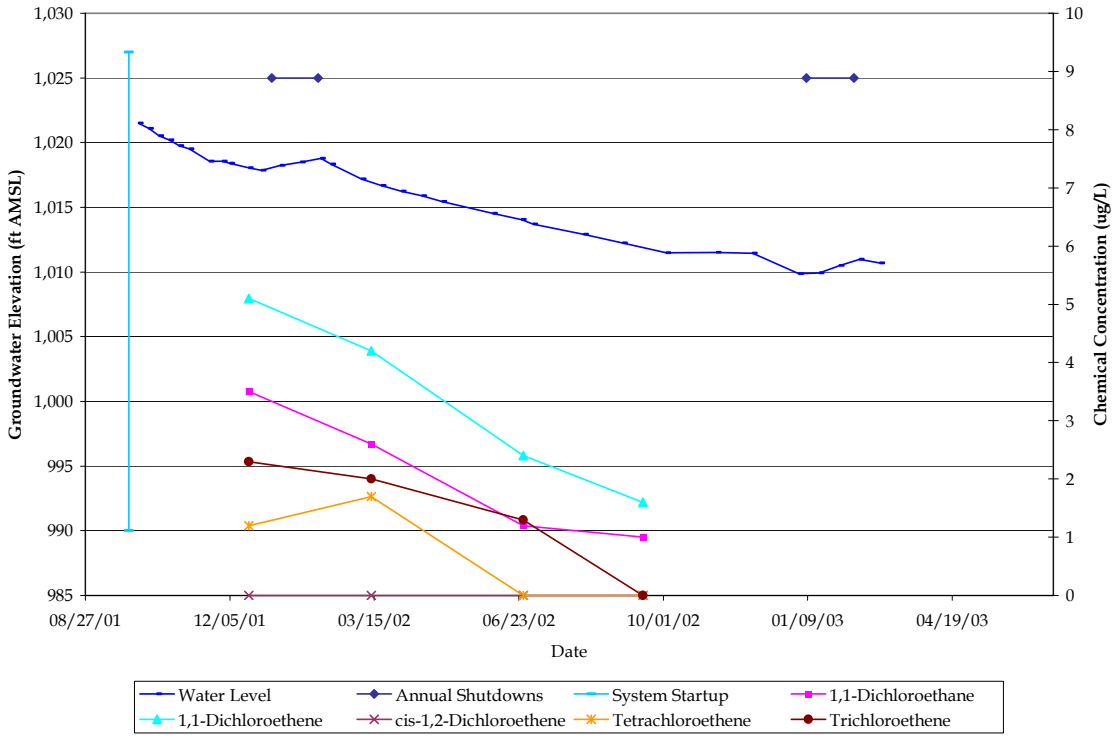
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

EW23



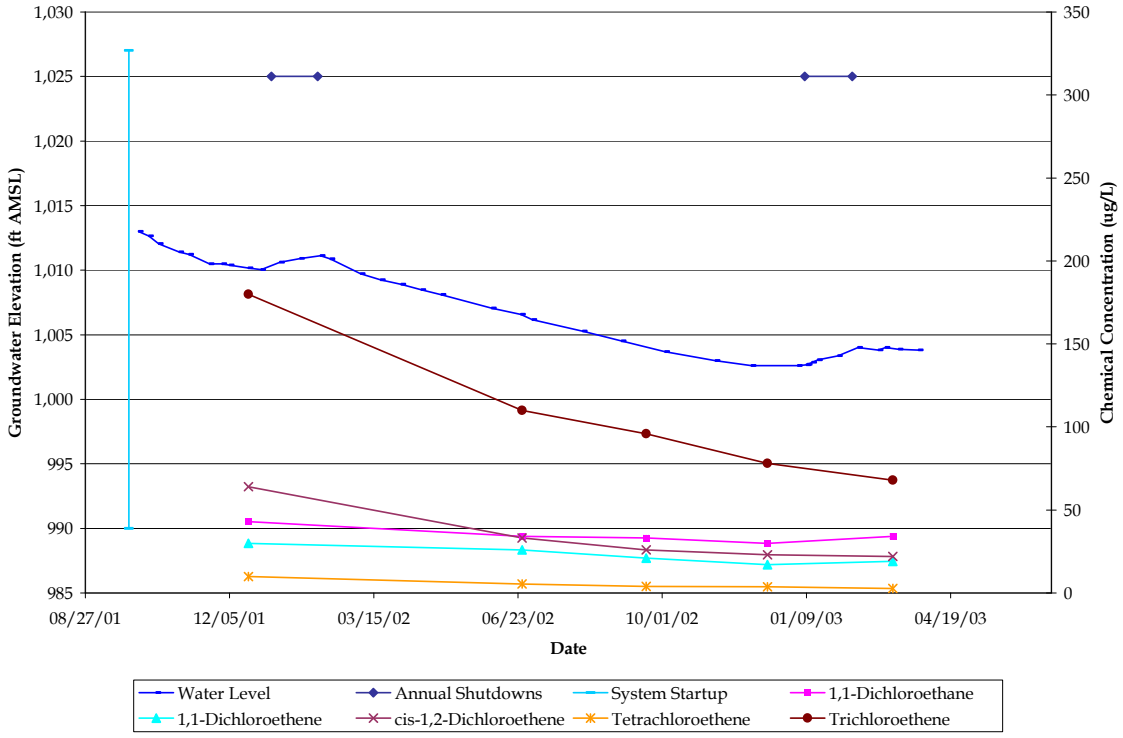
MW01



Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

MW05



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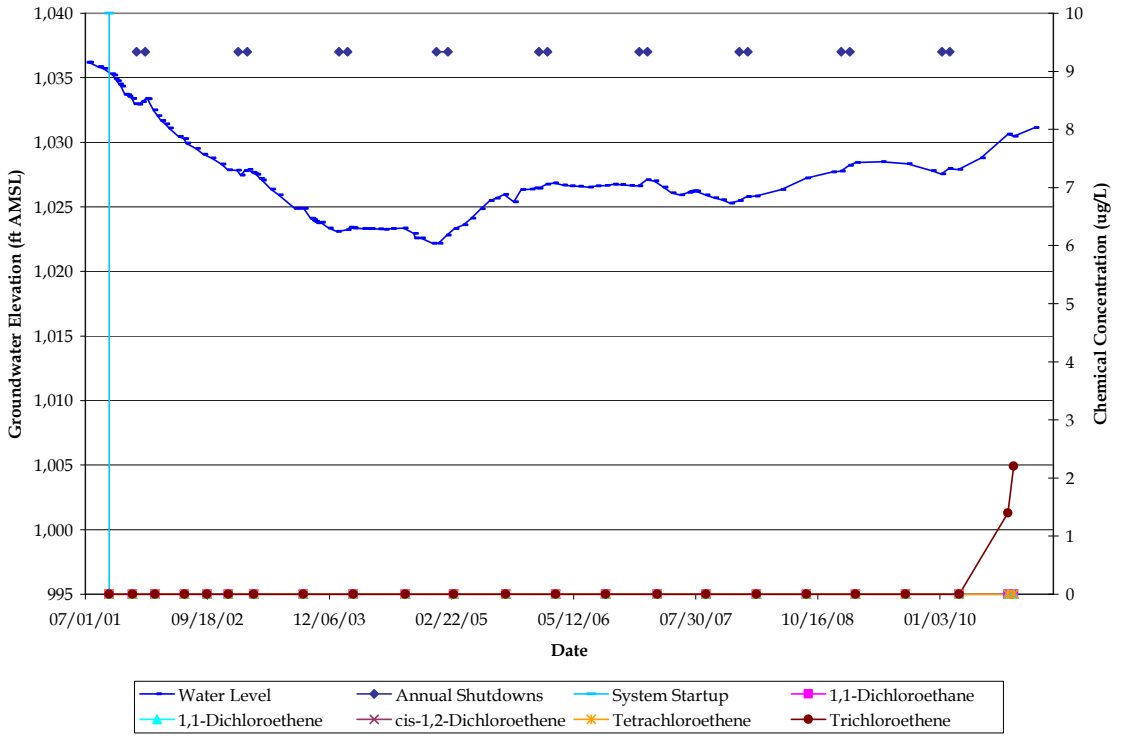
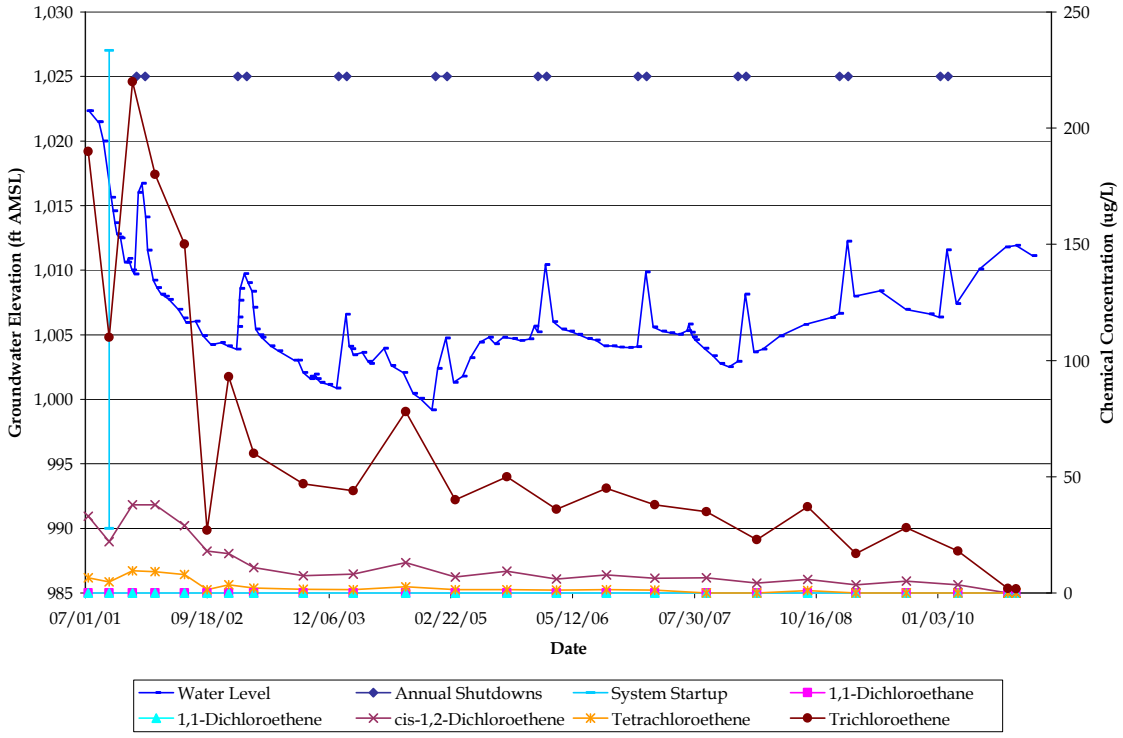


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW02



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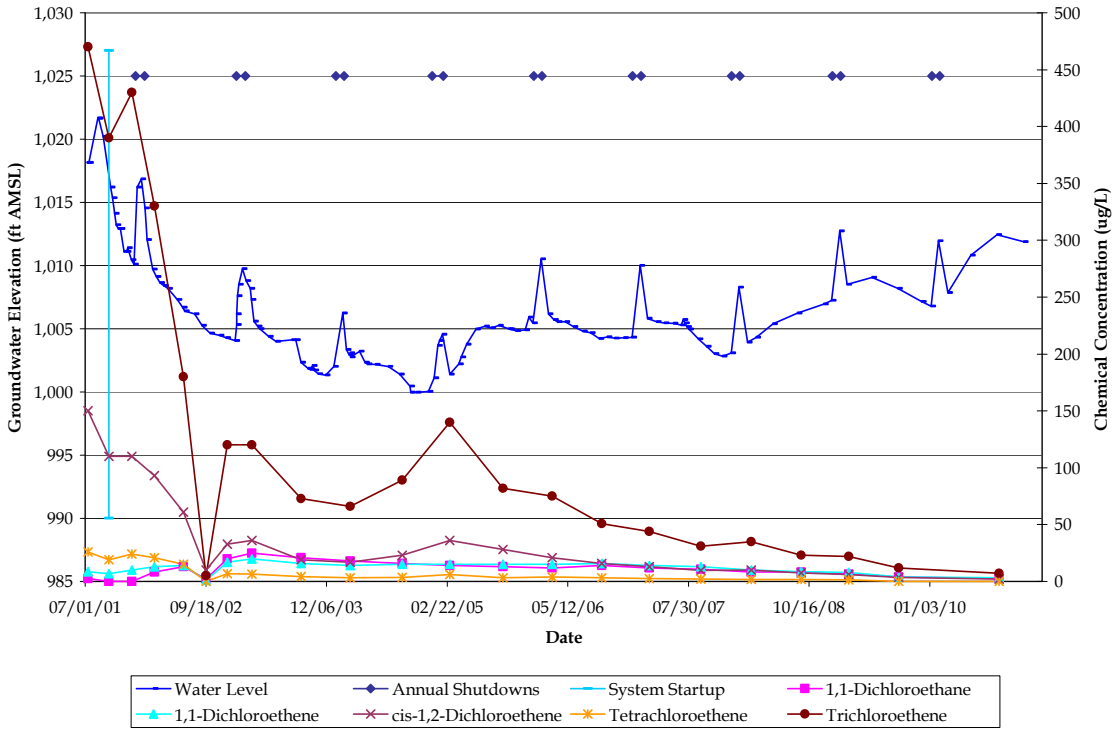
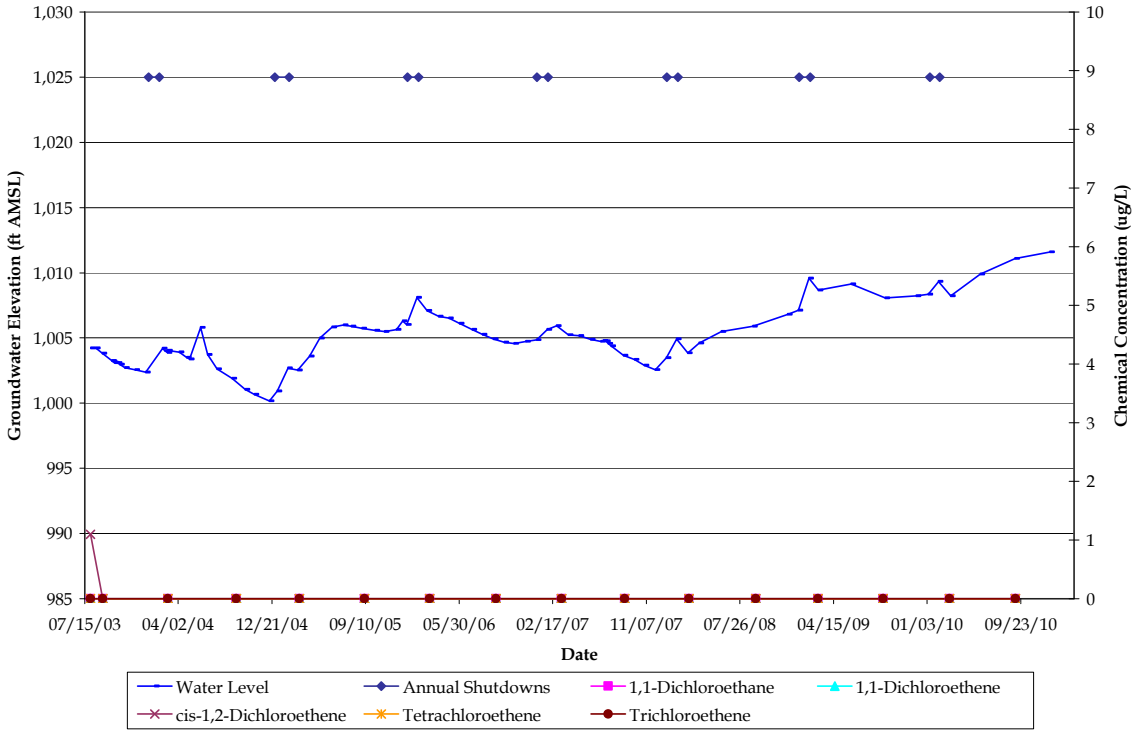


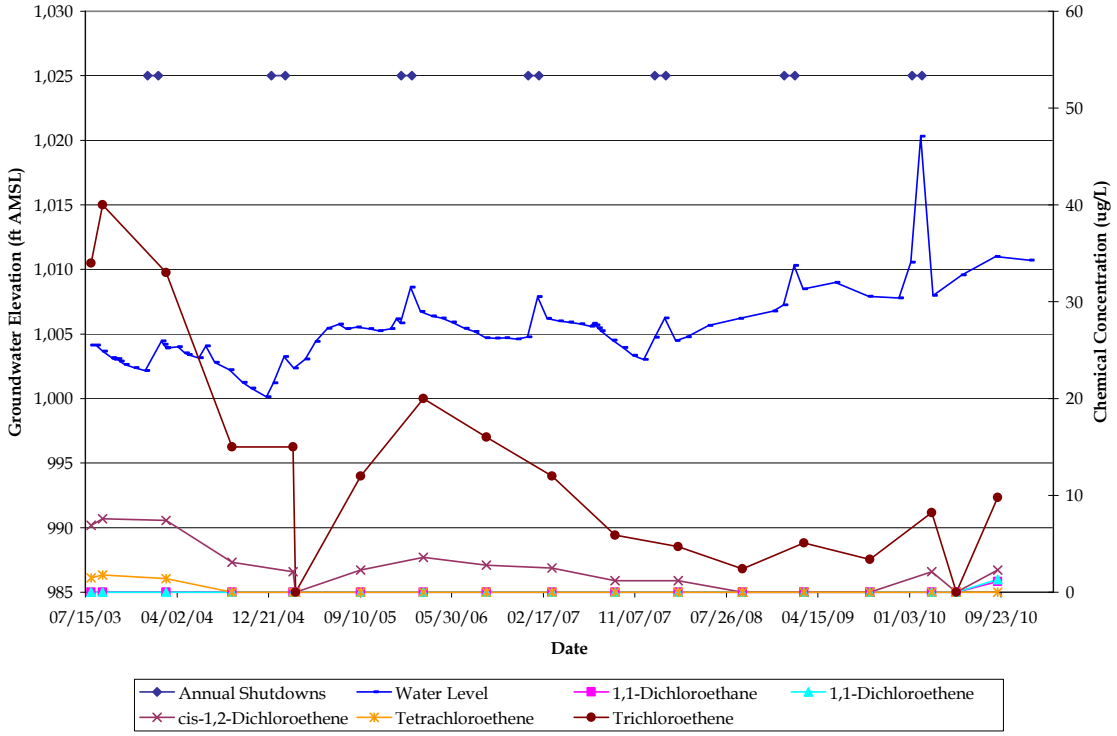
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW04-D



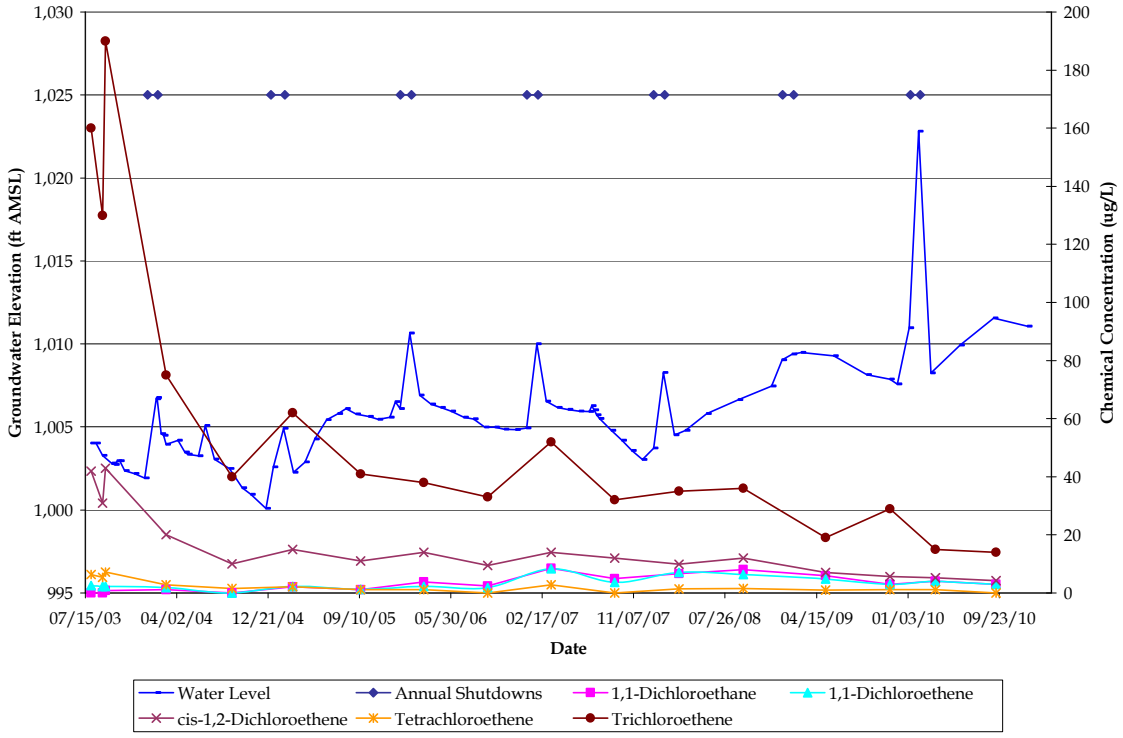
NW04-S



Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW05-S



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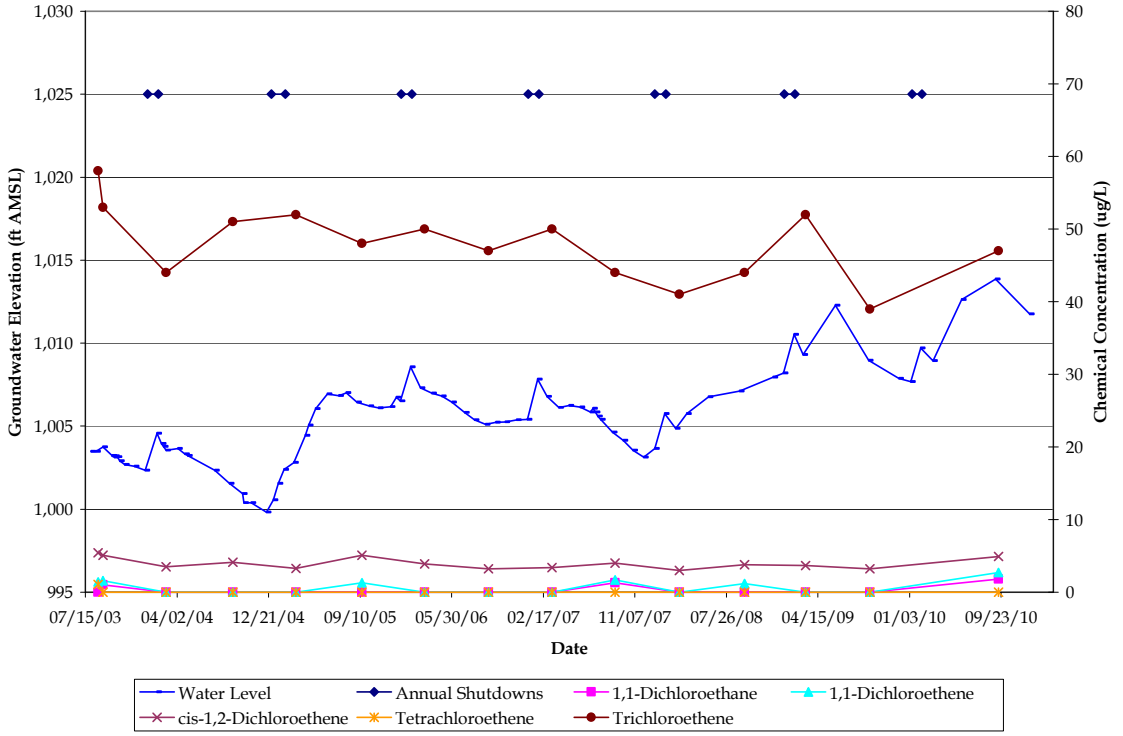
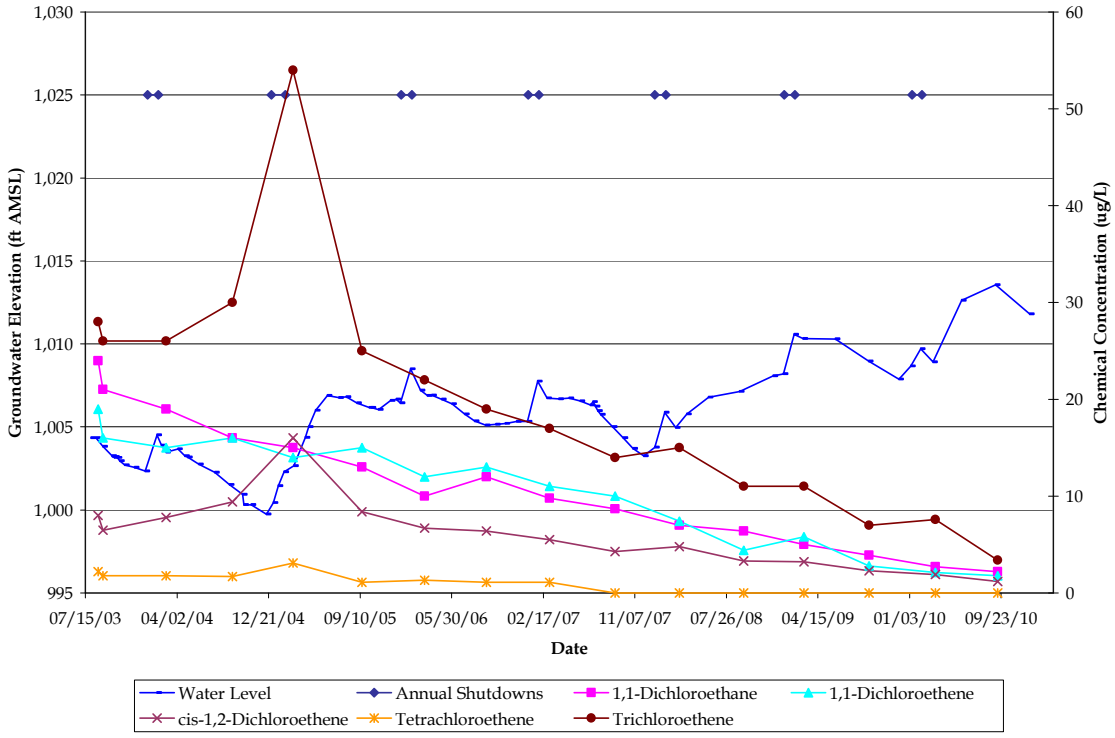


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW06-S



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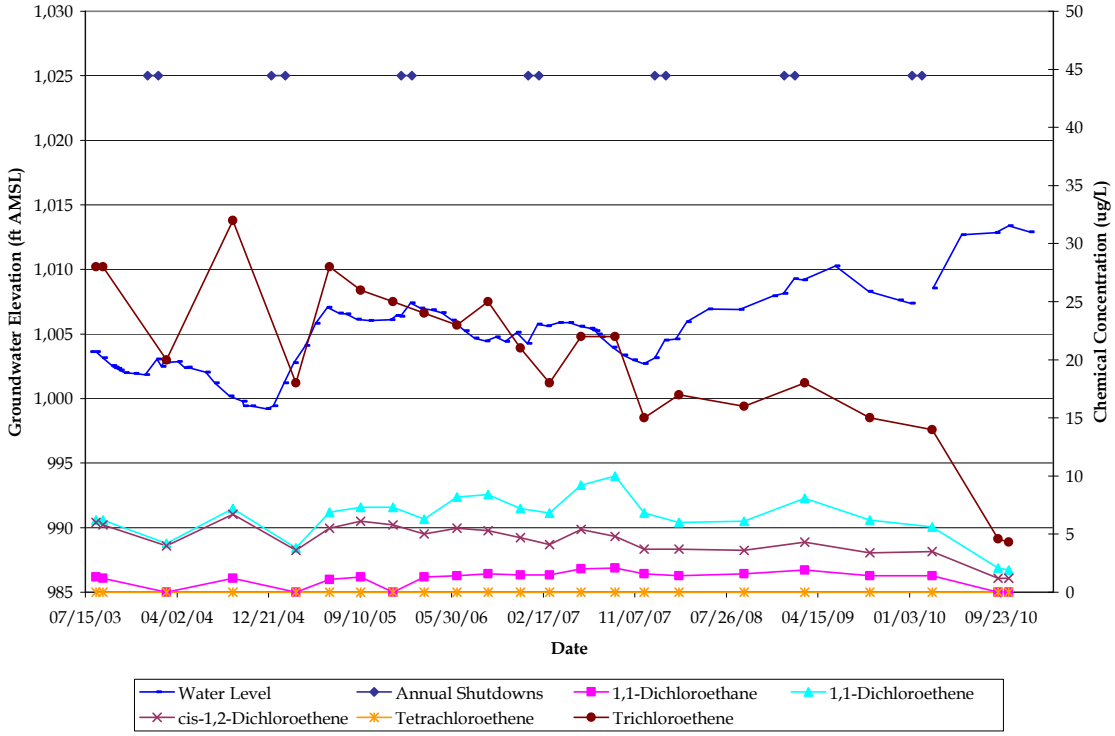
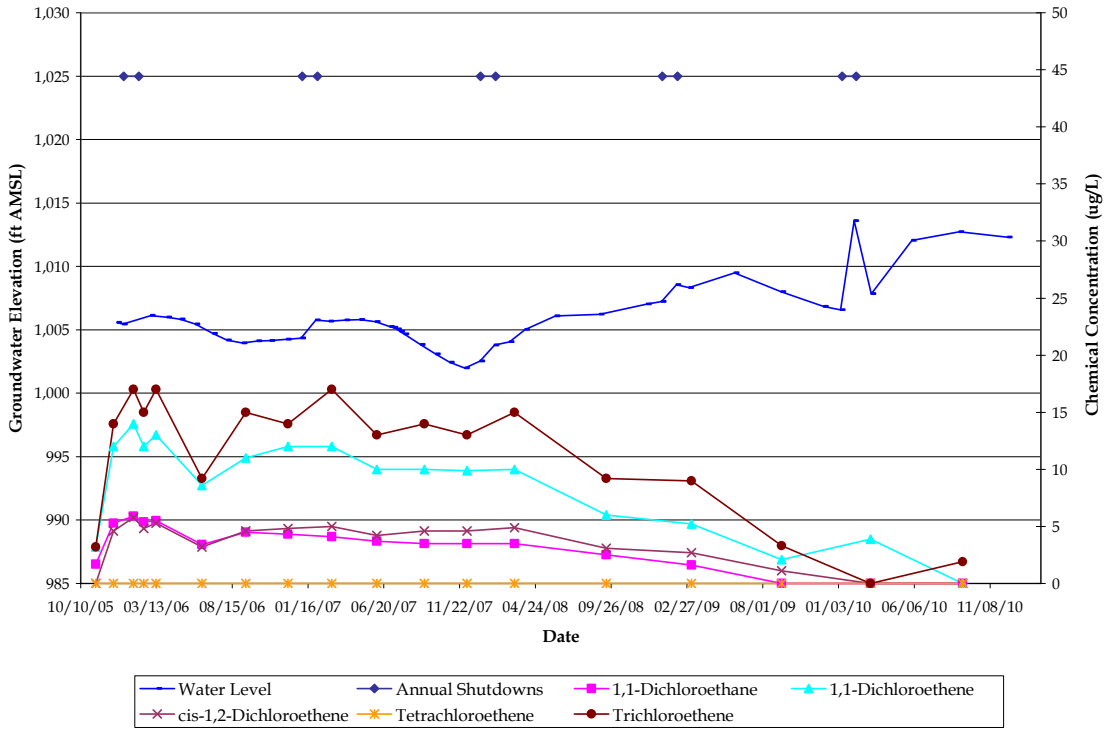


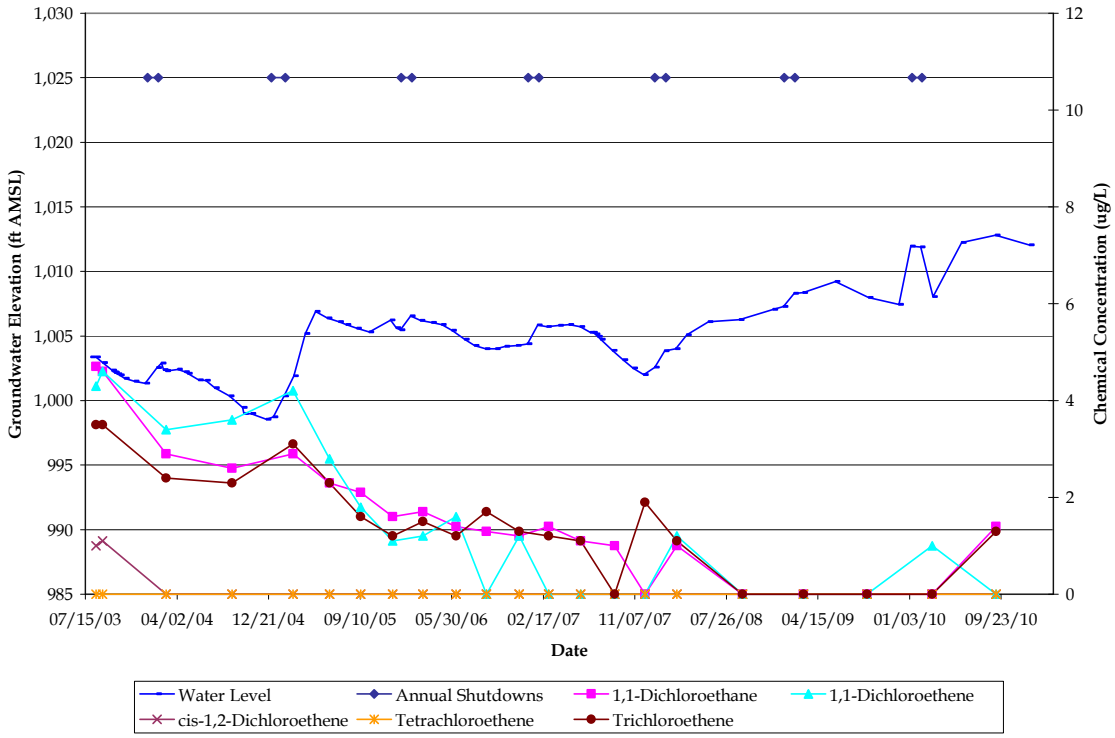
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW07-M



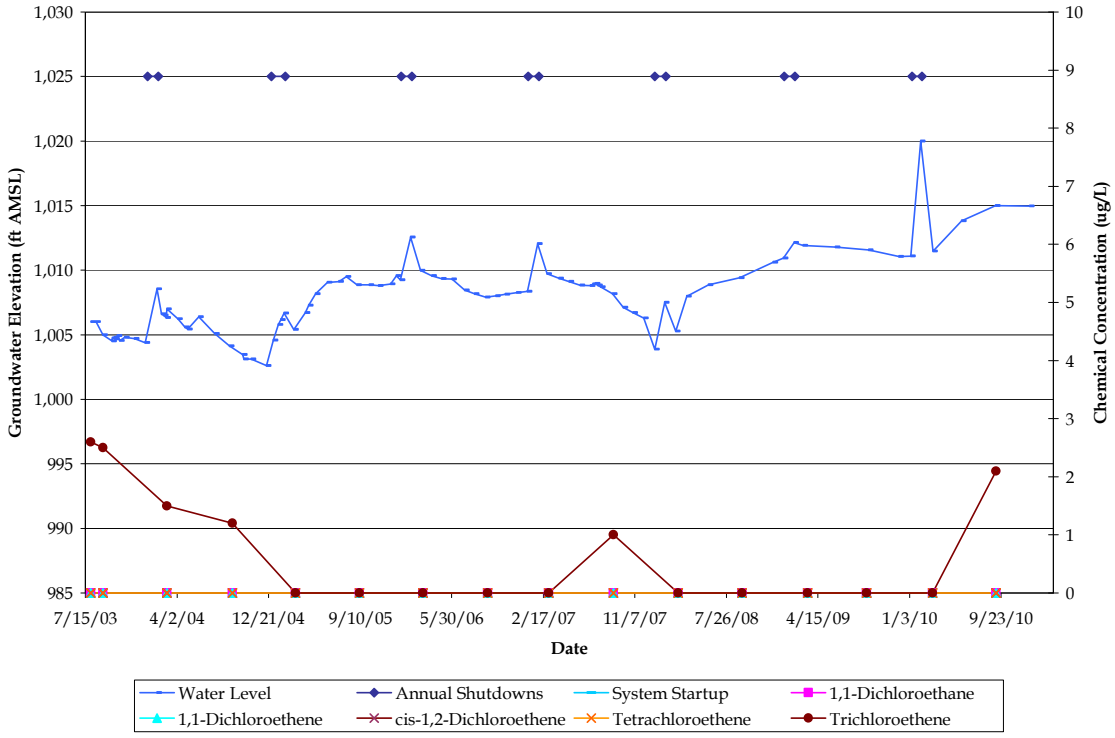
NW07-S



Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW08-D



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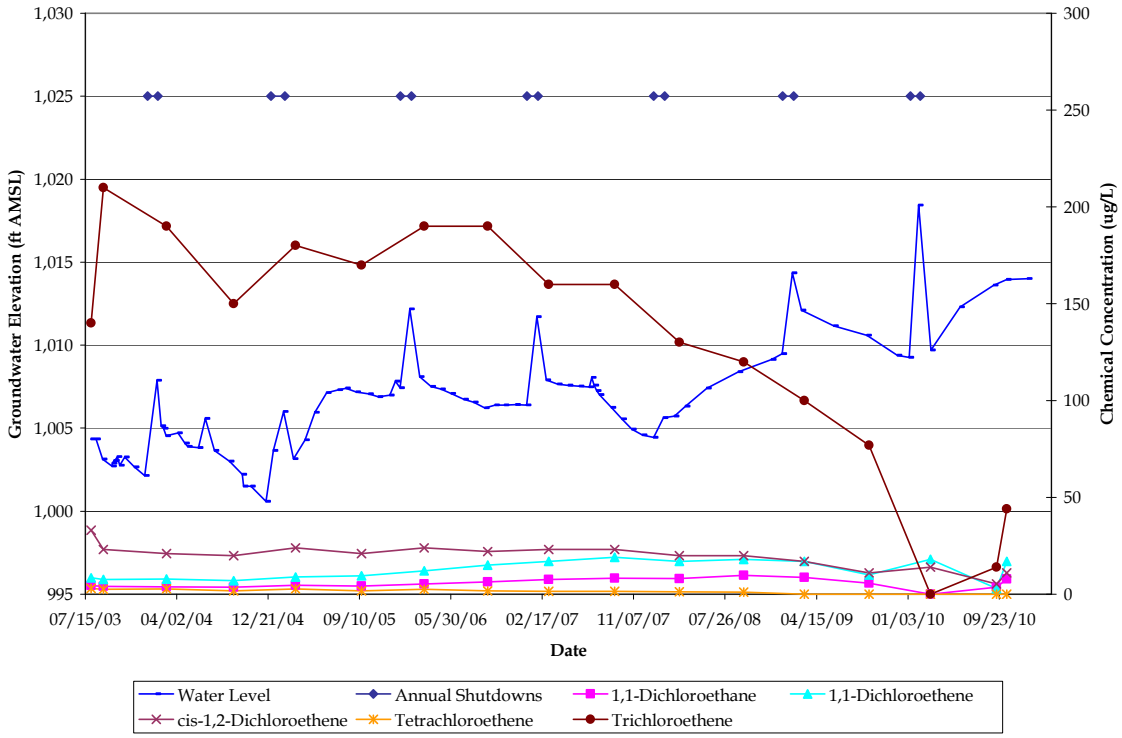
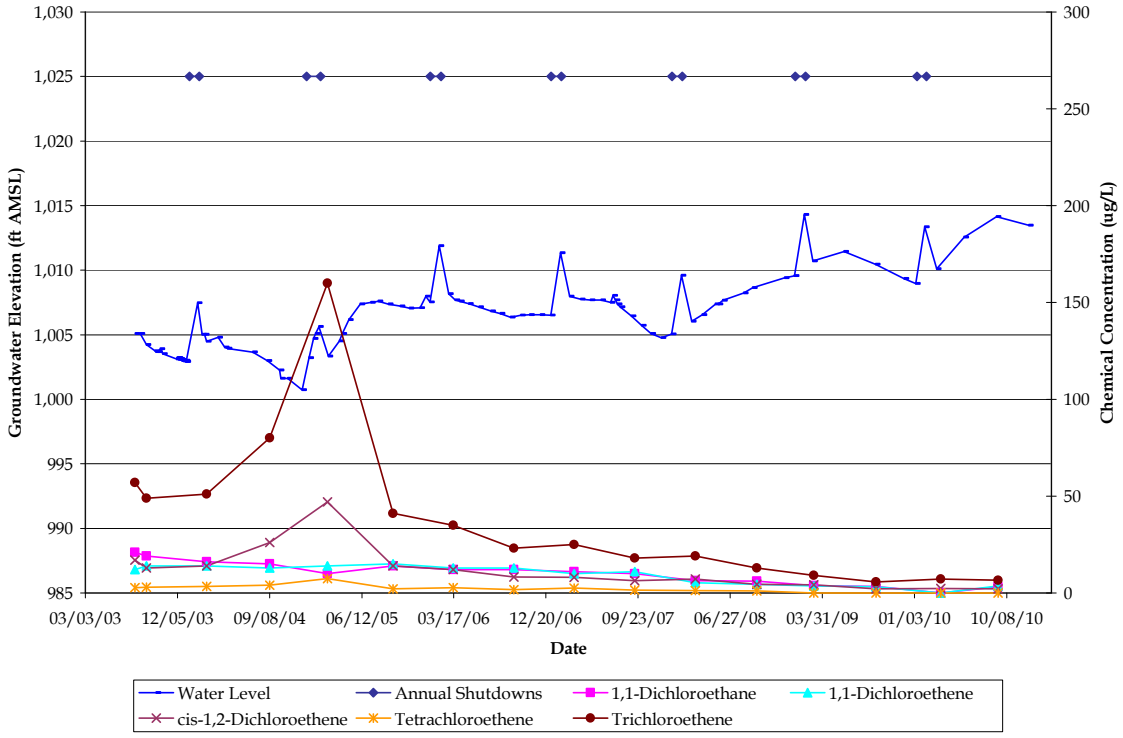


Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW08-S



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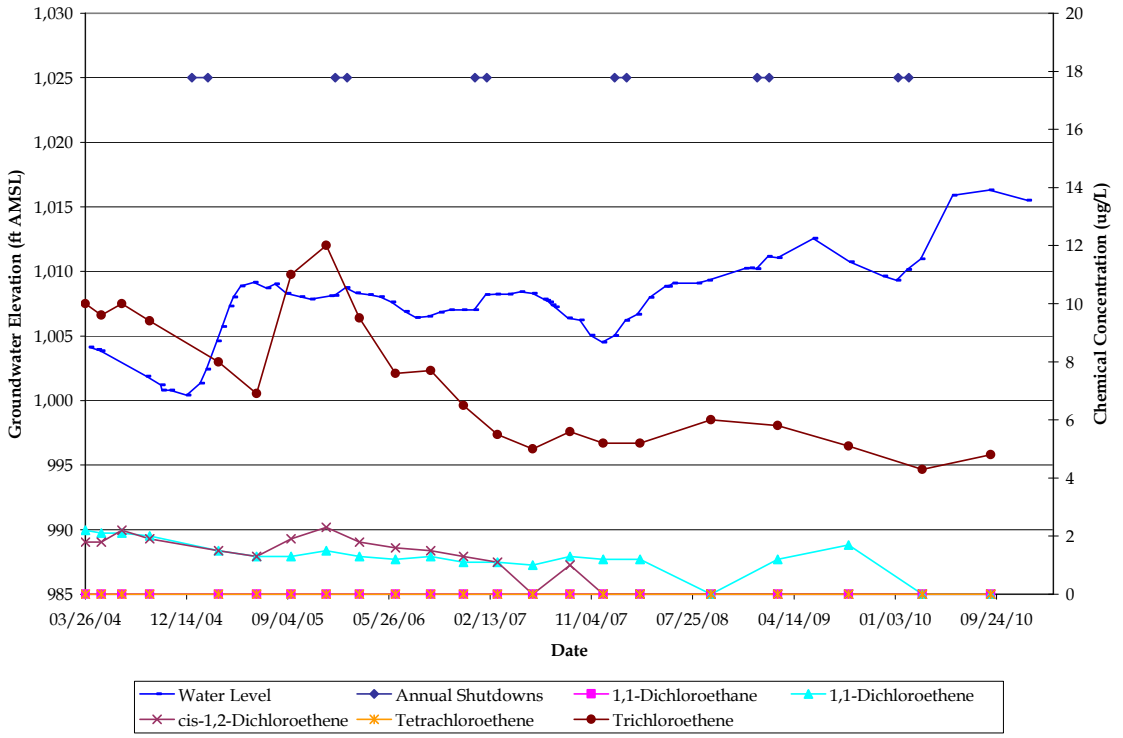
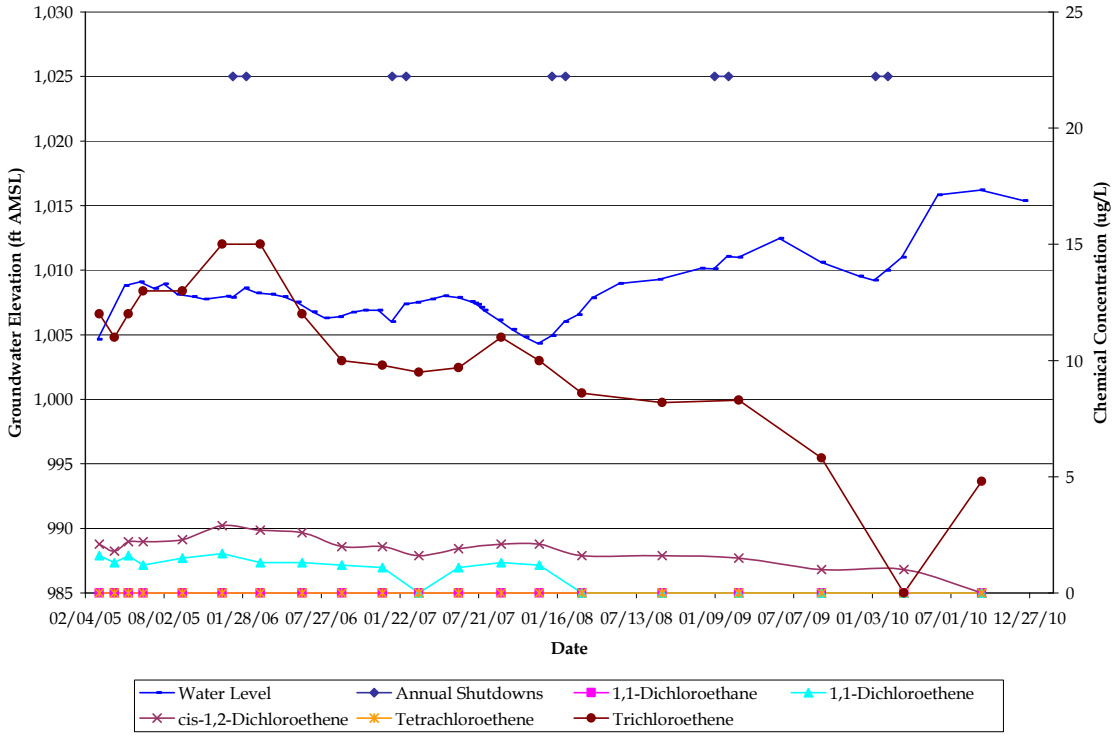


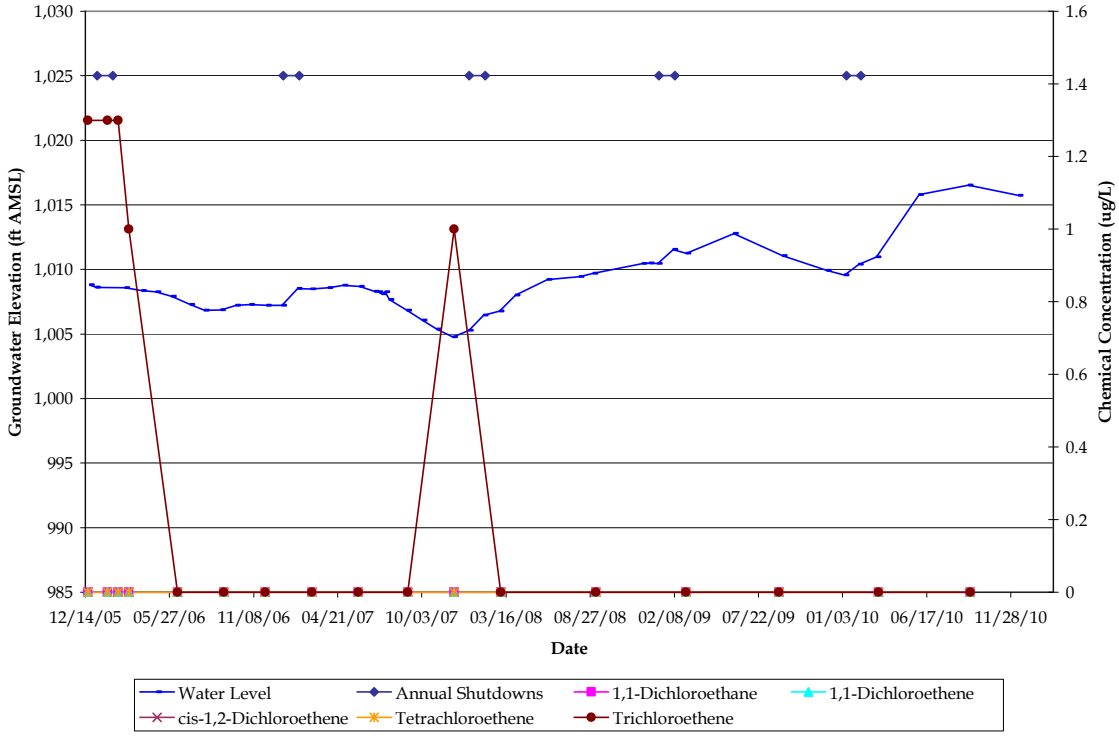
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW09-D2



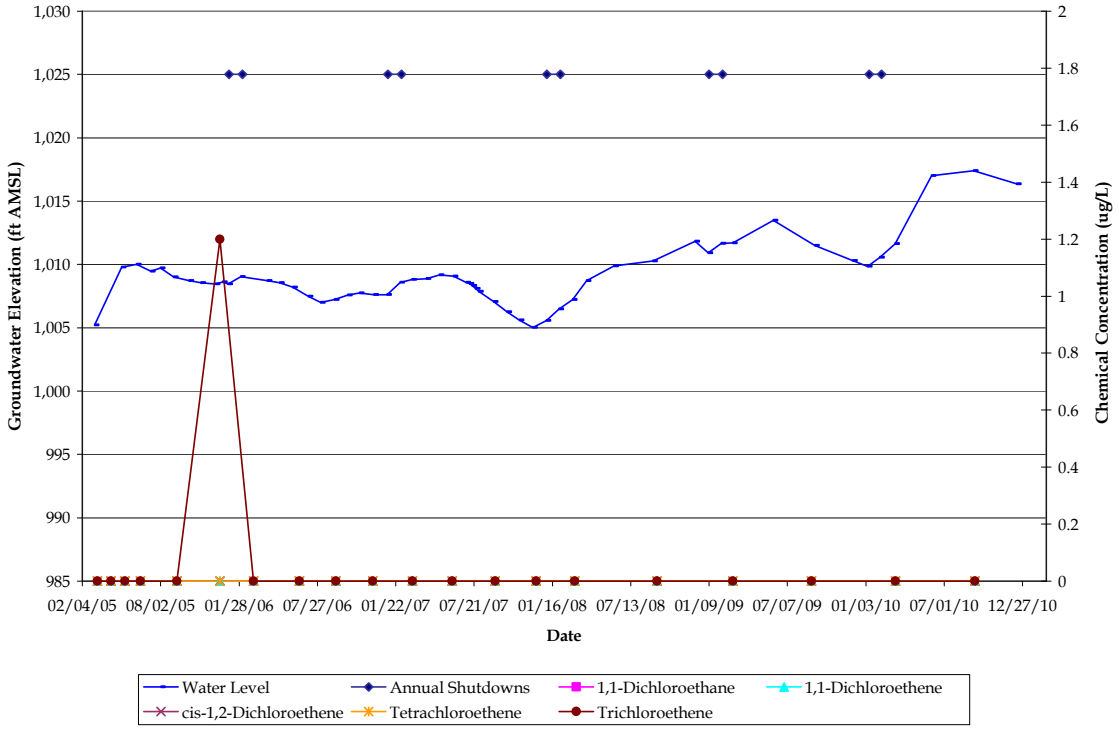
NW09-M



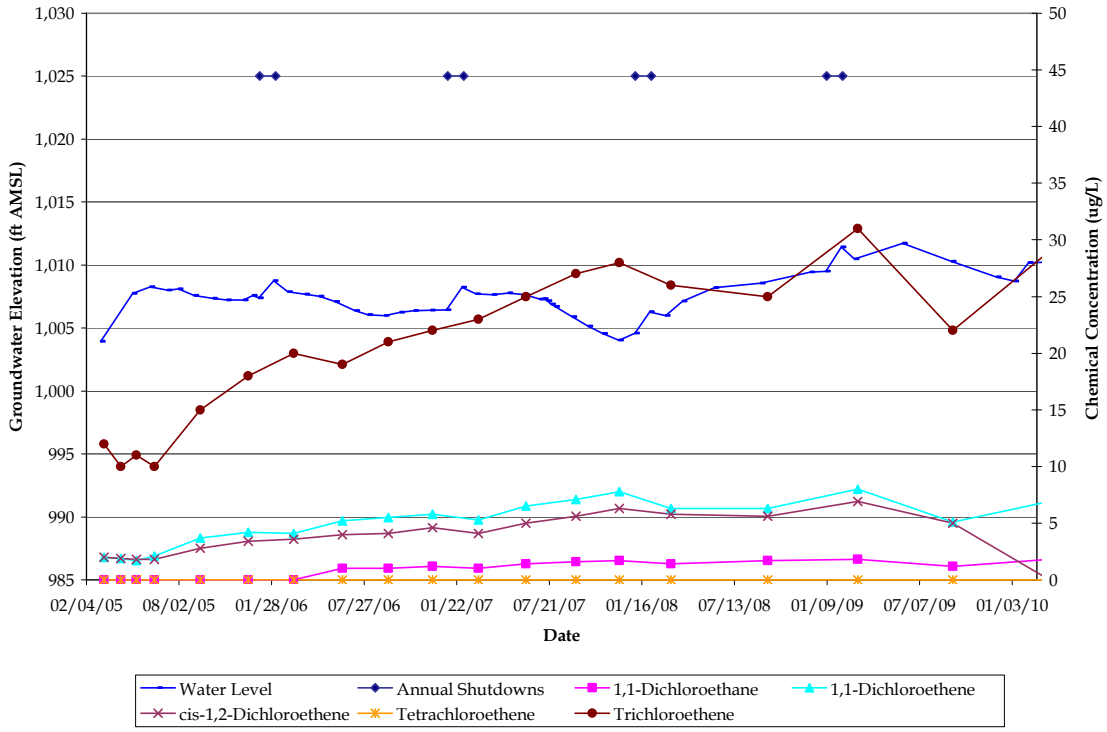
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW10-D



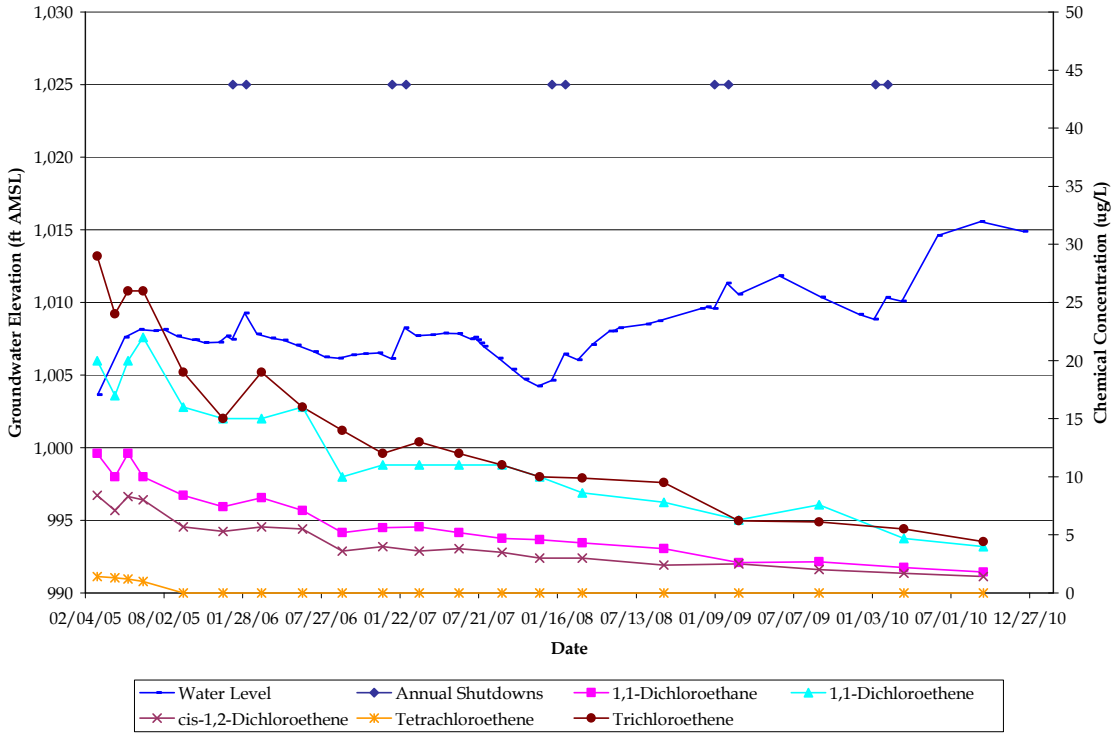
NW11-D



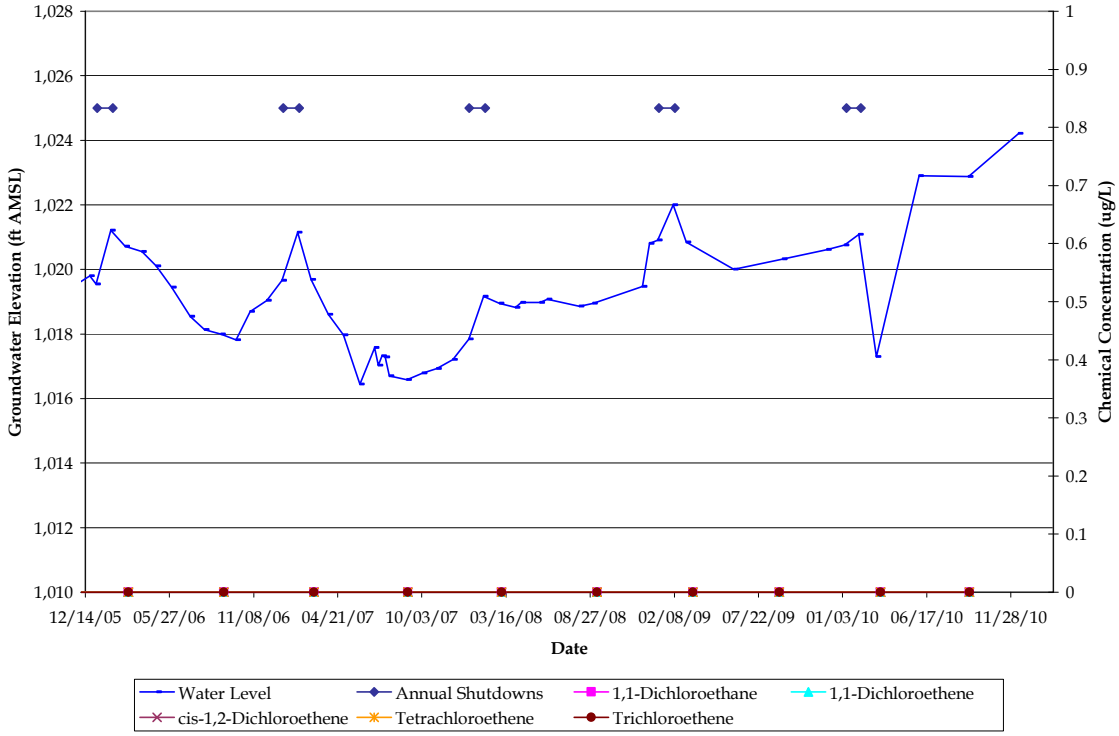
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW11-M



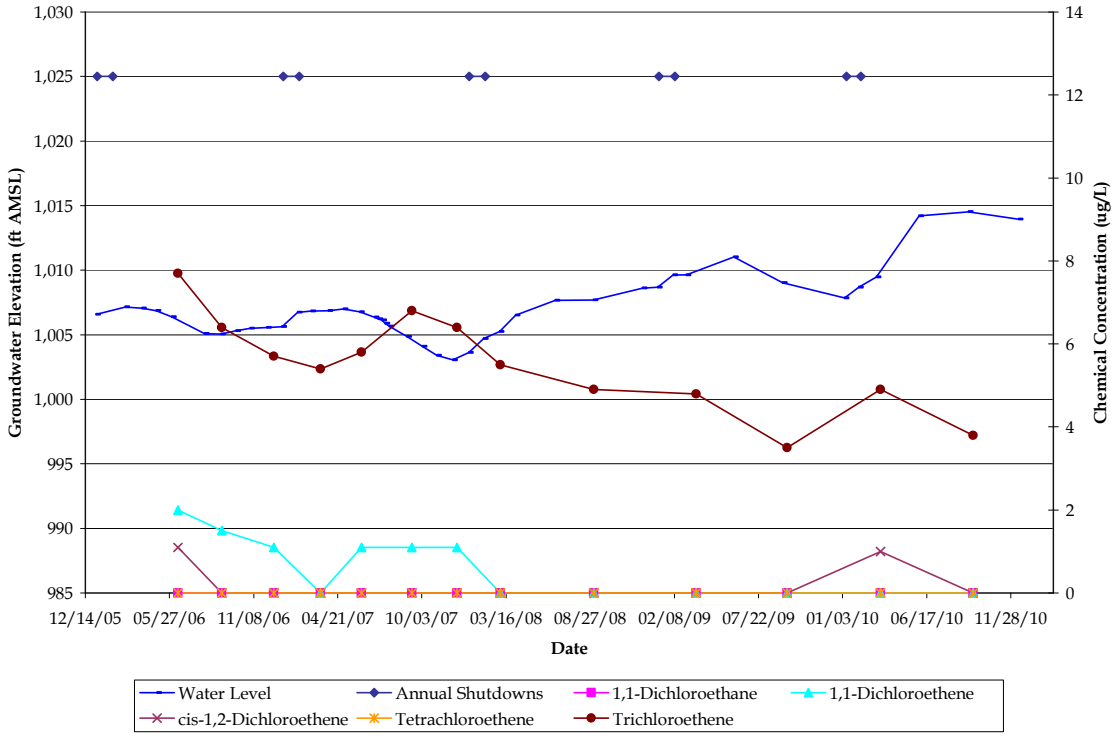
NW12-D



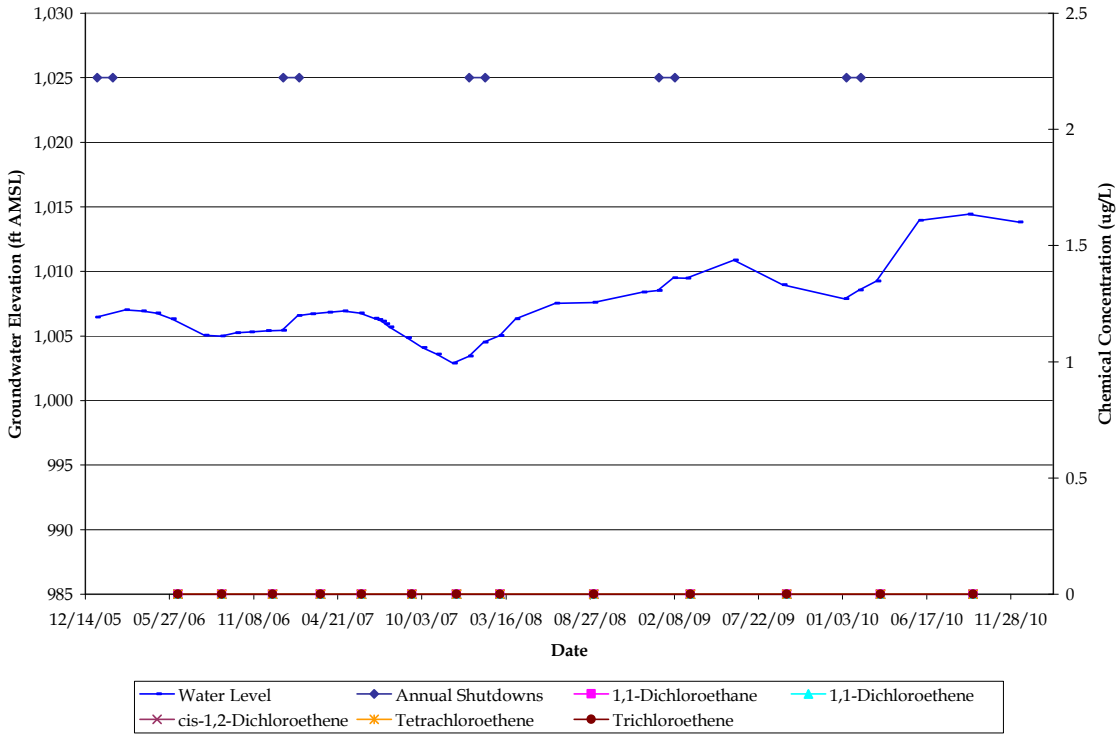
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW13-D



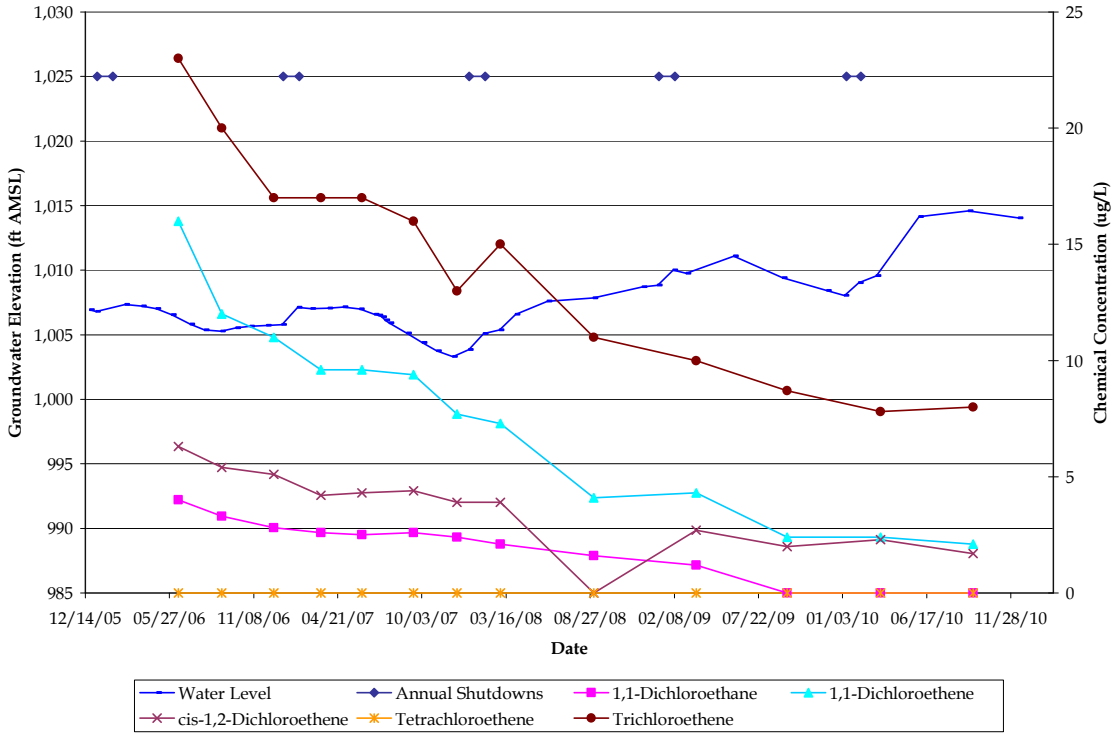
NW13-M



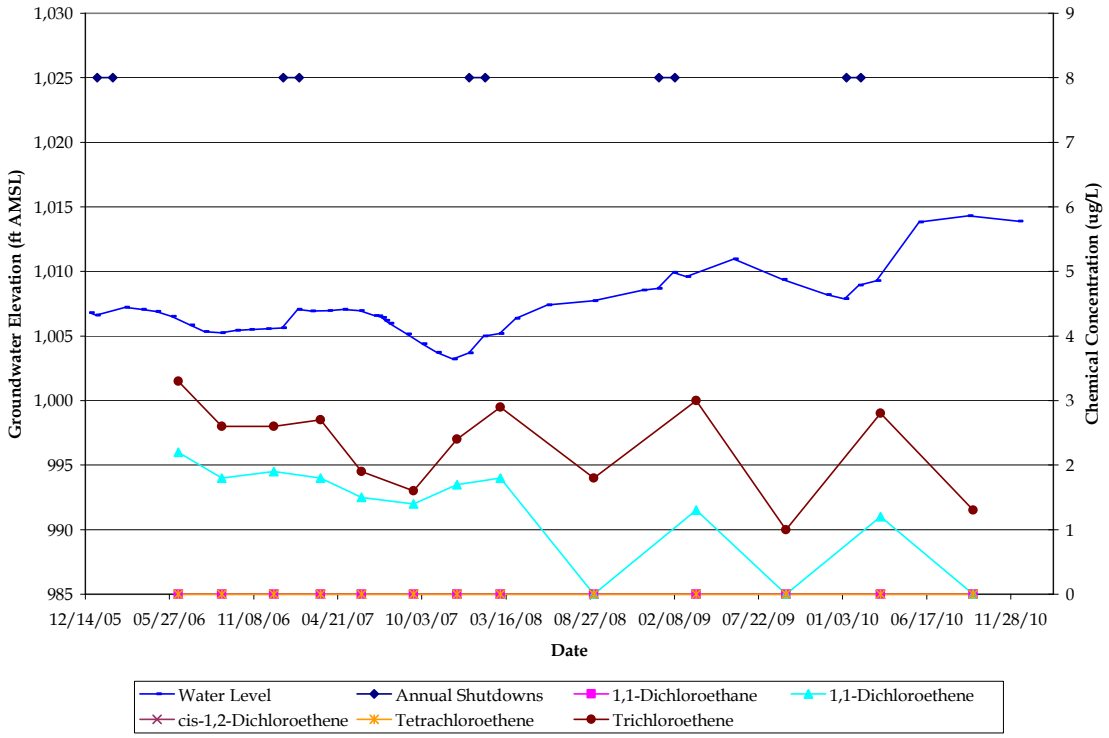
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW14-D



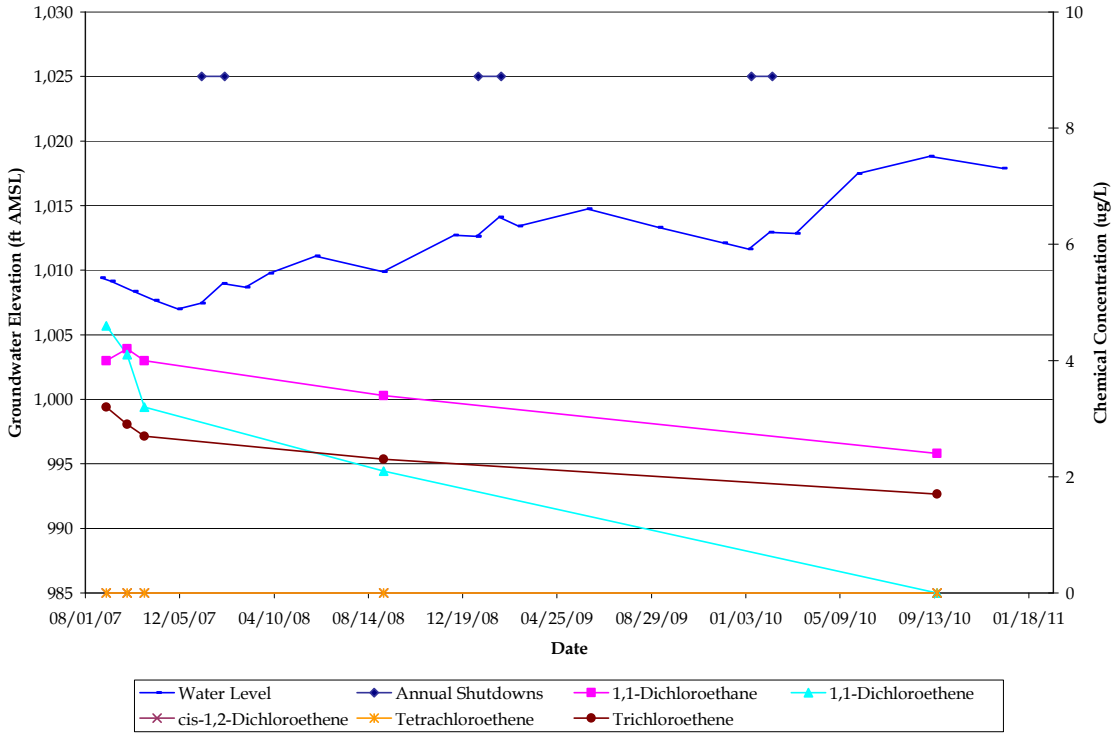
NW14-M



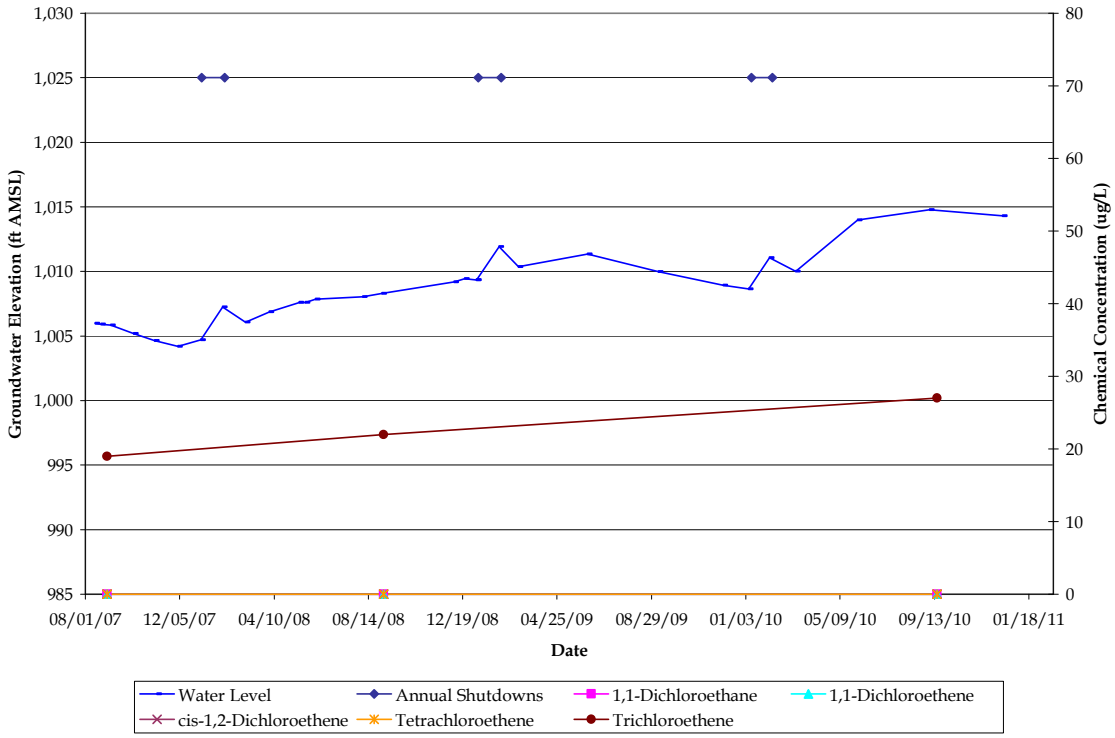
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW15-S



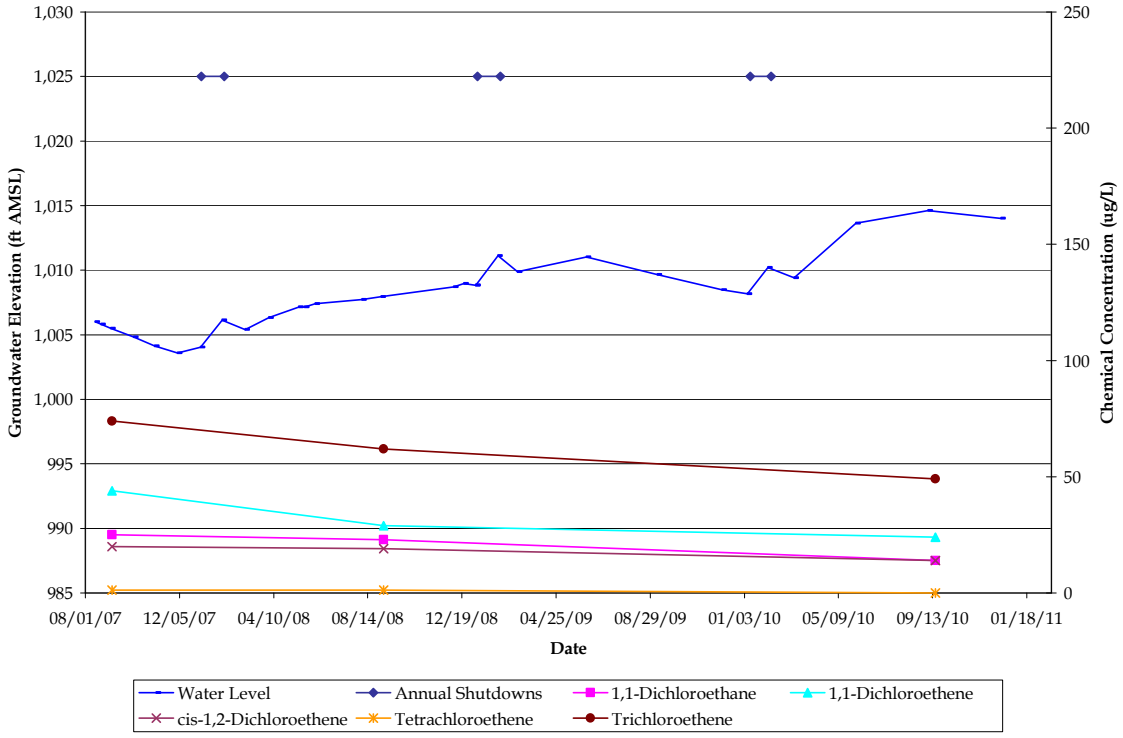
NW16-D



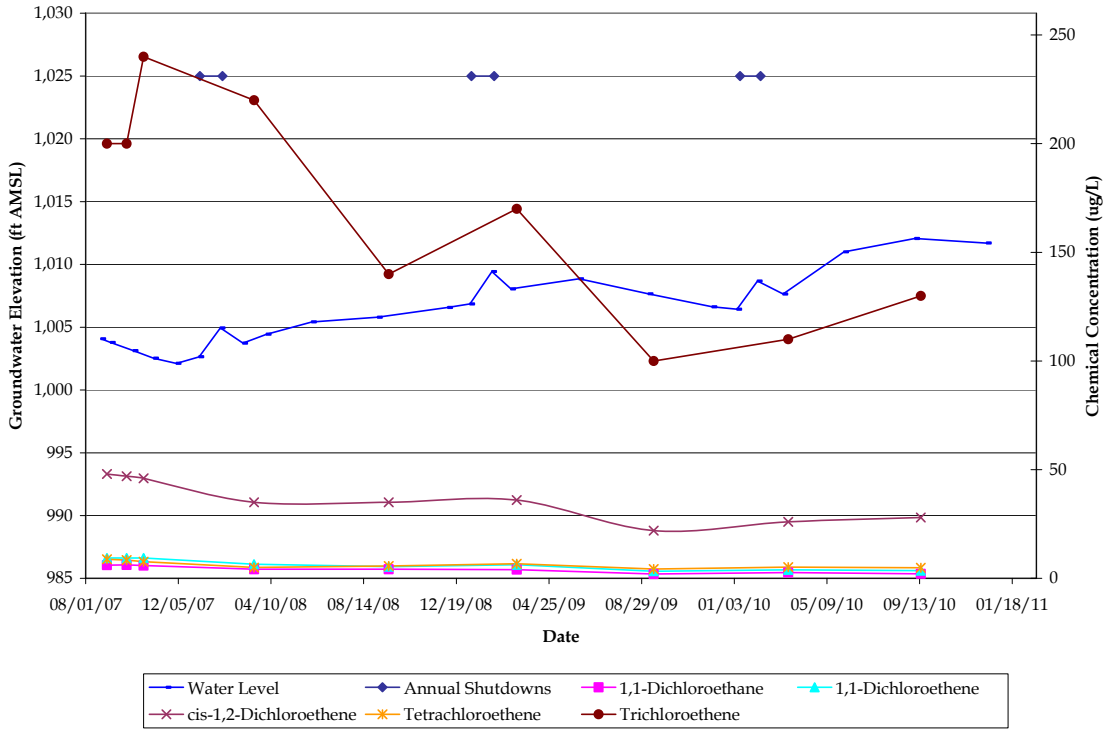
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW16-M



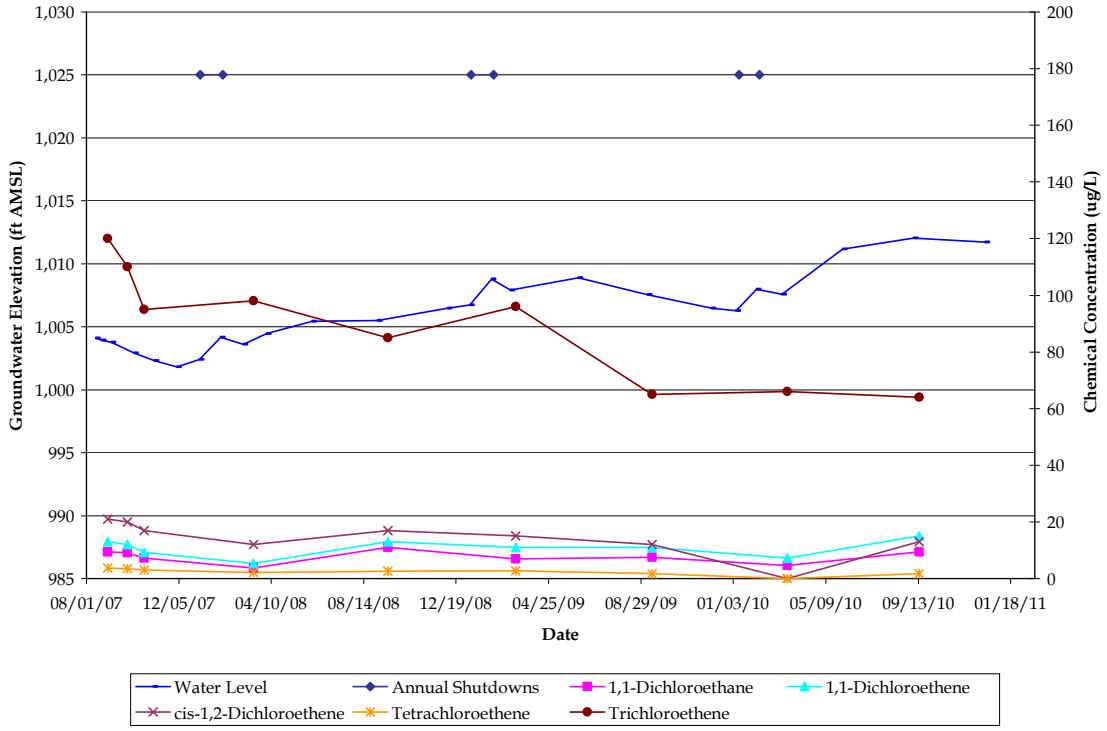
NW17-S



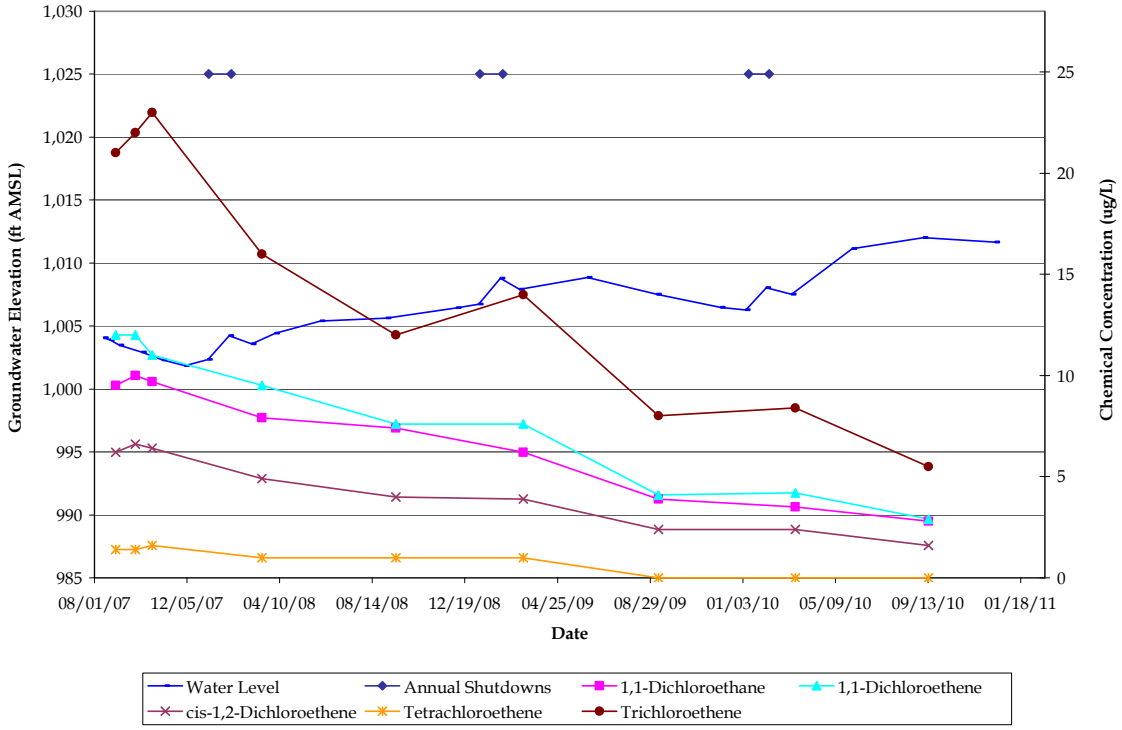
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW18-M



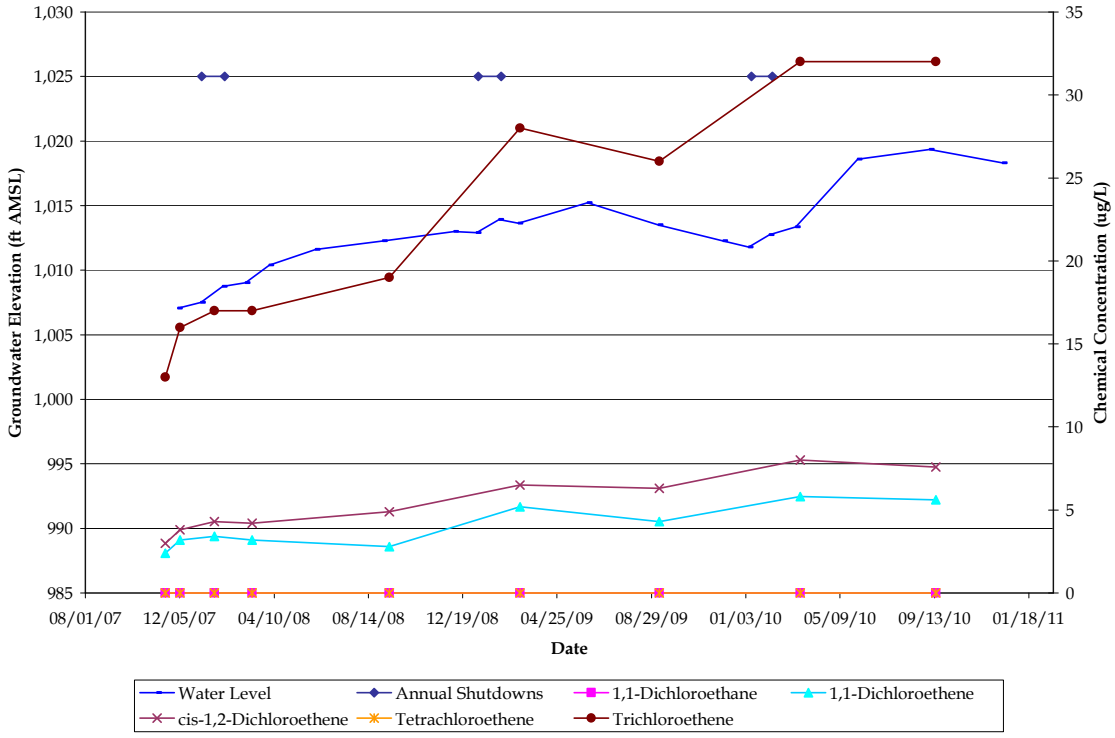
NW18-S



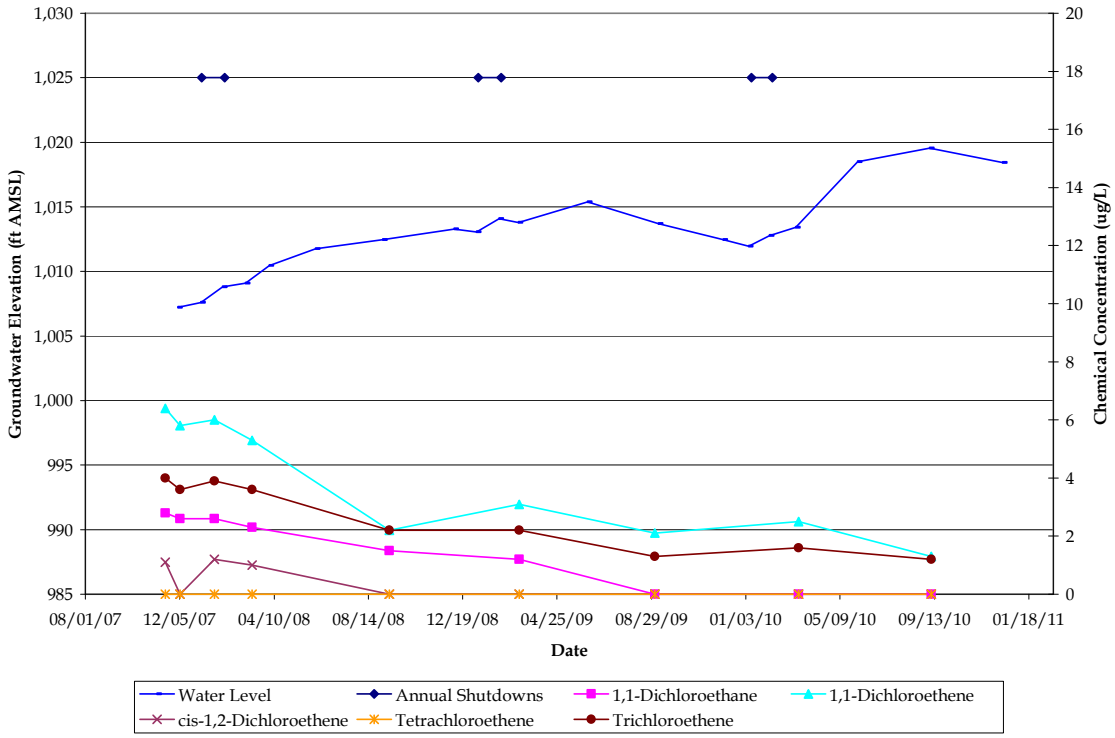
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

NW19-D



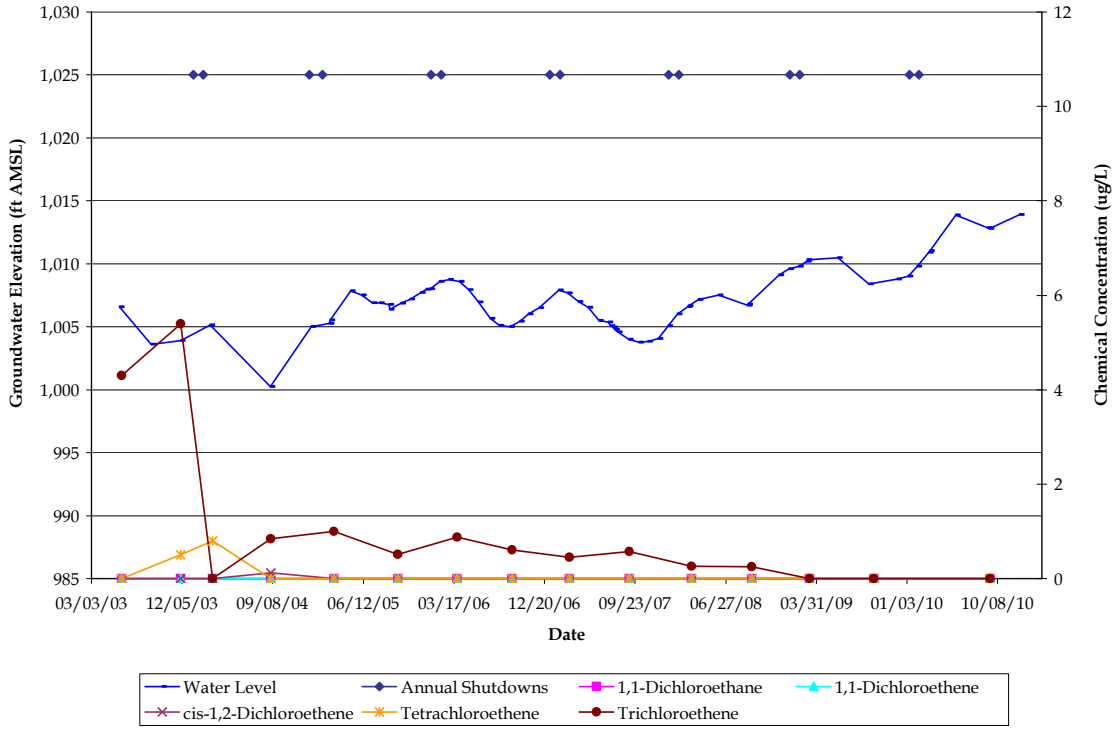
NW19-M



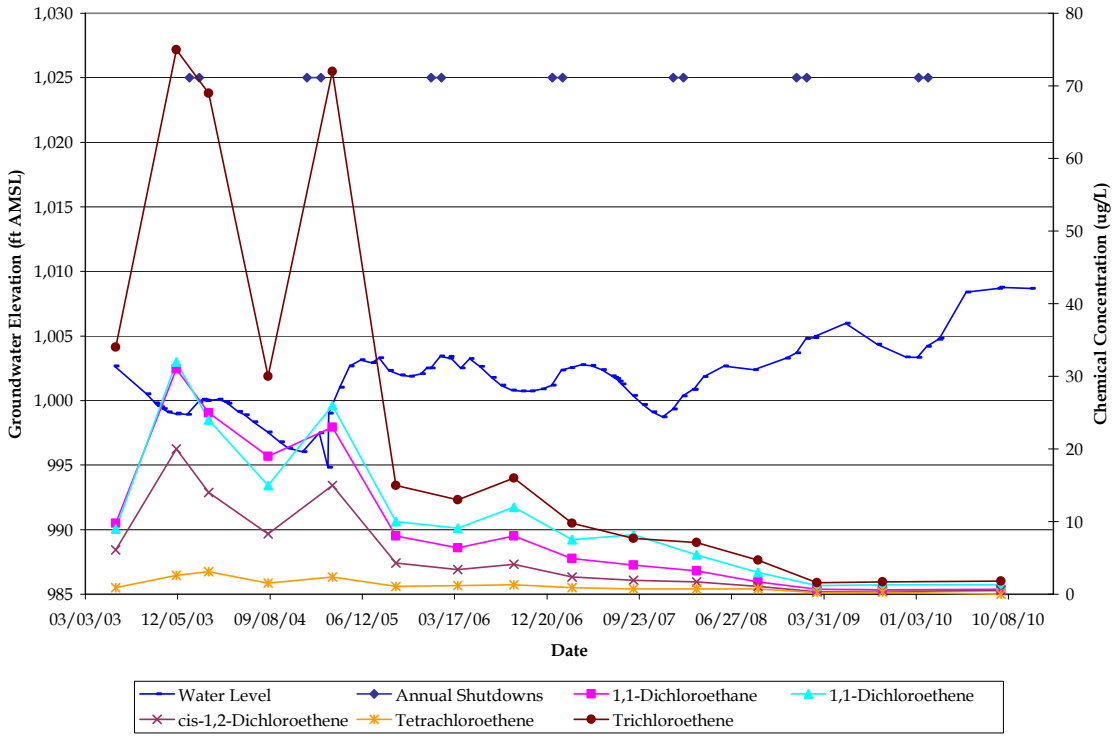
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

OU3-12D



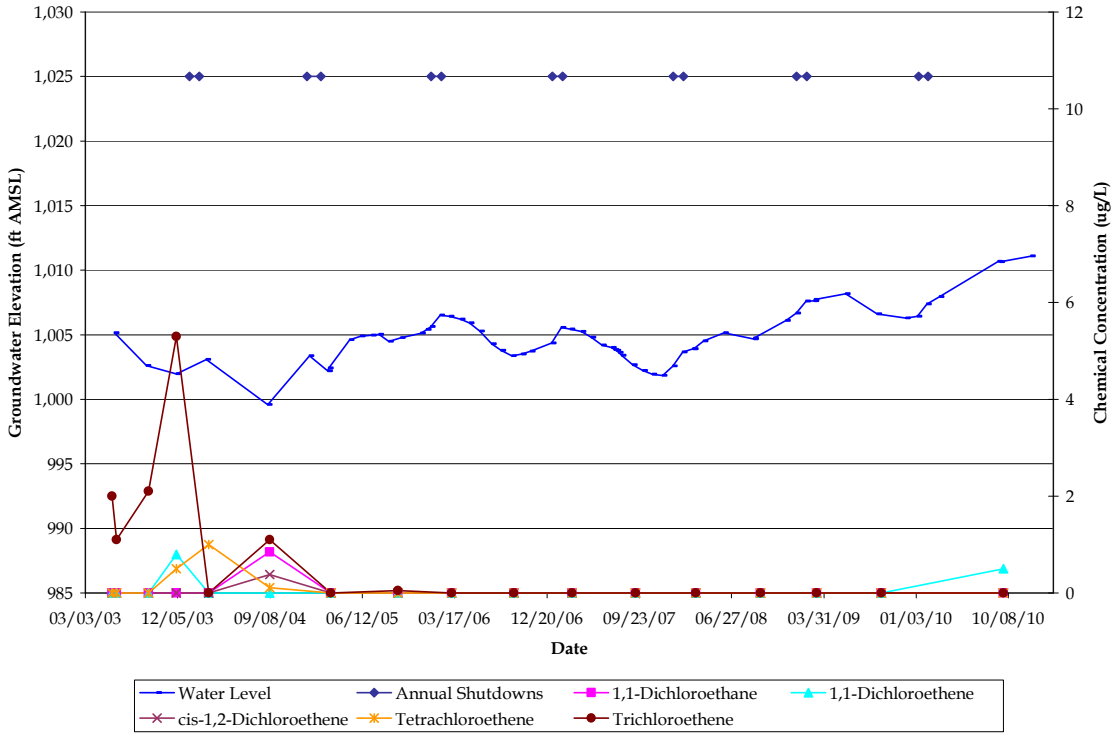
OU3-12M



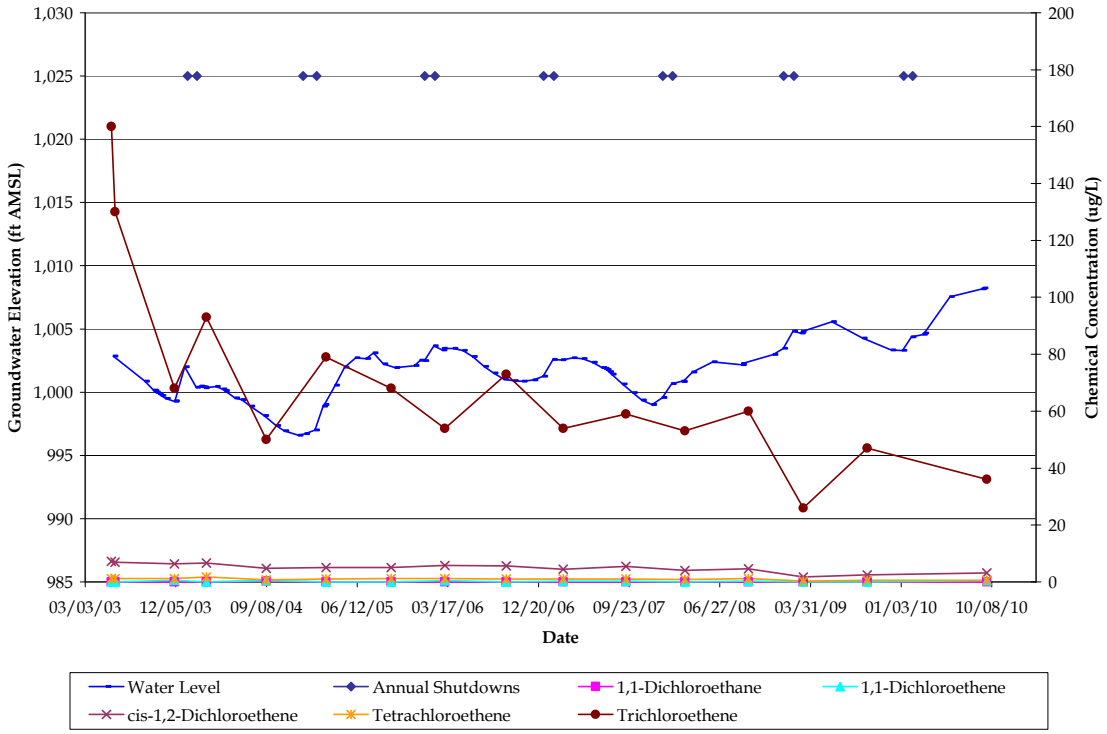
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

OU3-13D



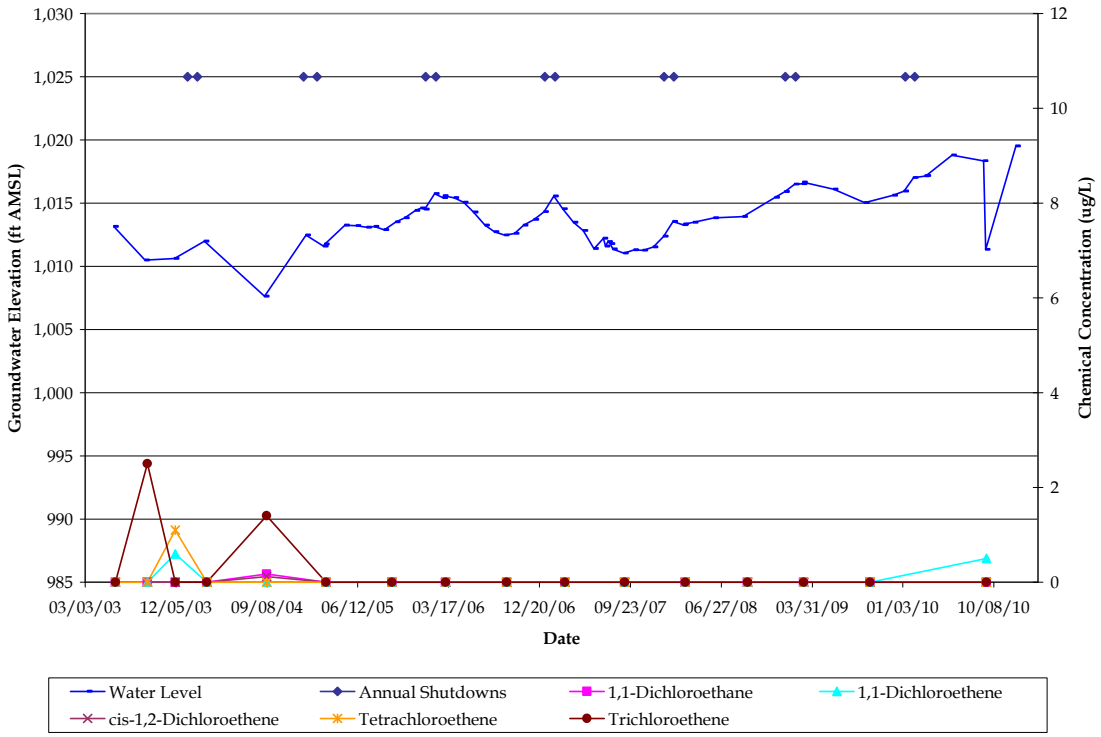
OU3-13M



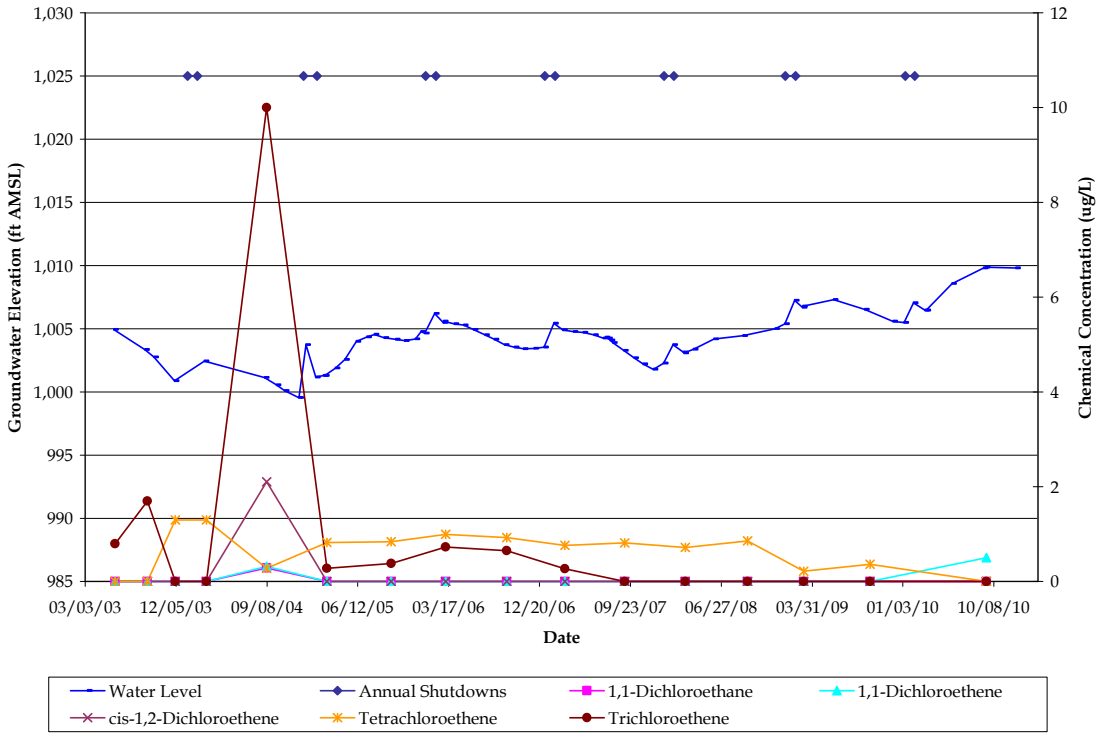
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

OU3-14D



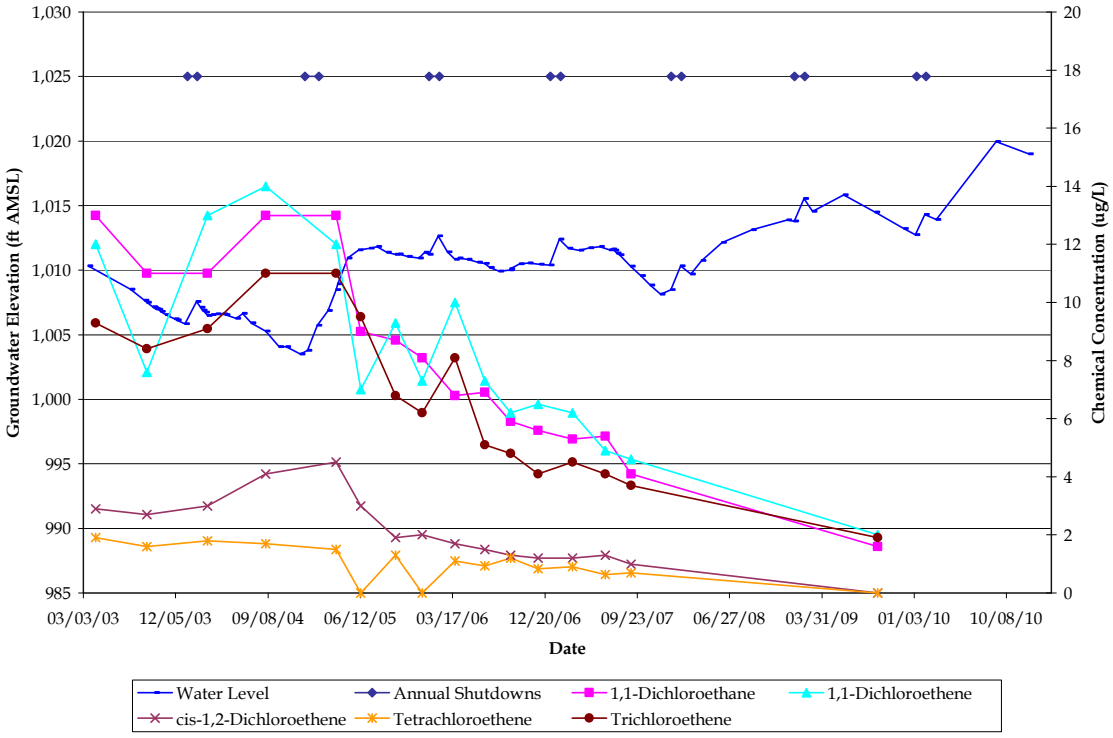
OU3-14M



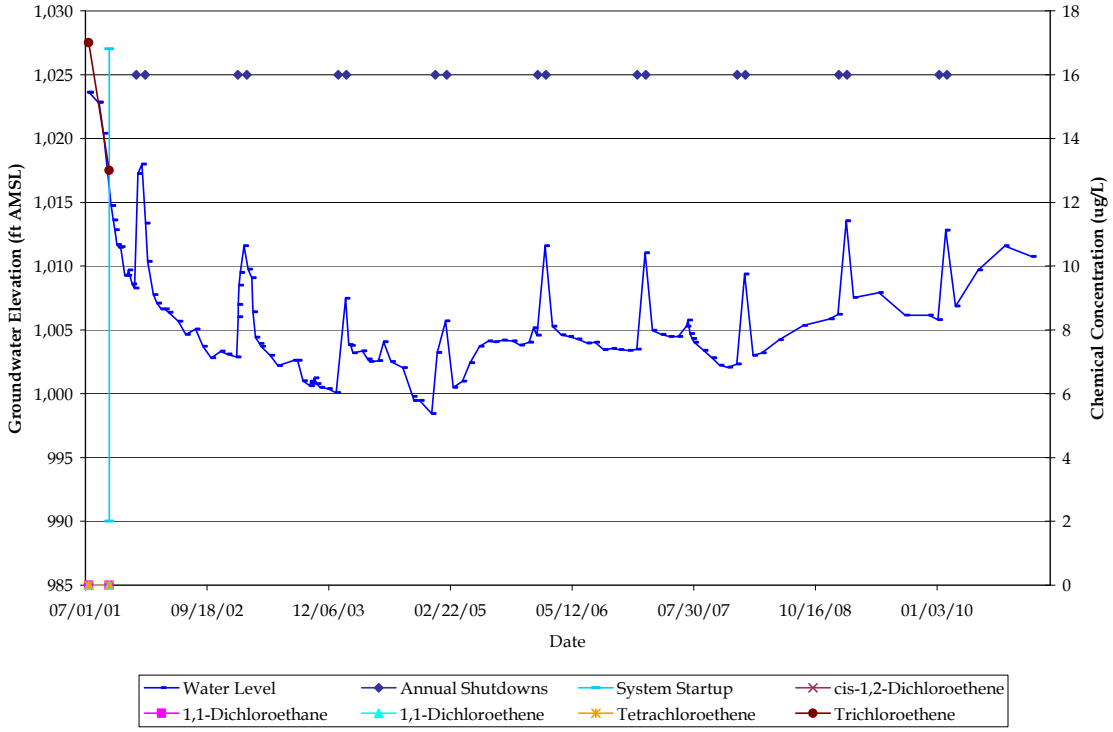
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

PHXA06



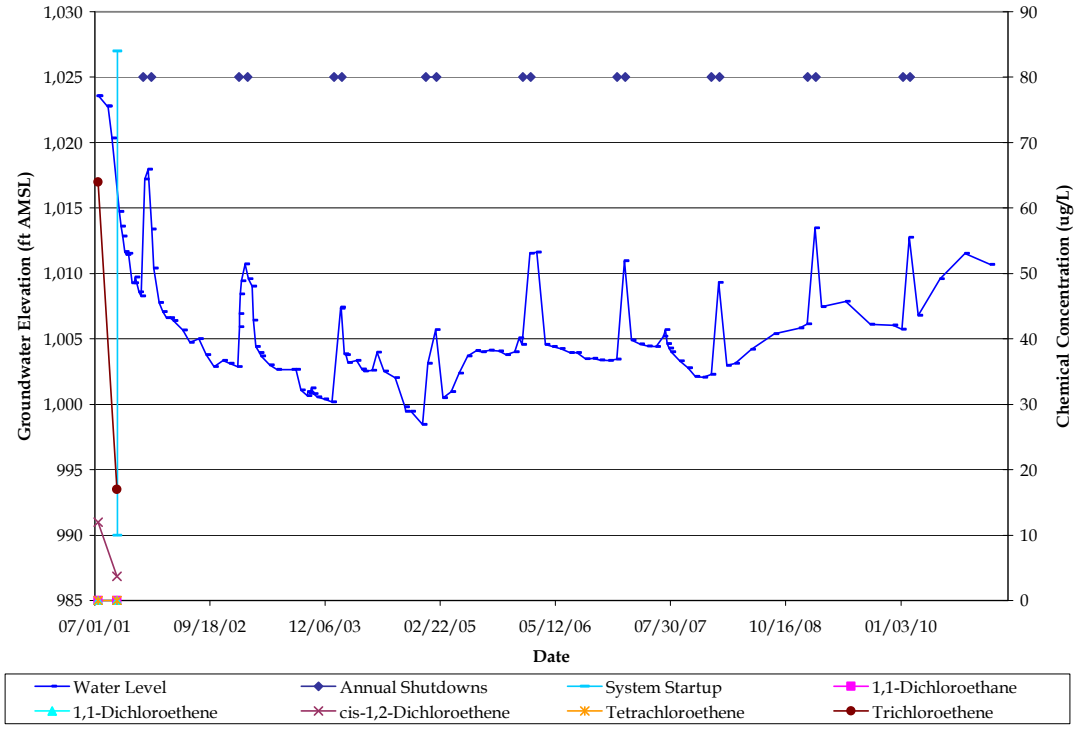
PZ01-D



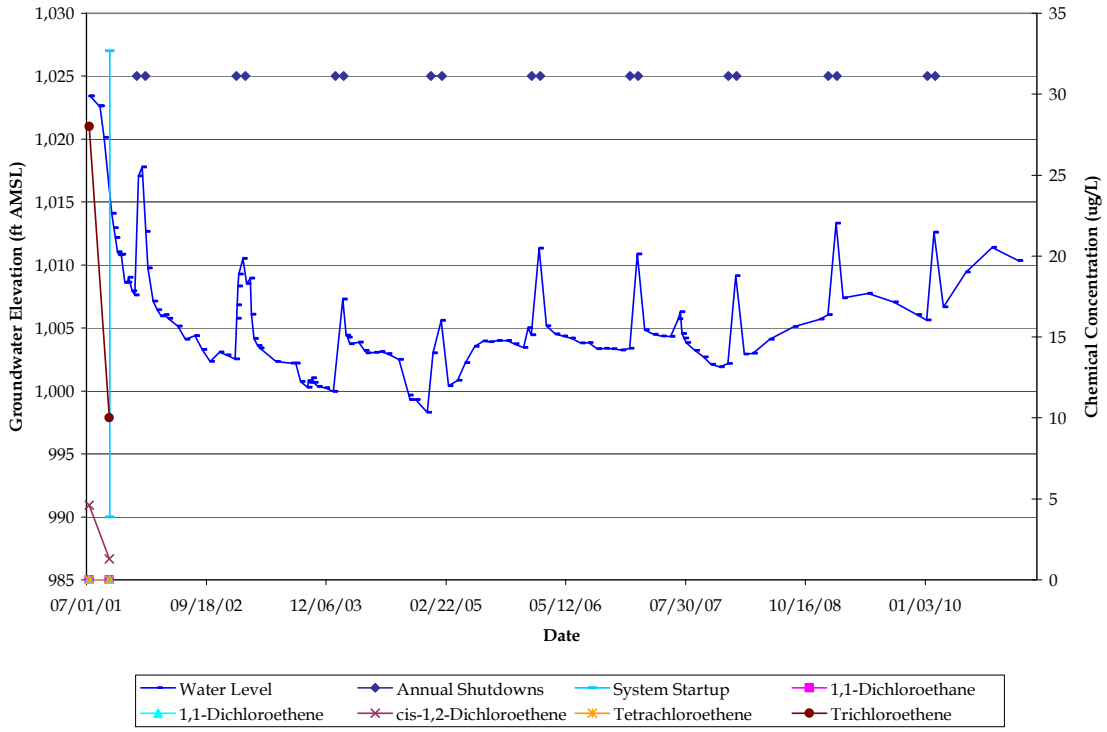
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

PZ01-S



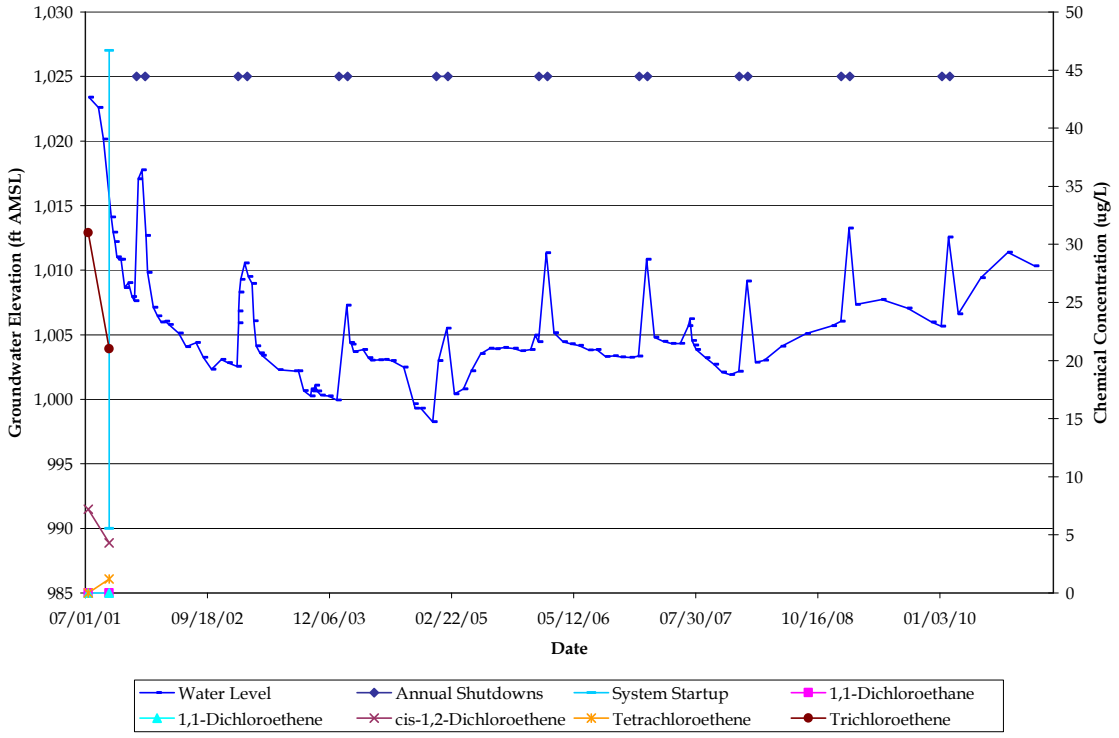
PZ02-D



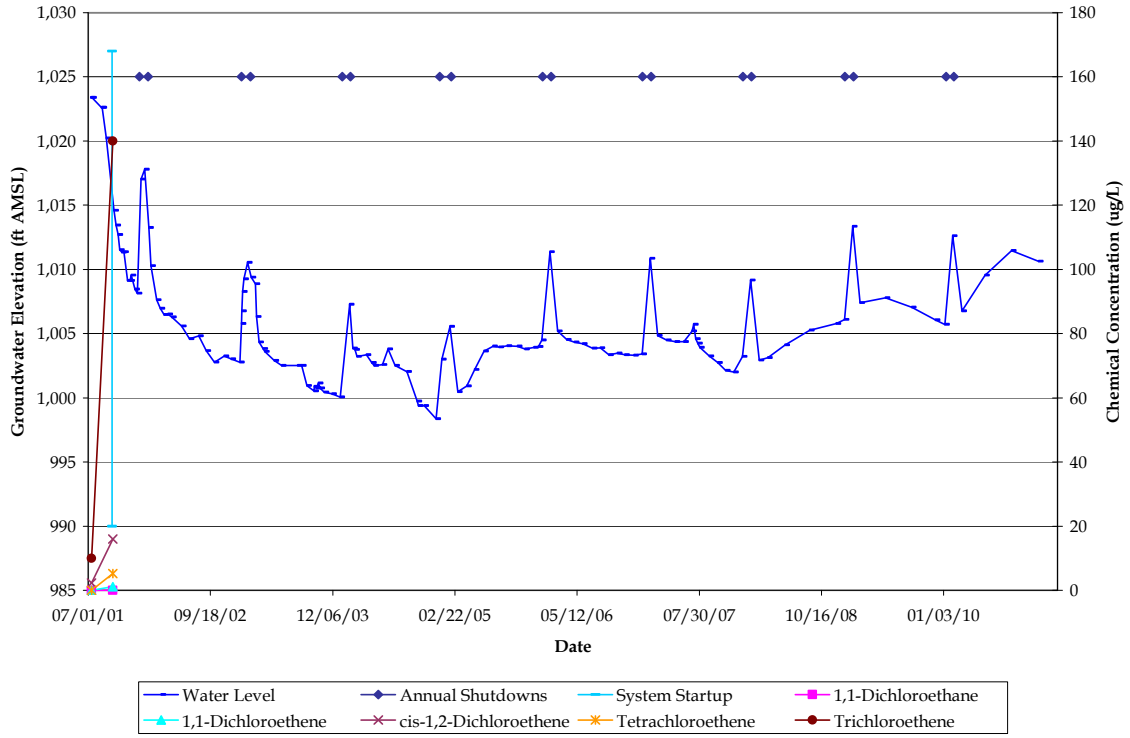
Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

GROUNDWATER ELEVATION AND SELECT VOC CONCENTRATION TRENDS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

PZ02-S

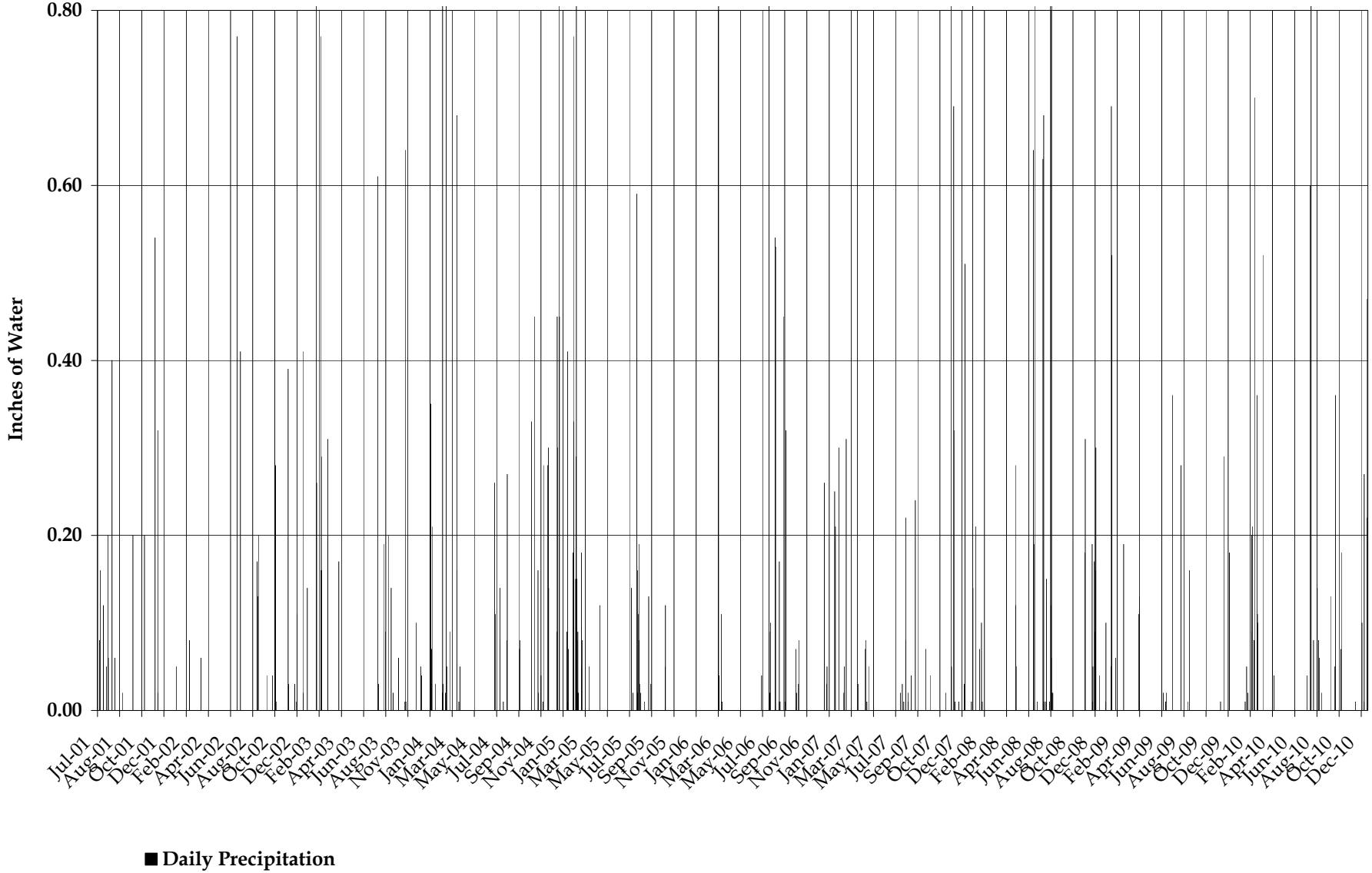


TEW01



Notes:
ft AMSL – feet Above Mean Sea Level
µg/L – micrograms per liter

DAILY PRECIPITATION DATA
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA



■ **Daily Precipitation**

TABLE A.1

GROUNDWATER MONITOR WELL NETWORK
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

			Monitoring Date	*1/7/2010*		*2/4/2010*		*3/11/2010*		*6/2/2010*		*9/7/2010*		*12/14/2010*	
Well ID	*Hydrostratigraphic Unit Sampled*	*ADEQ Hydrostratigraphic Unit Screened*	*Reference Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*
AS02	SRG	A	1,099.67	89.62	1,010.05	88.75	1,010.92	88.02	1,011.65	82.60	1,017.15	82.13	1,017.15	83.04	1,017.62
ASE28-A	SRG	A	1,108.20	--	--	--	--	86.78	1,021.42	--	--	79.19	1,029.01	82.32	1,025.88
ASE36-A	SRG	A	1,102.58	--	--	--	--	84.91	1,017.67	--	--	77.13	1,025.45	--	--
ASE76-A	SRG	A	1,105.42	--	--	--	--	--	--	--	--	79.45	1,025.97	80.35	1,025.07
ASE76-B	BF	B/D	1,105.34	--	--	--	--	--	--	--	--	79.54	1,025.80	80.50	1,024.84
ASE77-A	SRG	A	1,101.86	--	--	--	--	86.85	1,015.01	--	--	80.94	1,020.92	81.53	1,020.33
ASE77-B	BF	B/D	1,101.76	--	--	--	--	87.43	1,014.33	--	--	81.61	1,020.15	82.22	1,019.54
ASE78-B	BF	B	1,099.97	--	--	--	--	86.54	1,013.43	--	--	80.32	1,019.65	81.06	1,018.91
ASE86-A	SRG	A	1,106.07	--	--	--	--	84.39	1,021.68	--	--	78.16	1,027.91	78.40	1,027.67
ASE87-A	SRG	A	1,113.84	--	--	--	--	84.86	1,028.98	--	--	76.53	1,037.31	77.87	1,035.97
ASE88-B	BF	B/D	1,103.08	--	--	--	--	88.09	1,014.99	--	--	81.25	1,021.83	82.26	1,020.82
BC11-A	BF	D	1,111.21	--	--	--	--	88.25	1,022.96	--	--	80.97	1,030.24	81.82	1,029.39
BC11-B	BF	B	1,111.25	--	--	--	--	89.27	1,021.98	--	--	82.14	1,029.11	82.92	1,028.33
CRA01	SRG	A	1,106.43	92.92	1,013.51	91.30	1,015.13	92.21	1,014.22	90.99	1,015.44	89.17	1,017.26	89.06	1,017.37
DM515-210	BF	D	1,103.61	85.22	1,018.39	84.40	1,019.21	84.45	1,019.16	81.00	1,022.61	78.80	1,024.81	79.49	1,024.12
EW06	SRG	A	1,097.75	88.79	1,008.96	87.16	1,010.59	87.51	1,010.24	83.06	1,014.69	82.02	1,015.73	82.71	1,015.04
EW07	SRG	A	1,104.96	95.65	1,009.31	91.72	1,013.24	94.33	1,010.63	92.25	1,012.71	90.30	1,014.66	90.78	1,014.18
EW13-118	SRG	A	1,092.71	--	--	--	--	--	--	--	--	81.14	1,011.57	--	--
EW13-228	BF	D	1,092.71	--	--	--	--	--	--	--	--	79.14	1,013.57	--	--
EW13-268	BF	D	1,092.71	--	--	--	--	--	--	--	--	78.57	1,014.14	--	--
EW19-D	BF	D	1,087.48	78.91	1,008.57	78.29	1,009.19	76.95	1,010.53	74.87	1,012.61	76.62	1,010.86	74.50	1,012.98
EW19-S	SRG	A	1,087.42	87.92	999.50	87.21	1,000.21	86.43	1,000.99	83.26	1,004.16	83.27	1,004.15	82.90	1,004.52
EW21	SRG	A	1,094.11	93.38	1,000.73	92.64	1,001.47	92.15	1,001.96	89.61	1,004.50	89.14	1,004.97	88.85	1,005.26
EW22-D	BF	D	1,095.75	82.98	1,012.77	82.20	1,013.55	81.34	1,014.41	79.45	1,016.30	80.78	1,014.97	78.92	1,016.83
EW22-S	SRG	A	1,095.72	92.52	1,003.20	91.44	1,004.28	91.30	1,004.42	88.45	1,007.27	87.75	1,007.97	87.70	1,008.02
EWM	SRG/BF	A/B/D	1,103.61	108.05	995.56	91.86	1,011.75	105.70	997.91	102.60	1,001.01	100.35	1,003.26	100.85	1,002.76
EWN	SRG/BF	A/B/D	1,110.78	118.51	992.27	98.90	1,011.88	117.80	992.98	113.60	997.18	111.45	999.33	123.99	986.79
EWS	SRG/BF	A/B/C	1,100.37	104.40	995.97	89.57	1,010.80	100.90	999.47	96.80	1,003.57	97.18	1,003.19	98.80	1,001.57
EWSPZ1	SRG/BF	A/B/D	1,098.26	90.26	1,008.00	86.70	1,011.56	89.10	1,009.16	85.29	1,012.97	83.99	1,014.27	84.68	1,013.58
NW01	SRG	A	1,112.22	84.69	1,027.53	84.27	1,027.95	84.32	1,027.90	83.45	1,028.77	81.59	1,030.63	81.09	1,031.13
NW02	SRG	B	1,101.83	95.48	1,006.35	90.25	1,011.58	94.42	1,007.41	91.74	1,010.09	90.05	1,011.78	90.70	1,011.13
NW03	SRG	A	1,097.16	90.37	1,006.79	85.22	1,011.94	89.31	1,007.85	86.11	1,010.81	84.48	1,012.44	85.05	1,011.87
NW04-D	SRG	B	1,099.92	91.57	1,008.35	90.61	1,009.31	91.69	1,008.23	89.05	1,009.88	87.85	1,011.08	87.35	1,011.58
NW04-S	SRG	A	1,099.96	89.40	1,010.56	79.66	1,020.30	91.98	1,007.98	89.28	1,009.58	87.85	1,011.01	88.14	1,010.72
NW05-S	SRG	A	1,099.98	89.02	1,010.96	77.18	1,022.80	91.74	1,008.24	88.90	1,009.94	87.29	1,011.55	87.78	1,011.06
NW06-D	BF	B	1,096.92	89.24	1,007.68	87.21	1,009.71	87.99	1,008.93	84.29	1,012.63	83.05	1,013.87	83.78	1,011.75
NW06-S	SRG	A	1,096.82	88.14	1,008.68	87.11	1,009.71	87.91	1,008.91	84.20	1,012.62	83.25	1,013.57	83.69	1,011.80
NW07-D	BF	D	1,094.21	86.84	1,007.37	37.70	1,056.51	85.66	1,008.55	81.36	1,012.67	81.18	1,012.85	81.14	1,012.89
NW07-M	SRG	B	1,093.94	87.35	1,006.59	80.34	1,013.60	86.09	1,007.85	81.85	1,012.04	81.15	1,012.74	81.60	1,012.29
NW07-S	SRG	A	1,094.19	82.24	1,011.95	82.31	1,011.88	86.16	1,008.03	81.89	1,012.23	81.31	1,012.81	82.09	1,012.03
NW08-D	BF	D	1,098.72	87.62	1,011.10	78.73	1,019.99	87.24	1,011.48	83.85	1,013.83	82.69	1,014.99	82.72	1,014.96
NW08-M	BF	B	1,098.65	89.39	1,009.26	80.22	1,018.43	88.95	1,009.70	85.24	1,012.31	83.93	1,013.62	83.53	1,014.02
NW08-S	SRG	A	1,098.45	89.48	1,008.97	85.09	1,013.36	88.34	1,010.11	84.83	1,012.56	83.25	1,014.14	83.92	1,013.47

TABLE A.1

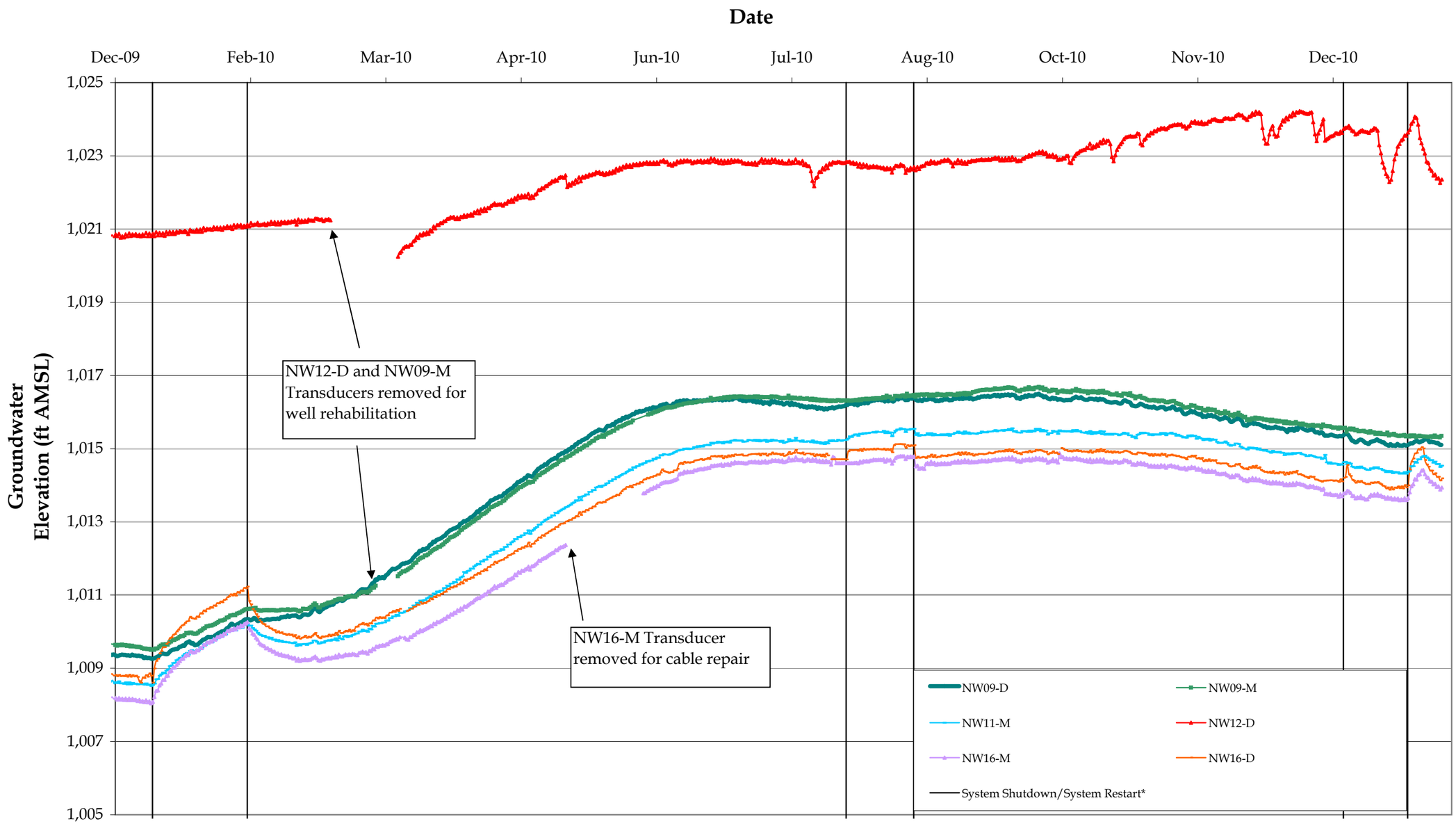
GROUNDWATER MONITOR WELL NETWORK
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

			Monitoring Date	*1/7/2010*		*2/4/2010*		*3/11/2010*		*6/2/2010*		*9/7/2010*		*12/14/2010*	
Well ID	*Hydrostratigraphic Unit Sampled*	*ADEQ Hydrostratigraphic Unit Screened*	*Reference Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*	*Depth to Water (ft)*	*Groundwater Elevation (ft AMSL)*
NW09-D	BF	D	1,099.58	90.28	1,009.30	89.44	1,010.14	88.63	1,010.95	83.68	1,015.90	83.29	1,016.29	84.06	1,015.52
NW09-D2	BF	D	1,099.30	90.09	1,009.21	89.31	1,009.99	88.31	1,010.99	83.46	1,015.84	83.10	1,016.20	83.91	1,015.39
NW09-M	SRG	B	1,099.42	89.85	1,009.57	89.02	1,010.40	88.46	1,010.96	83.64	1,015.78	82.88	1,016.54	83.70	1,015.72
NW10-D	BF	D	1,098.91	89.05	1,009.86	88.36	1,010.55	87.27	1,011.64	81.89	1,017.02	81.51	1,017.40	82.54	1,016.37
NW11-D	BF	D	1,097.69	88.98	1,008.71	87.50	1,010.19	87.48	1,010.21	83.03	1,014.66	82.38	1,015.31	83.11	1,014.58
NW11-M	SRG	B	1,097.59	88.75	1,008.84	87.26	1,010.33	87.50	1,010.09	82.98	1,014.61	82.02	1,015.57	82.71	1,014.88
NW12-D	BF	D	1,104.10	83.34	1,020.76	83.01	1,021.09	86.80	1,017.30	81.33	1,022.90	81.35	1,022.88	79.89	1,024.21
NW13-D	BF	D	1,096.61	88.75	1,007.86	87.93	1,008.68	87.15	1,009.46	82.40	1,014.21	82.10	1,014.51	82.66	1,013.95
NW13-M	SRG	B	1,096.67	88.79	1,007.88	88.13	1,008.54	87.42	1,009.25	82.71	1,013.96	82.25	1,014.42	82.85	1,013.82
NW14-D	BF	D	1,096.12	88.08	1,008.04	87.09	1,009.03	86.56	1,009.56	81.99	1,014.13	81.52	1,014.60	82.07	1,014.05
NW14-M	SRG	B	1,096.11	88.22	1,007.89	87.17	1,008.94	86.82	1,009.29	82.28	1,013.83	81.81	1,014.30	82.21	1,013.90
NW15-S	Colluvium	NA	1,099.02	87.39	1,011.63	86.10	1,012.92	86.19	1,012.83	81.48	1,017.48	80.16	1,018.80	81.13	1,017.89
NW16-D	BF	D	1,097.96	89.31	1,008.65	86.90	1,011.06	87.94	1,010.02	83.98	1,013.98	83.18	1,014.78	83.66	1,014.30
NW16-M	BF	B	1,097.92	89.74	1,008.18	87.73	1,010.19	88.50	1,009.42	84.28	1,013.64	83.29	1,014.63	83.90	1,014.02
NW17-S	Colluvium	NA	1,096.75	90.32	1,006.43	88.07	1,008.68	89.11	1,007.64	85.75	1,011.00	84.69	1,012.06	85.05	1,011.70
NW18-M	Colluvium	NA	1,094.92	88.64	1,006.28	86.96	1,007.96	87.35	1,007.57	83.75	1,011.17	82.86	1,012.06	83.20	1,011.72
NW18-S	SRG	A	1,094.78	88.51	1,006.27	86.74	1,008.04	87.27	1,007.51	83.66	1,011.12	82.76	1,012.02	83.13	1,011.65
NW19-D	BF	D	1,100.50	88.71	1,011.79	87.76	1,012.74	87.15	1,013.35	81.90	1,018.60	81.14	1,019.36	82.21	1,018.29
NW19-M	BF	B	1,100.69	88.75	1,011.94	87.92	1,012.77	87.27	1,013.42	82.20	1,018.49	81.16	1,019.53	82.25	1,018.44
OU312-D	BF	D	1,090.77	81.75	1,009.02	80.97	1,009.80	79.88	1,010.89	76.91	1,013.86	77.92	1,012.85	76.88	1,013.89
OU312-M	SRG	B	1,090.79	87.46	1,003.33	86.61	1,004.18	86.04	1,004.75	82.40	1,008.39	82.11	1,008.68	82.11	1,008.68
OU313-D	BF	D	1,095.71	89.30	1,006.41	88.35	1,007.36	--	--	--	--	85.03	1,010.68	84.61	1,011.10
OU313-M	SRG	B	1,095.75	92.45	1,003.30	91.39	1,004.36	91.19	1,004.56	88.19	1,007.56	87.60	1,008.15	--	--
OU314-D	BF	D	1,099.14	83.21	1,015.93	82.14	1,017.00	82.01	1,017.13	80.34	1,018.80	80.80	1,018.34	79.63	1,019.51
OU314-M	SRG	B	1,099.05	93.56	1,005.49	92.00	1,007.05	92.60	1,006.45	90.47	1,008.58	89.25	1,009.80	89.25	1,009.80
PHXA06 [1]	SRG	A	1,100.44	87.71	1,012.73	86.14	1,014.30	86.53	1,013.91	--	--	80.46	1,019.95	81.45	1,018.99
PZ01-D	BR	C	1,102.69	96.90	1,005.79	89.89	1,012.80	95.84	1,006.85	93.01	1,009.68	91.10	1,011.59	91.95	1,010.74
PZ01-S	SRG	A	1,102.69	96.96	1,005.73	89.95	1,012.74	95.90	1,006.79	93.09	1,009.60	91.16	1,011.53	92.00	1,010.69
PZ02-D	BR	C	1,107.95	102.31	1,005.64	95.34	1,012.61	101.29	1,006.66	98.50	1,009.45	96.56	1,011.39	97.59	1,010.36
PZ02-S	SRG	A	1,107.95	102.30	1,005.65	95.39	1,012.56	101.35	1,006.60	98.53	1,009.42	96.58	1,011.37	97.61	1,010.34
TEW01	SRG	A	1,103.56	97.85	1,005.71	90.94	1,012.62	96.81	1,006.75	94.03	1,009.53	92.11	1,011.45	92.94	1,010.62

Notes:

"--" = Not Measured
SRG = SRGs
BF = BF Deposits
BR = BR
NI = No Information
NA = Not Applicable
ft AMSL = feet Above Mean Sea Level
[1] PHX well is different survey datum

ADEQ Hydrostratigraphic Unit Designation
A = SRGs
B = Interbedded sands and silt/clays
C = BR
D = Interbedded sands and silt/clays w/ fine grained silt/clay marker bed at top of unit



Notes:
* Full system shutdown or individual well shutdown or restart
See monthly progress reports for full description of shutdown/restart events
ft AMSL - feet Above Mean Sea Level

SELECT MONITOR WELL DATALOGGER DATA
52nd STREET SUPERFUND SITE - OU2 AREA
Phoenix, Arizona

APPENDIX B

OU2 AREA DATA MAPS

APPENDIX B

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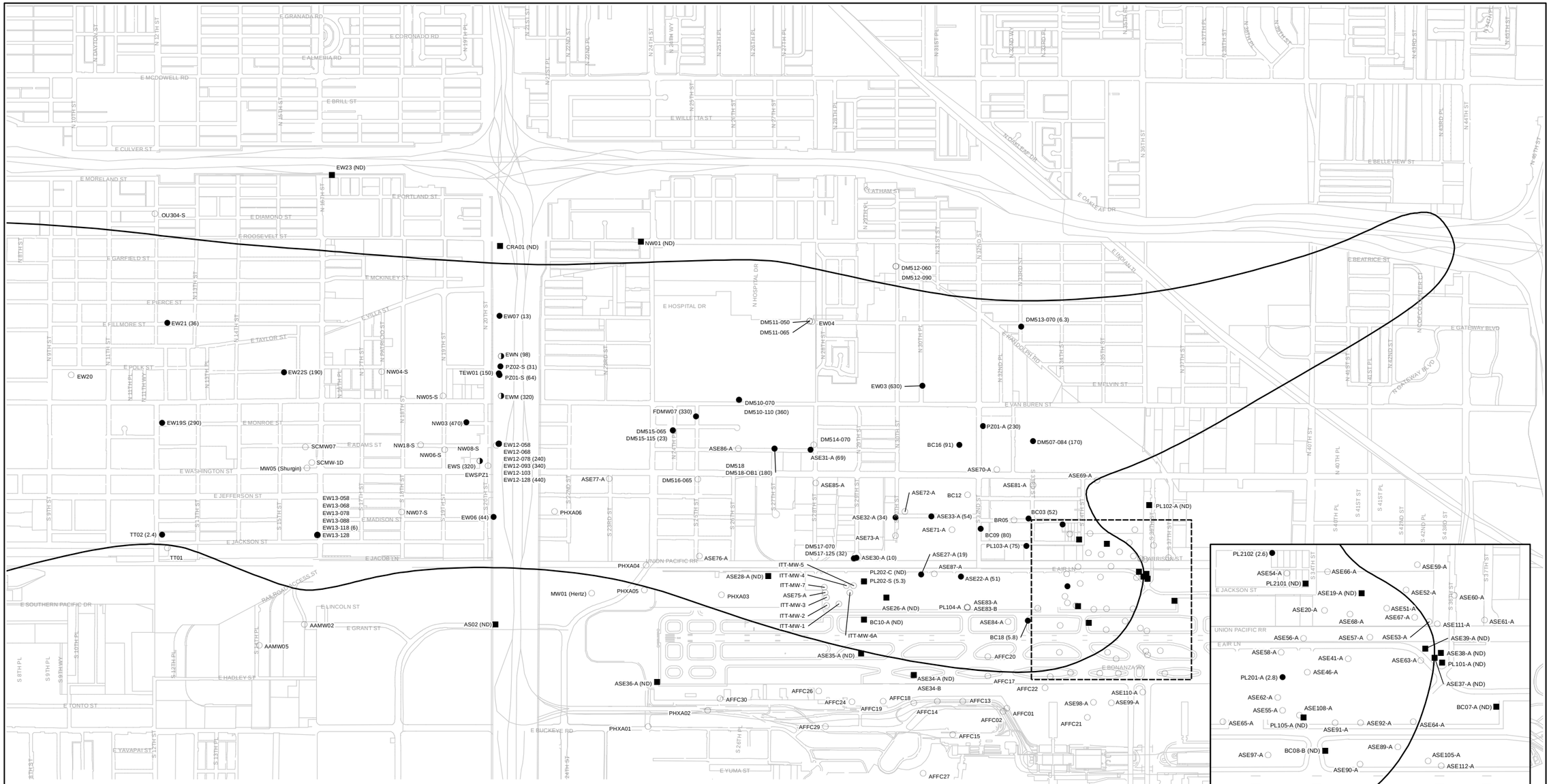
EW23 (ND)
OU304-S
CRA01 (ND)
NW01 (ND)
EW07 (13)
EW21 (36)
EW20
EW22S (190)
NW04-S
TEW01 (150)
EWN (98)
PZ02-S (31)
PZ01-S (64)
EWM (320)
NW05-S
EW19S (290)
NW03 (470)
SCMW07
NW18-S
NW06-S
NW08-S
EWS (320)
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SCMW-1D
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EW12-068
EW12-078 (240)
EW12-093 (340)
EW12-103
EW12-128 (440)
EW13-058
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EW13-118 (6)
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NW07-S
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MW01 (Hertz)
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DM510-070
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FDMW07 (330)
DM515-065
DM515-115 (23)
ASE86-A
DM514-070
ASE31-A (69)
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DM518-OB1 (180)
DM516-065
ASE77-A
ASE85-A
PZ01-A (230)
DM507-084 (170)
BC16 (91)
ASE70-A
ASE69-A
ASE81-A
ASE72-A
BC12
ASE32-A (34)
ASE33-A (54)
BR05
BC03 (52)
ASE71-A
BC09 (80)
PL103-A (75)
ASE73-A
DM517-070
DM517-125 (32)
ASE30-A (10)
ASE27-A (19)
ASE76-A
ASE87-A
ASE22-A (51)
ITT-MW-5
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ASE28-A (ND)
PL202-C (ND)
PL202-S (5.3)
ASE75-A
ASE26-A (ND)
PL104-A
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ASE83-B
BC10-A (ND)
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ASE35-A (ND)
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ASE98-A
ASE99-A
ASE110-A
PL102-A (ND)
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LEGEND

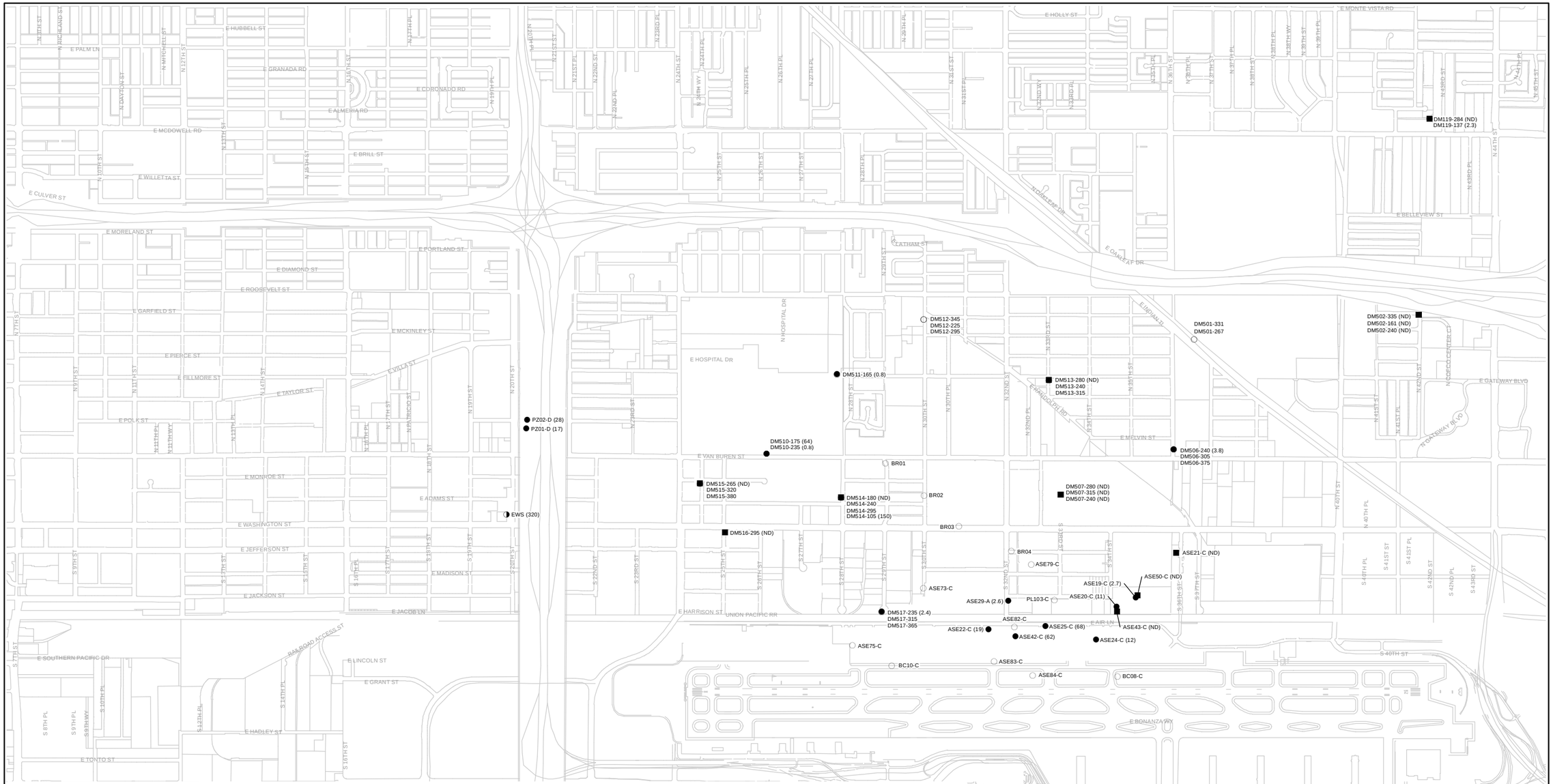
- MONITORING WELL - BASELINE TCE CONCENTRATION (ug/L)
- EXTRACTION WELL - BASELINE TCE CONCENTRATION (ug/L)
- MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- MONITORING WELL - NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK

N

0 500 1,000 2,000 Feet

figure B.3
BASELINE TCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA050_FigB-3 Thursday, April 07, 2011



LEGEND

- ● MONITORING WELL - BASELINE TCE CONCENTRATION (ug/L)
- ◑ EXTRACTION WELL - BASELINE TCE CONCENTRATION (ug/L)
- ■ MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- ○ NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS

N

0 500 1,000 2,000 Feet

figure B.4
BASELINE TCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA051_FigB-4

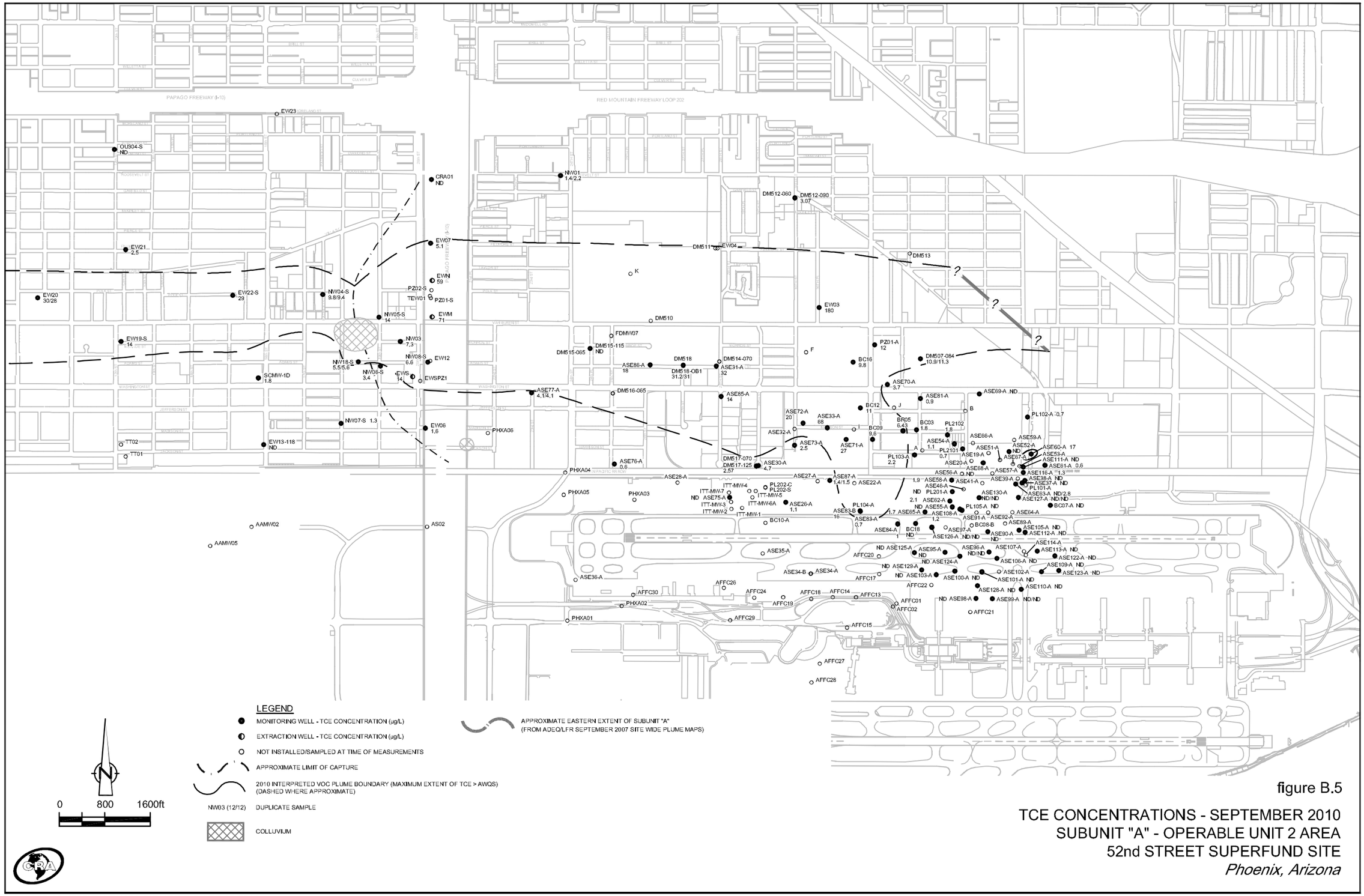


figure B.5

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX001 FIGURE B.5 APR 13/2011

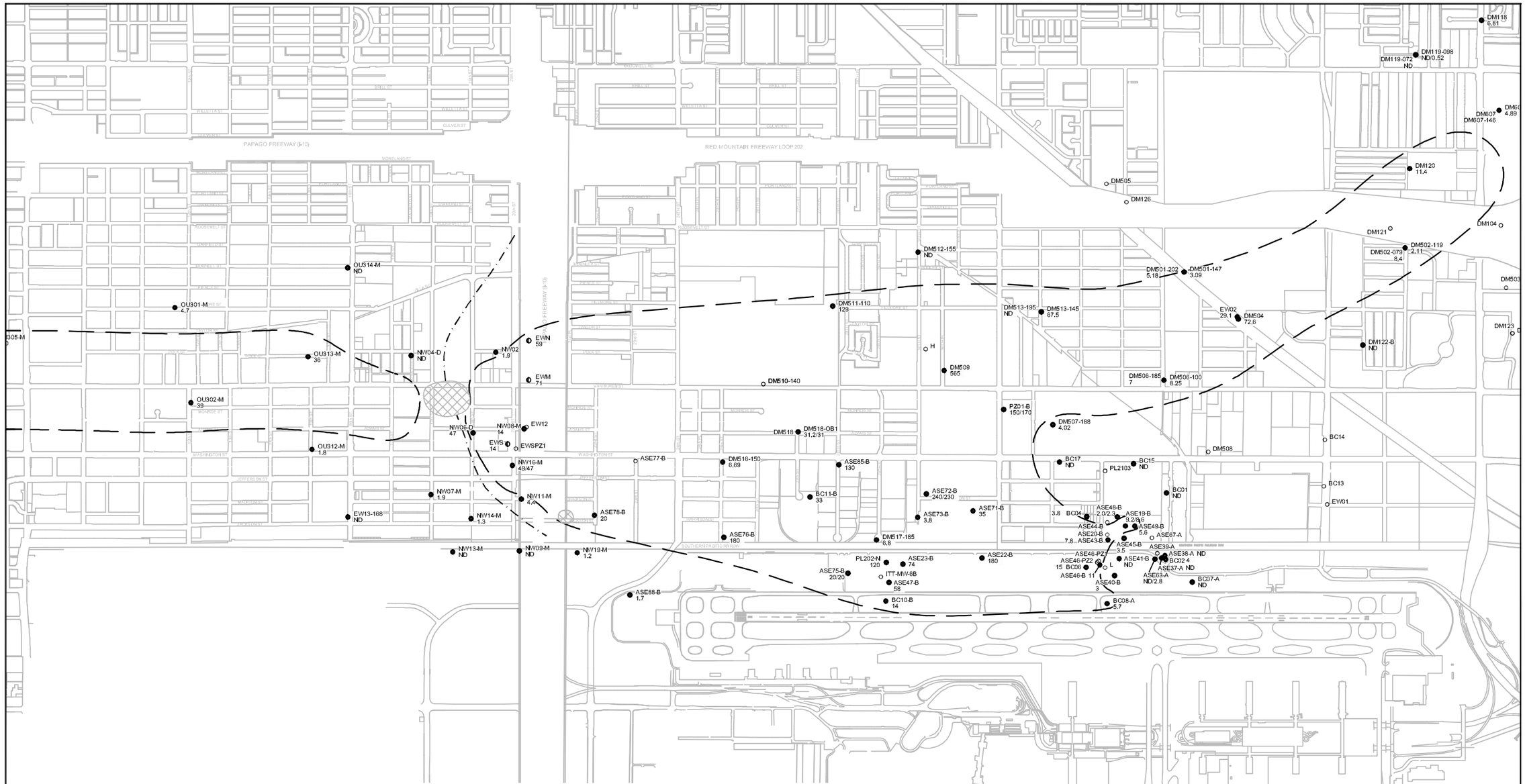


figure B.6

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX002 FIGURE B.6 APR 13/2011

figure B.7

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX003 FIGURE B.7 APR 06/2011

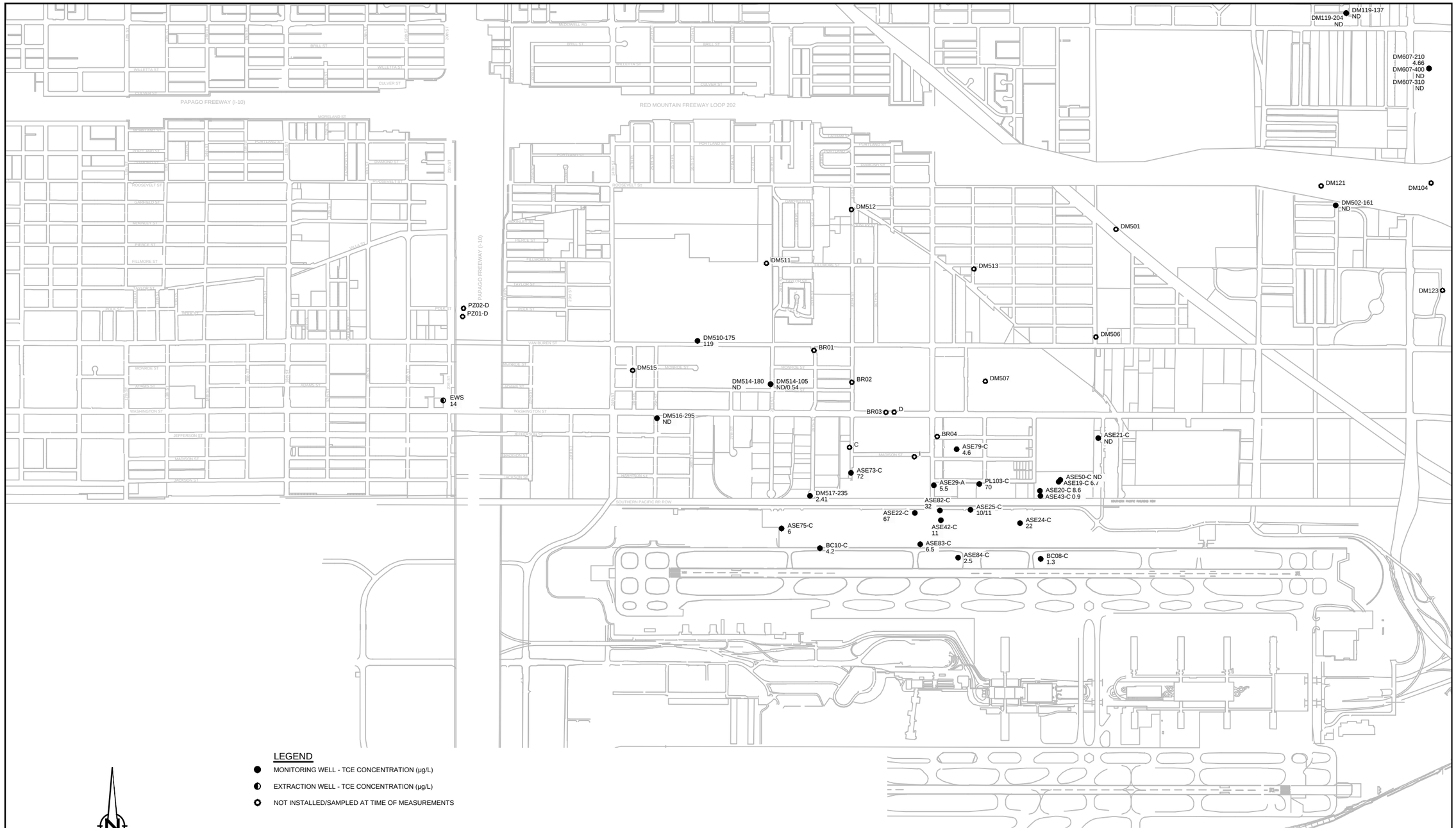
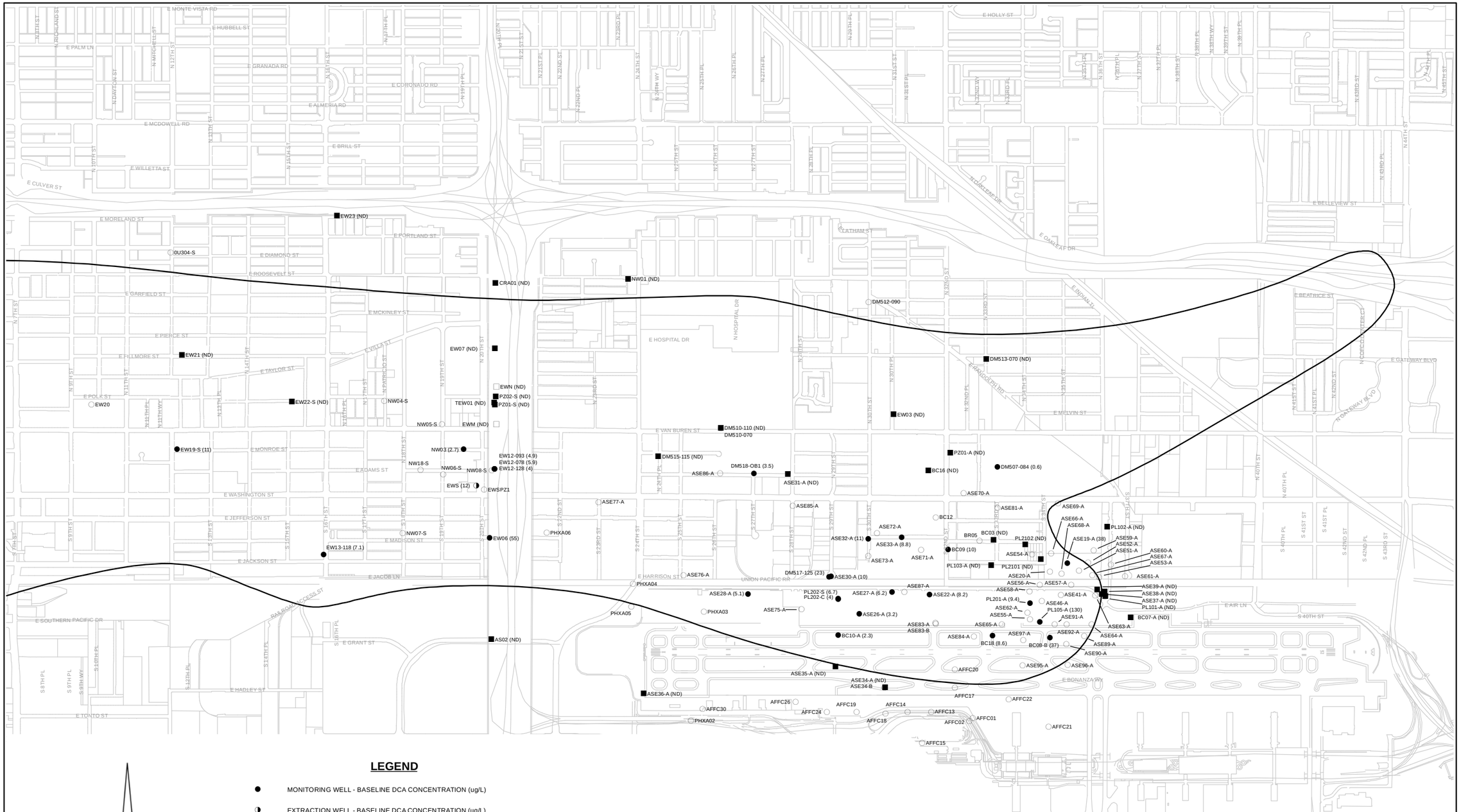


figure B.8

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX004 FIGURE B.8 APR 07/2011



LEGEND

- ● MONITORING WELL - BASELINE DCA CONCENTRATION (ug/L)
- ◑ EXTRACTION WELL - BASELINE DCA CONCENTRATION (ug/L)
- ■ MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- □ EXTRACTION WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- ○ NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE

0 500 1,000 2,000 Feet

figure B.9
BASELINE DCA CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA056_FigB-9

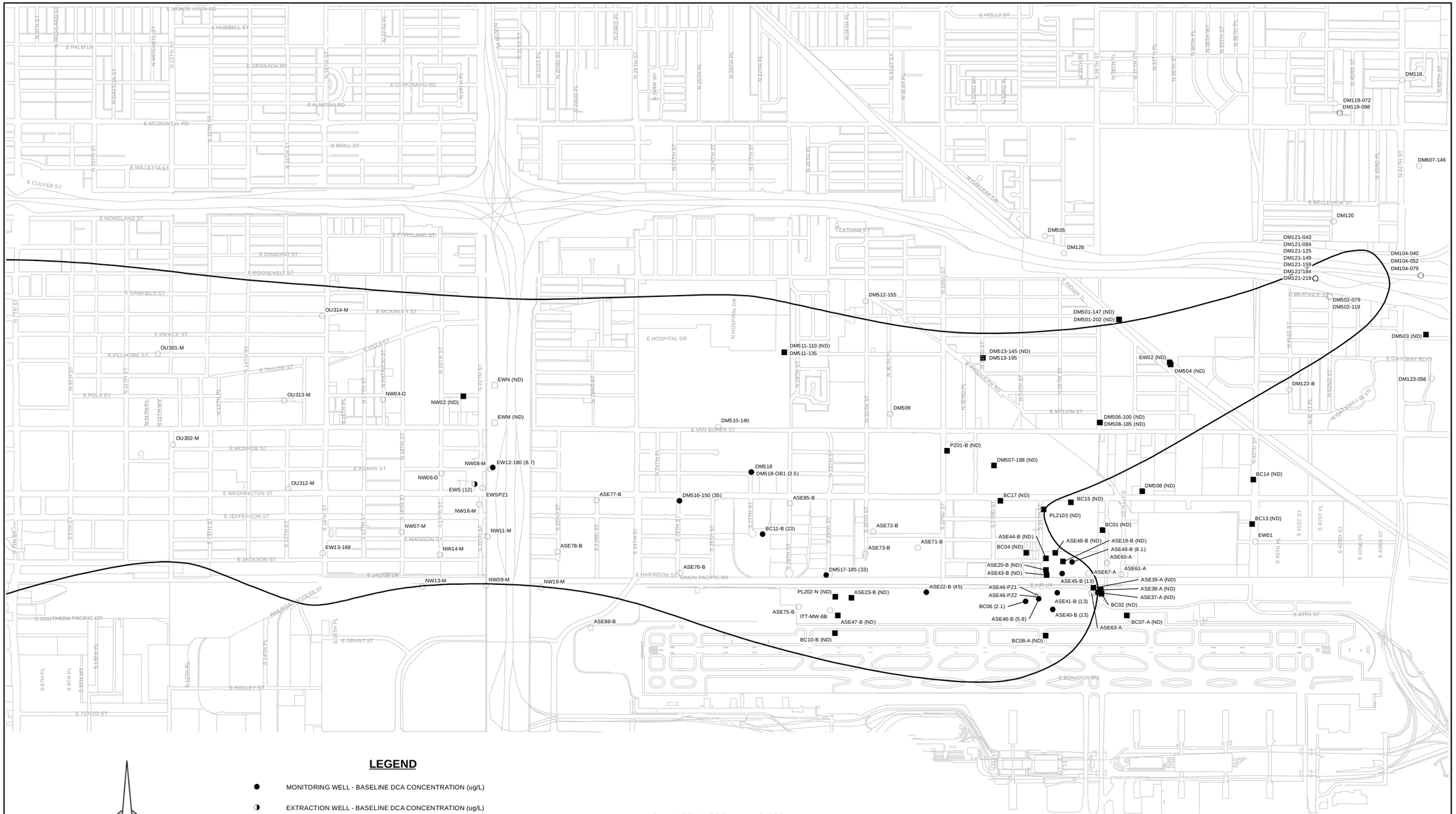


figure B.10
BASELINE DCA CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA057_FigB-10

LEGEND

- MONITORING WELL - BASELINE DCA CONCENTRATION (ug/L)
- MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- EXTRACTION WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK

0 500 1,000 2,000 Feet

figure B.11
BASELINE DCA CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA058_FigB-11 Thursday, April 07, 2011

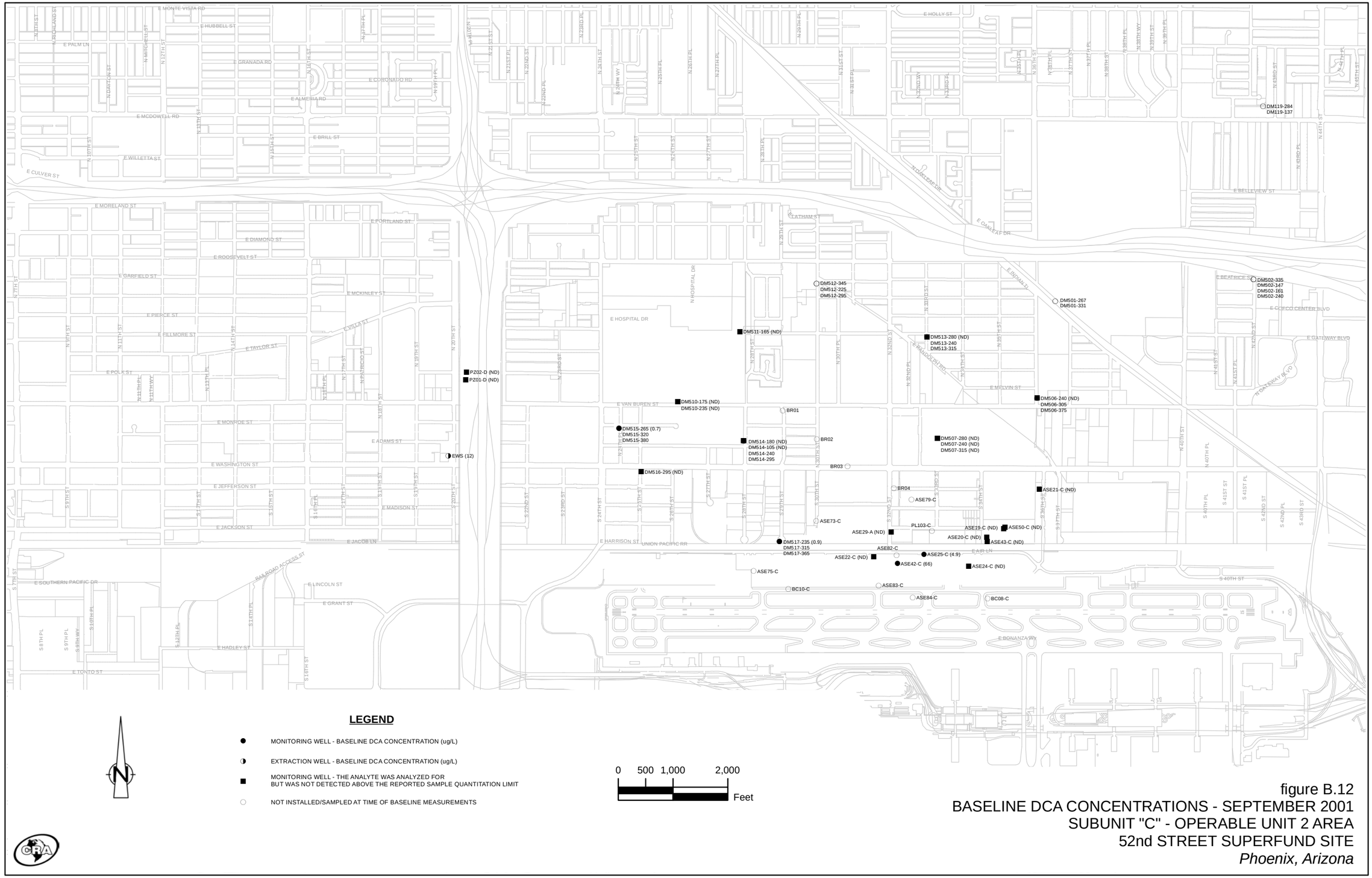


figure B.12
BASELINE DCA CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA059_FigB-12

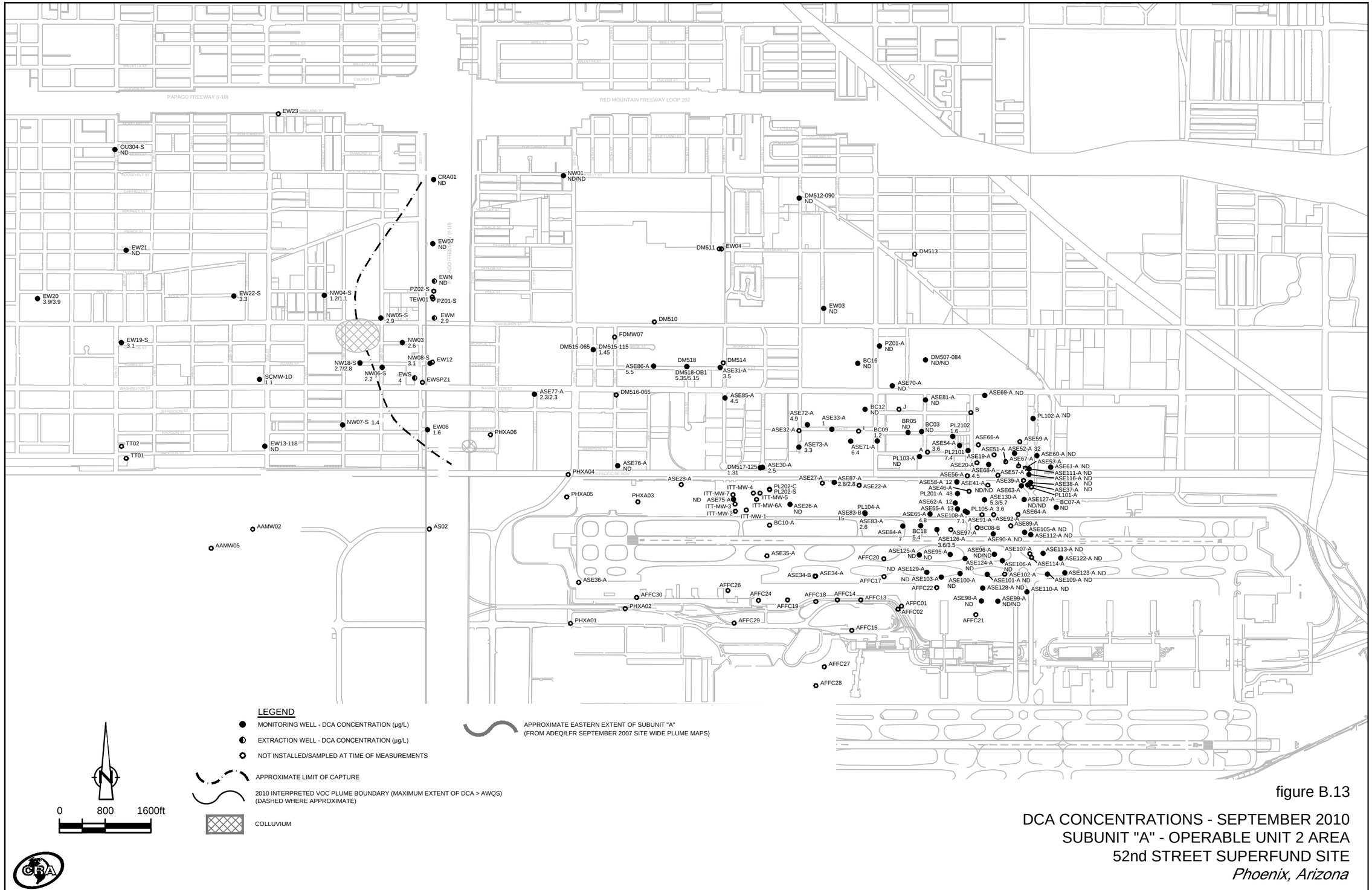


figure B.13

DCA CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX016 FIGURE B.13 APR 11/2011

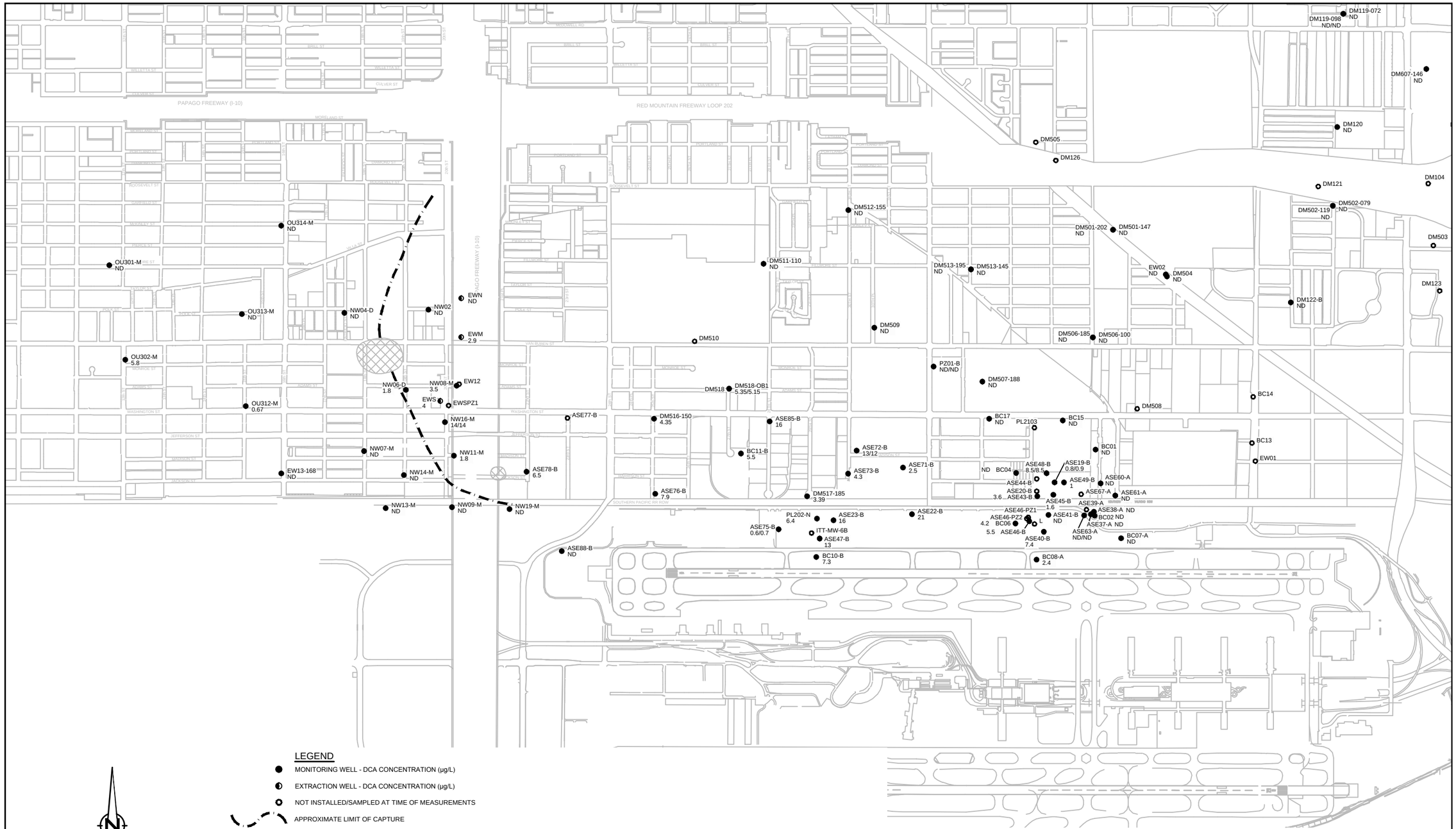


figure B.14

DCA CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX017 FIGURE B.14 APR 11/2011

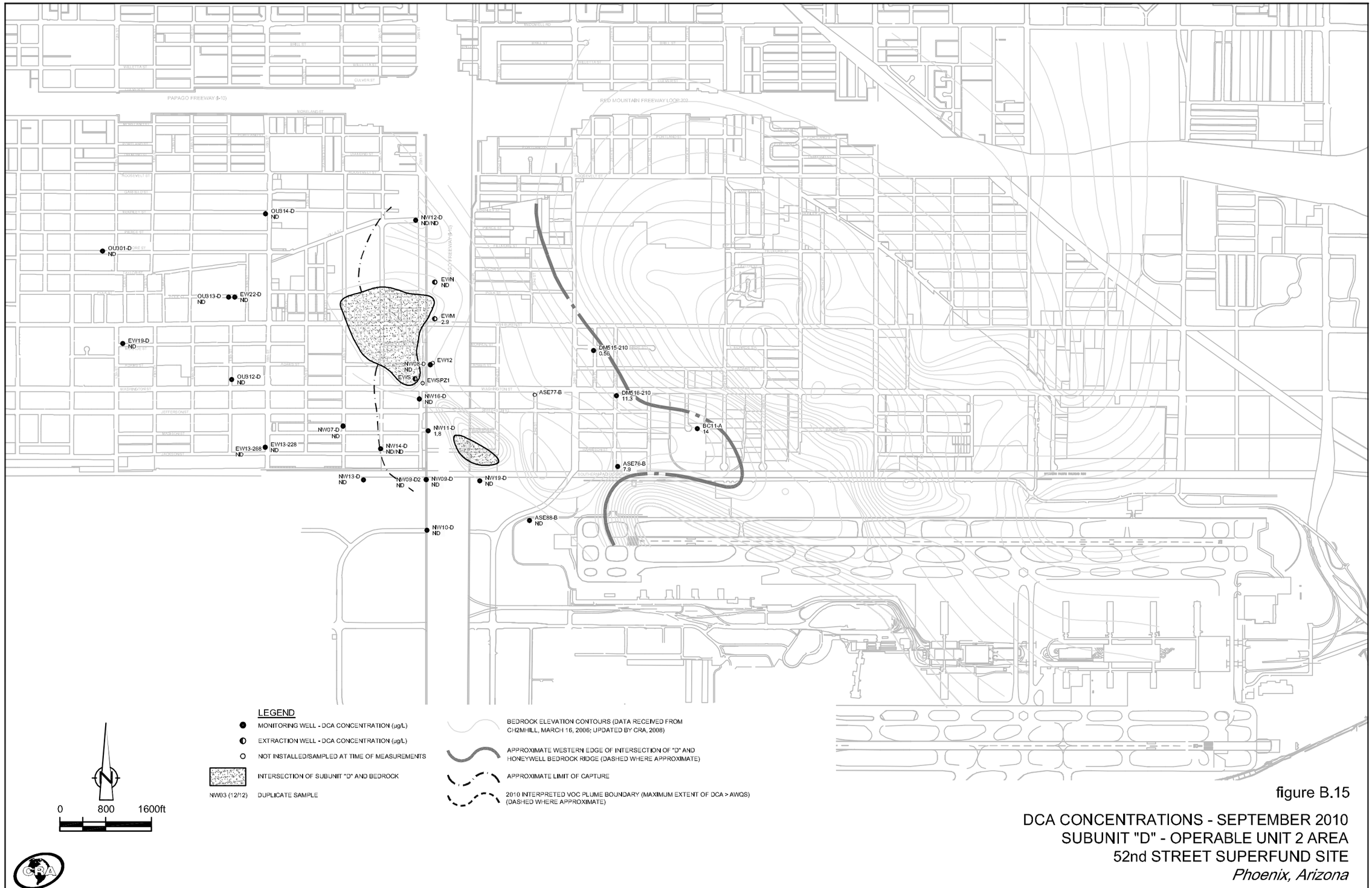
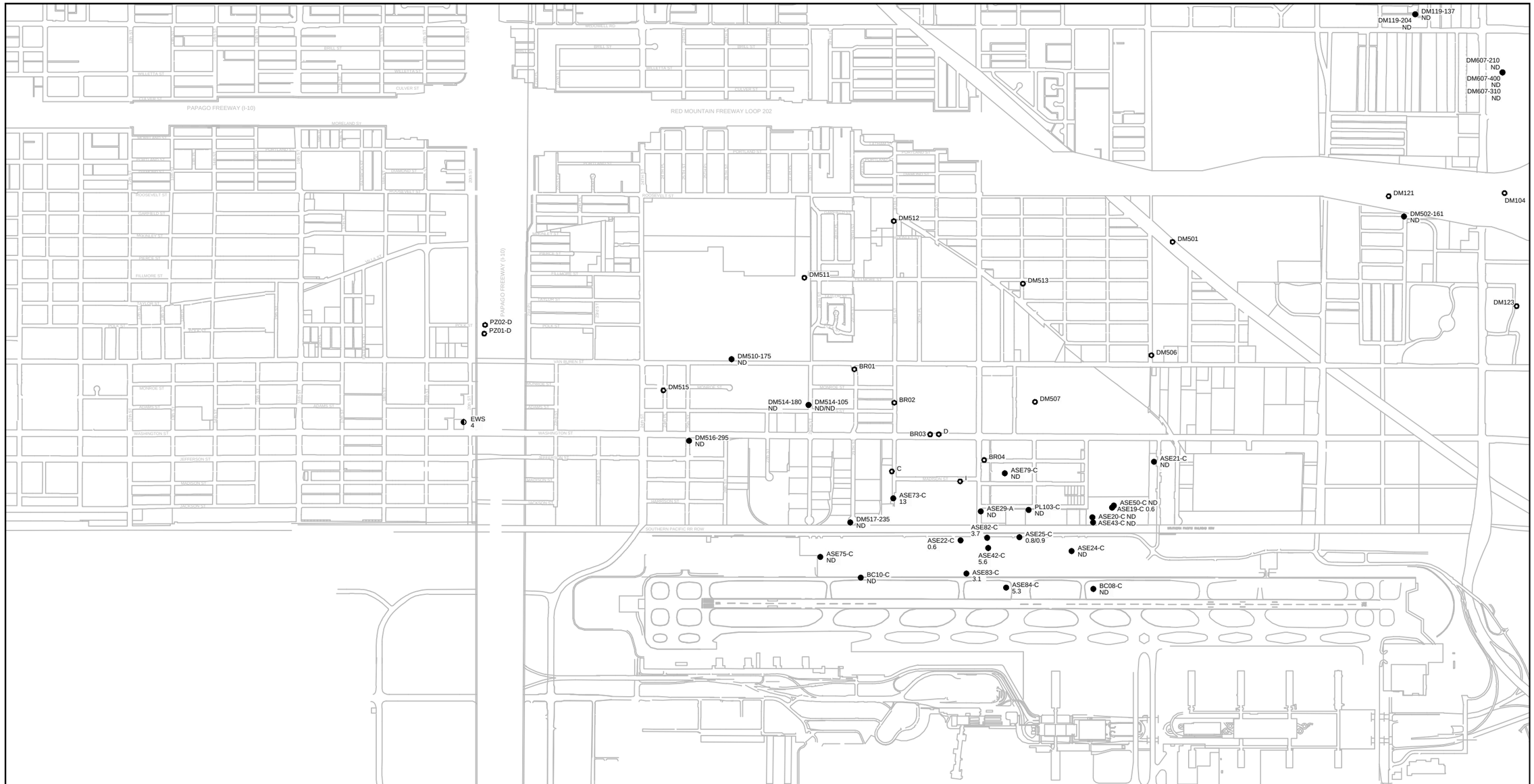


figure B.15

DCA CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX018 FIGURE B.15 APR 15/2011



LEGEND

- MONITORING WELL - DCA CONCENTRATION (µg/L)
- EXTRACTION WELL - DCA CONCENTRATION (µg/L)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS

N

0 800 1600ft

figure B.16

DCA CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX019 FIGURE B.16 APR 07/2011

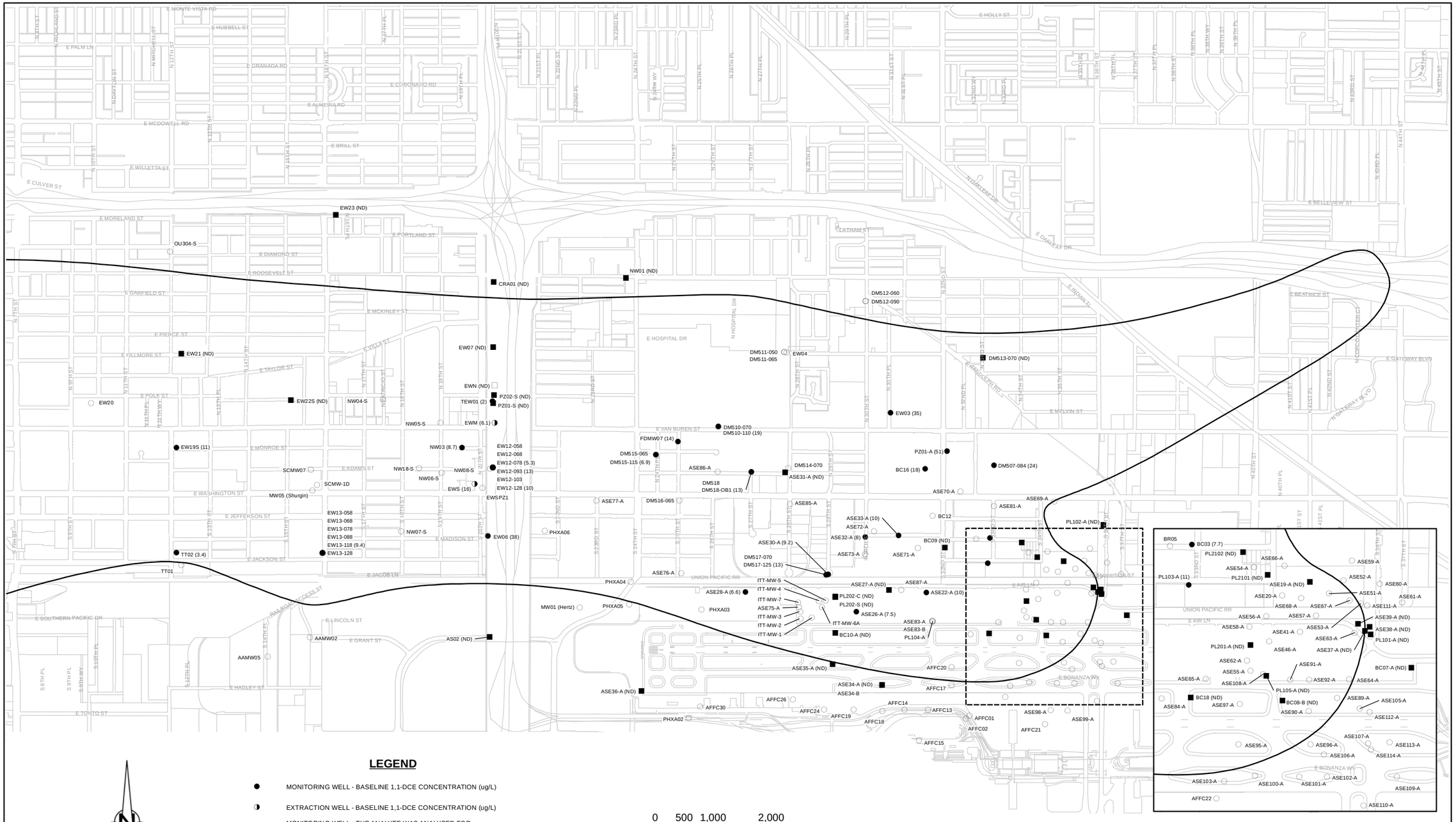
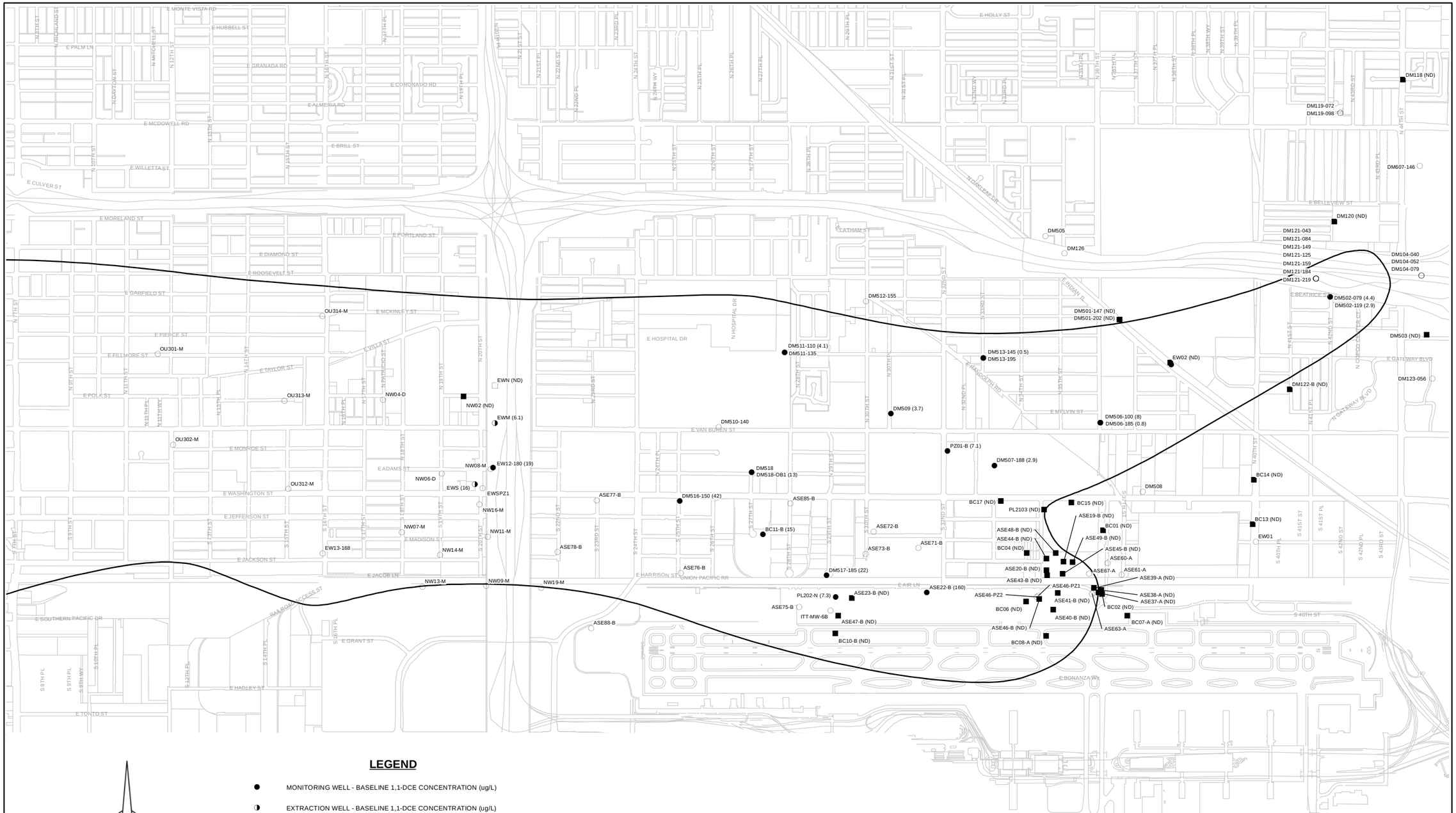


figure B.17
BASELINE 1,1-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA064_FigB-17



LEGEND

- MONITORING WELL - BASELINE 1,1-DCE CONCENTRATION (ug/L)
- EXTRACTION WELL - BASELINE 1,1-DCE CONCENTRATION (ug/L)
- MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- EXTRACTION WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE

0 500 1,000 2,000 Feet

figure B.18
BASELINE 1,1-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA065_FigB-18

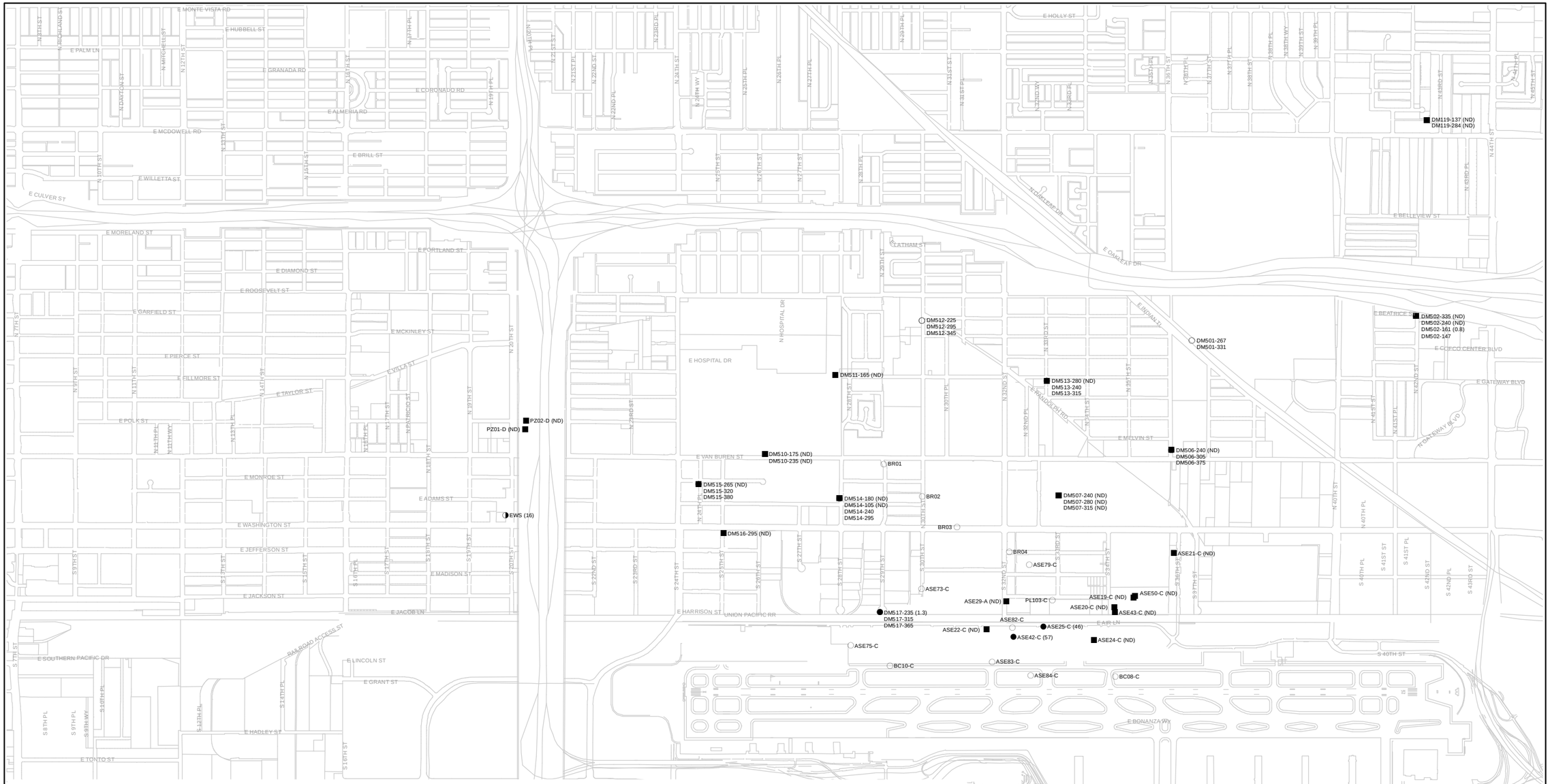
LEGEND

- ● MONITORING WELL - BASELINE 1,1-DCE CONCENTRATION (ug/L)
- ◑ EXTRACTION WELL - BASELINE 1,1-DCE CONCENTRATION (ug/L)
- ■ MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- □ EXTRACTION WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- ○ NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK

0 500 1,000 2,000 Feet

figure B.19
BASELINE 1,1-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA066_FigB-19 Thursday, April 07, 2011



LEGEND

- ● MONITORING WELL - BASELINE 1,1-DCE CONCENTRATION (ug/L)
- ◑ EXTRACTION WELL - BASELINE 1,1-DCE CONCENTRATION (ug/L)
- ■ MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- ○ NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS

N

0 500 1,000 2,000 Feet

figure B.20
BASELINE 1,1-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA067_FigB-20

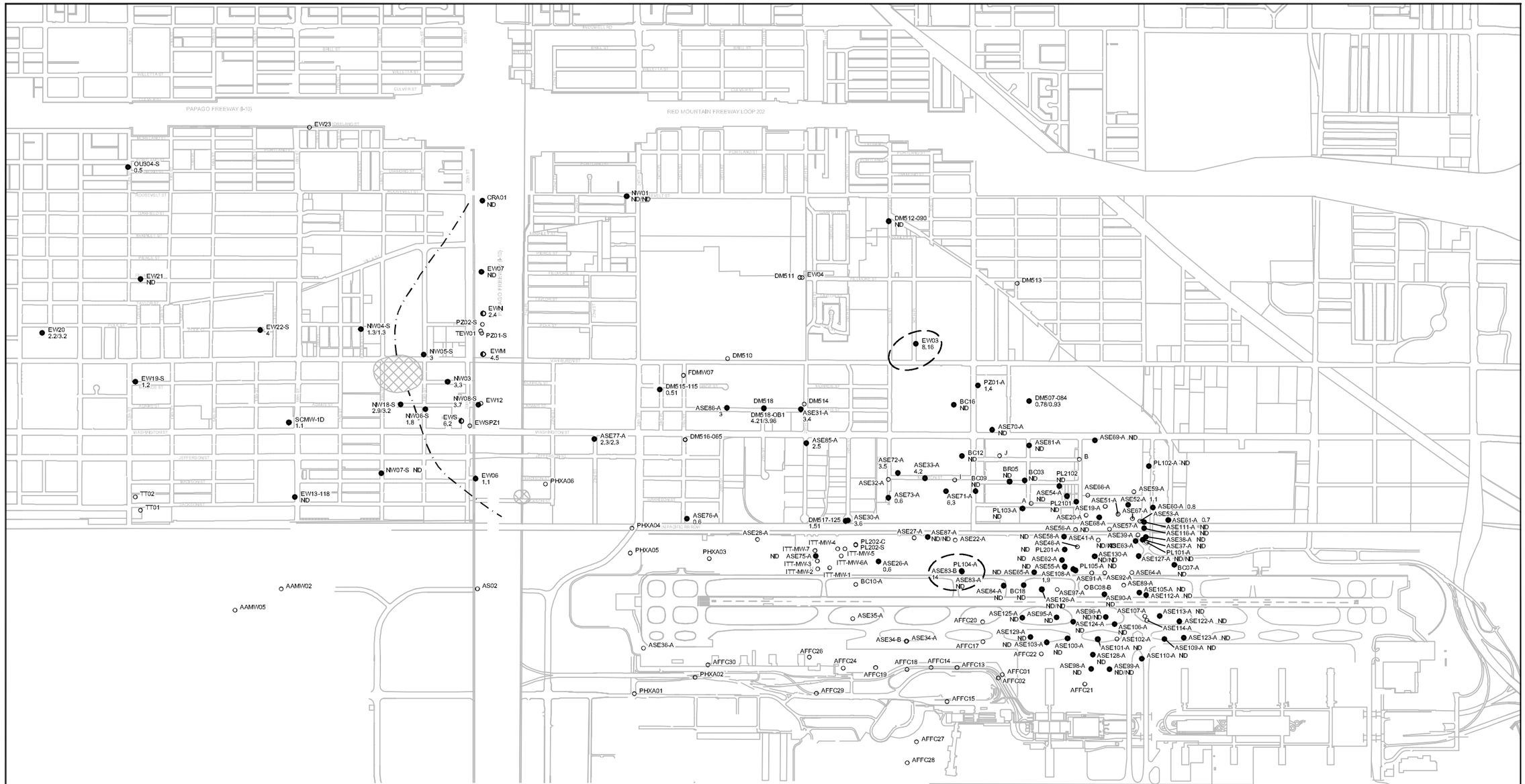


figure B.21

1,1-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX020 FIGURE B.21 APR 13/2011

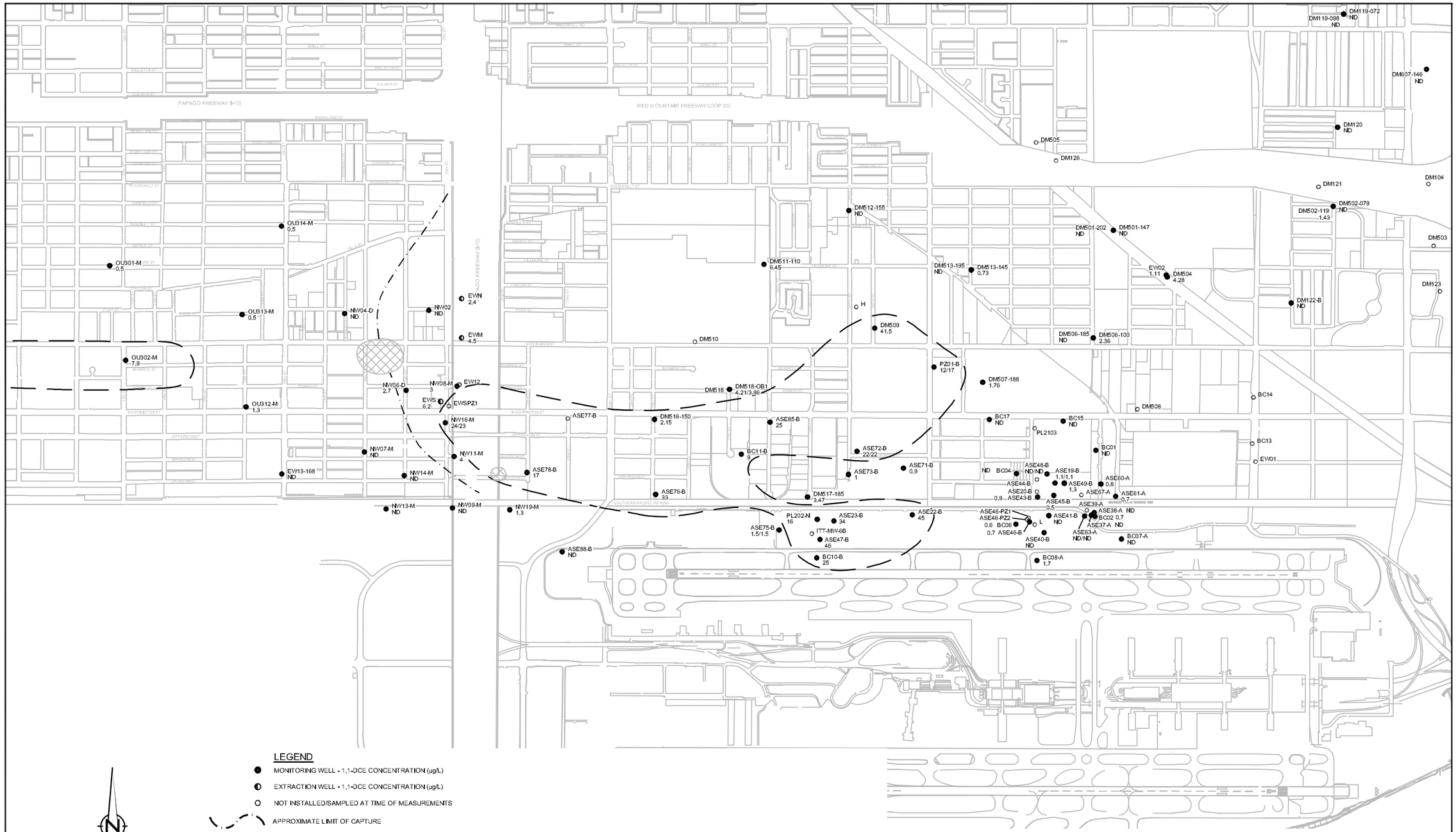


figure B.22

1,1-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX021 FIGURE B.22 APR 13/2011

LEGEND

- MONITORING WELL - 1 1-DCE CONCENTRATION (µg/L)
- EXTRACTION WELL - 1 1-DCE CONCENTRATION (µg/L)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- INTERSECTION OF SUBUNIT "D" AND BEDROCK
- NW03 (12/12) DUPLICATE SAMPLE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- APPROXIMATE LIMIT OF CAPTURE
- 2010 INTERPRETED VOC PLUME BOUNDARY (MAXIMUM EXTENT OF 1,1-DCE > AWQS) (DASHED WHERE APPROXIMATE)

0 800 1600ft

figure B.23

1,1-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX022 FIGURE B.23 APR 06/2011

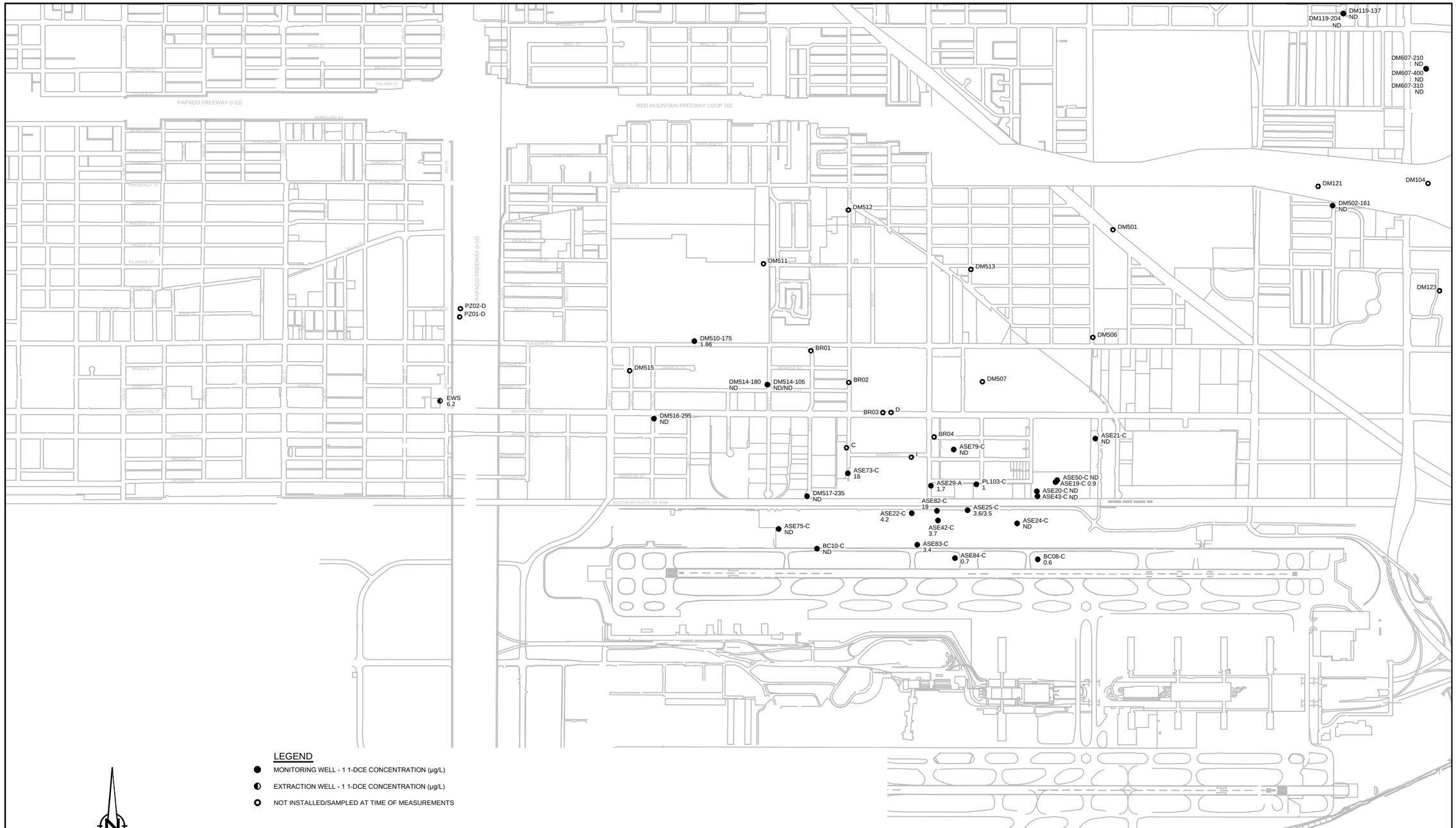
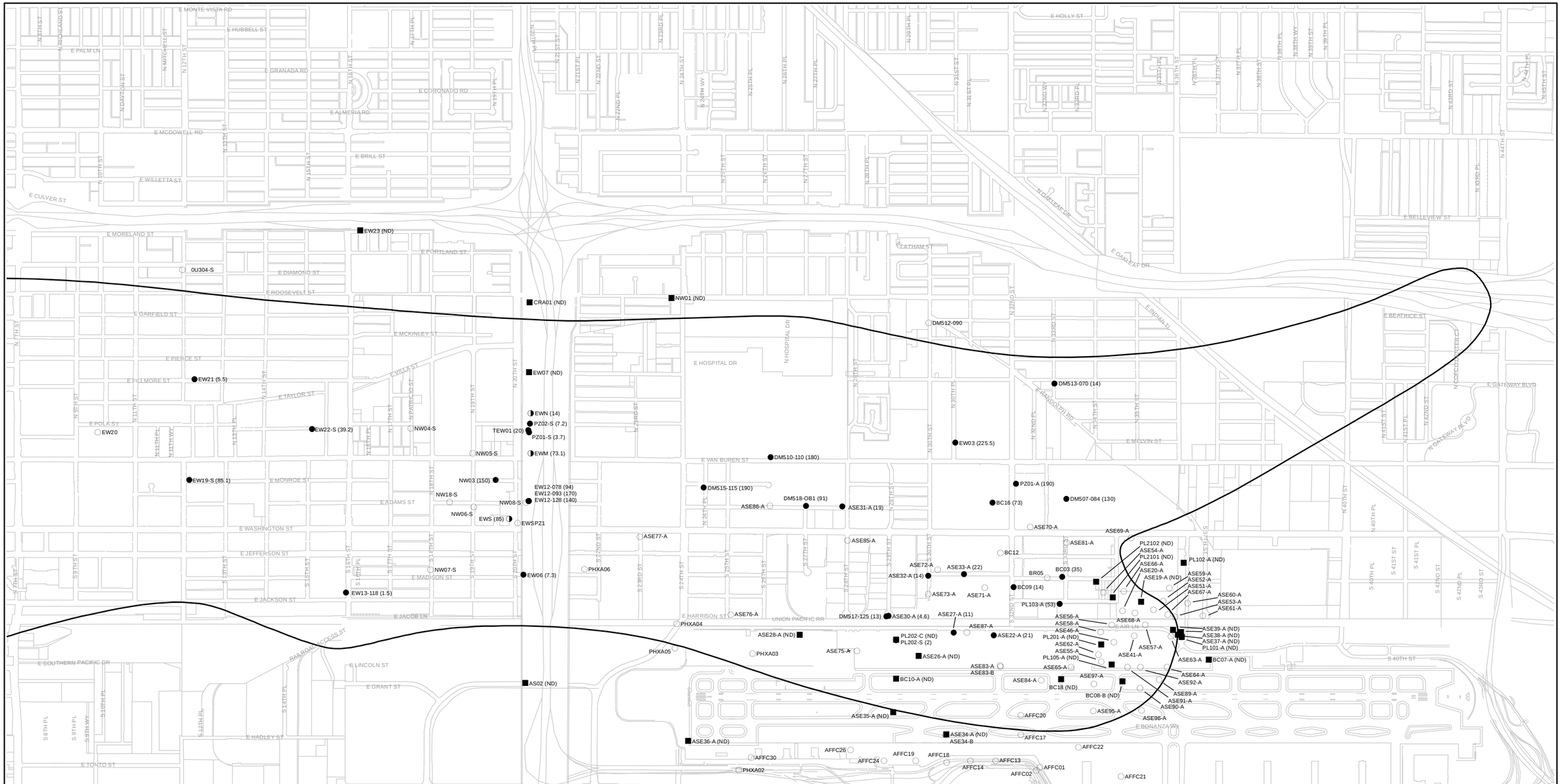


figure B.24

1,1-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX023 FIGURE B.24 APR 07/2011



LEGEND

- ● MONITORING WELL - BASELINE 1,2-DCE CONCENTRATION (ug/L)
- ◑ EXTRACTION WELL - BASELINE 1,2-DCE CONCENTRATION (ug/L)
- ■ MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- ○ NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE

0 500 1,000 2,000 Feet

figure B.25
BASELINE 1,2-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA072_FigB-25

E MONTE VISTA RD
E HUBBELL ST
E PALM LN
E GRANADA RD
E CORONADO RD
E ALMERIA RD
E MCDOWELL RD
E BRILL ST
E WILLETTA ST
E CULVER ST
E MORELAND ST
E PORTLAND ST
E DIAMOND ST
E ROOSEVELT ST
E GARFIELD ST
E MCKINLEY ST
E PIERCE ST
E FILLMORE ST
E TAYLOR ST
E POLK ST
E MONROE ST
E ADAMS ST
E WASHINGTON ST
E JEFFERSON ST
E MADISON ST
E JACKSON ST
E JACOB LN
E SOUTHERN PACIFIC DR
E GRANT ST
E HADLEY ST
E TONTO ST
E HOLLY ST
E LATHAM ST
E HOSPITAL DR
N HOSPITAL DR
E VAN BUREN ST
E VILLA ST
E PATRICIA ST
E INDIAN TL
E BELLEVIEW ST
E BEATRICE ST
E GATEWAY BLVD
N GATEWAY BLVD
E MELVIN ST
E GRANDOLPH RD
E AIR LN
UNION PACIFIC RR
RAILROAD ACCESS ST
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S 40TH ST
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OU301-M
OU313-M
OU302-M
OU312-M
NW04-D
NW02 (33)
EWN (14)
EWM (73.1)
EW12-180 (48)
NW06-D
NW08-M
EWS (85)
EWSPZ1
NW16-M
NW07-M
NW11-M
NW14-M
EW13-168
NW13-M
NW09-M
NW19-M
ASE77-B
ASE78-B
ASE88-B
DM510-140
DM511-110 (22)
DM511-135
DM512-155
DM509 (163.1)
DM516-150 (211.4)
DM517-185 (17)
DM518
DM518-OB1 (91)
BC11-B (11)
ASE76-B
ASE85-B
ASE72-B
ASE73-B
ASE71-B
ASE75-B
ITT-MW-6B
ASE47-B (13)
BC10-B (6.6)
PL202-N (13)
ASE23-B (17)
ASE22-B (69)
DM513-195
DM513-145 (5.5)
PZ01-B (190)
DM507-188 (160)
BC17 (18)
BC04 (3.1)
ASE44-B (ND)
ASE20-B (ND)
ASE43-B (ND)
ASE46-PZ1
ASE46-PZ2
BC06 (ND)
ASE46-B (ND)
ASE45-B (ND)
ASE41-B (ND)
ASE40-B (ND)
ASE67-A
ASE63-A
BC08-A (ND)
PL2103 (ND)
ASE48-B (ND)
ASE19-B (ND)
ASE49-B (ND)
ASE60-A
ASE61-A
ASE39-A (ND)
ASE38-A (ND)
ASE37-A (ND)
BC02 (ND)
BC07-A (ND)
BC15 (ND)
BC01 (ND)
DM505
DM126
DM501-147 (ND)
DM501-202 (0.9)
EW02 (5.1)
DM504 (34)
DM506-100 (24)
DM506-185 (17)
DM508
BC14 (ND)
BC13 (ND)
EW01
DM118 (ND)
DM119-098
DM119-072
DM607-146
DM120 (ND)
DM121-043
DM121-084
DM121-125
DM121-149
DM121-159
DM121-184
DM121-219
DM104-040
DM104-052
DM104-079
DM502-119 (67)
DM502-079 (16)
DM503 (ND)
DM122-B (ND)
DM123-056
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S 9TH WY
S 10TH PL
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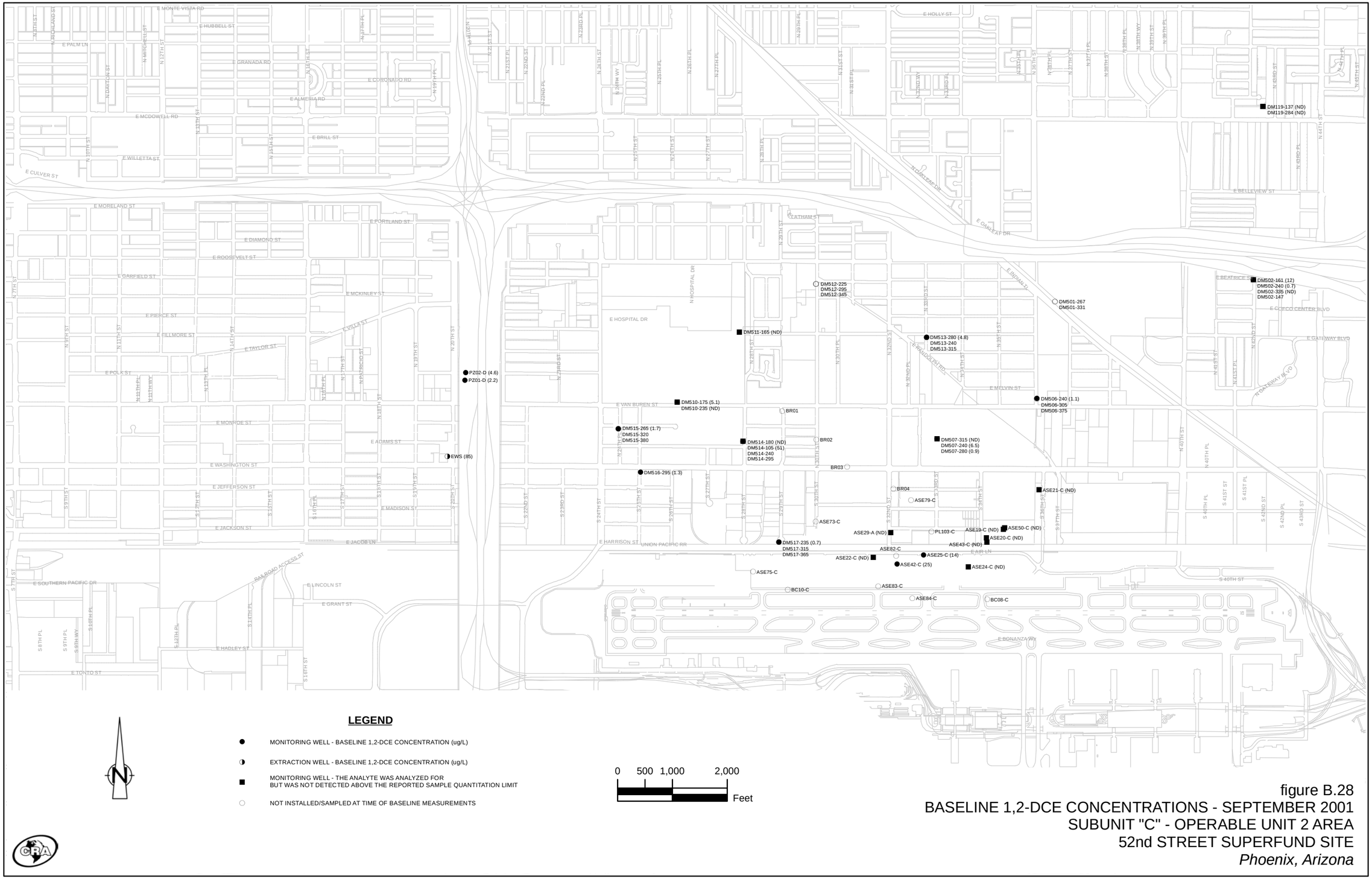
LEGEND

- MONITORING WELL - BASELINE 1,2-DCE CONCENTRATION (ug/L)
- EXTRACTION WELL - BASELINE 1,2-DCE CONCENTRATION (ug/L)
- MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK

0 500 1,000 2,000 Feet

figure B.27
BASELINE 1,2-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA074_FigB-27 Thursday, April 07, 2011



LEGEND

- ● MONITORING WELL - BASELINE 1,2-DCE CONCENTRATION (ug/L)
- ◑ EXTRACTION WELL - BASELINE 1,2-DCE CONCENTRATION (ug/L)
- ■ MONITORING WELL - THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT
- ○ NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS

0 500 1,000 2,000 Feet

figure B.28
BASELINE 1,2-DCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA075_FigB-28

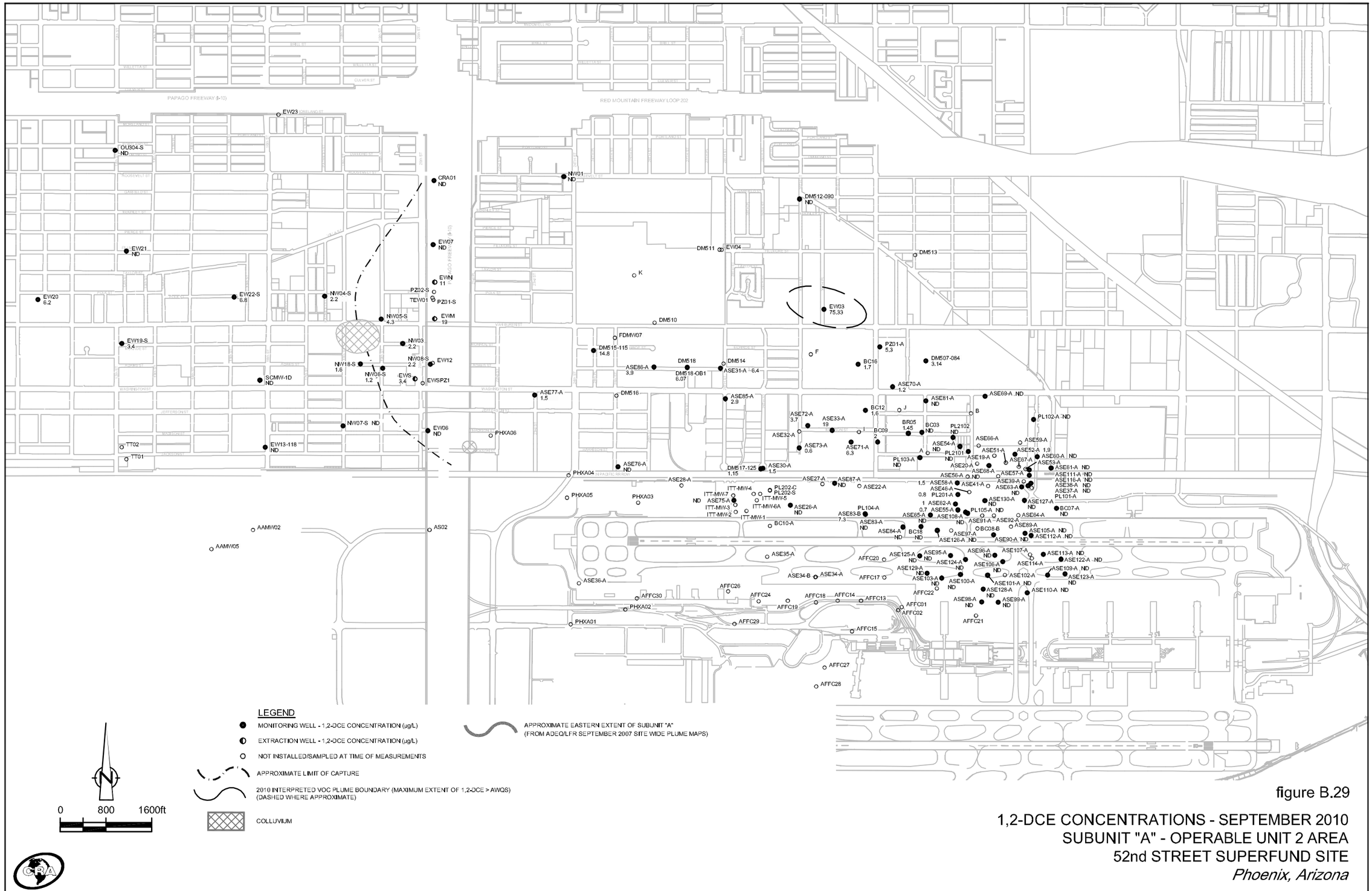
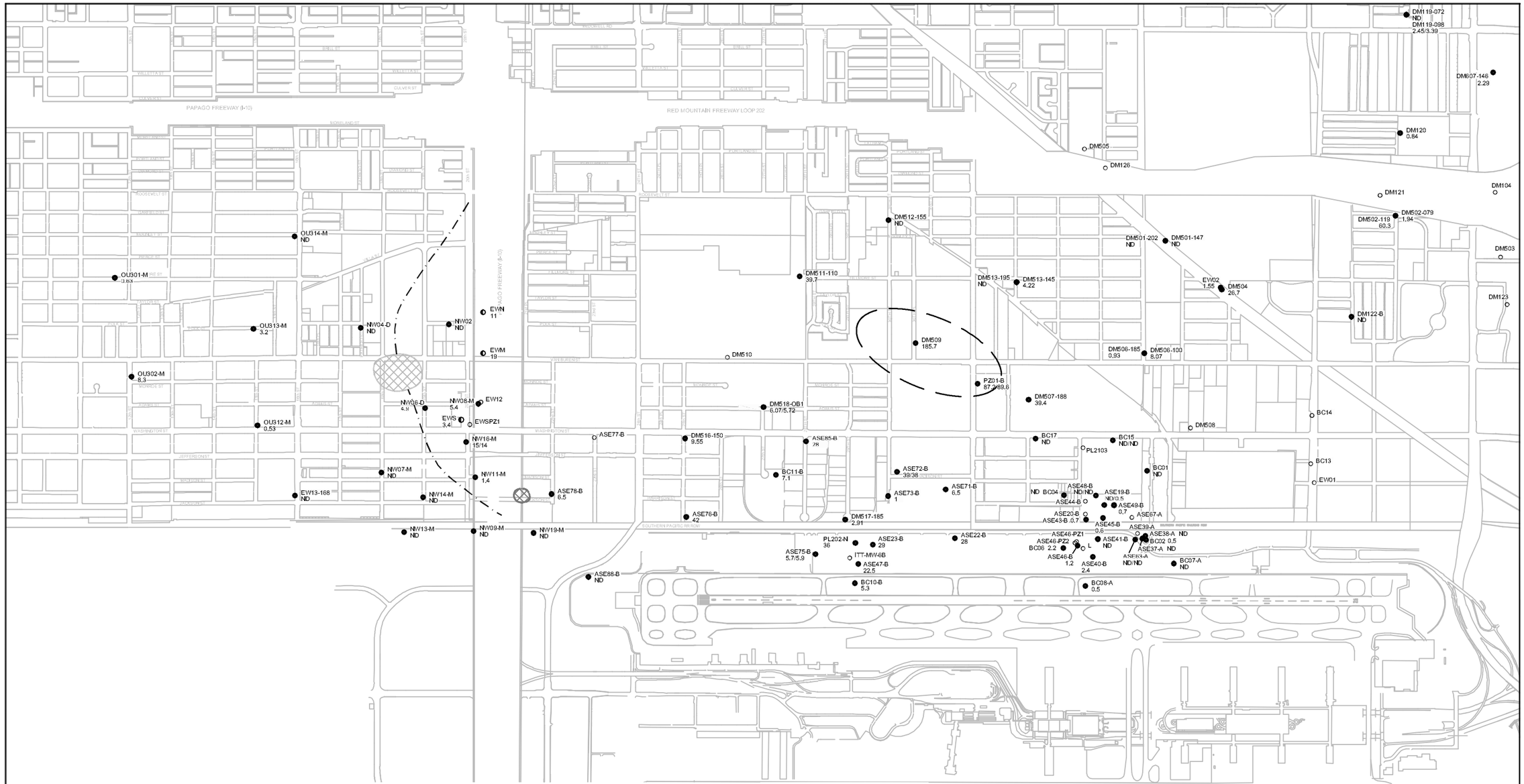


figure B.29

1,2-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX024 FIGURE B.29 APR 13/2011



LEGEND

- MONITORING WELL - 1,2-DCE CONCENTRATION (µg/L)
- EXTRACTION WELL - 1,2-DCE CONCENTRATION (µg/L)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- APPROXIMATE LIMIT OF CAPTURE
- 2010 INTERPRETED VOC PLUME BOUNDARY (MAXIMUM EXTENT OF 1,2-DCE > AWQS) (DASHED WHERE APPROXIMATE)
- COLLUVIUM

0 800 1600ft

figure B.30

1,2-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX025 FIGURE B.30 APR 13/2011

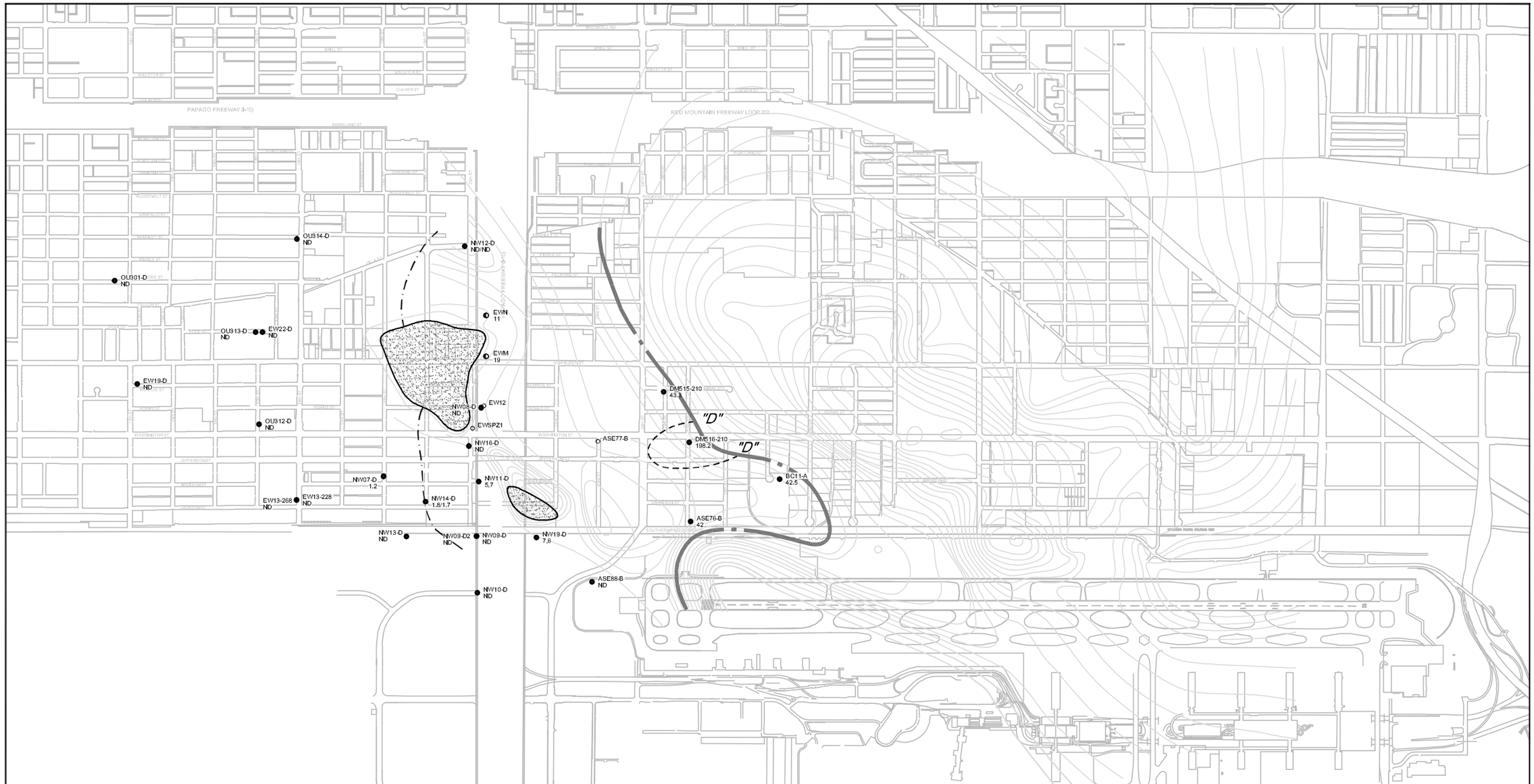
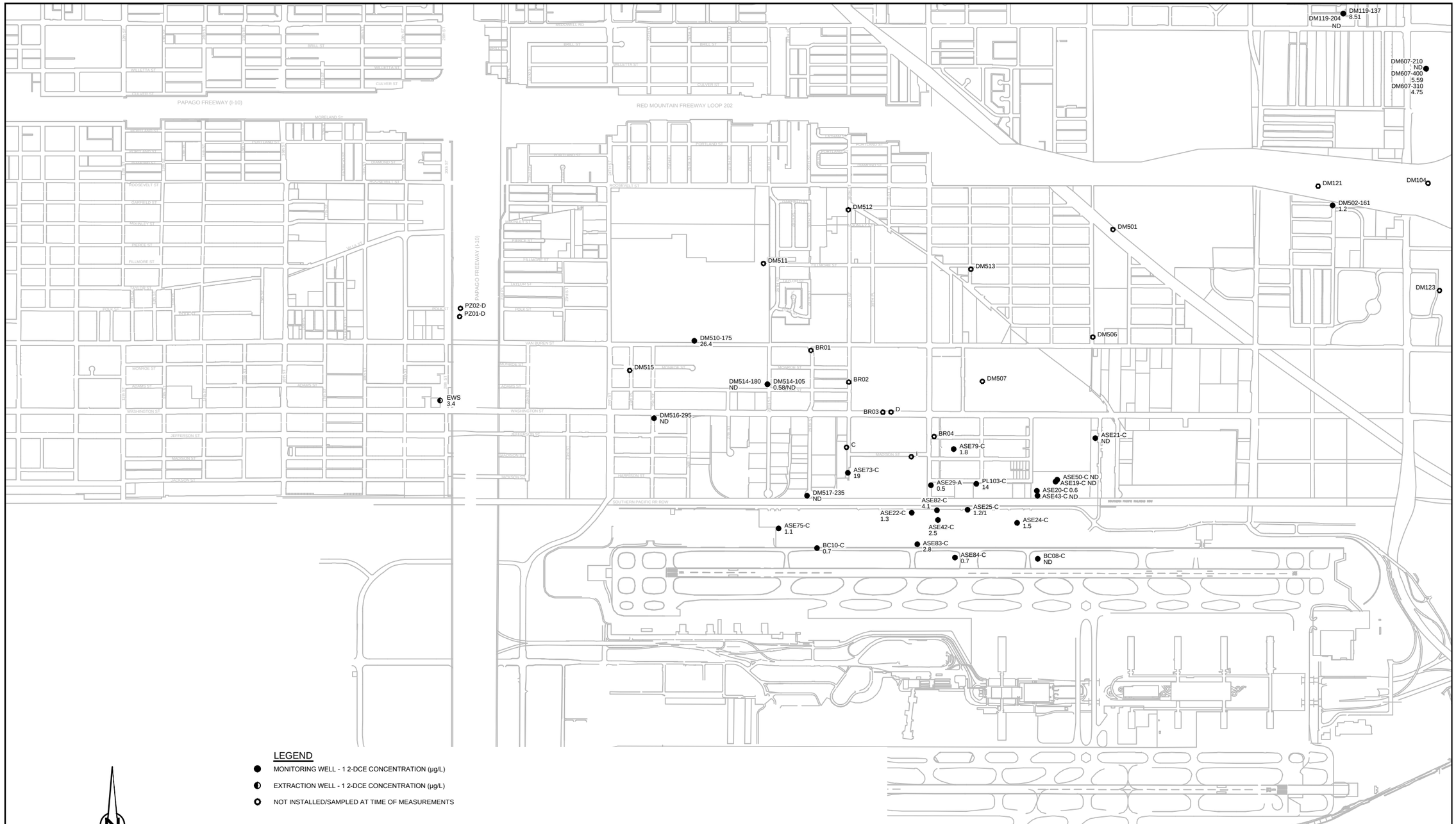


figure B.31

1,2-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX026 FIGURE B.31 APR 15/2011



LEGEND

- MONITORING WELL - 1 2-DCE CONCENTRATION (µg/L)
- EXTRACTION WELL - 1 2-DCE CONCENTRATION (µg/L)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS

N

0 800 1600ft

figure B.32

1,2-DCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX027 FIGURE B.32 APR 07/2011

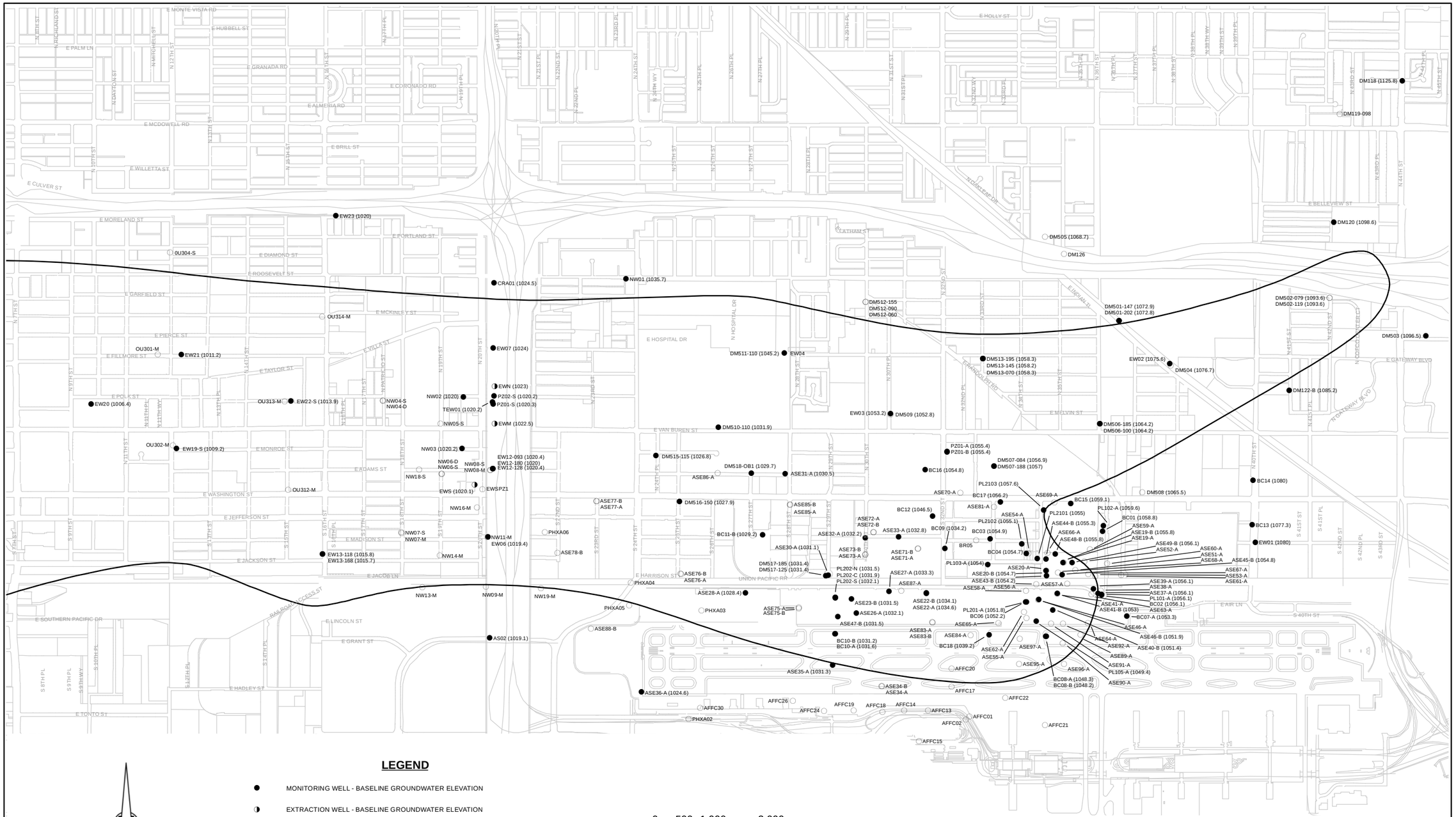
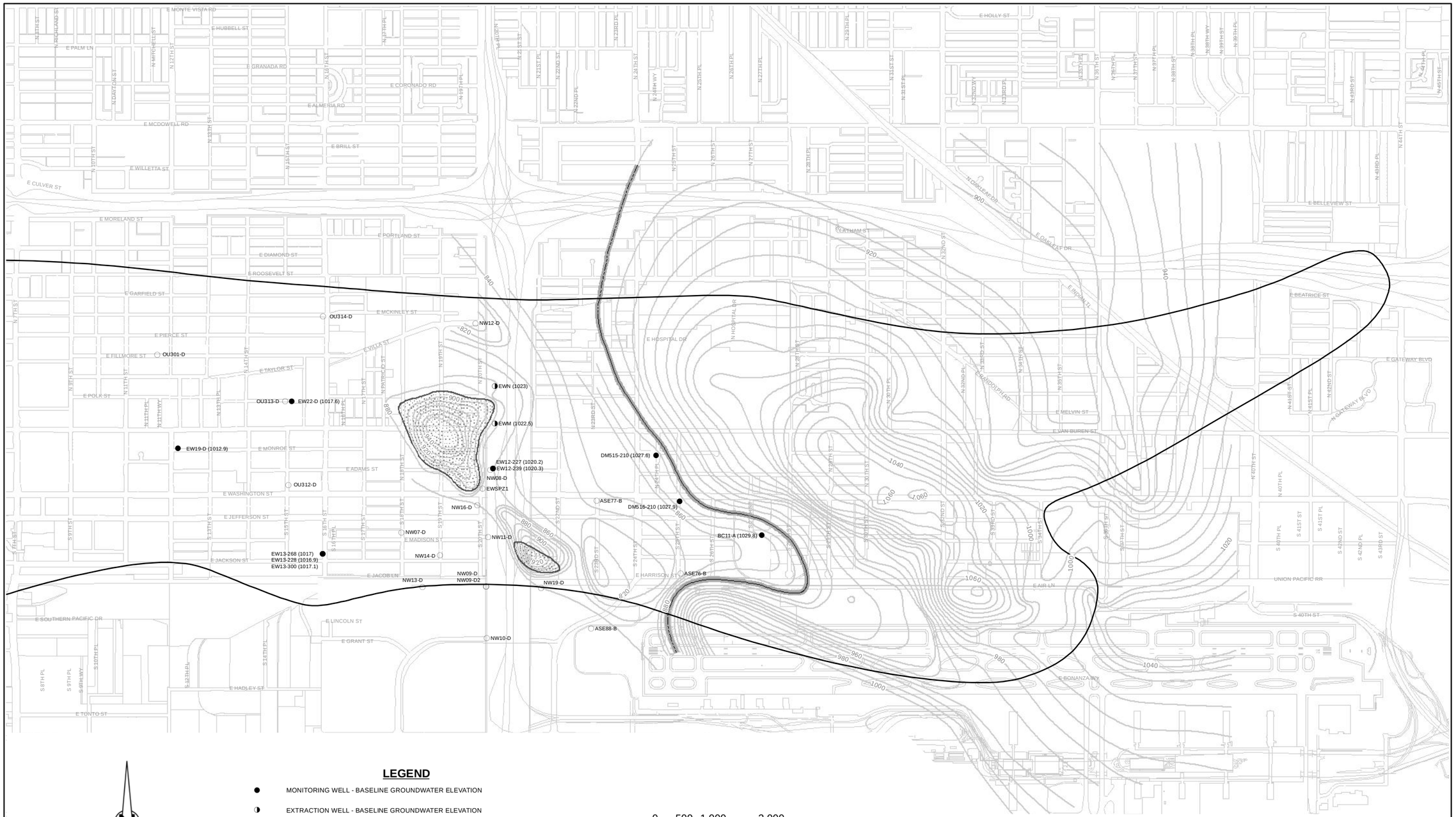


figure B.33
BASELINE GROUNDWATER ELEVATIONS - SEPTEMBER 2001
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA080_FigB-33



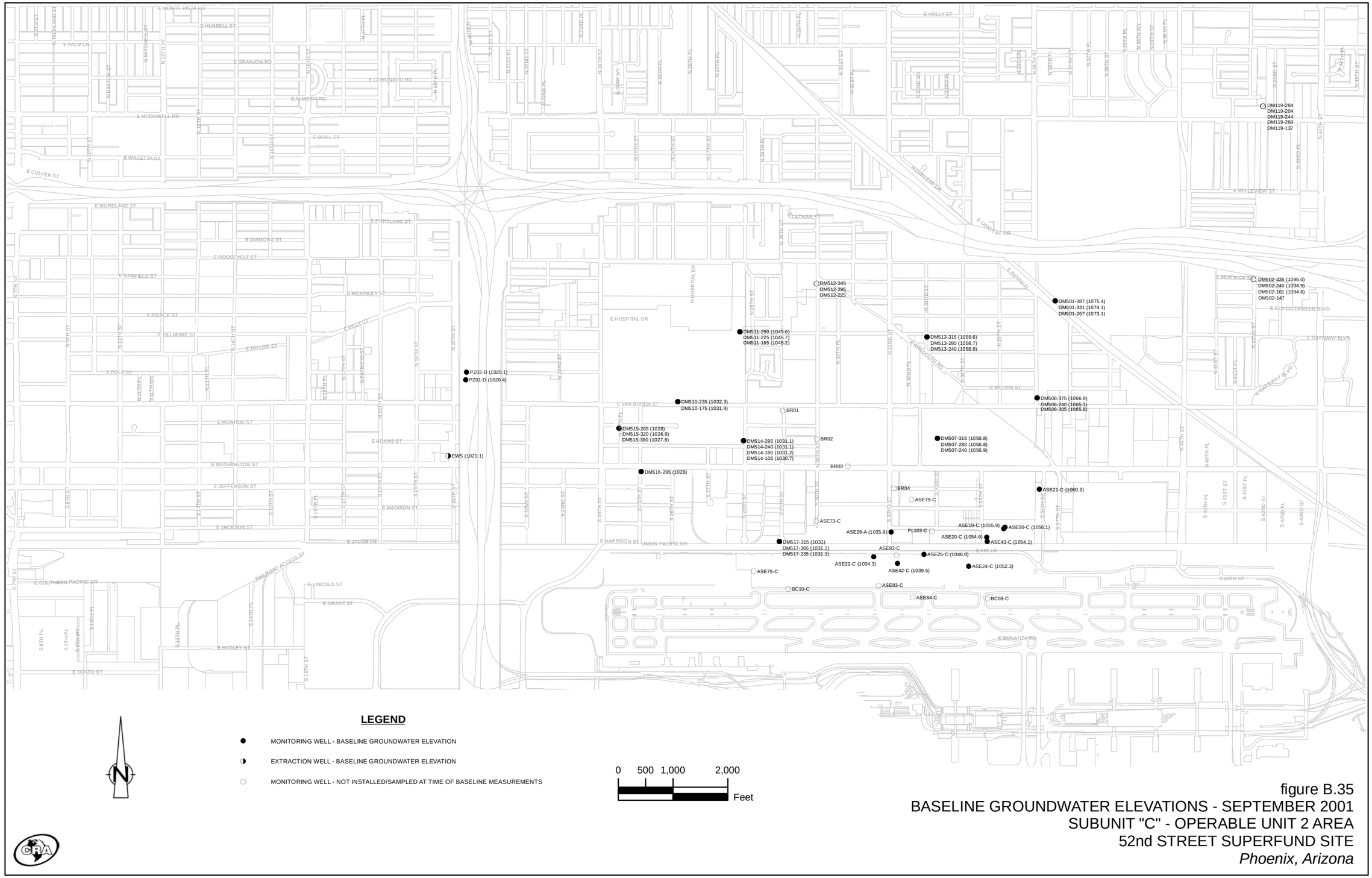
LEGEND

- MONITORING WELL - BASELINE GROUNDWATER ELEVATION
- EXTRACTION WELL - BASELINE GROUNDWATER ELEVATION
- MONITORING WELL - NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- ADEQ VOC PLUME BOUNDARY (SEPT 2001), DASHED WHERE APPROXIMATE
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK

0 500 1,000 2,000 Feet

figure B.34
BASELINE GROUNDWATER ELEVATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA081_FigB-34 Thursday, April 07, 2011



LEGEND

- ● MONITORING WELL - BASELINE GROUNDWATER ELEVATION
- ◑ EXTRACTION WELL - BASELINE GROUNDWATER ELEVATION
- ○ MONITORING WELL - NOT INSTALLED/SAMPLED AT TIME OF BASELINE MEASUREMENTS

N

0 500 1,000 2,000
Feet

figure B.35
BASELINE GROUNDWATER ELEVATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GIS-WA082_FigB-35

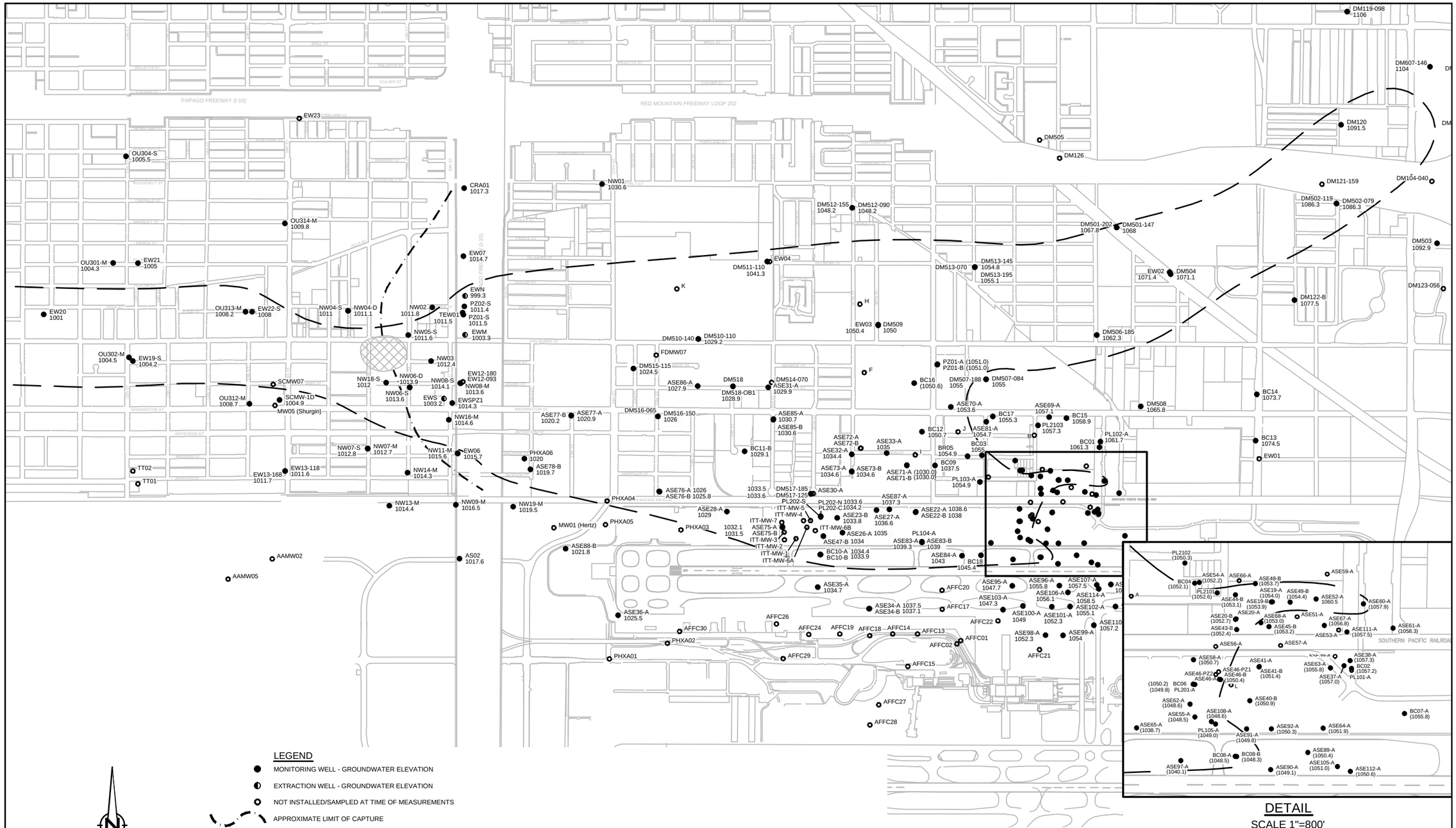


figure B.36

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX042 FIGURE B.36 APR 07/2011

LEGEND

- MONITORING WELL - GROUNDWATER ELEVATION
- EXTRACTION WELL - GROUNDWATER ELEVATION
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- INTERSECTION OF SUBUNIT "D" AND BEDROCK
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL, MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- APPROXIMATE LIMIT OF CAPTURE
- 2010 INTERPRETED VOC PLUME BOUNDARY (MAXIMUM EXTENT OF TCE > AWQS) (DASHED WHERE APPROXIMATE)

N

0 800 1600ft

figure B.37

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX043 FIGURE B.37 APR 07/2011

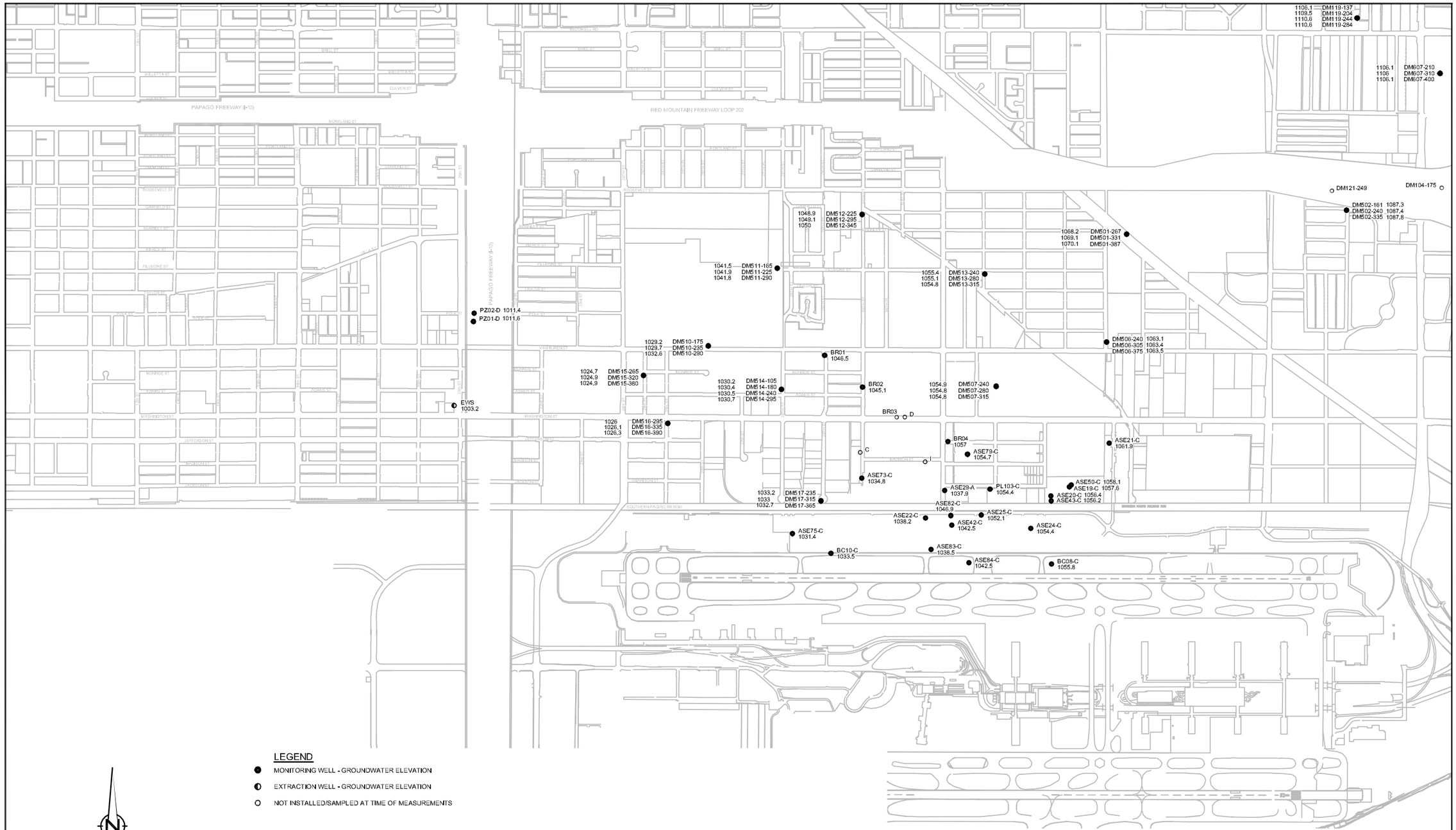


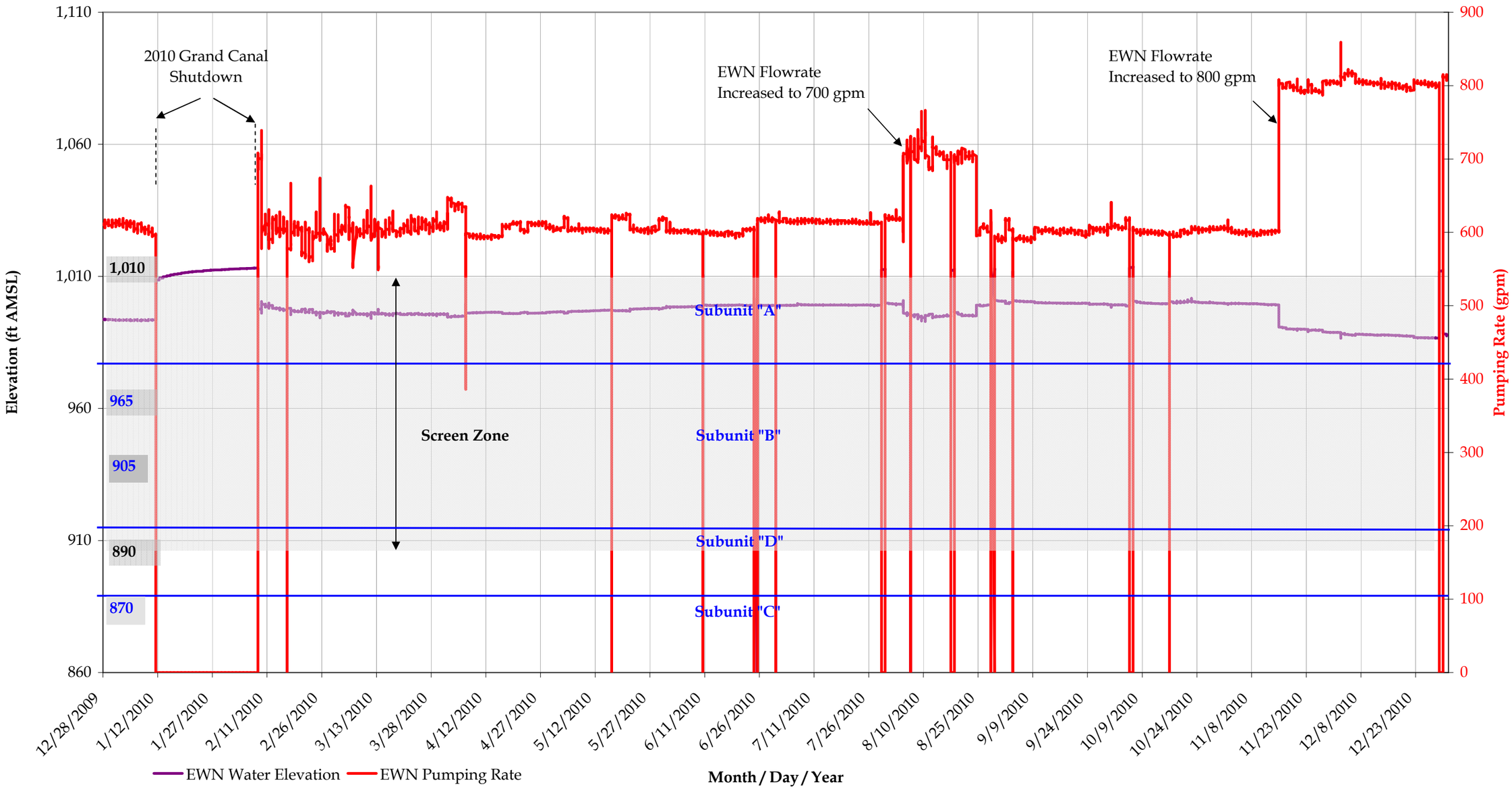
figure B.38

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX044 FIGURE B.38 FEB 23/2011

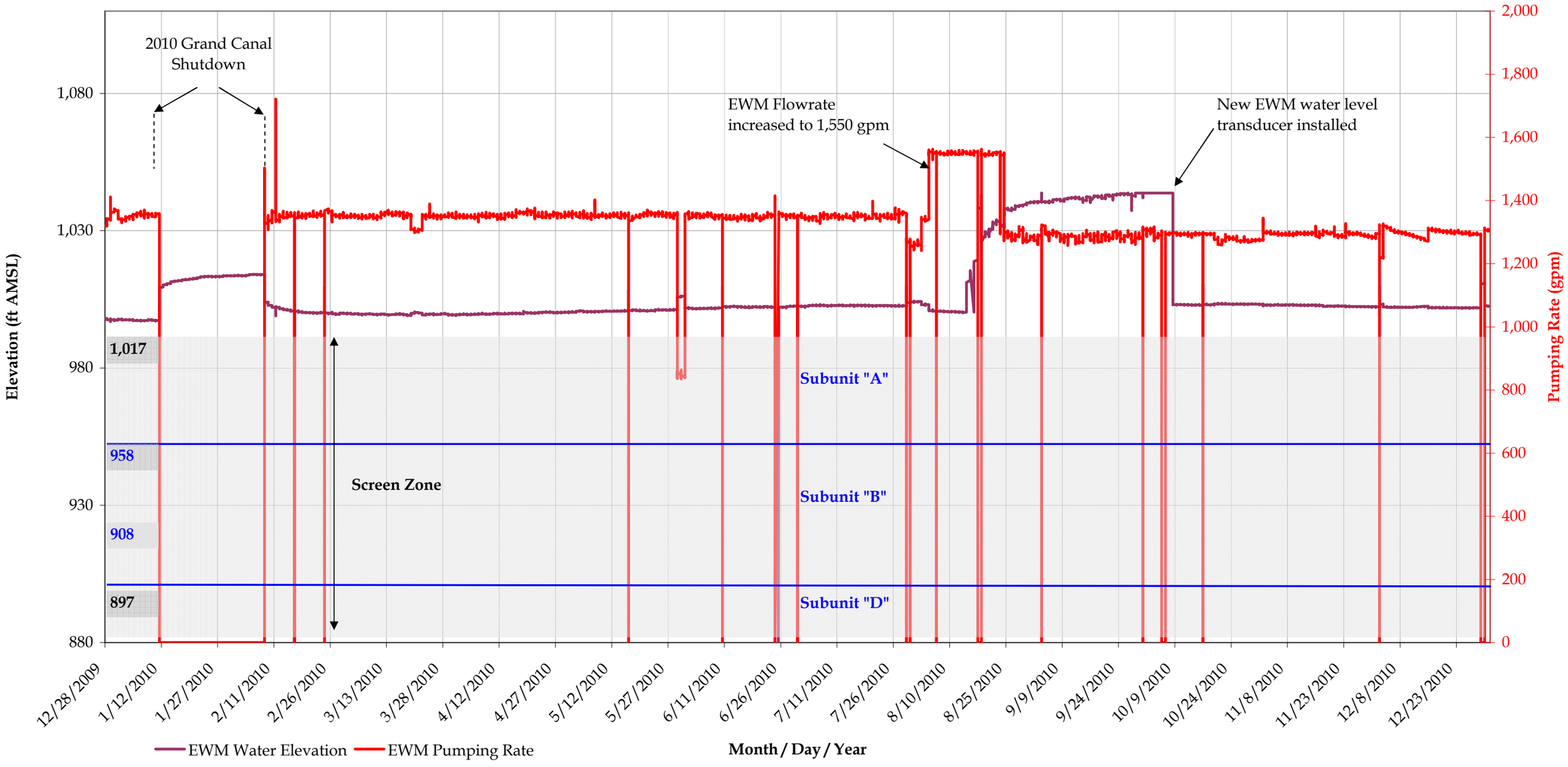
APPENDIX C

2010 EXTRACTION WELL HYDROGRAPHS AND VOC TRENDING CHARTS



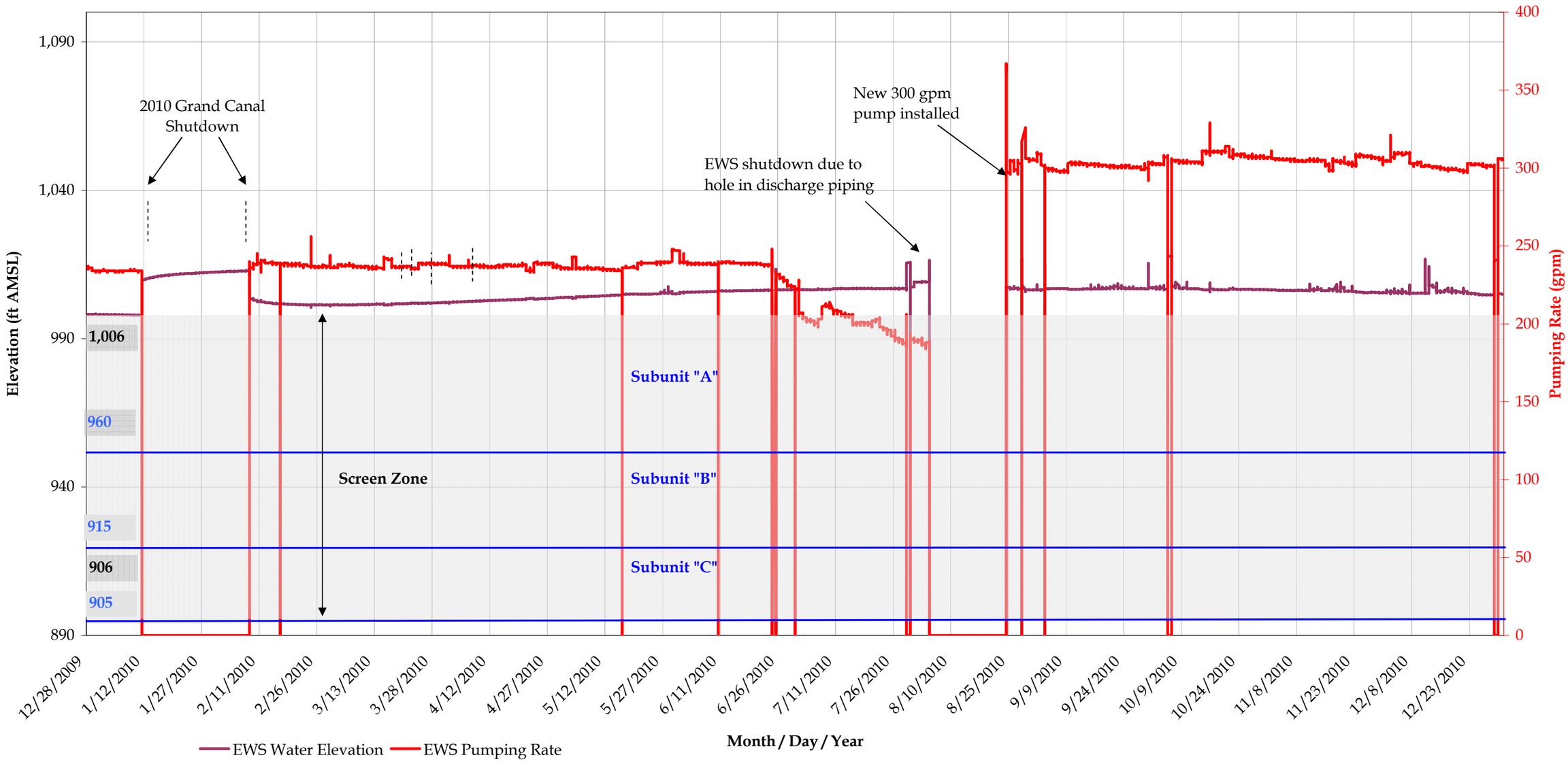
Notes:
ft AMSL - feet Above Mean Sea Level
gpm - gallons per minute

2010 HYDROGRAPH FOR NORTH EXTRACTION WELL (EWN)
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona



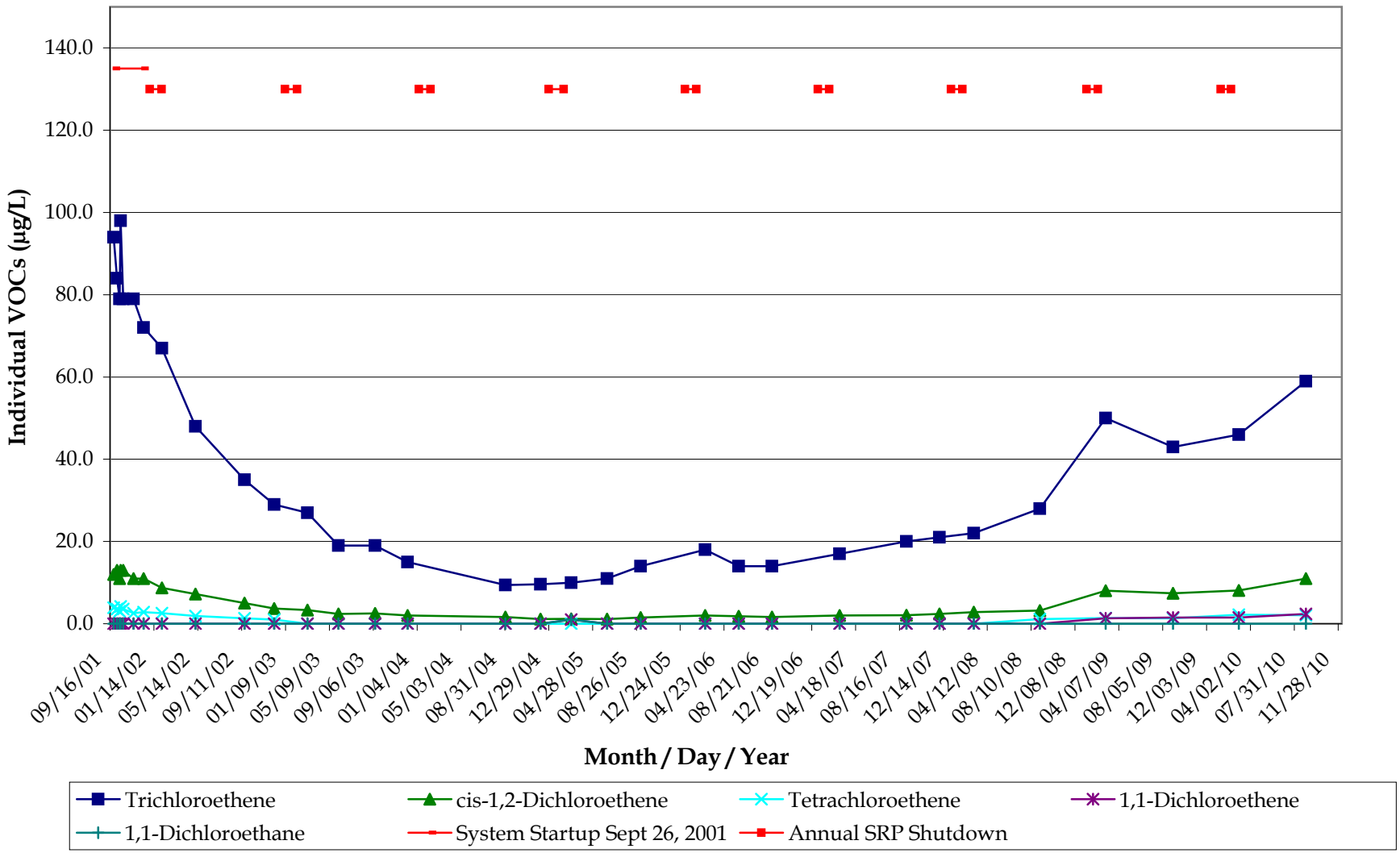
Notes:
ft AMSL - feet Above Mean Sea Level
gpm - gallons per minute

2010 HYDROGRAPH FOR MIDDLE EXTRACTION WELL (EWM)
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona



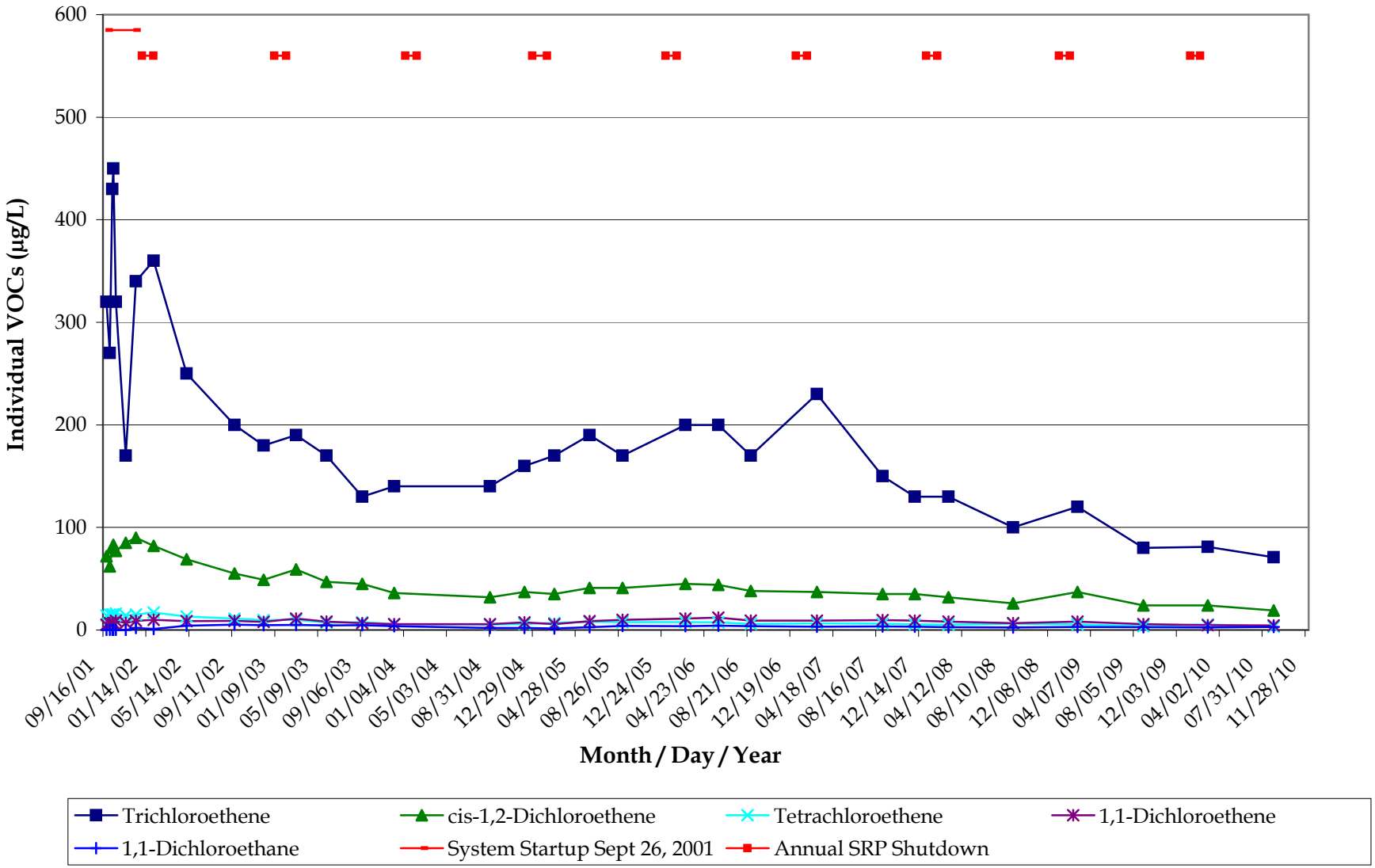
Notes:
ft AMSL - feet Above Mean Sea Level
gpm - gallons per minute

2010 HYDROGRAPH FOR SOUTH EXTRACTION WELL (EWS)
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona



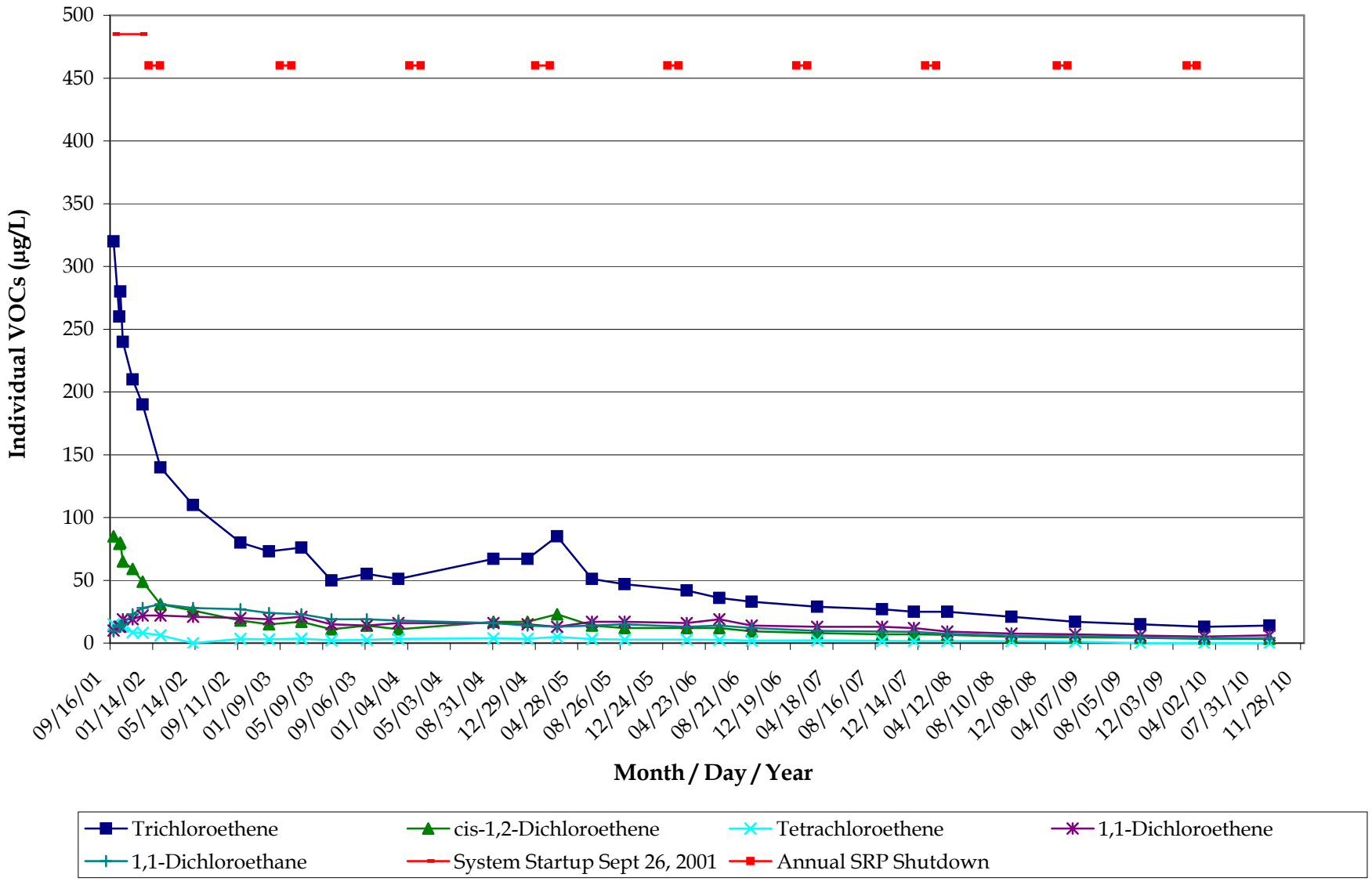
Note:
ug/L - micrograms per liter

VOC TRENDING EWN
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona



Note:
ug/L - micrograms per liter

VOC TRENDING EWM
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona



Note:
ug/L - micrograms per liter

VOC TRENDING EWS
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

APPENDIX D

STATISTICAL ANALYSIS MEMORANDUM AND FLOW PATH ANALYSIS

APPENDIX D-1

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CONESTOGA-ROVERS & ASSOCIATES

651 Colby Drive, Waterloo, Ontario, Canada N2V 1C2
Telephone: (519) 884-0510 Fax: (519) 884-0525
www.CRAworld.com

MEMORANDUM

TO:	Mike Mateyk/Manfred Plaschke	REF. NO.:	013932-151
FROM:	Wesley Dyck/Daniela Araujo/kf/48	DATE:	April 12, 2011

RE: **Trend Evaluation of Groundwater Monitoring Data in Operable Unit 2 Area**
52nd Street Superfund Site
Phoenix, Arizona

1.0 INTRODUCTION

This memo evaluates chemical concentration data from groundwater monitoring samples at the 52nd Street Superfund Site (Site) in Phoenix, Arizona. Statistical testing is performed to evaluate trends in chemical concentrations over time at monitoring wells at the Site. The chemicals evaluated were chosen based on the presence of by-products in the degradation pathway of chlorinated ethenes at this Site, which are the subjects of the trend tests performed.

2.0 TREND TEST METHODOLOGY

Statistical trend tests were undertaken during this evaluation. The selected procedure for trend assessment was the Mann-Kendall trend test which is commonly applied to environmental monitoring data (Helsel and Hirsch [1992]; United States Environmental Protection Agency [USEPA] [2006]). The Mann-Kendall test is a non-parametric (rank-based) method that evaluates a set of data for a monotonic (unidirectional) trend. The procedure makes no assumptions regarding the shape of the trend (e.g., linear, log linear), except that it is in a single direction (i.e., either consistently upward or downward). The test is a robust procedure suitable for general trend analysis. However, the Mann Kendall procedure loses sensitivity if a large proportion of censored data (non-detect results) is present.

In implementing the Mann-Kendall trend test, a significance level of 0.05 (i.e., 95-percent confidence) was used for data sets with more than four samples. This confidence level (95 percent) is commonly utilized in statistical testing, and is frequently found in USEPA statistical guidance examples (e.g., Box 4-8 and Box 4-10 of USEPA, 2006). Performing the trend tests at a confidence level of 0.05 ensures a false positive rate (concluding a significant trend when none is present) of no more than one in twenty. However, for smaller data sets containing four results, a significance level of 0.10 (i.e., 90-percent confidence) was applied, since it is not mathematically possible to achieve 0.05 significance for a two-sided test (i.e., testing for either increasing or decreasing trends) with only four points (see Table B8 of Helsel and Hirsch, 1992). No test was performed if three or fewer data points were available.

For the purposes of performing the Mann-Kendall trend test, non-detects were considered to be tied (i.e., equal) values with concentrations lower than the detected observations. Any field duplicate results were averaged prior to carrying out trend analyses. If one field duplicate was a detected value and the

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other a non-detect, the detected result was conservatively retained to represent a maximum estimate of the analyte concentration. Any individual observations with ambiguous rankings for the Mann-Kendall test (i.e. either a detected value - typically "J-qualified" - below other detection limits; or an elevated detection limit above other detected values) was dealt with on a case-by-case basis to obtain the most appropriate trend test.

The Mann-Kendall trend test was applied for data sets containing up to 50 percent non-detects. At very high non-detect rates (above 50 percent), the Mann-Kendall test loses sensitivity and is of limited utility in assessing trends. Thus, any data sets in which parameters were non-detect in more than 50 percent of samples were excluded from statistical evaluation.

3.0 SCOPE OF DATA

Data generated from the chemical analysis of 1,1-dicholorethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), and trichloroethene (TCE) in groundwater samples were used for the evaluation. A total of 468 wells monitored within the Operable Unit (OU) 2 Area and the eastern portion of OU3 (just downgradient of the OU2 groundwater extraction system) were assessed for data suitability for trend testing. The criteria used to establish suitability for each data set (well and analyte) included:

i) A minimum of four samples collected

ii) A minimum detection rate of 50 percent

iii) Sampling during 2010

Data sets for the five volatile organic compounds (VOCs) at 50 wells were selected for trend analysis based on these criteria. The time period considered by the trend tests is 2001-2010, with the date of commencement of monitoring, as well as sampling frequency, varying by well. The number of samples available by well varied between 6 and 31 (as shown in Table 1).

4.0 RESULTS

The results of the trend tests are shown in Table 1. Three wells that were subjected to trend testing in 2009 were not sampled in 2010 (PHXA06, PL202-C, and PL2103), and were therefore not evaluated this year. From a total of 250 data sets (50 wells x 5 analytes) considered, 77 cases consisted of data not suitable for trend tests due to low percentages of detected results. A total of 29 of the remaining data sets did not have statistically significant trends observed. Statistically significant trends ($P<0.05$, i.e., greater than 95 percent confidence) were observed for 144 data sets representing 50 wells, including all 5 chemicals. Decreasing trends were observed for 119 of the 144 data sets with significant trends, including data from 41 wells. Increasing trends were observed for 25 data sets, representing 12 wells:

- 1,1-DCA at wells ASE76-B, BC11-A, NW05-S, NW08-M, NW11-D, PL201-A, PL202-N, and PL2101
- 1,1-DCE at wells ASE76-B, BC11-A, EW22S, NW08-M, NW11-D, NW19-D, and PZ01-B
- cis-1,2-DCE at wells ASE76-B, BC11-A, DM515-210, NW11-D, NW19-D, and PL202-N
- TCE at well ASE76-B, BC11-A, NW11-D and NW19-D

The current trend results are compared to those found in the last evaluation (CRA, 2009) in the final column of Table 1. In most cases, the trend test conclusions are identical. Six data sets were newly identified as having significant decreasing trends, where no statistically significant trend was present during the previous evaluation. Two data sets were found to have significant increasing trends (1,1-DCE at wells EW22S and NW19-D) that were previously not statistically significant. Two cases occurred where a previously statistically significant decreasing trend (cis-1,2-DCE at NW06-D and 1,1-DCA at NW13-D) was not repeated this year, and two additional cases were noted where previously statistically significant increasing trends were not significant during the current evaluation (1,1-DCA at wells ASE86-A and NW07-D).

Sample calculations showing a Mann-Kendall trend test are provided in Attachment A.

5.0 CONCLUSIONS

A series of trend tests performed evaluating patterns in concentrations over time for five chemicals in groundwater samples collected at 50 monitoring wells at the Site have indicated that in the majority of cases (119 data sets in 41 wells), statistically significant evidence (with 95 percent confidence) of decreasing trends over time has been seen. For most of the remaining data sets considered, either no significant trends were observed (29 data sets), or analyte detection frequencies are below 50 percent and therefore no trend tests were performed (77 data sets). However, occasional observation of significant increasing trends occurred for 25 data sets across 12 wells. For 8 of the 12 wells, the increasing trends were for breakdown by-products of PCE and TCE, which may occur for short periods during natural degradation of these compounds. For the remaining four wells (ASE76-B, BC11-A, NW11-D, and NW19-D), concentrations of both parent and breakdown by-products have increased over the monitoring period evaluated (2001-2010).

6.0 REFERENCES

CRA, 2009. Trend Evaluation of Groundwater Monitoring Data in Operable Unit 2 Area. Phoenix, Arizona. April 12, 2010.

Helsel, D.R. & R.M. Hirsch, 1992. Statistical Methods in Water Resources. Amsterdam: Elsevier. (Also available as a USGS publication at http://pubs.usgs.gov/twri/twri4a3/).

USEPA, February 2006. Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S). Office of Environmental Information, United States Environmental Protection Agency, Washington D.C. EPA/240/B-06/003.

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	Analytes	Number of Samples	Percent Non-detects	Mann-Kendall Trend Test (2001-2010 Data) Statistic	Probability	Conclusion	Previous Conclusion (2009 Report)	
ASE76-A								
	1,1-DCA	16	6%	22	1.9E-04	Decreasing Trend	Decreasing Trend	
	1,1-DCE	14	0%	18	1.8E-03	Decreasing Trend	Decreasing Trend	
	cis-1,2-DCE	15	87%	20	--	>50% ND	>50% ND	
	PCE	15	100%	20	--	100% ND	100% ND	
	TCE	17	0%	24	1.5E-04	Decreasing Trend	Decreasing Trend	
ASE76-B								
	1,1-DCA	13	38%	16	9.4E-05	Increasing Trend	Increasing Trend	
	1,1-DCE	15	7%	20	1.1E-05	Increasing Trend	Increasing Trend	
	cis-1,2-DCE	17	0%	24	1.3E-05	Increasing Trend	Increasing Trend	
	PCE	14	100%	18	--	100% ND	100% ND	
	TCE	17	0%	24	1.1E-04	Increasing Trend	Increasing Trend	
ASE77-A								
	1,1-DCA	17	0%	24	7.1E-06	Decreasing Trend	Decreasing Trend	
	1,1-DCE	17	0%	24	2.6E-03	Decreasing Trend	Decreasing Trend	
	cis-1,2-DCE	17	0%	24	2.9E-04	Decreasing Trend	Decreasing Trend	
	PCE	17	0%	24	1.2E-02	Decreasing Trend	Decreasing Trend	
	TCE	17	0%	24	2.1E-04	Decreasing Trend	Decreasing Trend	
ASE86-A								
	1,1-DCA	11	27%	13	1.4E-01	No trend identified	Increasing Trend	*
	1,1-DCE	13	0%	16	4.4E-05	Decreasing Trend	Decreasing Trend	
	cis-1,2-DCE	13	0%	16	4.4E-05	Decreasing Trend	Decreasing Trend	
	PCE	13	0%	16	2.0E-04	Decreasing Trend	Decreasing Trend	
	TCE	13	0%	16	1.9E-05	Decreasing Trend	Decreasing Trend	
BC11-A								
	1,1-DCA	18	28%	26	7.0E-05	Increasing Trend	Increasing Trend	
	1,1-DCE	20	5%	31	2.8E-05	Increasing Trend	Increasing Trend	
	cis-1,2-DCE	20	0%	31	1.8E-05	Increasing Trend	Increasing Trend	
	PCE	17	100%	24	--	100% ND	100% ND	
	TCE	20	0%	31	3.2E-04	Increasing Trend	Increasing Trend	
BC11-B								
	1,1-DCA	20	5%	31	2.5E-05	Decreasing Trend	Decreasing Trend	
	1,1-DCE	20	5%	31	2.3E-03	Decreasing Trend	Decreasing Trend	
	cis-1,2-DCE	20	5%	31	3.0E-01	No trend identified	No trend identified	
	PCE	17	0%	24	4.4E-02	Decreasing Trend	No trend identified	*
	TCE	20	0%	31	2.2E-01	No trend identified	No trend identified	
DM515-115								
	1,1-DCA	11	55%	13	--	>50% ND	>50% ND	
	1,1-DCE	11	9%	13	8.7E-02	No trend identified	No trend identified	
	cis-1,2-DCE	11	0%	13	1.0E-01	No trend identified	No trend identified	
	PCE	11	91%	13	--	>50% ND	>50% ND	
	TCE	11	18%	13	1.0E-02	Decreasing Trend	Decreasing Trend	
DM515-210								
	1,1-DCA	6	83%	5	--	>50% ND	100% ND	
	1,1-DCE	6	83%	5	--	>50% ND	100% ND	
	cis-1,2-DCE	6	17%	5	8.5E-03	Increasing Trend	Increasing Trend	
	PCE	6	83%	5	--	>50% ND	100% ND	
	TCE	6	0%	5	6.0E-02	No trend identified	No trend identified	

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	*Analytes*	*Number of Samples*	*Percent Non-detects*	*Mann-Kendall Trend Test (2001-2010 Data)*			*Previous Conclusion (2009 Report)*
				Statistic	*Probability*	*Conclusion*	
EW06							
	1,1-DCA	31	0%	59	1.1E-13	Decreasing Trend	Decreasing Trend
	1,1-DCE	31	0%	59	1.1E-10	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	29	34%	53	3.7E-10	Decreasing Trend	Decreasing Trend
	PCE	21	86%	33	--	>50% ND	>50% ND
	TCE	31	0%	59	1.3E-11	Decreasing Trend	Decreasing Trend
EW13-118							
	1,1-DCA	21	71%	33	--	>50% ND	>50% ND
	1,1-DCE	20	60%	31	--	>50% ND	>50% ND
	cis-1,2-DCE	21	86%	33	--	>50% ND	>50% ND
	PCE	14	79%	18	--	>50% ND	>50% ND
	TCE	18	61%	26	--	>50% ND	>50% ND
EW13-228							
	1,1-DCA	12	100%	15	--	100% ND	100% ND
	1,1-DCE	12	100%	15	--	100% ND	100% ND
	cis-1,2-DCE	12	100%	15	--	100% ND	100% ND
	PCE	12	83%	15	--	>50% ND	>50% ND
	TCE	12	0%	15	5.4E-01	No trend identified	No trend identified
EW19-S							
	1,1-DCA	17	0%	24	3.0E-01	No trend identified	No trend identified
	1,1-DCE	17	6%	24	5.8E-02	No trend identified	No trend identified
	cis-1,2-DCE	17	0%	24	2.7E-06	Decreasing Trend	Decreasing Trend
	PCE	17	0%	24	1.5E-05	Decreasing Trend	Decreasing Trend
	TCE	17	0%	24	5.9E-06	Decreasing Trend	Decreasing Trend
EW21							
	1,1-DCA	17	100%	24	--	100% ND	100% ND
	1,1-DCE	17	100%	24	--	100% ND	100% ND
	cis-1,2-DCE	15	40%	20	1.1E-04	Decreasing Trend	Decreasing Trend
	PCE	16	19%	22	1.9E-01	No trend identified	No trend identified
	TCE	17	6%	24	5.4E-05	Decreasing Trend	Decreasing Trend
EW22-S							
	1,1-DCA	22	68%	35	--	>50% ND	>50% ND
	1,1-DCE	22	32%	35	3.2E-02	Increasing Trend	No trend identified *
	cis-1,2-DCE	22	0%	35	2.9E-06	Decreasing Trend	Decreasing Trend
	PCE	22	14%	35	6.2E-05	Decreasing Trend	Decreasing Trend
	TCE	22	0%	35	2.9E-06	Decreasing Trend	Decreasing Trend
NW02							
	1,1-DCA	24	100%	40	--	100% ND	100% ND
	1,1-DCE	24	100%	40	--	100% ND	100% ND
	cis-1,2-DCE	24	8%	40	1.2E-08	Decreasing Trend	Decreasing Trend
	PCE	24	29%	40	1.5E-07	Decreasing Trend	Decreasing Trend
	TCE	24	0%	40	1.9E-07	Decreasing Trend	Decreasing Trend

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	*Analytes*	*Number of Samples*	*Percent Non-detects*	*Mann-Kendall Trend Test (2001-2010 Data)*			*Previous Conclusion (2009 Report)*	
				Statistic	*Probability*	*Conclusion*		
NW03								
	1,1-DCA	23	9%	38	1.5E-01	No trend identified	No trend identified	
	1,1-DCE	23	0%	38	5.4E-02	No trend identified	No trend identified	
	cis-1,2-DCE	23	0%	38	8.3E-08	Decreasing Trend	Decreasing Trend	
	PCE	23	17%	38	1.3E-07	Decreasing Trend	Decreasing Trend	
	TCE	23	0%	38	6.0E-07	Decreasing Trend	Decreasing Trend	
NW04-S								
	1,1-DCA	17	94%	24	--	>50% ND	100% ND	
	1,1-DCE	17	94%	24	--	>50% ND	100% ND	
	cis-1,2-DCE	17	18%	24	2.3E-03	Decreasing Trend	Decreasing Trend	
	PCE	17	82%	24	--	>50% ND	>50% ND	
	TCE	17	0%	24	7.3E-04	Decreasing Trend	Decreasing Trend	
NW05-S								
	1,1-DCA	16	19%	22	7.9E-03	Increasing Trend	Increasing Trend	
	1,1-DCE	16	6%	22	6.5E-02	No trend identified	No trend identified	
	cis-1,2-DCE	16	0%	22	9.0E-05	Decreasing Trend	Decreasing Trend	
	PCE	16	19%	22	3.4E-03	Decreasing Trend	Decreasing Trend	
	TCE	16	0%	22	2.3E-05	Decreasing Trend	Decreasing Trend	
NW06-D								
	1,1-DCA	16	81%	22	--	>50% ND	>50% ND	
	1,1-DCE	16	63%	22	--	>50% ND	>50% ND	
	cis-1,2-DCE	16	0%	22	1.9E-01	No trend identified	Decreasing Trend	*
	PCE	16	94%	22	--	>50% ND	>50% ND	
	TCE	16	0%	22	1.0E-02	Decreasing Trend	Decreasing Trend	
NW06-S								
	1,1-DCA	16	0%	22	1.4E-07	Decreasing Trend	Decreasing Trend	
	1,1-DCE	16	0%	22	9.2E-07	Decreasing Trend	Decreasing Trend	
	cis-1,2-DCE	16	0%	22	2.8E-05	Decreasing Trend	Decreasing Trend	
	PCE	16	44%	22	1.6E-04	Decreasing Trend	Decreasing Trend	
	TCE	16	0%	22	8.3E-06	Decreasing Trend	Decreasing Trend	
NW07-D								
	1,1-DCA	23	22%	38	9.1E-02	No trend identified	Increasing Trend	*
	1,1-DCE	23	0%	38	4.9E-01	No trend identified	No trend identified	
	cis-1,2-DCE	23	0%	38	2.4E-05	Decreasing Trend	Decreasing Trend	
	PCE	23	100%	38	--	100% ND	100% ND	
	TCE	23	0%	38	2.3E-06	Decreasing Trend	Decreasing Trend	
NW07-M								
	1,1-DCA	18	11%	26	2.1E-04	Decreasing Trend	Decreasing Trend	
	1,1-DCE	18	6%	26	1.3E-03	Decreasing Trend	Decreasing Trend	
	cis-1,2-DCE	18	11%	26	2.8E-02	Decreasing Trend	No trend identified	*
	PCE	18	100%	26	--	100% ND	100% ND	
	TCE	18	0%	26	1.7E-02	Decreasing Trend	No trend identified	*

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	*Analytes*	*Number of Samples*	*Percent Non-detects*	*Mann-Kendall Trend Test (2001-2010 Data)*			*Previous Conclusion (2009 Report)*
				Statistic	*Probability*	*Conclusion*	
NW07-S							
	1,1-DCA	22	23%	35	1.8E-07	Decreasing Trend	Decreasing Trend
	1,1-DCE	22	41%	35	4.3E-05	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	22	91%	35	--	>50% ND	>50% ND
	PCE	22	100%	35	--	100% ND	100% ND
	TCE	22	23%	35	1.2E-05	Decreasing Trend	Decreasing Trend
NW08-M							
	1,1-DCA	17	0%	24	1.1E-02	Increasing Trend	Increasing Trend
	1,1-DCE	17	0%	24	2.6E-02	Increasing Trend	Increasing Trend
	cis-1,2-DCE	17	0%	24	5.4E-04	Decreasing Trend	Decreasing Trend
	PCE	17	29%	24	1.0E-05	Decreasing Trend	Decreasing Trend
	TCE	17	0%	24	1.8E-04	Decreasing Trend	Decreasing Trend
NW08-S							
	1,1-DCA	16	0%	22	1.2E-06	Decreasing Trend	Decreasing Trend
	1,1-DCE	16	0%	22	3.8E-04	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	16	0%	22	1.9E-05	Decreasing Trend	Decreasing Trend
	PCE	16	25%	22	1.1E-04	Decreasing Trend	Decreasing Trend
	TCE	16	0%	22	1.9E-05	Decreasing Trend	Decreasing Trend
NW09-D							
	1,1-DCA	22	100%	35	--	100% ND	100% ND
	1,1-DCE	22	14%	35	3.4E-05	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	22	36%	35	1.4E-05	Decreasing Trend	Decreasing Trend
	PCE	22	100%	35	--	100% ND	100% ND
	TCE	22	0%	35	9.6E-06	Decreasing Trend	Decreasing Trend
NW09-D2							
	1,1-DCA	20	100%	31	--	100% ND	100% ND
	1,1-DCE	20	35%	31	1.1E-04	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	20	5%	31	5.8E-04	Decreasing Trend	Decreasing Trend
	PCE	20	100%	31	--	100% ND	100% ND
	TCE	20	0%	31	3.8E-05	Decreasing Trend	Decreasing Trend
NW11-D							
	1,1-DCA	20	35%	31	2.2E-06	Increasing Trend	Increasing Trend
	1,1-DCE	20	0%	31	2.5E-05	Increasing Trend	Increasing Trend
	cis-1,2-DCE	20	0%	31	2.2E-06	Increasing Trend	Increasing Trend
	PCE	20	100%	31	--	100% ND	100% ND
	TCE	20	0%	31	5.6E-06	Increasing Trend	Increasing Trend
NW11-M							
	1,1-DCA	20	0%	31	1.4E-08	Decreasing Trend	Decreasing Trend
	1,1-DCE	20	0%	31	4.2E-07	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	20	0%	31	2.9E-08	Decreasing Trend	Decreasing Trend
	PCE	20	80%	31	--	>50% ND	>50% ND
	TCE	20	0%	31	1.1E-08	Decreasing Trend	Decreasing Trend
NW13-D							
	1,1-DCA	13	100%	16	--	100% ND	100% ND
	1,1-DCE	13	54%	16	--	>50% ND	Decreasing Trend *
	cis-1,2-DCE	13	85%	16	--	>50% ND	>50% ND
	PCE	13	100%	16	--	100% ND	100% ND
	TCE	13	0%	16	2.3E-03	Decreasing Trend	Decreasing Trend

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	*Analytes*	*Number of Samples*	*Percent Non-detects*	*Mann-Kendall Trend Test (2001-2010 Data)*			*Previous Conclusion (2009 Report)*
				Statistic	*Probability*	*Conclusion*	
NW14-D							
	1,1-DCA	13	23%	16	1.1E-05	Decreasing Trend	Decreasing Trend
	1,1-DCE	13	0%	16	1.1E-05	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	13	8%	16	1.6E-04	Decreasing Trend	Decreasing Trend
	PCE	13	100%	16	--	100% ND	100% ND
	TCE	13	0%	16	1.5E-05	Decreasing Trend	Decreasing Trend
NW14-M							
	1,1-DCA	13	100%	16	--	100% ND	100% ND
	1,1-DCE	13	23%	16	1.2E-03	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	13	100%	16	--	100% ND	100% ND
	PCE	13	100%	16	--	100% ND	100% ND
	TCE	13	0%	16	2.2E-01	No trend identified	No trend identified
NW17-S							
	1,1-DCA	9	0%	10	6.7E-03	Decreasing Trend	Decreasing Trend
	1,1-DCE	9	0%	10	6.7E-03	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	9	0%	10	1.2E-02	Decreasing Trend	Decreasing Trend
	PCE	9	0%	10	1.6E-02	Decreasing Trend	Decreasing Trend
	TCE	9	0%	10	4.8E-02	Decreasing Trend	No trend identified *
NW18-M							
	1,1-DCA	10	0%	11	1.0E+00	No trend identified	No trend identified
	1,1-DCE	10	0%	11	2.4E-01	No trend identified	No trend identified
	cis-1,2-DCE	9	0%	10	4.9E-03	Decreasing Trend	Decreasing Trend
	PCE	9	0%	10	4.9E-03	Decreasing Trend	Decreasing Trend
	TCE	9	0%	10	4.9E-03	Decreasing Trend	Decreasing Trend
NW18-S							
	1,1-DCA	9	0%	10	1.2E-03	Decreasing Trend	Decreasing Trend
	1,1-DCE	9	0%	10	1.2E-03	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	9	0%	10	1.8E-03	Decreasing Trend	Decreasing Trend
	PCE	9	33%	10	1.2E-02	Decreasing Trend	No trend identified *
	TCE	9	0%	10	9.1E-03	Decreasing Trend	No trend identified *
NW19-D							
	1,1-DCA	9	100%	10	--	100% ND	100% ND
	1,1-DCE	9	0%	10	2.2E-02	Increasing Trend	No trend identified *
	cis-1,2-DCE	9	0%	10	2.5E-03	Increasing Trend	Increasing Trend
	PCE	9	100%	10	--	100% ND	100% ND
	TCE	9	0%	10	1.2E-03	Increasing Trend	Increasing Trend
NW19-M							
	1,1-DCA	9	33%	10	1.2E-03	Decreasing Trend	Decreasing Trend
	1,1-DCE	9	0%	10	4.9E-03	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	9	67%	10	--	>50% ND	>50% ND
	PCE	9	100%	10	--	100% ND	100% ND
	TCE	9	0%	10	2.5E-03	Decreasing Trend	Decreasing Trend

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	Analytes	Number of Samples	Percent Non-detects	Mann-Kendall Trend Test (2001-2010 Data) Statistic	Probability	Conclusion	Previous Conclusion (2009 Report)
OU312-D							
	1,1-DCA	15	100%	20	--	100% ND	100% ND
	1,1-DCE	15	100%	20	--	100% ND	100% ND
	cis-1,2-DCE	12	100%	15	--	100% ND	100% ND
	PCE	14	86%	18	--	>50% ND	>50% ND
	TCE	14	43%	18	8.4E-04	Decreasing Trend	Decreasing Trend
OU312-M							
	1,1-DCA	15	0%	20	1.3E-05	Decreasing Trend	Decreasing Trend
	1,1-DCE	15	0%	20	2.1E-04	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	15	0%	20	3.2E-05	Decreasing Trend	Decreasing Trend
	PCE	15	7%	20	1.7E-04	Decreasing Trend	Decreasing Trend
	TCE	15	0%	20	3.2E-05	Decreasing Trend	Decreasing Trend
OU313-M							
	1,1-DCA	12	100%	15	--	100% ND	100% ND
	1,1-DCE	13	77%	16	--	>50% ND	>50% ND
	cis-1,2-DCE	16	0%	22	2.2E-04	Decreasing Trend	Decreasing Trend
	PCE	16	0%	22	6.9E-03	Decreasing Trend	Decreasing Trend
	TCE	16	0%	22	7.3E-04	Decreasing Trend	Decreasing Trend
OU314-M							
	1,1-DCA	12	100%	15	--	100% ND	100% ND
	1,1-DCE	12	92%	15	--	>50% ND	100% ND
	cis-1,2-DCE	16	94%	22	--	>50% ND	>50% ND
	PCE	14	7%	18	1.0E-02	Decreasing Trend	Decreasing Trend
	TCE	16	50%	22	2.2E-02	Decreasing Trend	Decreasing Trend
PL103-A							
	1,1-DCA	16	100%	22	--	100% ND	100% ND
	1,1-DCE	14	14%	18	1.3E-01	No trend identified	No trend identified
	cis-1,2-DCE	19	5%	29	2.4E-04	Decreasing Trend	Decreasing Trend
	PCE	19	5%	29	1.6E-06	Decreasing Trend	Decreasing Trend
	TCE	19	0%	29	7.8E-04	Decreasing Trend	Decreasing Trend
PL103-C							
	1,1-DCA	12	100%	15	--	100% ND	100% ND
	1,1-DCE	13	15%	16	2.4E-02	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	15	0%	20	3.0E-03	Decreasing Trend	Decreasing Trend
	PCE	13	8%	-29	8.8E-02	No trend identified	No trend identified
	TCE	14	0%	18	1.4E-01	No trend identified	No trend identified
PL105-A							
	1,1-DCA	23	0%	38	2.7E-04	Decreasing Trend	Decreasing Trend
	1,1-DCE	6	100%	5	--	100% ND	100% ND
	cis-1,2-DCE	7	43%	7	1.3E-01	No trend identified	No trend identified
	PCE	22	100%	35	--	100% ND	100% ND
	TCE	22	95%	35	--	>50% ND	>50% ND
PL201-A							
	1,1-DCA	25	16%	43	1.2E-02	Increasing Trend	Increasing Trend
	1,1-DCE	6	100%	5	--	100% ND	100% ND
	cis-1,2-DCE	10	0%	11	2.1E-01	No trend identified	No trend identified
	PCE	6	100%	5	--	100% ND	100% ND
	TCE	25	28%	43	5.9E-06	Decreasing Trend	Decreasing Trend

TABLE 1

CONCENTRATION VS. TIME TREND TESTS RESULTS FOR GROUNDWATER MONITORING DATA IN OPERABLE UNIT 2 AREA 52ND STREET SUPERFUND SITE PHOENIX, ARIZONA

Well	*Analytes*	*Number of Samples*	*Percent Non-detects*	*Mann-Kendall Trend Test (2001-2010 Data)*			*Previous Conclusion (2009 Report)*
				Statistic	*Probability*	*Conclusion*	
PL202-N							
	1,1-DCA	18	33%	26	4.3E-05	Increasing Trend	Increasing Trend
	1,1-DCE	18	11%	26	2.7E-01	No trend identified	No trend identified
	cis-1,2-DCE	19	0%	29	6.9E-04	Increasing Trend	Increasing Trend
	PCE	15	100%	20	--	100% ND	100% ND
	TCE	19	0%	29	7.4E-02	No trend identified	No trend identified
PL2101							
	1,1-DCA	26	35%	45	1.2E-05	Increasing Trend	Increasing Trend
	1,1-DCE	23	100%	38	--	100% ND	100% ND
	cis-1,2-DCE	23	100%	38	--	100% ND	100% ND
	PCE	8	88%	8	--	>50% ND	>50% ND
	TCE	11	0%	13	1.6E-01	No trend identified	No trend identified
PL2102							
	1,1-DCA	23	78%	38	--	>50% ND	>50% ND
	1,1-DCE	6	67%	5	--	>50% ND	>50% ND
	cis-1,2-DCE	23	100%	38	--	100% ND	100% ND
	PCE	8	25%	8	9.0E-01	No trend identified	No trend identified
	TCE	20	30%	31	3.2E-03	Decreasing Trend	Decreasing Trend
PZ01-A							
	1,1-DCA	16	100%	22	--	100% ND	100% ND
	1,1-DCE	19	0%	29	1.1E-07	Decreasing Trend	Decreasing Trend
	cis-1,2-DCE	19	0%	29	1.4E-08	Decreasing Trend	Decreasing Trend
	PCE	19	0%	29	7.1E-08	Decreasing Trend	Decreasing Trend
	TCE	19	0%	29	1.2E-06	Decreasing Trend	Decreasing Trend
PZ01-B							
	1,1-DCA	15	100%	20	--	100% ND	100% ND
	1,1-DCE	19	5%	29	2.6E-03	Increasing Trend	Increasing Trend
	cis-1,2-DCE	19	0%	29	5.9E-02	No trend identified	No trend identified
	PCE	19	0%	29	4.6E-06	Decreasing Trend	Decreasing Trend
	TCE	19	0%	29	2.8E-06	Decreasing Trend	Decreasing Trend

Notes:
* Denotes a change in trend result compared to the previous year's evaluation (data through 2009).
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
TCE = Trichloroethene

TABLE 2

LIST OF ADJUSTMENTS IN ANALYTICAL DATA USED IN THE MANN-KENDALL TREND TEST
52ND STREET SUPERFUND SITE
PHOENIX, ARIZONA

Location	*Sample Date*	*Parameter*	*Original Result*	*Result used in trend test*	*Comment*
ASE76-A	9/17/2007	1,1-DCA	ND(2)	--	High DL
ASE76-A	6/14/2005	1,1-DCE	ND(5.0)	--	High DL
ASE76-A	10/4/2005	1,1-DCE	ND(5.0)	--	High DL
ASE76-A	9/18/2006	1,1-DCE	ND(5)	--	High DL
ASE76-B	6/13/2003	1,1-DCE	ND(5)/ND(5)	--	High DL
BC11-A	3/20/2007	1,1-DCA	ND(8.0)	--	High DL
BC11-B	6/18/2001	PCE	ND(2)	--	High DL
BC11-B	9/14/2001	PCE	ND(2)/ND(2)	--	High DL
DM515-115	9/8/2008	1,1-DCA	0.42/0.38	ND(0.5)	Below lowest common DL
EW06	9/14/2001	cis-1,2-DCE	ND(2.0)	--	High DL
EW06	9/18/2003	cis-1,2-DCE	ND(2.0)	--	High DL
EW06	12/12/2003	cis-1,2-DCE	ND(2)	--	High DL
EW06	7/17/2001	PCE	ND(2.0)	--	High DL
EW06	9/14/2001	PCE	ND(2.0)	--	High DL
EW06	12/20/2001	PCE	ND(2.0)	--	High DL
EW06	9/10/2002	PCE	ND(2.0)	--	High DL
EW06	12/6/2002	PCE	ND(2.0)	--	High DL
EW06	3/31/2003	PCE	ND(2.0)	--	High DL
EW06	6/12/2003	PCE	ND(2)	--	High DL
EW06	9/18/2003	PCE	ND(2.0)	--	High DL
EW06	12/12/2003	PCE	ND(2)	--	High DL
EW13-118	3/3/2005	1,1-DCA	0.21	ND(0.5)	Below lowest common DL
EW13-118	9/2/2003	1,1-DCE	ND(1.0)	--	High DL
EW13-118	3/2/2004	1,1-DCE	ND(1)	--	High DL
EW13-118	3/3/2005	1,1-DCE	0.25	ND(0.5)	Below lowest common DL
EW13-118	3/2/2007	1,1-DCE	0.32 J	ND(0.5)	Below lowest common DL
EW13-118	7/11/2001	PCE	ND(1.0)	--	High DL
EW13-118	12/18/2001	PCE	ND(1.0)	--	High DL
EW13-118	7/3/2002	PCE	ND(1.0)	--	High DL
EW13-118	9/4/2002	PCE	ND(1.0)	--	High DL
EW13-118	3/5/2003	PCE	ND(1.0)	--	High DL
EW13-118	9/2/2003	PCE	ND(1.0)/ND(1.0)	--	High DL
EW13-118	3/2/2004	PCE	ND(1)	--	High DL
EW13-118	3/3/2005	PCE	0.12	ND(0.5)	Below lowest common DL
EW13-118	3/24/2008	PCE	0.2 J	ND(0.5)	Below lowest common DL
EW13-118	3/5/2003	TCE	ND(1.0)	--	High DL
EW13-118	9/2/2003	TCE	ND(1.0)/ND(1.0)	--	High DL
EW13-118	3/3/2005	TCE	0.36	ND(0.5)	Below lowest common DL
EW13-118	9/2/2005	TCE	0.24 J	ND(0.5)	Below lowest common DL
EW13-118	3/2/2007	TCE	0.3 J	ND(0.5)	Below lowest common DL
EW13-118	3/24/2008	TCE	0.13 J	ND(0.5)	Below lowest common DL
EW21	12/18/2002	cis-1,2-DCE	ND(1)	--	High DL
EW21	3/7/2003	cis-1,2-DCE	ND(1)	--	High DL
EW21	9/14/2007	cis-1,2-DCE	0.45 J	ND(0.5)	Below lowest common DL
EW21	3/18/2008	cis-1,2-DCE	0.29 J	ND(0.5)	Below lowest common DL
EW21	9/16/2008	cis-1,2-DCE	0.28 J	ND(0.5)	Below lowest common DL
EW21	3/11/2004	PCE	ND(1)UJ	--	High DL
EW21	9/29/2009	PCE	0.35 J	ND(0.5)	Below lowest common DL
EW22-S	9/18/2002	1,1-DCE	0.9 J/ND(2.0)	ND(1.0)	Below lowest common DL
OU312-D	6/4/2003	cis-1,2-DCE	ND(1.0)/ND(1.0)	--	High DL
OU312-D	12/2/2003	cis-1,2-DCE	ND(1)	--	High DL
OU312-D	3/8/2004	cis-1,2-DCE	ND(1)	--	High DL

TABLE 2

LIST OF ADJUSTMENTS IN ANALYTICAL DATA USED IN THE MANN-KENDALL TREND TEST
52ND STREET SUPERFUND SITE
PHOENIX, ARIZONA

Location	*Sample Date*	*Parameter*	*Original Result*	*Result used in trend test*	*Comment*
OU312-D	9/3/2004	cis-1,2-DCE	0.12	ND(0.5)	Below lowest common DL
OU312-D	6/4/2003	PCE	ND(1.0)/ND(1.0)	--	High DL
OU312-D	3/8/2004	TCE	ND(1)U	--	High DL
OU312-D	3/6/2007	TCE	0.45 J	ND(0.5)	Below lowest common DL
OU312-D	3/14/2008	TCE	0.26 J	ND(0.5)	Below lowest common DL
OU312-D	9/15/2008	TCE	0.25 J	ND(0.5)	Below lowest common DL
OU313-M	5/22/2003	1,1-DCA	ND(1)	--	High DL
OU313-M	6/3/2003	1,1-DCA	ND(1)	--	High DL
OU313-M	12/2/2003	1,1-DCA	ND(1)	--	High DL
OU313-M	3/8/2004	1,1-DCA	ND(1)	--	High DL
OU313-M	9/7/2004	1,1-DCA	0.34	ND(0.5)	Below lowest common DL
OU313-M	9/25/2005	1,1-DCA	0.063 J	ND(0.5)	Below lowest common DL
OU313-M	5/22/2003	1,1-DCE	ND(1)	--	High DL
OU313-M	6/3/2003	1,1-DCE	ND(1)	--	High DL
OU313-M	3/8/2004	1,1-DCE	ND(1)	--	High DL
OU313-M	9/7/2004	1,1-DCE	0.42	ND(0.5)	Below lowest common DL
OU313-M	3/6/2007	1,1-DCE	0.33 J+	ND(0.5)	Below lowest common DL
OU313-M	9/13/2007	1,1-DCE	0.31 J	ND(0.5)	Below lowest common DL
OU313-M	9/22/2008	1,1-DCE	0.24 J	ND(0.5)	Below lowest common DL
OU314-M	6/2/2003	1,1-DCA	ND(1)	--	High DL
OU314-M	9/9/2003	1,1-DCA	ND(1)	--	High DL
OU314-M	12/3/2003	1,1-DCA	ND(1)	--	High DL
OU314-M	3/8/2004	1,1-DCA	ND(1)	--	High DL
OU314-M	9/7/2004	1,1-DCA	0.29	ND(0.5)	Below lowest common DL
OU314-M	6/2/2003	1,1-DCE	ND(1)	--	High DL
OU314-M	9/9/2003	1,1-DCE	ND(1)	--	High DL
OU314-M	12/3/2003	1,1-DCE	ND(1)	--	High DL
OU314-M	3/8/2004	1,1-DCE	ND(1)	--	High DL
OU314-M	9/7/2004	1,1-DCE	0.32	ND(0.5)	Below lowest common DL
OU314-M	6/2/2003	PCE	ND(1)	--	High DL
OU314-M	9/9/2003	PCE	ND(1)	--	High DL
PHXA06	9/27/2005	cis-1,2-DCE	ND(2.0)	--	High DL
PHXA06	3/24/2006	cis-1,2-DCE	ND(2)	--	High DL
PHXA06	3/13/2007	cis-1,2-DCE	ND(2.0)	--	High DL
PHXA06	9/1/2004	PCE	ND(2.0)	--	High DL
PHXA06	4/1/2005	PCE	ND(2)	--	High DL
PHXA06	6/14/2005	PCE	ND(2.0)	--	High DL
PHXA06	9/27/2005	PCE	ND(2.0)	--	High DL
PHXA06	12/16/2005	PCE	ND(2.0)	--	High DL
PHXA06	3/24/2006	PCE	ND(2)	--	High DL
PHXA06	3/13/2007	PCE	ND(1.0)	--	High DL
PL103-A	9/8/2004	PCE	ND(2.0)	--	High DL
PL103-A	9/8/2004	cis-1,2-DCE	ND(2.0)	--	High DL
PL103-A	9/8/2004	PCE	ND(2.0)	--	High DL
PL103-C	6/23/2004	1,1-DCE	ND(5.0)	--	High DL
PL103-C	3/15/2005	1,1-DCE	ND(5)	--	High DL
PL103-C	3/16/2007	1,1-DCE	ND(13)	--	High DL
PL103-C	3/16/2007	PCE	ND(6.7)	--	High DL
PL105-A	9/11/2008	1,1-DCE	--	--	Test started on this date (1)
PL105-A	12/1/2006	cis-1,2-DCE	--	--	Test started on this date (1)
PL105-A	3/21/2007	cis-1,2-DCE	ND(8.0)	--	High DL
PL105-A	6/18/2007	cis-1,2-DCE	ND(2)	--	High DL

TABLE 2

LIST OF ADJUSTMENTS IN ANALYTICAL DATA USED IN THE MANN-KENDALL TREND TEST
52ND STREET SUPERFUND SITE
PHOENIX, ARIZONA

Location	*Sample Date*	*Parameter*	*Original Result*	*Result used in trend test*	*Comment*
PL105-A	9/20/2007	cis-1,2-DCE	ND(2)	--	High DL
PL105-A	3/17/2008	cis-1,2-DCE	ND(2.0)	--	High DL
PL201-A	9/9/2008	1,1-DCE	--	--	Test started on this date (1)
PL201-A	--	cis-1,2-DCE	--	--	Test on detected data only (2)
PL201-A	9/9/2008	PCE	--	--	Test started on this date (1)
PL201-A	9/18/2006	TCE	ND(2)/ND(2)	--	High DL
PL202-C	3/19/2007	1,1-DCA	ND(2.0)	--	High DL
PL202-C	9/17/2007	1,1-DCA	ND(2)	--	High DL
PL202-C	9/13/2001	1,1-DCE	ND(5)	--	High DL
PL202-C	9/16/2005	1,1-DCE	ND(5.0)	--	High DL
PL202-C	9/18/2006	1,1-DCE	ND(5)	--	High DL
PL202-C	3/19/2007	1,1-DCE	ND(2.0)	--	High DL
PL202-C	9/17/2007	1,1-DCE	ND(2)	--	High DL
PL202-C	9/13/2001	TCE	ND(2)	--	High DL
PL202-C	9/13/2001	TCE	ND(2)	--	High DL
PL202-C	9/18/2006	TCE	ND(2)	--	High DL
PL202-C	3/19/2007	TCE	ND(1.0)	--	High DL
PL202-C	9/17/2007	TCE	ND(1)	--	High DL
PL202-N	3/19/2007	1,1-DCA	ND(13)	--	High DL
PL202-N	3/19/2007	PCE	ND(6.7)	--	High DL
PL2101	9/9/2008	PCE	--	--	Test started on this date (1)
PL2101	4/10/2001	PCE	4.8 J	4.8 J	Retained in trend test (3)
PL2101	--	TCE	--	--	Test on detected data only (2)
PL2102	9/9/2008	1,1-DCA	--	--	Test started on this date (1)
PL2102	9/9/2008	1,1-DCE	--	--	Test started on this date (1)
PL2102	9/9/2008	PCE	--	--	Test started on this date (1)
PL2102	4/10/2001	PCE	5.3 J	5.3 J	Retained in trend test (3)
PL2102	9/22/2005	TCE	ND(2.0)	--	High DL
PL2102	12/12/2005	TCE	ND(2.0)	--	High DL
PL2102	7/5/2006	TCE	ND(2)/ND(2)	--	High DL
PL2102	9/12/2006	TCE	ND(2)	--	High DL
PL2102	12/1/2006	TCE	0.61 J	ND(1)	Below lowest common DL
PL2102	12/11/2006	TCE	0.61 J	ND(1)	Below lowest common DL
PL2102	9/9/2008	TCE	0.7	ND(1)	Below lowest common DL

Notes:
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
TCE = Trichloroethene
This table was originally presented in the 2009 evaluation memo. No additional data adjustments have been made since that time
High DL: detection limit is higher than currently reported, datum was excluded from the trend test
Below lowest common DL: datum is below common detection limit and was substituted by a non-detect.
(1) Trend test started on the date indicated due to recent data following reduction in detection limit.
(2) Due to inconsistent detection limits falling in between detected values, trend test was performed using detected values only.
(3) Retained in trend test, since detected value is higher than the current reported detection limit.

ATTACHMENT A

MANN-KENDALL TREND TEST SAMPLE CALCULATION

ATTACHMENT A

MANN-KENDALL TREND TEST SAMPLE CALCULATION

OU312-D Trichloroethene

Time	*6/4/2003*	*12/2/2003*	*3/8/2004*	*9/3/2004*	*3/15/2005*	*9/26/2005*	*3/27/2006*	*9/12/2006*	*3/6/2007*	*9/6/2007*	***Number of + Signs***	***Number of - Signs***
Data	4.4	5.4	4.3	0.84	1	0.51	0.88	0.61	0.45	0.57		
4.4		+	--	--	--	--	--	--	--	--	1	8
5.4			--	--	--	--	--	--	--	--	0	8
4.3				--	--	--	--	--	--	--	0	7
0.84					+	--	+	--	--	--	2	4
1						--	--	--	--	--	0	5
0.51							+	+	--	+	3	1
0.88								--	--	--	0	3
0.61									--	--	0	2
0.45										+	1	0
											0	0
										Total:	7	38

STEP 1	Null Hypothesis:	H_0: there is no trend
STEP 2	Null Hypothesis:	H_A: There is a downward trend
STEP 3	Test Statistic	S = Total plusses - total minuses = 7 - 38 = - 31
STEP 4	a) Critical Value:	Using Table A-12a, the critical value is 21.
STEP 4	b) p-value	Using Table A-12b, the p-value is 0.0023 (one-sided test) or 0.0046 (two-sided test)
STEP 5	a) Conclusion:	As S = - 31 < 21 (critical value), fail to reject the null hypothesis of no trend.
STEP 5	b) Conclusion:	Since p-value = 0.0046 < 0.05 (significance level), we reject the null hypothesis of no trend.

Conclusion: Decreasing Trend

Note:

Tables A-12a and A-12b are found at EPA QA/G-9S, Data Quality Assessment: Statistical Methods for Practitioners, February 2006. (EPA/240/B-06/003).

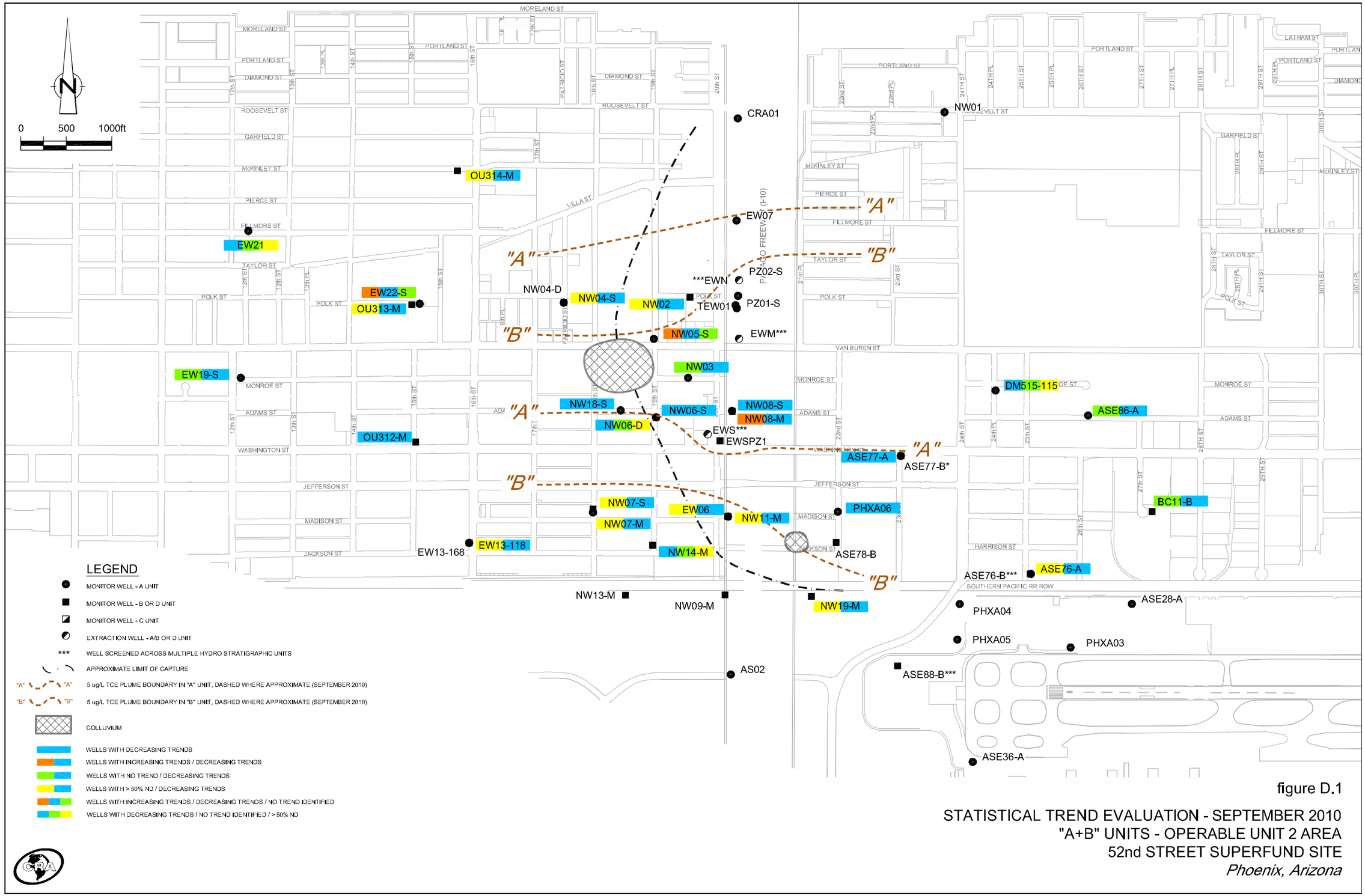

figure D.1

STATISTICAL TREND EVALUATION - SEPTEMBER 2010
"A+B" UNITS - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX051 FIGURE D-1 FEB 23/2011

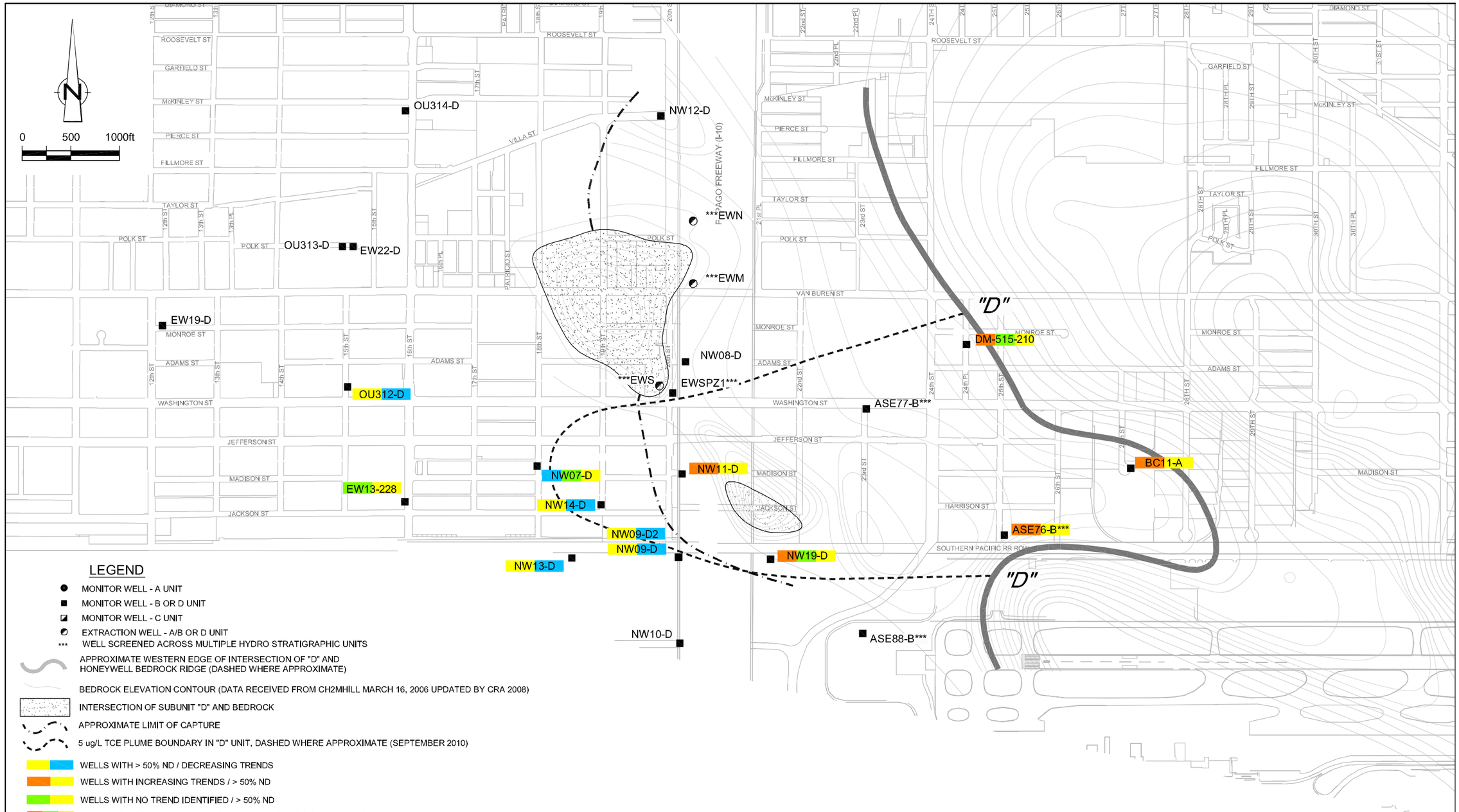

figure D.2

STATISTICAL TREND EVALUATION - SEPTEMBER 2010
"D" UNIT - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX052 FIGURE D-2 APR 15/2011

APPENDIX D-2

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GROUNDWATER ELEVATIONS – SEPTEMBER 2010 SUBUNIT "D" D.4

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FLOW PATH 1 SUBUNIT "D" TCE TREND D.6

FLOW PATH 2 SUBUNITS "A+B" TCE TREND D.7

FLOW PATH 2 SUBUNIT "D" TCE TREND D.8

FLOW PATH 3 SUBUNITS "A+B" TCE TREND D.9

FLOW PATH 3 SUBUNIT "D" TCE TREND D.10

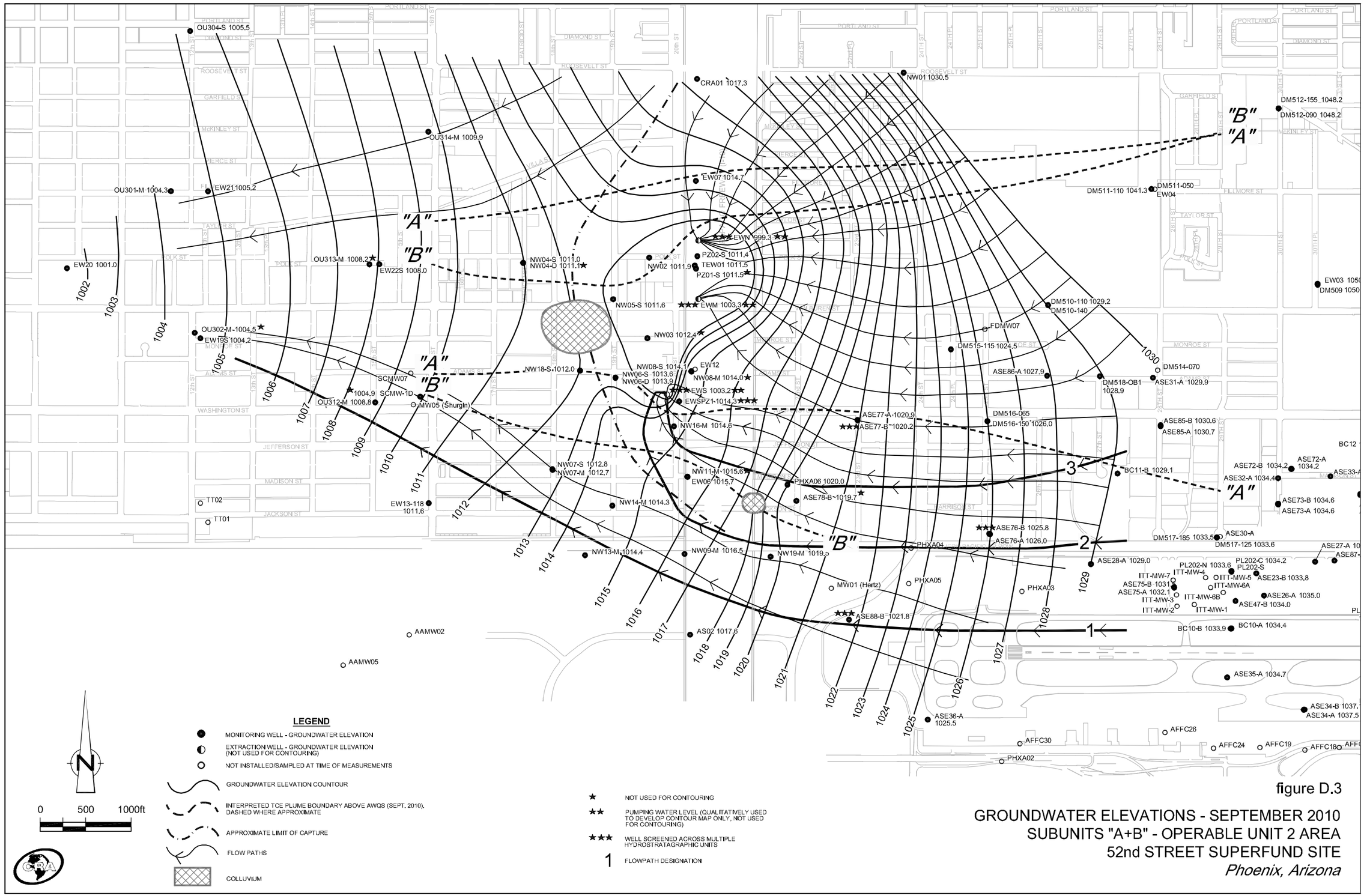


figure D.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX050 FIGURE D.3 FEB 23/2011

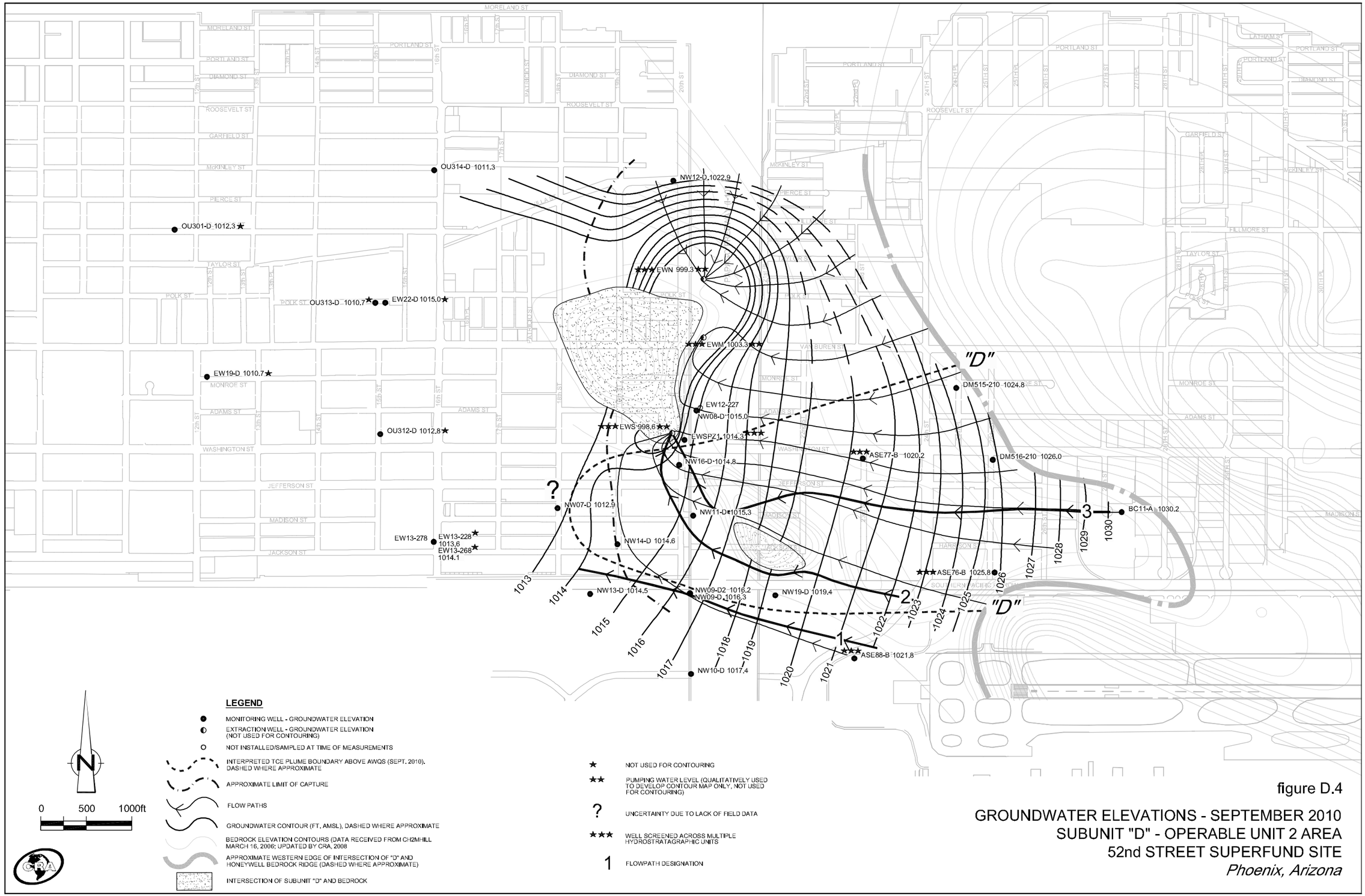


figure D.4

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX067 FIGURE D.4 APR 14/2011

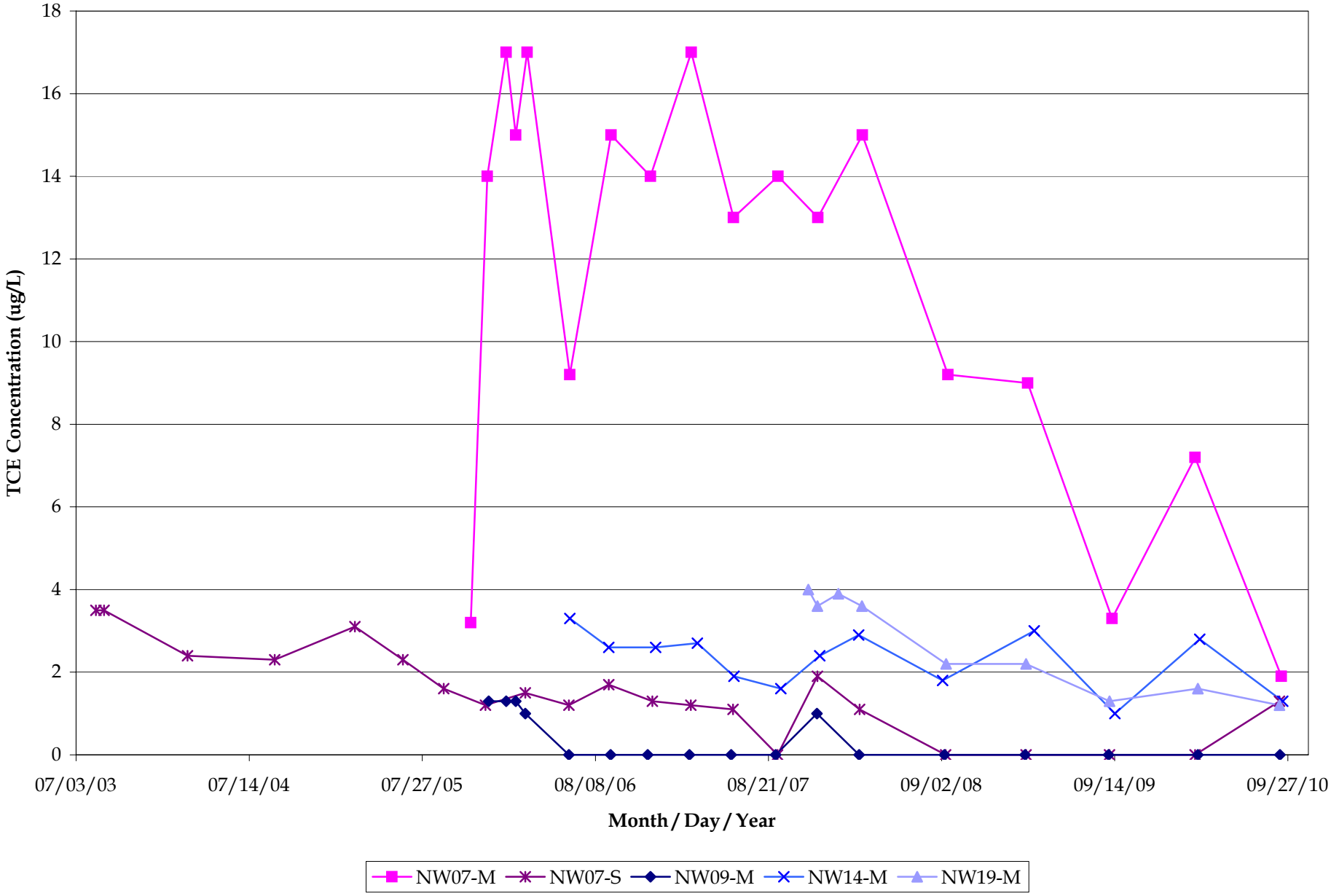


figure D.5
FLOW PATH 1 SUBUNITS "A+B" TCE TREND
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

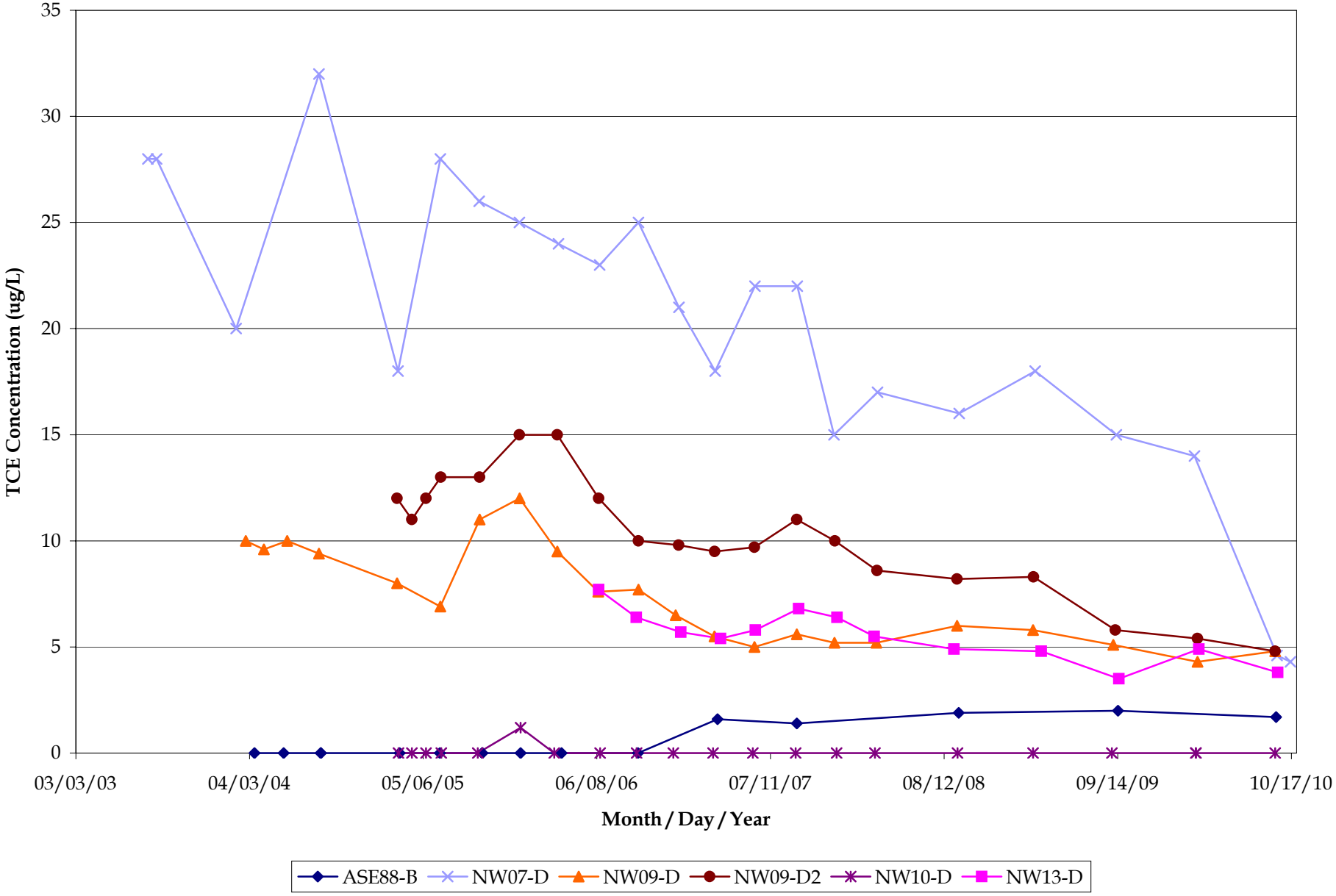


figure D.6
FLOW PATH 1 SUBUNIT "D" TCE TREND
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

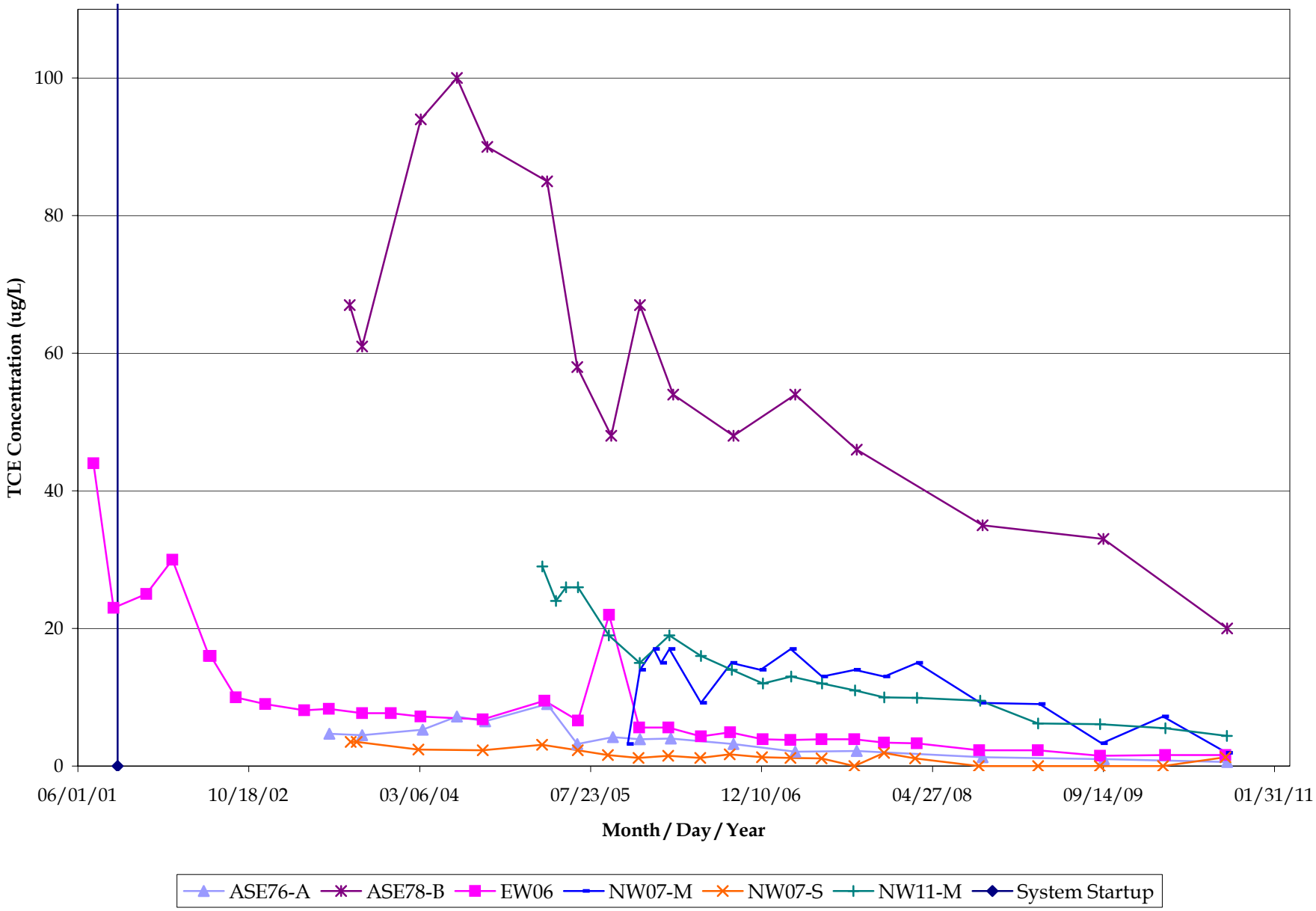


figure D.7
FLOW PATH 2 SUBUNITS "A+B" TCE TREND
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

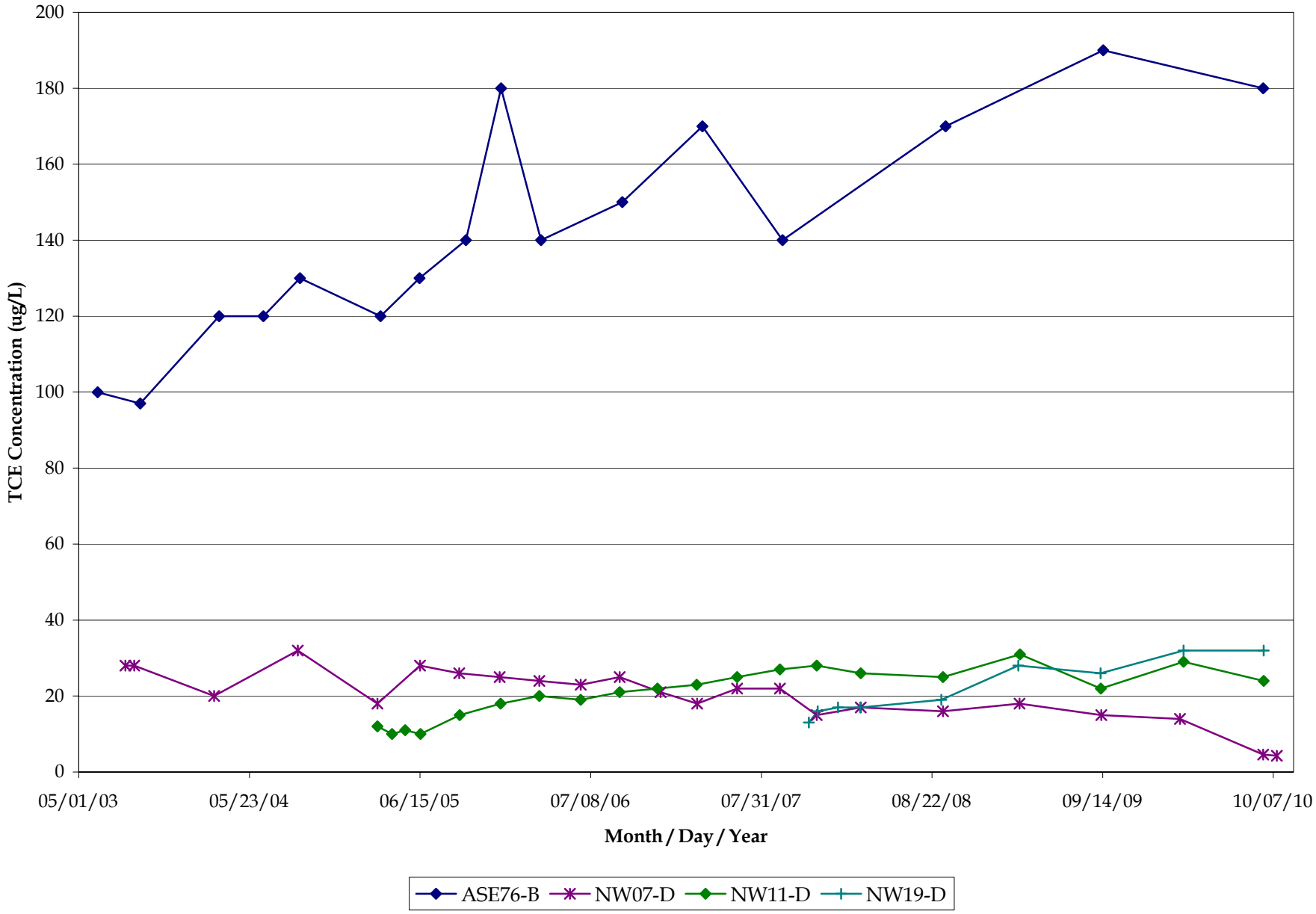


figure D.8
FLOW PATH 2 SUBUNIT "D" TCE TREND
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

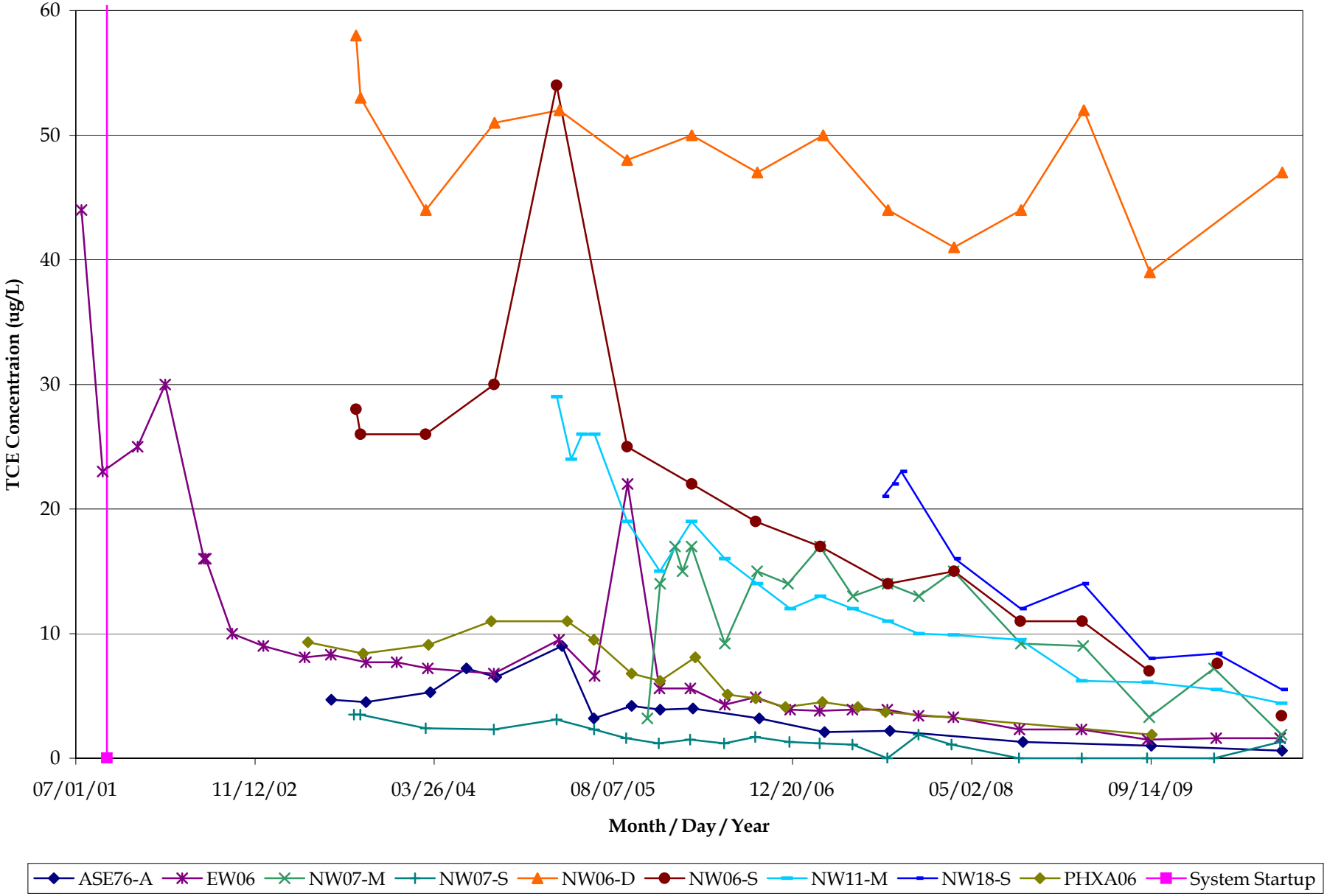


figure D.9
FLOW PATH 3 SUBUNITS "A+B" TCE TREND
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

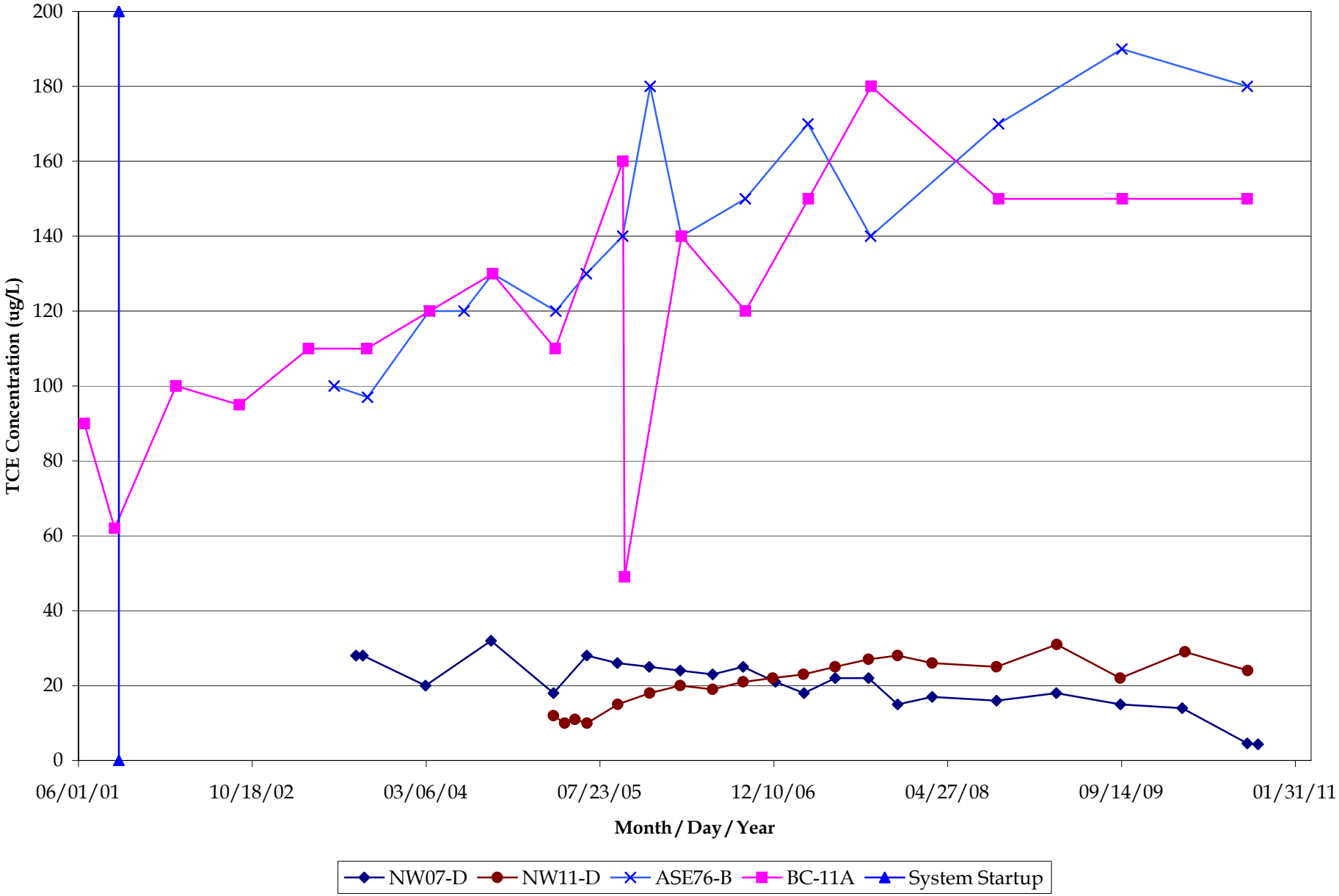


figure D.10
FLOW PATH 3 SUBUNIT "D" TCE TREND
52nd STREET SUPERFUND SITE, OU2 AREA
Phoenix, Arizona

APPENDIX E

SUMMARY OF EXTRACTION WELL AND TREATMENT SYSTEM SHUTDOWNS

SUMMARY OF EXTRACTION WELL AND TREATMENT SYSTEM SHUTDOWNS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

January 2010

1/11/2010	System shut down due to annual SRP maintenance on Grand Canal.

February 2010

02/08/10	System shut down for 8 days due to annual SRP maintenance on Grand Canal.

March 2010

No shutdowns.

April 2010

No shutdowns.

May 2010

05/16/10	System was shut down for 60 minutes due to an "Extraction Pumps Not Available" alarm.

June 2010

06/10/10	System was shut down for 2 hours and 35 minutes to install a new breaker disconnect in the Facility electrical room and the GAC building.

July 2010

07/06/10	System was shut down for 35 minutes due to a power outage.
07/29/10	System was shut down for 1 hour and 35 minutes due to flooding of the Grand Canal caused by heavy rains.
07/30/10	System was shut down for 3 hours due to a power outage.

August 2010

08/17/10	System was shut down for 11 hours and 54 minutes due to flooding of the Grand Canal caused by heavy rains.

September 2010

09/03/10	System was shut down for 1 hour to repair a leaking air eliminator valve in the discharge piping.

October 2010

10/05/10	System was shut down for 15 hours due to flooding of the Grand Canal caused by heavy rains.

November 2010

No shutdowns.

December 2010

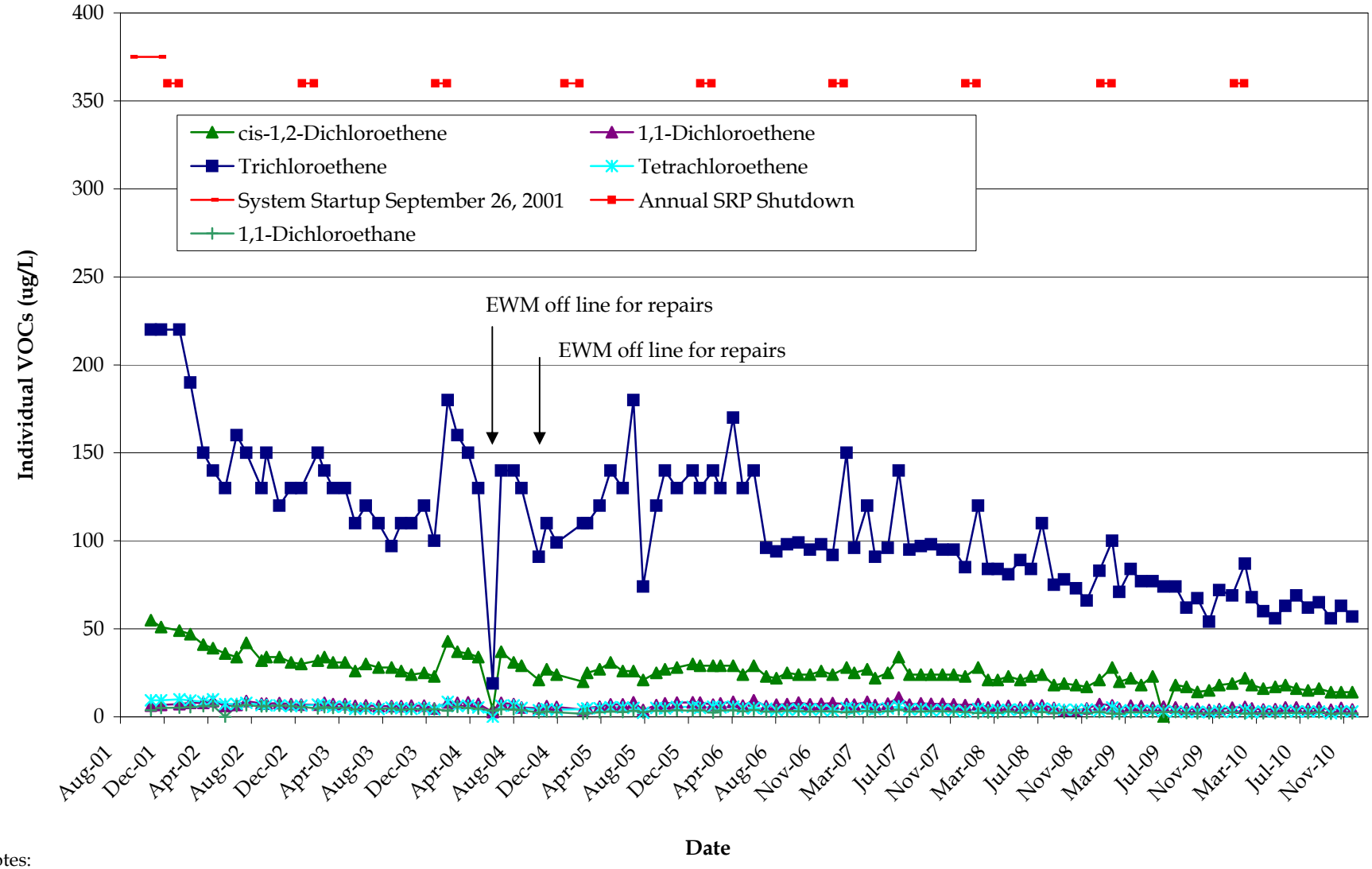
12/29/10	System was shut down for 12 hours and 10 minutes due to flooding of the Grand Canal caused by heavy rains.

Note:
GAC - granular activated carbon

APPENDIX F

COMBINED INFLUENT VOC TRENDING CHART

COMBINED INFLUENT VOC TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

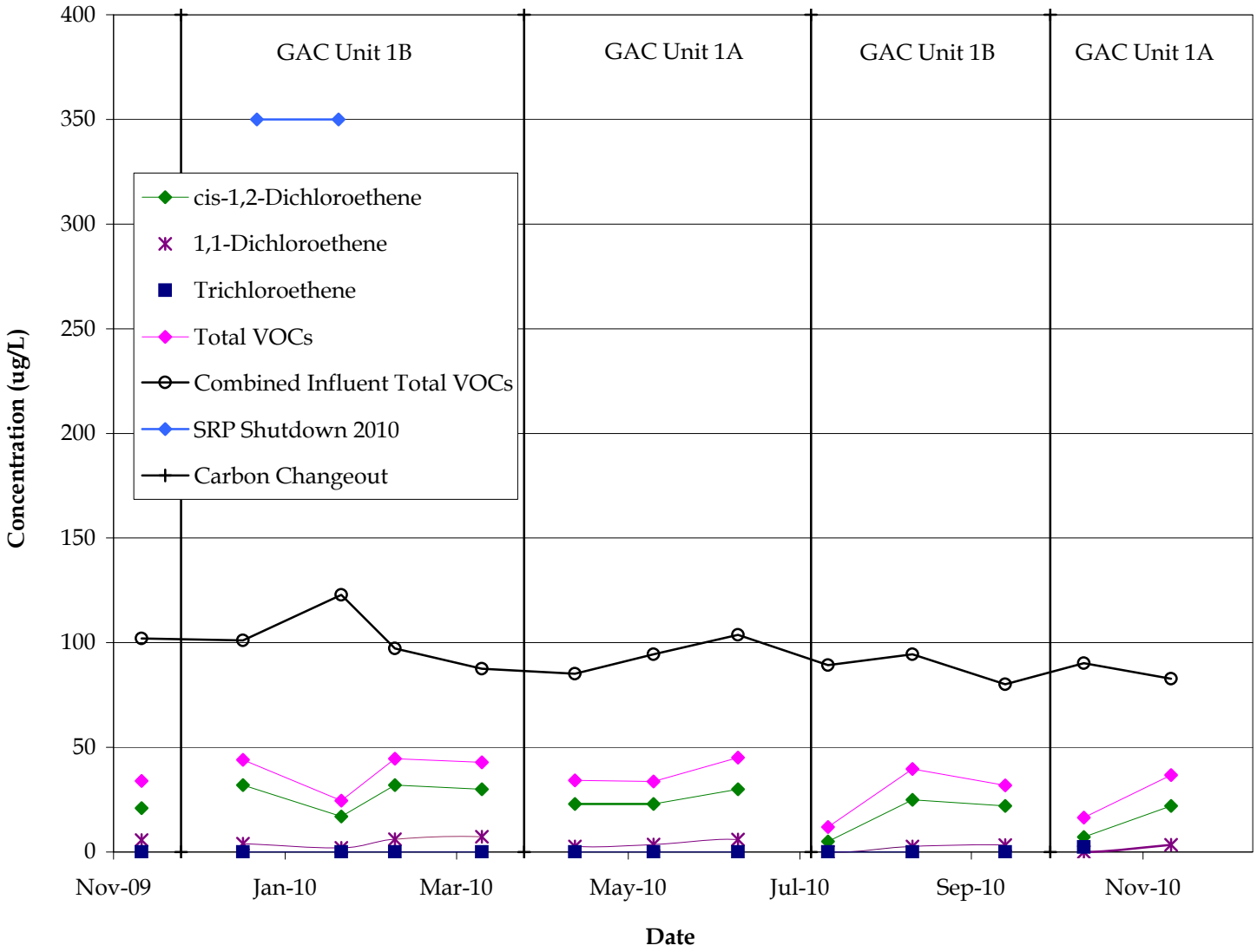


Notes:
ug/L - micrograms per Liter
VOCs - volatile organic compounds

APPENDIX G

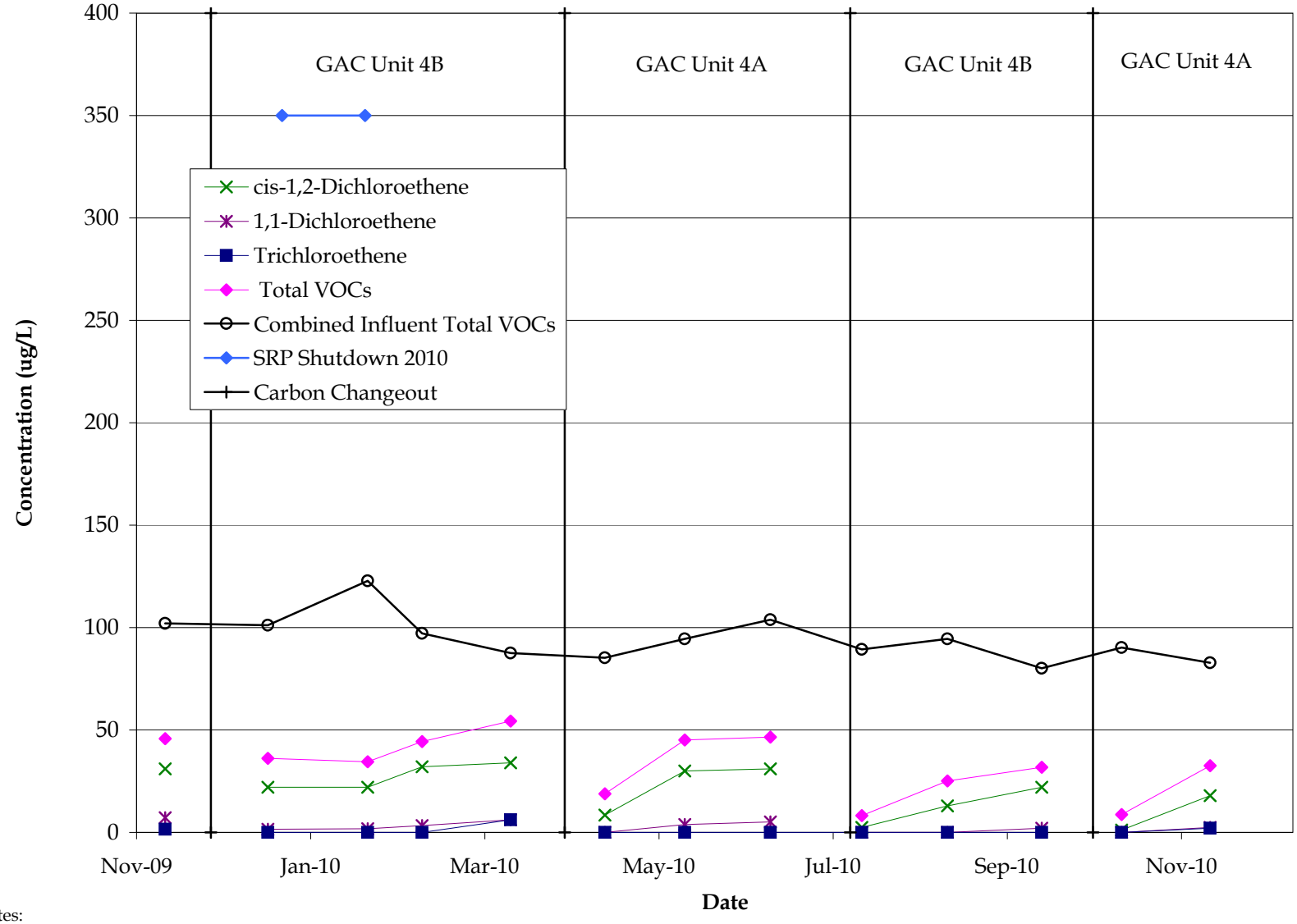
GAC PRIMARY UNIT VOC TRENDING CHARTS

GAC #1 PRIMARY UNIT VOC TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA



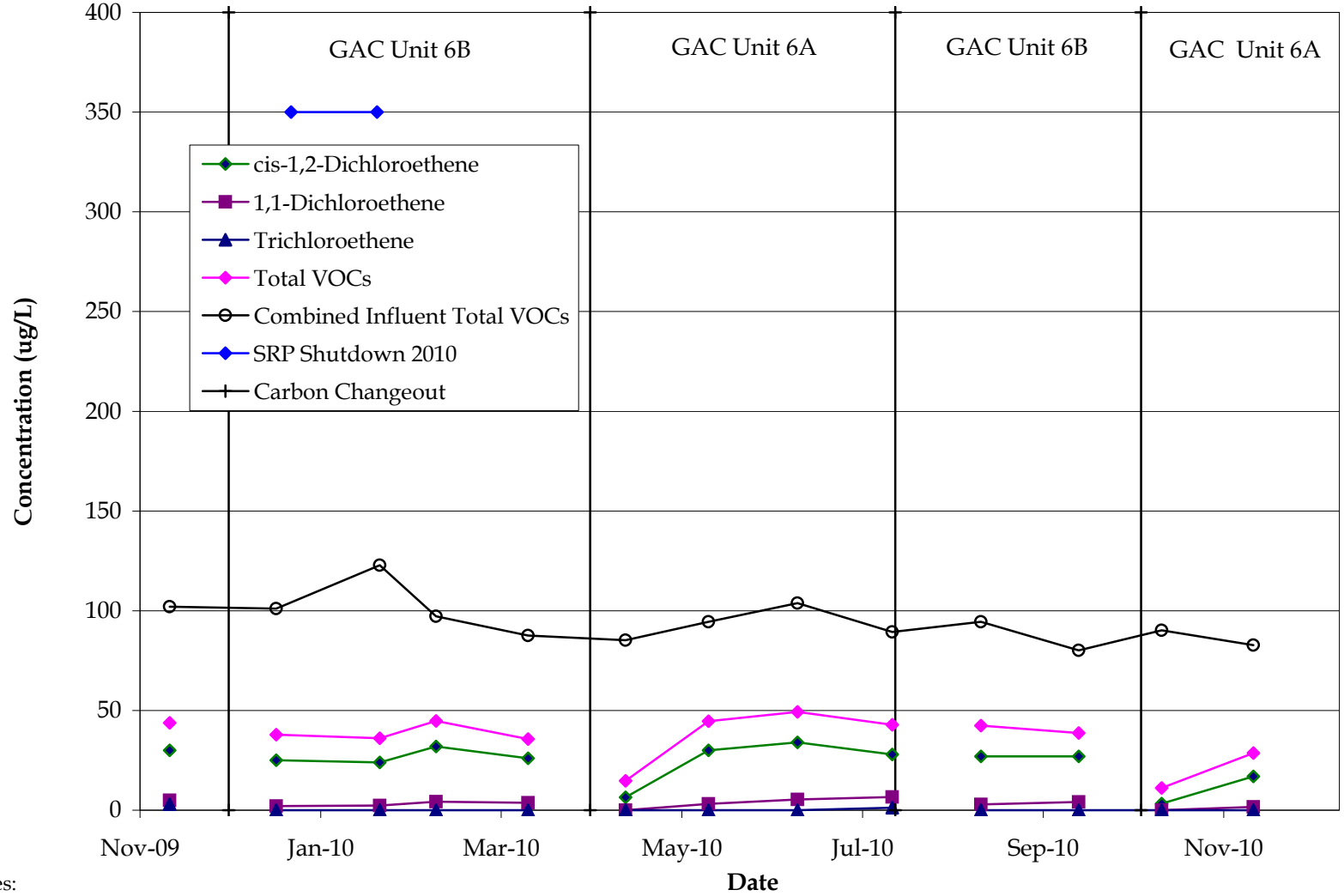
Notes:
VOCs - volatile organic compounds
GAC - granular activated carbon
ug/L - micrograms per liter

GAC #4 PRIMARY UNIT VOC TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA



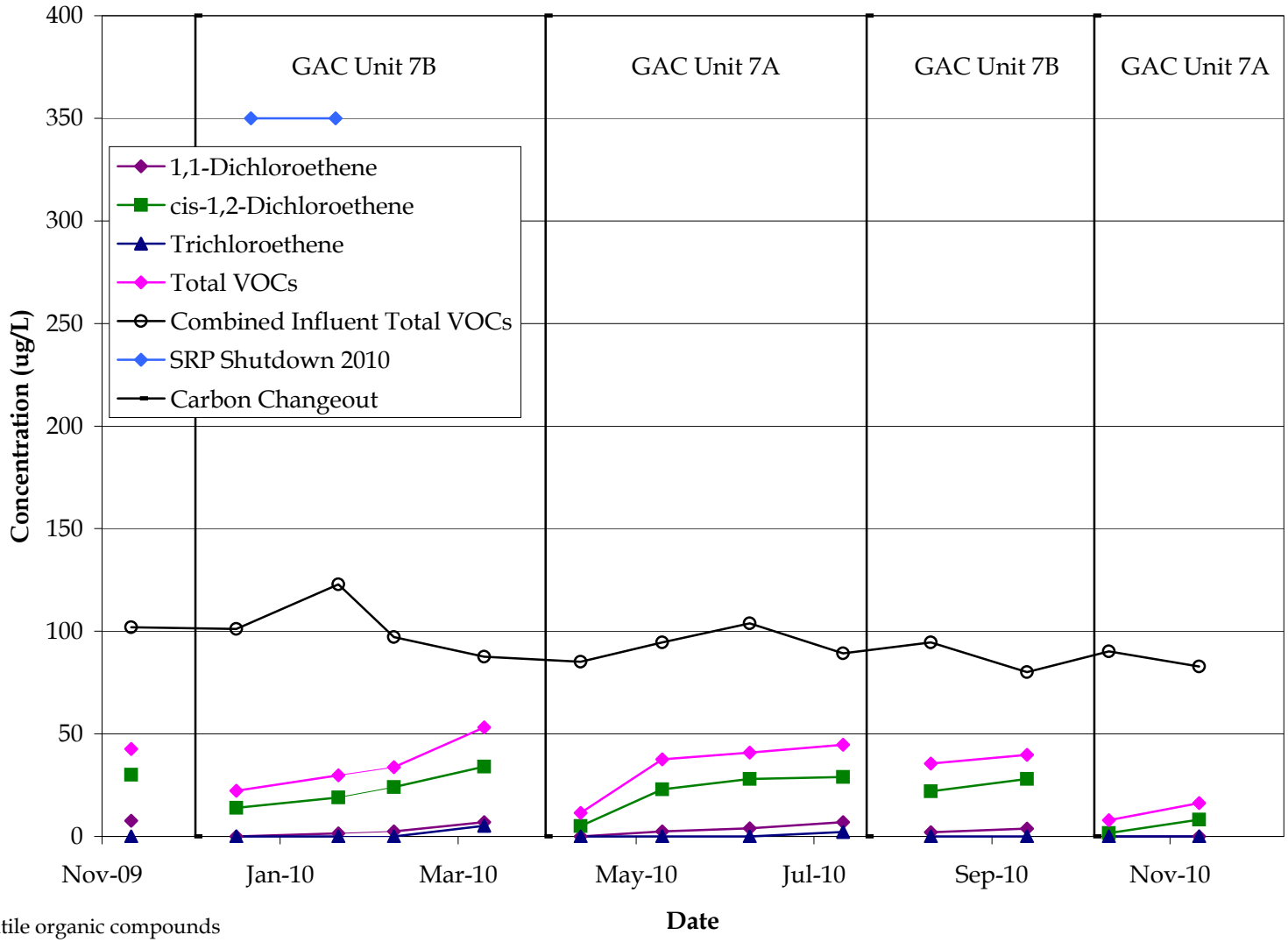
Notes:
VOCs - volatile organic compounds
GAC - granular activated carbon
ug/L - micrograms per liter

GAC #6 PRIMARY UNIT VOC TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA



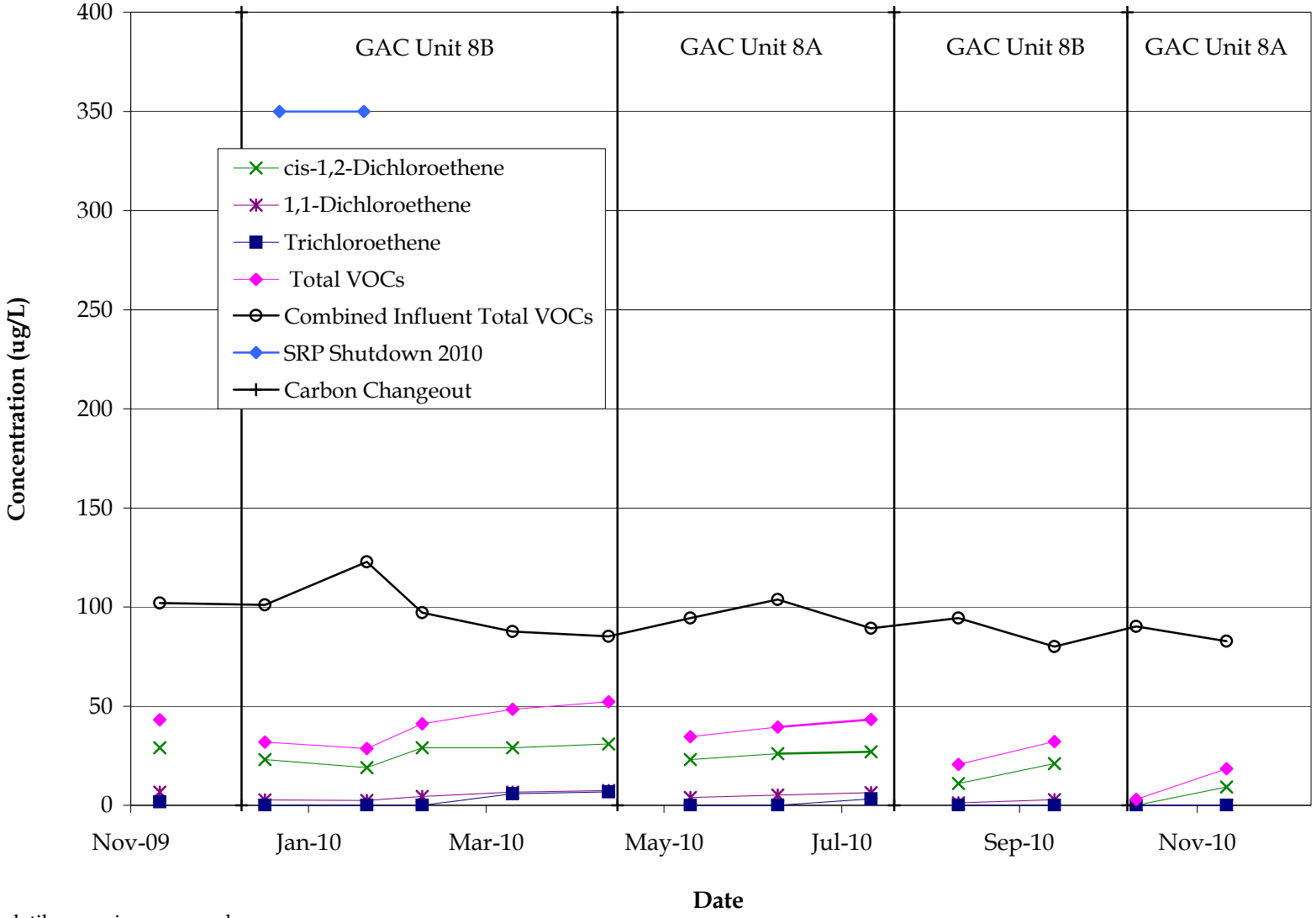
Notes:
VOCs - volatile organic compounds
GAC - granular activated carbon
ug/L - micrograms per liter

GAC #7 PRIMARY UNIT VOC TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA



Notes:
VOCs - volatile organic compounds
GAC - granular activated carbon
ug/L - micrograms per liter

GAC #8 PRIMARY UNIT VOC TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

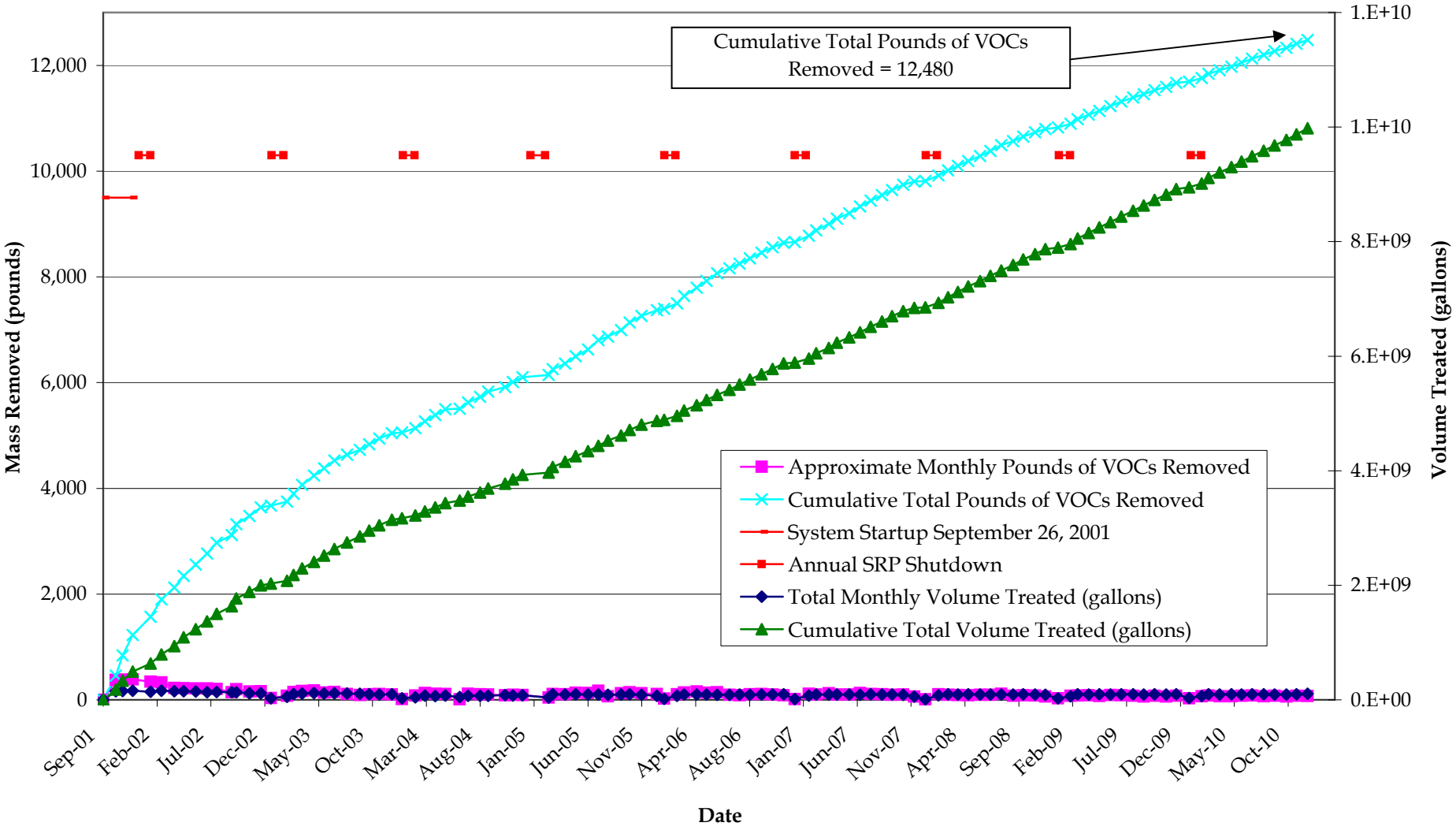


Notes:
VOCs - volatile organic compounds
GAC - granular activated carbon
ug/L - micrograms per liter

APPENDIX H

VOC MASS REMOVED TRENDING CHART

VOC MASS REMOVED TRENDING
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA



Note:
VOC - volatile organic compound

SUMMARY OF TOTAL ANNUAL GALLONS GROUNDWATER TREATED
AND TOTAL POUNDS VOCs REMOVED
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Date	*Cumulative Total Gallons Treated (acre-feet)*	*Cumulative Total Pounds VOCs Removed*
2002 Totals	2,028,312,000 (6224)	3,674
2003 Totals	3,172,740,000 (9737)	5,058
2004 Totals	3,929,282,000 (12059)	6,101
2005 Totals	4,888,505,000 (15002)	7,393
2006 Totals	5,872,384,000 (18022)	8,646
2007 Totals	6,841,588,000 (20996)	9,804
2008 Totals	7,869,457,000 (24150)	10,796
2009 Totals	8,917,866,000 (27368)	11,668
2010 Totals	9,979,853,500 (30627)	12,480

APPENDIX I

SUMMARY OF INSPECTIONS, MAINTENANCE, AND REPAIRS

SUMMARY OF INSPECTIONS, MAINTENANCE, AND REPAIRS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

January 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Changed oil, filters, and separator in facility air compressor
- Cleaned air relief valves on granular activated carbon (GAC) units
- Tightened electrical connections on the GAC panels, UV power supplies, facility main control panel, and the control panels on the extraction wells
- Tested all programmable logic controller (PLC) batteries
- MP Environmental Services vacuumed and cleaned out the Backwash Wastewater (BWWW) tank and transported sludge to Waste Management's Butterfield Station Landfill
- Replaced check valves in BWWW pumps
- Began repairing air relief valves in the force main
- Disassembled and inspected EWN, EWM, EWS, and the backwash flow control valves
- Performed annual maintenance on dry type transformers
- Cintas tested security, fire protection, and hazard alarms
- Cintas tested the RP backflow prevention devices
- Inspected facility piping for scaling
- Removed, cleaned, and checked operability of BWWW flow meter
- Cleaned and inspected EWN, EWM, EWS, and BWWW flow meter sensors

February 2010

- Collected meter reading totals.
- Checked trending program daily.
- Cleaned EWS basket strainer.
- Cleaned GAC pad.
- Repaired leaking air eliminator valve on GAC Vessel #6B.
- Repaired air eliminator valves in force main.
- Replaced leaking isolation ball valve for the force main air eliminator on Roosevelt Street between 28th Street and 29th
- Repaired leaking solenoid valve on EWN flow control valve (FCV).
- Repaired leaking air eliminator valves on EWS and EWM.
- Replaced the solenoid valve on EWM FCV.
- Instrumentation and Controls (subcontractor) calibrated all six extraction and treatment system flow meters on February 11, 2010. SRP field verified the effluent flow meter calibration on February 15, 2010.
- Performed general maintenance on all GAC Vessels (tightened bolts on manway covers, replaced filter cones, inspected piping for scaling, etc.).
- Backed up all PLC programs.
- Tested alarm set points.
- Removed and cleaned BWWW check valves.
- Cleaned out and archived electronic files on Supervisory Control and Data Acquisition (SCADA) computer.

March 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Cleaned GAC pad
- Lubricated facility East Gate chain
- Performed monthly inspection of the fire extinguishers and emergency lighting system
- Repaired leaking air eliminator valve at EWM
- Rehabilitated/acid cleaned monitor wells NW04-S, NW04-D, NW05-S, NW07-S, NW07-M, NW07-D, NW08-S, NW08-M, NW08-D, NW09-M, and NW12-D
- Replaced/repaired well vault and J-plugs, and installed new identification plates on monitor wells NW12-D, NW08-S, NW08-M, NW08-D, NW07-S, NW07-M, NW07-D, NW06-S, NW06-D, NW05-S, NW04-S, NW04-D, and NW03 as vault integrity/water tight seal compromised
- Repaired leaking sample port valve at GAC Vessel #1A
- Backwashed GAC Vessels #4B, #7B, and #9B
- Performed pump/falling head tests on NW18-M and NW17-S

SUMMARY OF INSPECTIONS, MAINTENANCE, AND REPAIRS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

April 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Cleaned GAC pad
- Cleaned GAC pad
- Performed monthly inspection of the fire extinguishers and emergency lighting system
- Repaired leaking air eliminator valve at first force main vault on Van Buren Street
- Replaced burned out emergency light in electrical room
- Repaired a leaking air eliminator valve on GAC Vessel #4B
- Cleaned the filter screen in GAC Vessel #4B
- Backwashed GAC Vessels #1B, #4B, #6B, and #7B
- Emptied the irrigation pump expansion tank and recharged
- Repaired a leaking air eliminator valve on GAC Vessel #6B
- Repaired a leak in the irrigation line along the 20th Street sidewalk

May 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Cleaned GAC pad
- Performed monthly inspection of the fire extinguishers and emergency lighting system
- Replaced burned-out lamps at EWN building
- Repaired a leaking sample port on GAC Vessel #7B
- Cleaned the filter screens on GAC Vessels #6B and #7B
- Repaired a leak on the groundwater tank feed pump
- Backwashed GAC Vessel #8B
- Repaired leaking irrigation line along Washington Street facility entrance
- Repaired, cleaned and adjusted East facility slide gate chain

June 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Cleaned GAC pad
- Backwashed GAC Vessels as needed
- Performed monthly inspection of the fire extinguishers and emergency lighting system
- Replaced a cracked outer glass tube for lamp #3 in the UV system
- Repaired a small leak on the air eliminator at EWM
- Added grease to the pump motors on EWN and EWM
- Pulled and cleaned the air eliminator valve at GAC Vessel #7A
- Repaired a broken "L" channel for the slide gate to the facility

July 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Cleaned GAC pad
- Backwashed GAC Vessels as needed
- Performed monthly inspection of the fire extinguishers and emergency lighting system
- Vacuumed out and washed the coils in the GAC building Air Conditioning (A/C) unit
- Drained and recharged the irrigation expansion tank
- Repaired a leaking air eliminator in the effluent piping near the SRP discharge to the Grand Canal
- Cleaned the solenoid valves at EWM
- Repaired the leaking check valve at EWM
- Vacuumed and washed the coils in the EWS building A/C unit
- Recharged A/C unit in the facility office

SUMMARY OF INSPECTIONS, MAINTENANCE, AND REPAIRS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

August 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned EWS basket strainer
- Cleaned GAC pad
- Backwashed GAC Vessels as needed
- Performed monthly inspection of the fire extinguishers and emergency lighting system
- Repaired facility main building A/C unit
- Cleaned outlet solenoid valve for EWN FCV
- Repaired a leaking air eliminator on GAC Vessel #1A
- Installed 4-inch FCV on EWS discharge piping
- Retrofitted EWS discharge piping to accommodate new FCV
- Replaced discharge piping for EWS
- Replaced EWS pump with one of higher capacity (300 gallons per minute)
- Brushed, swabbed, bailed, and videoed EWS well casing
- Cleaned GAC Vessel #1A filter screen

September 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned GAC pad and piping
- Cleaned EWS basket strainer
- Repaired leaking air eliminator valve in facility discharge piping near the corner of 24th Street and Roosevelt Street
- Repaired leaking air eliminator valve on GAC Vessel #8B
- Drained and recharged irrigation system expansion tank
- Adjusted and lubricated chain on Washington Street side gate
- Inspected BWWW flow transmitter
- Cleaned the coils in the facility A/C units
- Replaced two security lamps along inside of facility wall
- Cleaned GAC Vessels #1B and #8A filter screens

October 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned GAC pad and piping
- Cleaned EWS basket strainer
- Backwashed GAC Vessels #1B, #4B, #6B, #7B, and #8B
- Pulled, cleaned, and inspected backwash wastewater flow transmitter
- Cleaned the filter screen for GAC Vessel #1B
- Repaired leaking air eliminator valve on GAC Vessel #1B
- Repaired leaking sample port on GAC Vessel #6B
- Installed new level transducer in EWM
- Cleaned the coils in the facility A/C units
- Replaced two security lamps along inside of facility wall
- Cleaned GAC Vessels #1B and #8A filter screens

November 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned GAC pad and piping
- Cleaned EWS basket strainer
- Backwashed GAC Vessels #1A, #2A, #2B, and #4A
- Cleaned the filter screens for GAC Vessels #2A and #8B
- Repaired 6-inch nipples below air eliminators on GAC Vessels #2B and #4A
- Installed new "High High" alarm for GAC pad sump
- Repaired lids on monitoring well vaults
- Painted EWS piping and flow control valve
- Performed 24-hour maintenance run of UV system

SUMMARY OF INSPECTIONS, MAINTENANCE, AND REPAIRS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

December 2010

- Collected meter reading totals
- Checked trending program daily
- Cleaned GAC pad and piping
- Cleaned EWS basket strainer
- Repaired facility lights along Washington Street fence
- Cleaned the filter screens for GAC Vessels #2B, #6A, #6B, and #8A
- Repaired leaking air eliminator on GAC Vessel #2B
- Repaired V-belt on the main facility building HVAC unit
- Cleaned main facility chemical room HVAC heating coil
- Repaired lids on and sealed monitoring well vaults
- Remounted the bearing block on the 20th Street slide gate drive shaft
- Tightened the chain on the 20th Street slide gate
- Cleaned the inlet solenoid valve on EWM FCV
- Repaired stuck check valve on EWN FCV
- Tightened the chain on the 20th Street slide gate