EMF RI TABLES

TABLE 2.3-2
ANALYTICAL PARAMETERS FOR GROUNDWATER SAMPLES

I. Heavy Metals	**IV. Volatile Organics[a]**
Aluminum	Chloromethane
Antimony	Bromomethane
Arsenic	Vinyl chloride
Barium	Chloroethane
Beryllium	Methylene chloride
Boron	Acetone
Cadmium	Carbon disulfide
Chromium	1,1-dichloroethene
Cobalt	1,1-dichloroethane
Copper	Trans-1,2-dichloroethene
Iron	Chloroform
Lead	1,2-dichloroethane
Lithium	2-Butanone
Manganese	1,1,1-trichloroethane
Mercury	Carbon tetrachloride
Molybdenum	Vinyl acetate
Nickel	Bromodichloromethane
Selenium	1,2-dichloropropane
Silver	cis-1,3-dichloropropene
Thallium	Trichloroethene
Vanadium	Dibromochloromethane
Zinc	1,1,2-trichloroethane
	Benzene
II. General Water Quality Parameters	Trans-1,3-dichloropropene
Alkalinity (bicarbonate)	2-chloroethylvinylether
Alkalinity (carbonate)	Bromoform
Ammonia	4-methyl-2-pentanone
Calcium	2-hexanone
Chloride	Tetrachloroethene
Conductivity	1,1,2,2-tetrachloroethane
Fluoride	Tetrahydrofuran
Magnesium	Toluene
Nitrate	Chlorobenzene
pH	Ethylbenzene
Phosphorus (total)	Styrene
Phosphorus (orthophosphate)	Total xylenes
Potassium	
Sodium	**V. Semivolatile Organics[a]**
Sulfate	Phenol
Temperature	bis(2-chloro-ethyl)ether
Total Dissolved Solids	2-chlorophenol
	1,3-dichlorobenzene
III. Radionuclides	1,4-dichlorobenzene
Gross Alpha	benzyl alcohol
Gross Beta	1,2-dichlorobenzene
Radium - 226[a]	2-methylphenol
Radium - 228[a]	

TABLE 2.3-2 *(continued)*
ANALYTICAL PARAMETERS FOR GROUNDWATER SAMPLES

V.	**Semivolatile Organics (continued)**	
	bis(2-chloroisopropyl)ether	4,6-dinitro-2-methylphenol
	4-methylphenol	N-Nitrosodiphenylamine
	n-nitroso-dipropylamine	4-Bromophenyl phenyl ether
	Hexachloroethane	Hexachlorobenzene
	Nitrobenzene	Pentachlorophenol
	Isophorone	Phenanthrene
	2-nitrophenol	Anthracene
	2,3-dimethylphenol	Di-n-butyl phthalate
	Benzoic acid	Fluoranthene
	bis(2-chloroethoxy)methane	Pyrene
	2,4-dichlorophenol	Butyl benzyl phthalate
	1,2,4-trichlorobenzene	3,3"-dichlorobenzidine
	Naphthalene	Benzo(a)anthracene
	4-chloroaniline	bis(2-ethylhexyl)phthalate
	Hexachlorobutadiene	Chrysene
	4-chloro-3-methylphenol	Di-n-octyl phthalate
	2-methylnaphthalene	Benzo(b)fluoranthene
	Hexachlorocyclopentadiene	Benzo(k)fluoranthene
	2,4,6-trichlorophenol	Benzo(a)pyrene
	2,4,5-trichlorophenol	Indeno(1,2,3-c,d)pyrene
	2-chloronaphthalene	Dibenzo(a,h)anthracene
	2-nitroaniline	Benzo(g,h,l)perylene
	Dimethyl phthalate	(1-methylethyl)-Benzene
	Acenaphthylene	
	3-nitroaniline	
	Acenaphthylene	
	2,4-dinitrophenol	
	4-nitrophenol	
	Dibenzofuran	
	2,4-dinitrotoluene	
	2,6-dinitrotoluene	
	Diethyl phthalate	
	4-chlorophenyl phenyl ether	
	Fluorene	
	4-nitroaniline	

Notes: (a) Selected samples only

TABLE 3.3-1

HYDRAULIC CONDUCTIVITIES AND TRANSMISSIVITIES OF EMF AQUIFER SYSTEM

TABLE 3.3-1

	Shallow Wells	Hydraulic Conductivity cm/s	Hydraulic Conductivity ft/day	Type of Test	Source
MICHAUD FLATS	104	4.45E-02	126	Slug Test	BEI
	108	1.01E-01	286	Slug Test	BEI
	110	3.80E-02	108	Slug Test	BEI
	111	1.40E-01	397	Slug Test	BEI
	113	1.40E-01	397	Pumping Test	BEI
	126	5.85E-02	166	Slug Test	BEI
	134	1.09E-01	309	Slug Test	BEI
	135	3.15E-02	89.3	Slug Test	BEI
	139	1.90E-02	53.9	Slug Test	BEI
	140	9.70E-02	275	Slug Test	BEI
	146	6.10E-02	173	Slug Test	Hydrometrics
	148	2.45E-02	69.5	Slug Test	Hydrometrics
	150	3.55E-01	1000	Pumping Test	BEI
	153	3.30E-01	935	Slug Test	BEI
	154	1.74E-02	49.3	Slug Test	Hydrometrics
	501	9.05E-02	257	Slug Test	BEI
	514	3.92E-02	111	Slug Test	Hydrometrics
	515	1.05E-02	29.8	Slug Test	Hydrometrics
	516	2.33E-02	66.0	Slug Test	Hydrometrics
BANNOCK RANGE	106	4.30E-03	12.2	Slug Test	Hydrometrics
	142	7.00E-04	1.98	Slug Test	BEI
	300	2.43E-04	0.69	Slug Test	Hydrometrics
	301	1.00E-05	0.03	Slug Test	BEI
	304	4.95E-04	1.41	Slug Test	Hydrometrics
	306	1.17E-03	3.32	Slug Test	Hydrometrics
	307	9.91E-02	281	Slug Test	Hydrometrics
	308	2.51E-02	71.2	Slug Test	Hydrometrics
	313	1.80E-02	51.0	Slug Test	BEI
	316	1.02E-02	28.9	Slug Test	BEI
	323	1.20E-03	3.40	Slug Test	Hydrometrics
	325	5.45E-03	15.5	Slug Test	BEI
	333	9.91E-03	28.1	Slug Test	Hydrometrics
	PEI-2	1.00E-03	2.83	Pumping Test	PEI
	PEI-5	4.50E-04	1.28	Pumping Test	PEI
PORTNEUF RIVER	312	1.40E+00	3970	Pumping Test	BEI
	318	1.40E-03	3.97	Slug Test	BEI
	324	5.45E-02	154	Slug Test	BEI
	327	1.18E-01	334	Slug Test	Hydrometrics
	328	1.84E-01	522	Slug Test	Hydrometrics
	502	1.39E-01	394	Slug Test	Hydrometrics
	503	1.68E+00	4760	Slug Test	BEI
	505	3.66E-01	1038	Slug Test	Hydrometrics
	507	6.40E-01	1810	Slug Test	BEI
	517	7.20E-01	2040	Slug Test	BEI
	518	1.49E-01	422	Slug Test	Hydrometrics

	Deep Wells	Hydraulic Conductivity cm/s	Hydraulic Conductivity ft/day	Type of Test	Source
MICHAUD FLATS	103	5.20E-03	14.7	Slug Test	BEI
	107	2.20E-02	62.4	Slug Test	BEI
	109	5.15E-03	14.6	Slug Test	BEI
	125	7.22E-02	205	Slug Test	Hydrometrics
	133	1.20E-01	340	Slug Test	BEI
	145	2.15E-01	609	Slug Test	BEI
	500	6.70E-02	190	Slug Test	BEI
BANNOCK RANGE	315	1.19E-02	33.7	Slug Test	BEI
PORTNEUF RIVER	311	8.60E-04	2.44	Slug Test	BEI
	317	9.90E-03	28.1	Slug Test	BEI
	319	1.00E-02	28.4	Slug Test	BEI
	321	1.50E-01	425	Slug Test	BEI
	322	2.80E-01	794.7	Pumping Test	BEI
	329	3.65E-01	1030	Slug Test	BEI
	330	5.64E-02	160	Slug Test	Hydrometrics
	504	7.10E-02	201	Slug Test	Hydrometrics
	506	2.30E-01	652	Slug Test	BEI
	512	5.80E-01	1640	Slug Test	BEI
	519	1.59E-02	45.0	Slug Test	Hydrometrics

	Production Wells	Transmissivity (ft^2/day)	Transmissivity (gpd/ft)	Type of Test	Source
MICHAUD FLATS	FMC-6	7370	55130	Pumping Test	BEI
	32ACD1	35100	262550	Pumping Test	USGS
	32DDC1	135700	1015000	Pumping Test	USGS
	33BAA1	21900	163810	Pumping Test	USGS
	33CCD1	41400	309670	Pumping Test	USGS
	34ADD1	40400	302190	Pumping Test	USGS
	34DCC1	36600	273770	Pumping Test	USGS
	35DDC1	164400	1229700	Pumping Test	USGS
	3ACD1	41200	308176	Pumping Test	USGS
	3BDC1	444000	3321100	Pumping Test	USGS
	4BBA1	38500	287980	Pumping Test	USGS
	5BDA1	36800	275260	Pumping Test	USGS
	8ADA1	27300	204200	Pumping Test	USGS
	9CAC1	199000	1488500	Pumping Test	USGS
	12BBC1	54700	409160	Pumping Test	USGS
PORTNEUF RIVER	SWP-7	227270	1700000	Pumping Test	Simplot

References:
BEI = Bechtel Environmental, Inc., Preliminary Site Characterization Summary for the Eastern Michaud Flats site, January, 1994
PEI = PEI Associates, Inc., Evaluation of Waste Management for Phosphate Processing, April 1985
Hydrometrics = Hydrometrics, Inc., Hydraulic Conductivity Testing of Existing Well Sites at the Eastern Michaud Flats Site, Pocatello, Idaho, April 1994
USGS = United States Geological Survey, Water-Resources Investigations Report 84-4201, Hydrogeology of Eastern Michaud Flats, Fort Hall Indian Reservation, Idaho
Simplot = J.R. Simplot files
FMC = FMC files

Hydraulic conductivity at Well 318 not used in K-zone mapping due to potential precipitation reactions in formation related to mixing of low pH water with groundwater.
Transmissivity at Well 311 not used due to possible grout contamination in filter pack.

TABLE 3.6-2
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 05S Range: 33E Section: 36		
NENE	Rhoades, W	0.04
NWNENE	Snook, D	0.04
SENE	Zitterkopf	0.06
Township: 05S Range: 34E Section: 31		
SENESE	Lacey, J	0.04
SWSE	Jackson, V	0.06
SWSE	Gould, R	0.04
SWSE	Scroggins, R	0.04
NESWSE	Labbee, L	0.08
NENENE	Mc Nabb, S	0.06
SESENE	Johnson, A	0.04
NENW	Naylor, G	0.08
NWNWNW	Bentel, J	0.04
Township: 05S Range: 34E Section: 32		
SWNWNW	Bentel, J	0.13
SWNW	Correll, G	0.04
SWNW	Nelson, D	0.04
SWNW	Hardenbrook, W	0.04
NESWNW	Valenty, J	0.25
NWSWNW	Heimer, J	0.06
NWSWNW	Howser, M	0.06
SENW	Moore, J	0.04
SENW	Larsen, N	0.24
SWSENW	McLaughlin	0.04
SWSENW	Beard, D	0.04
SWSENW	Butler, C	0.04
SWSENW	Patterson, J	0.04
SWSENW	Cunningham, J	0.04
NENWSE	Church of Jesus Christ, Latter Day Saints	0.24
SWSE	Allen, D	0.04

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 05S Range: 34E Section: 32 (Continued)		
SWSE	Parkin, J	0.06
SWSE	Porter, R	0.06
SESWSE	Goosey, M	0.04
SESWSE	Fernau, L	0.03
SESESE	Johnson, A	0.04
Township: 05S Range: 34E Section: 33		
NENENE	Johnson, F	0.06
SESENE	Johnson, A	0.04
SESENE	Ganske, D	0.04
SWNWSW	Johnson, A	0.04
SESW	Hancock, D	0.04
SESESW	Johnson, A	0.04
NESE	Hancock, G	0.08
Township: 06S Range: 33E Section: 01		
NENE	Monric Inc.	4.46
SWNENE	Thousand Springs	75.14
SWNENE	Aqua Life Inc.	75.00
SWNENE	Aqua Life Inc.	0.14
SWNWNE	Thousand Spings	75.14
SWNWNE	Aqua Life Inc.	75.00
NWSENE	Aqua Life Inc.	0.10
NWSENE	Thousand Spings	75.14
NWSENE	Aqua Life Inc.	75.00
NENENW	Rowland, C	0.04
SWSESW	Rowland, C	3.60
SWSESW	Rowland, V	3.60
SWNESE	Douglass, W	1.18
SENESE	Douglass, W	0.66

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 33E Section: 02		
NENE	Bowman, D	0.04
NWNENE	Peck, J	0.04
NWNENE	Thompson, L	0.08
SENWNE	Hull, R	0.04
SWSENE	Sharp, G	0.06
NENW	Jacobson, L	0.24
NENENW	Rhoades, A	0.18
SWNENW	Mason, J	0.12
NWNW	Leighton, W	0.20
NENWNW	Corbridge, K	0.09
NENWNW-1	Applebee, V	0.06
NENWNW	Jensen, B	0.06
NENWNW-2	Applebee, V	0.03
SENW	Harmon, D	0.18
NESE	Tharp, M	0.04
NESE	Michael, P	0.04
SESESE	Clark, J	0.06
Township: 06S Range: 33E Section: 04		
SENWNE-1	Deppe, V	0.63
SENWNE-2	Deppe, Y	0.10
SENWNE-1	Weaver, D	1.23
SENWNE	Deppe Trust, s	0.63
SENWNE-2	Waver, D	0.13
Township: 06S Range: 33E Section: 10		
NESE-1	City of Pocatello	3.34
NESE-2	City of Pocatello	1.92
Township: 06S Range: 33E Section: 11		
NWSE-1	Evans, J	2.60
NWSE-2	Evans, J	0.38

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 33E Section: 12		
SENE	City of Pocatello	5.72
NWSWNW	Lindley, D	1.49
NWNWSW-1	Lindley, H	0.40
NWNWSW-2	Lindley, H	0.48
SESWSW-1	FMC Corporation	0.63
SESWSW-2	FMC Corporation	0.04
SESW	FMC Corporation	4.50
NESE	FMC Corporation	1.10
Township: 06S Range: 33E Section: 13		
NENW	FMC Coporation	4.00
NWNW	FMC Coporation	4.50
Township: 06S Range: 33E Section: 14		
SESE	Idaho Power Co.	0.02
Township: 06S Range: 33E Section: 15		
SWNE	City of Pocatello	2.20
SWNE	Smith, E	2.20
Township: 06S Range: 33E Section: 22		
NWNW	Smith, E	4.78
SWSW	Michaud Creek	2.00
SWSW	Michaud Creek	1.08
NESE-1	Feld, R	0.04
NESE-2	Feld, R	0.04
NESE	Buzzard, J	0.20
NWNESE	Herrman, J	0.20
NWNESE	Herrman, J	0.12
NWNESE	Herrman, J	0.04
NWNESE	Herrman, J	0.06
NWNESE	Lehman, M	0.16
NENWSE	Marshall, B	0.04
NWNWSE	Shimada, Jr.	0.04
SESE	Herrman, Sr.	0.04
SESE	Maxell, Jr.	0.04
NWSESE	Camara, K	0.04

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 33E Section: 23		
SWSW-1	Ames, O	0.26
SWSW-2	Ames, O	0.26
Township: 06S Range: 34E Section: 04		
NENENE	Whitworth, G	0.04
NENENE	Lemmon, E	0.04
NENENE	Orton, K	0.04
NENENE	Lemmon, J	0.04
SENE	Edwards, B	0.06
NWNW	Church of Jesus Christ, Latter Day Saints	0.15
NWSWNW	Bodily, K	0.14
NWSW	Hanson, C	0.04
NWSW	Hanson, C	0.04
NWSW	Kautzsch, R	0.06
SWNWSW	Nanninga, F	0.06
SWSWSW	Bilbyeu, F	0.06
SESW	City of Chubbuck	4.45
NESE	Selders, L	0.06
SESWSE	Layne, M	0.06
Township: 06S Range: 34E Section: 05		
NENE	Gaskin, C	0.02
NENE	Cunningham, D	0.08
NENE	Henriksen, J	0.06
NENE	Wilson, L	0.05
NENENE	Pony Acres	0.16
NENENE	Shappart, D	0.06
SENENE	Lasley, J	0.07
NWNE	Pline, D	0.06
SWNWNE	Perkins, C	0.04
SWNWNE	Orchard, R	0.04
SWNWNE	Wilson, J	0.06
SWNE	Jensen, C	0.06

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 34E Section: 05 (Continued)		
SWNE	Line, D	0.04
NWSWNE	Gouchnour, D	0.04
SESWNE	French, D	0.04
NESENE	Waters, R	0.08
NWSENE	O'Neil, D	0.04
NENW	Allen, J	0.04
NENW	Allen, S	0.04
SENW	Christensen, E	0.04
SENW	Nelson, S	0.04
NWSW	Rees, P	0.09
NWSW	Smith, N	0.16
SWNWSW	Lambert, L	0.04
SWSW	Talbot, D	0.04
SWSW	Gagon, Duane	0.04
SWSW	Smith, W	0.04
SWSW	Fisher, B	0.04
NWSWSW	Sidell, R	0.06
SESW	Roeder, J	0.08
SESW	Frasure, A	0.04
SESW	Roeder, E	0.04
SESW	Shipley, S	0.04
SESW	Buchholtz, Jr.	0.03
SESW	Hancock, L	0.06
SESW	Mowrey, C	0.04
SESW	Wuthrich, R	0.06
SESW	Christensen, B	0.04
NWSESW	Hall, K	0.04
SWSESW	Ground, G	0.04
SESESW	Shepherd, G	0.06
SESWSE	Armstrong, L	0.24

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 34E Section: 06		
NESW	FMC	0.09
NWNWSW	Turner, E	0.17
SWNWSW	Douglass, E	0.04
SWNWSW	Madden, B	0.25
SWNWSW	Madden, B	0.04
SENWSW	Madden, B	0.04
NWSESW	Aqua Life Inc.	0.04
SESESW	Aqua Life Inc.	44.77
NESE	Eriksen, W	0.06
SENE	Jackson, V	0.04
SENE	Jackson Inc.	0.08
NENENW	Crapo, R	0.14
SWSWNW	Douglas, E	0.63
SESWNW	Thousand Springs	75.14
SESWNW	Aqua Life Inc.	75.00
SENW	Monroc Inc.	4.46
Township: 06S Range: 34E Section: 07		
NENE	City of Pocatello	12.13
NWNE	Rowland, R	0.02
NWNE	Rowland, E	0.56
SENWNE	Rowlands, Inc.	0.30
SWNE	City of Pocatello	9.28
SWNE	Union Pacific	1.48
NWNW	Chevron	1.00
NWNW	Chevron	0.56
NESW	J.R. Simplot	6.68
NESW-1	J.R. Simplot	5.57
NESW-2	J.R. Simplot	6.66
NESW	J.R. Simplot	0.10
SESW	J.R. Simplot	0.10
SESW	J.R. Simplot	6.68
SESW-1	J.R. Simplot	5.57

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 34E Section: 07 (Continued)		
SESW-2	J.R. Simplot	6.66
NESE	J.R. Simplot	3.20
NESE	J.R. Simplot	0.22
NESE	J.R. Simplot	2.28
NWSE	J.R. Simplot	0.28
NWSE	J.R. Simplot	3.35
Township: 06S Range: 34E Section: 08		
NENE	Traughber, C	0.06
NWNE	Perkins, B	0.08
NWNE	Lowder, J	0.07
NWNE	Miles, D	0.04
NWNE	Traughber, F	0.09
NWNWNE	Artinger, M	0.04
NENW	Hansen, J	0.04
NENW	Fries, C	0.04
NENW	Sortor, H	0.06
NENW	Sortor, R	0.04
NENW	O'Brien, A	0.02
NENW	Hebdon, K	0.18
	Millard, D	
NENW	Sampson, R	0.06
NENW	Wilson, B	0.06
NENW	Anderson, L	0.06
NENENW	Hebdon, K	0.06
NENENW	Millard, D	0.06
NENENW	Anderson, K	0.06
NWNW	Wilson, L	0.06
SENW	J.R. Simplot	0.15
SENW	J.R. Simplot	0.15
SWSE	Baldwin, A	0.04

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 06S Range: 34E Section: 09		
SWSWNW	McNabb, S	0.06
NESE	Cleaves, C	0.04
NESE	Eriksen, L	0.09
NESE	Jensen, T	0.06
SENESE	Cook, C	0.04
SWSE	Ward, O	1.00
SESE	Wright, M	0.02
SWSESE	Harrop, E	0.06
SWSESE	Harrop, C	0.06
Township: 06S Range: 34E Section: 10		
NENE	City of Pocatello	17.07
NENE	Taysom, A	0.02
NWNE	Ward, W	0.08
SWSENE	Jensen, M	0.06
SWSENE	Dalton, M	0.04
SWNW	McPherson, D	0.06
NWSWNW	Moss, M	0.08
SENW	Home Acres Wat.	0.10
NWSENW	Kiggins, T	0.04
NWSENW	Clezie, R	0.04
SESW	Michaud Creek	0.38
SESW	Great Western	3.25
Township: 06S Range: 34E Section: 16		
SESW	J.R. Simplot	3.20
SESW	J.R. Simplot	2.28
Township: 06S Range: 34E Section: 17		
SWNE	Baldwin, G	0.06
NESENE	Pocatello Read	0.24

TABLE 3.6-2 *(continued)*
WELL REGISTRATION TABLE

TRACT	OWNER	TOTAL DIVERSION (CUBIC FEET PER SECOND)
Township: 05S Range: 34E Section: 31		
NENE	Smith, D	0.04
NENE	Miles, B	0.11
NENENE	Ellis, R	0.06
NWNE	Davis, B	0.11
NENW	Spitzer, D	0.11
NWNW	Mc Omber	0.04
SWNW	Paul, S	0.06
SWSWNW	Lusk, E	0.04
SWSWNW	McGee, R	0.04

Source: Idaho Department of Water Resources, 1992 data files.

Table 4.4-1

Table 4.4-1
Representative Groundwater Chemistry

ANALYTE (a)	CALCIUM-CHLORIDE WATER CHEMISTRY							CALCIUM-BICARBONATE WATER CHEMISTRY												
	Michaud Hydrogeochemical Regime							Bannock Hydrogeochemical Regime												
	Well TW-10S Mean (b)	Well 101 Mean (b)	Well 102 Mean (b)	Well 147 Mean (b)	Well 514 Mean (b)	Well 515 Mean (b)	Michaud 95% UCL (c)	Idaho Power Mean (b)	Well PEI-1 Mean (b)	Well 106 Mean (b)	Well 158 Mean (b)	Well 301 Mean (b)	Well 305 Mean (b)	Bannock 95% UCL (c)	Well PEI-6 Mean (b)	Well 510 Mean (b)	Well 511 Mean (b)	Well 512 Mean (b)	Well 513 Mean (b)	Portneuf 95% UCL (c)
COMMON IONS (mg/l)																				
Alkalinity, bicarbonate	142	143	148	171	132	190	198	165	159	151	169	120	137	171	293	284	291	280	280	307
Calcium	79.11	85.68	75.97	85.41	44.79	93.46	97.71	45.54	58.65	59.71	64.62	50.37	53.69	68.75	79.57	79.36	83.48	61.93	59.54	91.93
Chloride	168.85	131.23	111.38	147.89	29.00	187.50	192.90	45.09	39.28	47.81	66.50	42.02	45.78	52.42	60.98	57.35	55.55	34.37	21.72	67.87
Magnesium	25.66	31.76	27.34	25.55	14.56	32.63	33.59	16.85	15.40	16.70	22.41	10.93	13.16	19.20	32.24	30.49	29.95	26.72	30.16	35.92
Potassium	9.39	8.54	7.96	10.57	4.45	9.21	12.72	8.19	6.22	9.79	9.08	8.15	6.54	10.52	6.56	6.40	6.32	6.19	6.58	7.34
Sodium	52.35	32.60	28.93	55.79	21.43	86.35	74.28	25.03	13.95	22.93	23.53	25.56	18.30	27.53	40.47	39.58	36.42	49.85	37.02	53.21
Sulfate	33.73	63.71	48.34	56.53	44.00	113.50	72.57	23.00	16.17	37.61	46.50	13.67	35.33	43.40	52.85	51.87	48.13	50.45	69.13	70.68
PHYSICAL PARAMETERS																				
Spec.Conductivity (umhos/cm)	833	843	747	1229	460	1229	1136	574	410	529	554	422	496	569	789	780	793	747	761	871
pH	7.39	7.52	7.46	7.29	7.70	7.54	(d)	7.60	8.37	7.50	7.62	7.44	7.37	(d)	7.43	7.52	7.50	7.27	7.29	(d)
Temperature (degrees Celcius)	14.7	13.4	13.8	16.7	11.8	14.0	(d)	15.7	16.5	16.5	16.6	14.5	16.4	(d)	13.0	13.1	13.2	13.3	12.7	(d)
Total Dissolved Solids (mg/l)	563	542	485	668	281	736	867	326	324	344	404	311	374	412	527	509	505	445	440	580
Redox (mV)	0	112	110	70	157	169	(d)	69	(e)	99	44	105	122	(d)	167	171	170	127	133	(d)
NUTRIENTS AND FLUORIDE (mg/l)																				
Ammonia (NH3 as N)	0.16	0.20	0.25	0.33	0.50	0.50	0.50	0.35	0.10	0.35	0.50	0.35	0.65	0.50	0.31	0.35	0.33	0.35	0.35	0.50
Nitrate (NO3 as N)	4.45	1.76	1.69	2.29	0.65	2.02	5.52	1.45	0.81	1.02	1.03	0.66	1.03	1.60	1.97	2.98	2.31	3.49	3.19	4.00
Orthophosphate (PO4 as P)	0.02	0.02	0.02	0.02	0.03	0.03	0.06	0.03	0.11	0.04	0.03	0.05	0.04	0.13	0.16	0.04	0.04	0.04	0.05	0.27
Phosphorous	0.04	0.27	0.32	0.03	0.02	0.02	0.33	0.05	0.05	0.10	0.23	0.06	0.04	0.31	0.04	0.04	0.04	0.05	0.05	0.15
Fluoride	0.43	0.35	0.39	0.69	0.60	0.70	0.80	0.42	0.35	0.46	0.50	0.52	0.48	0.60	0.24	0.19	0.20	0.20	0.39	0.41
METALS (mg/l)																				
Aluminum	0.0134	0.0167	0.0329	0.0901	0.0226	0.0226	0.0977	0.0310	0.1400	0.1230	0.5130	0.3660	0.0420	0.5472	0.4592	0.0437	0.1522	0.1776	0.0688	0.9475
Antimony	0.0631	0.0336	0.0352	0.0725	0.0482	0.0482	0.1000	0.0747	0.0800	0.0831	0.0482	0.0747	0.0777	0.1340	0.0324	0.0278	0.0278	0.0278	0.0278	0.1000
Arsenic	0.0044	0.0130	0.0126	0.0049	0.0062	0.0041	0.0149	0.0160	0.0050	0.0040	0.0150	0.0080	0.0080	0.0180	0.0022	0.0045	0.0037	0.0064	0.0054	0.0104
Barium	0.1657	0.1532	0.1024	0.1991	0.0559	0.1081	0.2297	0.0440	0.0680	0.1170	0.0730	0.0640	0.0740	0.1204	0.1379	0.1497	0.1320	0.1221	0.0731	0.1735
Beryllium	0.0005	0.0006	0.0006	0.0010	0.0007	0.0007	0.0020	0.0010	0.0060	0.0020	0.0007	0.0010	0.0020	0.0040	0.0008	0.0011	0.0012	0.0017	0.0012	0.0026
Boron	0.0653	0.0600	0.0554	0.1675	0.0622	0.1166	0.2935	0.0790	0.2190	0.0660	0.1260	0.1690	0.1120	0.3078	0.1860	0.1355	0.1563	0.1419	0.1400	0.2500
Cadmium	0.0024	0.0033	0.0032	0.0014	0.0006	0.0006	0.0050	0.0020	0.0001	0.0030	0.0006	0.0020	0.0010	0.0050	0.0008	0.0012	0.0012	0.0014	0.0014	0.0050
Chromium	0.0053	0.0054	0.0058	0.0059	0.0030	0.0023	0.0114	0.0040	0.0008	0.0050	0.0027	0.0070	0.0030	0.0110	0.0026	0.0036	0.0027	0.0038	0.0029	0.0100
Cobalt	0.0033	0.0040	0.0036	0.0050	0.0027	0.0027	0.0145	0.0050	0.0100	0.0090	0.0030	0.0070	0.0060	0.0108	0.0031	0.0066	0.0076	0.0052	0.0064	0.0163
Copper	0.0037	0.0057	0.0039	0.0042	0.0037	0.0037	0.0085	0.0050	0.0073	0.0050	0.0040	0.0040	0.0050	0.0109	0.0078	0.0053	0.0044	0.0048	0.0049	0.0130
Iron	0.2521	0.1716	0.1183	0.0891	0.0620	0.0620	0.7690	0.1330	0.0670	0.1090	0.4440	0.2850	0.0470	0.8402	0.2691	0.0629	0.1420	0.3627	0.0659	1.0740
Lead	0.0015	0.0011	0.0011	0.0012	0.0028	0.0008	0.0020	0.0020	0.0050	0.0010	0.0020	0.0013	0.0010	0.0068	0.0015	0.0013	0.0013	0.0016	0.0013	0.0024
Lithium	0.0187	0.0097	0.0097	0.0508	0.0364	0.0533	0.0610	0.0120	0.0070	0.0160	0.0160	0.0070	0.0100	0.0165	0.0334	0.0299	0.0278	0.0292	0.0273	0.0400
Manganese	0.0079	0.0077	0.0096	0.0085	0.0028	0.0018	0.0518	0.0030	0.0060	0.0080	0.0021	0.0050	0.0070	0.0201	0.0254	0.0025	0.0047	0.0717	0.0037	0.1097
Mercury	0.00015	0.00016	0.00011	0.00027	0.00064	0.00048	0.00074	0.00030	0.00030	0.00040	0.00020	0.00020	0.00040	0.00078	0.00026	0.00024	0.00018	0.00020	0.00019	0.00054
Molybdenum	0.0084	0.0114	0.0078	0.0135	0.0138	0.0113	0.0245	0.0220	0.0250	0.0150	0.0110	0.0280	0.0190	0.0330	0.0086	0.0143	0.0164	0.0164	0.0231	0.0300
Nickel	0.0058	0.0064	0.0066	0.0104	0.0124	0.0124	0.0200	0.0130	0.0090	0.0120	0.0124	0.0120	0.0120	0.0200	0.0101	0.0160	0.0133	0.0148	0.0151	0.0247
Selenium	0.0032	0.0030	0.0031	0.0034	0.0024	0.0019	0.0057	0.0020	0.0040	0.0020	0.0020	0.0030	0.0030	0.0055	0.0013	0.0029	0.0027	0.0028	0.0028	0.0060
Silver	0.0032	0.0034	0.0035	0.0026	0.0039	0.0039	0.0050	0.0030	0.0020	0.0040	0.0040	0.0030	0.0050	0.0052	0.0020	0.0030	0.0031	0.0031	0.0034	0.0040
Thallium	0.0008	0.0009	0.0009	0.0100	0.0009	0.0009	0.0040	0.0020	0.0200	0.0020	0.0009	0.0080	0.0080	0.0400	0.0049	0.0024	0.0017	0.0017	0.0017	0.0045
Vanadium	0.0148	0.0185	0.0167	0.0144	0.0024	0.0022	0.0745	0.0200	0.0800	0.0160	0.0060	0.0080	0.0290	0.1000	0.0827	0.0076	0.0074	0.0087	0.0077	0.1987
Zinc	0.0113	0.0133	0.0122	0.0152	0.0054	0.0047	0.0501	0.0009	0.0095	0.0026	0.0060	0.2250	0.0060	0.1700	0.0782	0.0107	0.0102	0.0101	0.0105	0.1615

Notes:
(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.
(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.
(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.
(d) 95% UCLs for pH, temperature, and redox were not calculated.
(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			SOUTHWEST FMC AREA															
	Michaud	Bannock	Portneuf	Well 112 Mean (b)	Well 126 Mean (b)	Well 128 Mean (b)	Well 127 Mean (b)	Well 125 Mean (b)	Well 117 Mean (b)	Well 113 Mean (b)	Well 119 Mean (b)	Well 124 Mean (b)	Well 120 Mean (b)	Well 116 Mean (b)	Well 115 Mean (b)	Well 103 Mean (b)	Well 118 Mean (b)	Well 114 Mean (b)	Well 104 Mean (b)
MAJOR IONS (mg/l)																			
Alkalinity, bicarbonate	198	171	307	196	180	227	189	187	296	273	194	207	211	493	518	304	395	534	931
Calcium	97.71	68.75	91.93	93.16	92.60	91.95	137.91	46.15	121.23	83.24	77.48	72.56	67.77	191.96	51.34	105.38	121.36	49.53	74.09
Chloride	192.90	52.42	67.87	142.00	143.29	181.71	274.57	32.86	59.41	141.62	118.69	112.23	82.21	629.46	135.54	122.46	172.69	142.15	232.15
Magnesium	33.59	19.20	35.92	31.32	26.78	33.17	41.33	12.91	45.46	37.00	28.52	22.77	27.25	86.04	22.04	44.56	48.91	25.53	60.41
Potassium	12.72	10.52	7.34	8.84	10.18	15.09	15.22	8.67	15.36	37.93	10.42	11.20	8.70	167.89	8.68	13.22	29.52	10.67	431.17
Sodium	74.28	27.53	53.21	72.27	66.95	117.44	115.64	51.97	41.40	100.86	41.29	75.69	45.10	320.03	325.86	63.03	122.67	346.08	308.40
Sulfate	72.57	43.40	70.68	101.67	89.86	110.57	154.86	42.94	232.08	108.58	54.50	68.41	48.82	258.77	134.28	108.07	123.69	128.86	276.00
PHYSICAL PARAMETERS																			
Spec.Conductivity (umhos/cm)	1136	569	871	1060	995	1281	1549	538	1086	1168	742	890	748	3351	1514	1112	1482	1618	3132
pH	(d)	(d)	(d)	7.22	7.34	7.21	7.18	7.46	6.91	7.18	7.21	7.33	7.14	6.79	7.37	7.07	6.71	7.06	7.05
Temperature (degrees Celcius)	(d)	(d)	(d)	12.8	16.0	12.3	13.8	17.9	18.2	11.4	16.1	13.6	15.5	14.7	11.0	14.1	15.9	10.7	13.3
Total Dissolved Solids (mg/l)	867	412	580	655	578	745	855	339	767	752	506	518	474	2285	1073	734	964	1046	2023
Redox (mV)	(d)	(d)	(d)	159	161	164	200	91	132	72	67	184	80	109	23	209	42	-52	151
NUTRIENTS AND FLUORIDE (mg/l)																			
Ammonia (NH3 as N)	0.50	0.50	0.50	0.35	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.81	0.37	0.43	0.37	0.47	5.93
Nitrate (NO3 as N)	5.52	1.60	4.00	4.67	1.21	4.14	2.39	0.63	0.61	6.11	1.46	1.94	1.40	6.59	3.89	0.82	0.34	2.63	11.91
Orthophosphate (PO4 as P)	0.06	0.13	0.27	0.19	0.06	0.36	0.18	0.03	0.06	0.29	1.55	0.16	2.48	1.51	3.37	1.13	14.58	4.22	16.80
Phosphorous	0.33	0.31	0.15	0.24	0.08	0.43	0.22	0.08	0.07	0.84	2.04	0.22	3.30	2.80	11.37	1.89	40.31	21.28	18.75
Fluoride	0.80	0.60	0.41	0.56	0.89	0.29	0.32	1.16	0.35	0.86	0.20	0.81	0.20	0.90	0.18	0.18	0.18	0.85	10.88
METALS (mg/l)																			
Aluminum	0.0977	0.5472	0.9475	0.0517	0.0402	0.0397	0.0502	0.0350	0.0455	0.0352	0.0295	0.0360	0.0375	0.7595	0.0366	0.0346	0.0368	0.0520	0.0548
Antimony	0.1000	0.1340	0.1000	0.0631	0.0711	0.0769	0.0596	0.0725	0.0596	0.0596	0.0596	0.0673	0.0596	0.0596	0.0625	0.0596	0.0596	0.0639	0.0596
Arsenic	0.0149	0.0180	0.0104	0.0067	0.0099	0.0230	0.0210	0.0062	0.0124	0.0344	0.0152	0.0134	0.0195	0.0729	0.1855	0.0351	0.0320	0.1849	0.1325
Barium	0.2297	0.1204	0.1735	0.1177	0.1655	0.0694	0.0952	0.0915	0.1138	0.0578	0.1251	0.0702	0.0856	0.1452	0.1012	0.1248	0.2119	0.1814	0.3214
Beryllium	0.0020	0.0040	0.0026	0.0017	0.0010	0.0012	0.0014	0.0013	0.0013	0.0010	0.0013	0.0012	0.0012	0.0014	0.0010	0.0010	0.0013	0.0010	0.0013
Boron	0.2935	0.3078	0.2500	0.1553	0.1655	0.5190	0.3098	0.1607	0.1039	0.6927	0.1643	0.2206	0.2119	1.4509	2.139	1.2311	0.7009	1.8465	1.9317
Cadmium	0.0050	0.0050	0.0050	0.0016	0.0034	0.0035	0.0035	0.0035	0.0031	0.0038	0.0025	0.0035	0.0031	0.0027	0.0025	0.0027	0.0032	0.0025	0.0026
Chromium	0.0114	0.0110	0.0100	0.0036	0.0043	0.0048	0.0050	0.0048	0.0040	0.0053	0.0042	0.0057	0.0041	0.0063	0.0043	0.0039	0.0039	0.0044	0.0038
Cobalt	0.0145	0.0108	0.0163	0.0053	0.0053	0.0113	0.0114	0.0076	0.0053	0.0086	0.0051	0.0076	0.0051	0.0090	0.0357	0.1059	0.0052	0.0381	0.0329
Copper	0.0085	0.0109	0.0130	0.0036	0.0037	0.0035	0.0049	0.0038	0.0041	0.0037	0.0061	0.0060	0.0058	0.0230	0.0047	0.0044	0.0056	0.0042	0.0056
Iron	0.7690	0.8402	1.0740	0.0483	0.0417	0.0386	0.0416	0.0397	0.1043	0.0544	0.1464	0.0461	0.1055	0.7687	0.1041	0.2692	0.0844	0.1503	0.0654
Lead	0.0020	0.0068	0.0024	0.0013	0.0012	0.0013	0.0012	0.0012	0.0018	0.0012	0.0014	0.0012	0.0015	0.0044	0.0011	0.0014	0.0019	0.0011	0.0011
Lithium	0.0610	0.0165	0.0400	0.0518	0.0536	0.0554	0.0708	0.0476	0.0384	0.0441	0.0232	0.0546	0.0241	0.1838	0.0353	0.0304	0.0671	0.1415	0.1868
Manganese	0.0518	0.0201	0.1097	0.0024	0.0029	0.0031	0.0034	0.0038	0.0045	0.0088	0.0101	0.0130	0.0308	0.226	0.509	1.324	1.650	1.830	4.493
Mercury	0.00074	0.00078	0.00054	0.00025	0.00033	0.00024	0.00029	0.00026	0.00028	0.00025	0.00026	0.00023	0.00026	0.00026	0.00040	0.00031	0.00035	0.00031	0.00024
Molybdenum	0.0245	0.0330	0.0300	0.0143	0.0141	0.0141	0.0192	0.0145	0.0141	0.0159	0.0141	0.0141	0.0144	0.0222	0.0366	0.0310	0.0169	0.0274	0.0290
Nickel	0.0200	0.0200	0.0247	0.0120	0.0120	0.0120	0.0134	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0129	0.0129	0.0134	0.0142	0.0208
Selenium	0.0057	0.0055	0.0060	0.0010	0.0026	0.0045	0.0055	0.0018	0.0025	0.0042	0.0032	0.0024	0.0031	0.0150	0.0049	0.0028	0.0033	0.0039	0.0023
Silver	0.0050	0.0052	0.0040	0.0026	0.0033	0.0028	0.0039	0.0037	0.0037	0.0038	0.0037	0.0044	0.0037	0.0039	0.0038	0.0038	0.0038	0.0039	0.0039
Thallium	0.0040	0.0400	0.0045	0.0018	0.0016	0.0017	0.0016	0.0016	0.0016	0.0016	0.0017	0.0016	0.0016	0.0017	0.0016	0.0018	0.0016	0.0016	0.0017
Vanadium	0.0745	0.1000	0.1987	0.0083	0.0698	0.0209	0.0101	0.0151	0.0071	0.0203	0.0081	0.0119	0.0118	0.0149	0.0229	0.0128	0.0071	0.0198	0.0251
Zinc	0.0501	0.9714	0.1615	0.0074	0.0170	0.0138	0.0148	0.0137	0.0083	0.0131	0.0076	0.0164	0.0084	0.0194	0.0119	0.0143	0.0149	0.0123	0.0103

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			SOUTHWEST FMC AREA continued															
				Well 129	Well 130	Well 131	Well 132	Well 137	Well 139	Well 140	Well 141	Well 148	Well 149	Well 150	Well 151	Well 152	Well 153	Well 154	Well 159
	Michaud	Bannock	Portneuf	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)	Mean (b)
MAJOR IONS (mg/l)																			
Alkalinity, bicarbonate	198	171	307	229	206	461	820	236	196	336	547	208	200	1490	333	1415	188	195	802
Calcium	97.71	68.75	91.93	85.25	78.75	175.32	55.73	68.95	375.54	233.58	150.16	86.21	58.19	31.08	88.41	58.53	64.30	65.56	179.12
Chloride	192.90	52.42	67.87	106.38	87.06	145.69	260.85	155.86	980.33	276.33	258.00	154.64	91.43	408.86	119.83	371.00	69.90	125.22	311.50
Magnesium	33.59	19.20	35.92	34.59	31.90	64.06	64.47	28.03	136.96	93.39	68.74	27.75	17.35	97.37	40.45	95.38	15.60	19.12	95.61
Potassium	12.72	10.52	7.34	11.28	10.01	14.02	251.94	8.25	33.14	38.16	27.07	11.90	10.29	1293.59	21.71	1087.00	14.20	11.01	27.89
Sodium	74.28	27.53	53.21	50.11	26.24	149.09	369.91	122.55	212.98	406.11	236.99	80.62	70.01	535.93	132.71	542.09	75.20	62.57	352.31
Sulfate	72.57	43.40	70.68	83.20	60.63	150.54	245.54	113.18	591.65	842.72	210.50	89.22	50.33	252.86	93.50	225.71	42.00	41.70	237.50
PHYSICAL PARAMETERS																			
Spec.Conductivity (umhos/cm)	1136	569	871	914	773	1581	2794	1228	4091	2828	2179	1069	774	6105	1256	5246	726	791	3080
pH	(d)	(d)	(d)	7.31	7.25	6.95	6.74	7.54	6.93	6.90	6.78	7.30	7.40	7.02	6.90	6.92	8.99	7.37	6.63
Temperature (degrees Celcius)	(d)	(d)	(d)	12.9	14.1	13.3	14.3	11.6	13.5	16.7	17.1	15.8	15.8	15.0	16.9	15.1	17.2	17.0	17.0
Total Dissolved Solids (mg/l)	867	412	580	559	497	1111	1736	747	2863	2145	1487	655	484	5271	882	4580	440	565	2145
Redox (mV)	(d)	(d)	(d)	188	216	-113	-15	191	265	154	-17	82	69	-239	18	-238	(e)	99	-119
NUTRIENTS AND FLUORIDE (mg/l)																			
Ammonia (NH3 as N)	0.50	0.50	0.50	0.35	0.39	0.39	4.75	0.37	0.35	0.35	0.82	0.37	0.37	9.52	0.69	8.69	0.05	0.44	1.62
Nitrate (NO3 as N)	5.52	1.60	4.00	2.49	37.55	3.24	0.26	6.08	32.50	8.31	0.06	2.57	1.18	0.05	0.05	0.05	0.96	1.14	0.05
Orthophosphate (PO4 as P)	0.06	0.13	0.27	0.37	0.58	4.47	7.21	2.67	0.09	1.04	18.80	0.10	0.11	387.14	11.00	270.57	0.02	0.03	8.70
Phosphorous	0.33	0.31	0.15	0.61	0.73	32.21	27.45	3.79	0.11	5.13	52.62	0.15	0.16	664.57	55.40	489.00	0.06	0.02	191.50
Fluoride	0.80	0.60	0.41	0.30	0.28	0.33	1.19	0.16	1.13	2.98	0.14	0.79	1.05	8.65	0.14	8.58	1.17	1.12	0.20
METALS (mg/l)																			
Aluminum	0.0977	0.5472	0.9475	0.0341	0.0429	10.1454	0.0351	0.0349	0.0374	0.1496	0.0470	0.0359	0.0283	0.0344	0.0290	0.0373	0.0700	0.0325	0.0255
Antimony	0.1000	0.1340	0.1000	0.0631	0.0596	0.0596	0.0596	0.0596	0.0847	0.0631	0.0764	0.0711	0.0696	0.0596	0.0631	0.0890	0.1000	0.0515	0.0482
Arsenic	0.0149	0.0180	0.0104	0.0241	0.0305	0.0451	0.1467	0.0862	0.0113	0.0350	0.0820	0.0085	0.0148	0.1878	0.0543	0.1506	0.0030	0.0061	0.0795
Barium	0.2297	0.1204	0.1735	0.0620	0.0714	0.1286	0.0873	0.0583	0.0880	0.0559	0.3494	0.1324	0.0834	0.0117	0.2165	0.0313	0.1280	0.2317	0.4096
Beryllium	0.0020	0.0040	0.0026	0.0011	0.0012	0.0014	0.0012	0.0015	0.0017	0.0011	0.0011	0.0010	0.0010	0.0013	0.0011	0.0012	0.0030	0.0009	0.0007
Boron	0.2935	0.3078	0.2500	0.3919	0.2472	2.0177	2.0991	0.5847	0.7867	1.1107	1.4865	0.3204	0.1635	14.4936	0.9757	17.1035	0.1670	0.1223	2.2939
Cadmium	0.0050	0.0050	0.0050	0.0027	0.0026	0.0026	0.0027	0.0038	0.0014	0.0014	0.0014	0.0013	0.0013	0.0013	0.0015	0.0019	0.0010	0.0016	0.0006
Chromium	0.0114	0.0110	0.0100	0.0045	0.0041	0.0052	0.0039	0.0039	0.0072	0.0056	0.0024	0.0064	0.0047	0.0038	0.0024	0.0029	0.0160	0.0045	0.0007
Cobalt	0.0145	0.0108	0.0163	0.0278	0.0235	0.0214	0.0243	0.0110	0.0422	0.0143	0.0190	0.0083	0.0051	0.0323	0.0063	0.0150	0.0100	0.0033	0.0442
Copper	0.0085	0.0109	0.0130	0.0045	0.0048	0.0091	0.0096	0.0037	0.0068	0.0048	0.0045	0.0037	0.0036	0.0065	0.0041	0.0056	0.0030	0.0037	0.0037
Iron	0.7690	0.8402	1.0740	0.1531	0.0934	4.9496	0.2474	0.0418	0.0956	0.0983	0.0529	0.0398	0.0341	0.7739	0.0356	0.5201	0.0230	0.0417	1.3509
Lead	0.0020	0.0068	0.0024	0.0011	0.0011	0.0040	0.0029	0.0012	0.0013	0.0013	0.0027	0.0012	0.0012	0.0015	0.0013	0.0012	0.0020	0.0012	0.0008
Lithium	0.0610	0.0165	0.0400	0.0239	0.0207	0.0547	0.1475	0.0683	0.1147	0.1347	0.0728	0.0546	0.0551	0.1699	0.0522	0.1919	0.0440	0.0596	0.0916
Manganese	0.0518	0.0201	0.1097	0.0212	0.0052	0.4675	1.3213	0.1103	0.0089	0.2618	22.7002	0.0076	0.0028	1.8572	5.3680	1.5421	0.0050	0.0030	10.8648
Mercury	0.00074	0.00078	0.00054	0.00031	0.00024	0.00032	0.00022	0.00030	0.00051	0.00043	0.00031	0.00027	0.00025	0.00023	0.00029	0.00021	0.00020	0.00015	0.00008
Molybdenum	0.0245	0.0330	0.0300	0.0148	0.0151	0.0152	0.0259	0.0178	0.0181	0.0153	0.0242	0.0147	0.0175	0.0319	0.0168	0.0322	0.0200	0.0149	0.0430
Nickel	0.0200	0.0200	0.0247	0.0133	0.0121	0.0209	0.0221	0.0120	0.0120	0.0120	0.0209	0.0120	0.0120	0.0195	0.0169	0.0203	0.0100	0.0134	0.0124
Selenium	0.0057	0.0055	0.0060	0.0042	0.0040	0.0043	0.0025	0.0046	0.0166	0.0248	0.0044	0.0046	0.0037	0.0025	0.0021	0.0062	0.0035	0.0018	0.0016
Silver	0.0050	0.0052	0.0040	0.0038	0.0038	0.0038	0.0039	0.0027	0.0036	0.0026	0.0032	0.0029	0.0033	0.0031	0.0032	0.0033	0.0032	0.0037	0.0039
Thallium	0.0040	0.0400	0.0045	0.0018	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0016	0.0016	0.0016	0.0017	0.0018	0.0400	0.0019	0.0009
Vanadium	0.0745	0.1000	0.1987	0.0143	0.0152	0.0187	0.0077	0.0176	0.0310	0.0142	0.0285	0.0229	0.0234	0.0069	0.0185	0.0076	0.0200	0.0040	0.0022
Zinc	0.0501	0.9714	0.1615	0.0202	0.0086	0.0270	0.0215	0.0071	0.0168	0.0071	0.0171	0.0149	0.0144	0.0088	0.0065	0.0078	0.0128	0.0080	0.0026

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			CENTRAL FMC AREA									
	Michaud	Bannock	Portneuf	Well TW-5S Mean (b)	Well 107 Mean (b)	Well 108 Mean (b)	Well 111 Mean (b)	Well 121 Mean (b)	Well 122 Mean (b)	Well 133 Mean (b)	Well 134 Mean (b)	Well 135 Mean (b)	Well 146 Mean (b)
MAJOR IONS (mg/l)													
Alkalinity, bicarbonate	198	171	307	329	177	356	353	271	284	210	538	233	244
Calcium	97.71	68.75	91.93	90.20	69.84	99.06	95.99	113.42	64.62	83.41	112.35	144.76	82.35
Chloride	192.90	52.42	67.87	291.33	46.08	172.69	297.67	200.00	225.29	51.23	310.67	246.83	110.00
Magnesium	33.59	19.20	35.92	46.51	21.45	36.97	61.90	41.11	37.33	27.88	74.43	54.91	29.05
Potassium	12.72	10.52	7.34	207.90	8.42	180.21	139.00	159.65	231.15	13.31	197.06	20.26	68.95
Sodium	74.28	27.53	53.21	129.20	30.72	124.82	164.95	93.01	102.38	40.51	227.75	86.94	74.09
Sulfate	72.57	43.40	70.68	136.83	66.45	241.54	203.00	214.86	118.29	129.84	245.33	95.05	135.00
PHYSICAL PARAMETERS													
Spec.Conductivity (umhos/cm)	1136	569	871	2093	634	1888	2064	1853	1830	788	2263	1507	1141
pH	(d)	(d)	(d)	6.95	7.39	7.05	6.84	6.94	7.02	7.31	6.73	6.92	7.05
Temperature (degrees Celcius)	(d)	(d)	(d)	19.6	19.5	30.4	16.0	19.2	21.8	18.5	17.8	16.1	22.8
Total Dissolved Solids (mg/l)	867	412	580	1257	411	1163	1350	1179	1106	534	1533	1036	707
Redox (mV)	(d)	(d)	(d)	-79	59	-27	160	175	-19	106	90	86	134
NUTRIENTS AND FLUORIDE (mg/l)													
Ammonia (NH3 as N)	0.50	0.50	0.50	0.44	0.37	0.37	0.35	0.37	1.23	0.35	0.35	0.35	0.35
Nitrate (NO3 as N)	5.52	1.60	4.00	24.70	0.86	11.96	17.16	23.36	19.08	10.13	4.32	19.93	5.37
Orthophosphate (PO4 as P)	0.06	0.13	0.27	7.12	0.11	0.45	10.63	0.63	8.95	14.09	32.93	6.94	0.23
Phosphorous	0.33	0.31	0.15	8.02	0.08	0.72	15.05	0.61	8.08	0.24	34.25	5.24	0.29
Fluoride	0.80	0.60	0.41	0.13	0.60	2.88	0.14	2.41	0.27	0.52	0.17	0.22	0.76
METALS (mg/l)													
Aluminum	0.0977	0.5472	0.9475	0.0230	0.0397	0.0571	0.0494	0.0460	0.0372	0.0374	0.0307	0.0324	0.0357
Antimony	0.1000	0.1340	0.1000	0.0631	0.0617	0.0596	0.0631	0.0596	0.0596	0.0631	0.0631	0.0631	0.0631
Arsenic	0.0149	0.0180	0.0104	0.0558	0.0059	0.0350	0.0501	0.0171	0.0595	0.0100	0.1244	0.0465	0.0213
Barium	0.2297	0.1204	0.1735	0.1949	0.1075	0.1115	0.2188	0.0791	0.1206	0.1539	0.1481	0.1649	0.0899
Beryllium	0.0020	0.0040	0.0026	0.0011	0.0017	0.0015	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0014
Boron	0.2935	0.3078	0.2500	0.5519	0.0938	0.6669	0.9510	0.5538	0.4886	0.1067	1.3679	0.3396	0.3917
Cadmium	0.0050	0.0050	0.0050	0.0017	0.0025	0.0026	0.0014	0.0013	0.0015	0.0028	0.0029	0.0016	0.0014
Chromium	0.0114	0.0110	0.0100	0.0025	0.0041	0.0062	0.0023	0.0029	0.0023	0.0043	0.0041	0.0033	0.0028
Cobalt	0.0145	0.0108	0.0163	0.0100	0.0051	0.0074	0.0195	0.0057	0.0089	0.0052	0.0161	0.0052	0.0081
Copper	0.0085	0.0109	0.0130	0.0045	0.0040	0.0052	0.0050	0.0050	0.0043	0.0051	0.0105	0.0053	0.0040
Iron	0.7690	0.8402	1.0740	0.3034	0.2455	0.0878	0.0555	0.0484	0.0352	0.0458	0.0478	0.0395	0.0390
Lead	0.0020	0.0068	0.0024	0.0013	0.0014	0.0022	0.0016	0.0012	0.0013	0.0017	0.0030	0.0013	0.0013
Lithium	0.0610	0.0165	0.0400	0.0871	0.0403	0.0737	0.0917	0.0552	0.0945	0.0332	0.0948	0.0375	0.0688
Manganese	0.0518	0.0201	0.1097	0.4245	0.0207	0.5087	1.1368	0.0542	0.6300	0.0028	3.3961	0.0032	0.4614
Mercury	0.00074	0.00078	0.00054	0.00073	0.00017	0.00022	0.00026	0.00020	0.00018	0.00036	0.00031	0.00057	0.00027
Molybdenum	0.0245	0.0330	0.0300	0.0453	0.0141	0.0159	0.0295	0.0159	0.0478	0.0143	0.0158	0.0143	0.0162
Nickel	0.0200	0.0200	0.0247	0.0136	0.0120	0.0130	0.0165	0.0120	0.0145	0.0149	0.0183	0.0120	0.0127
Selenium	0.0057	0.0055	0.0060	0.0034	0.0022	0.0079	0.0028	0.0500	0.0027	0.0017	0.0041	0.0067	0.0063
Silver	0.0050	0.0052	0.0040	0.0029	0.0037	0.0037	0.0026	0.0030	0.0029	0.0039	0.0040	0.0026	0.0034
Thallium	0.0040	0.0400	0.0045	0.0018	0.0016	0.0016	0.0017	0.0022	0.0016	0.0017	0.0017	0.0024	0.0018
Vanadium	0.0745	0.1000	0.1987	0.0116	0.0077	0.0184	0.0110	0.0090	0.0105	0.0071	0.0229	0.0099	0.0137
Zinc	0.0501	0.9714	0.1615	0.0110	0.0072	0.0226	0.0078	0.0110	0.0062	0.0084	0.0124	0.0076	0.0074

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			JOINT FENCELINE AREA																			
	Michaud	Bannock	Portneuf	Well 109 Mean (b)	Well 110 Mean (b)	Well 123 Mean (b)	Well 136 Mean (b)	Well 142 Mean (b)	Well 143 Mean (b)	Well 144 Mean (b)	Well 145 Mean (b)	Well 304 Mean (b)	Well 307 Mean (b)	Well 308 Mean (b)	Well 309 Mean (b)	Well 310 Mean (b)	Well 312 Mean (b)	Well 323 Mean (b)	Well 324 Mean (b)	Well 329 Mean (b)	Well 330 Mean (b)	Well 331 Mean (b)	Well 333 Mean (b)
MAJOR IONS (mg/l)																							
Alkalinity, bicarbonate	198	171	307	167	552	737	1197	936	796	397	1125	664	1187	1177	811	722	830	562	216	166	164	664	1050
Calcium	97.71	68.75	91.93	55.86	242.50	390.85	303.41	442.09	402.37	212.32	365.30	425.70	207.90	243.12	368.66	310.97	362.58	425.13	72.97	52.25	48.05	282.50	318.78
Chloride	192.90	52.42	67.87	35.08	138.00	339.15	152.00	116.33	283.33	148.67	146.67	191.20	129.40	133.80	117.00	117.17	159.60	97.75	44.08	29.00	25.00	128.50	145.50
Magnesium	33.59	19.20	35.92	16.58	85.16	170.07	279.91	126.91	173.79	70.09	208.76	118.93	404.49	300.48	92.22	97.31	142.11	127.47	21.18	15.81	14.97	105.73	279.40
Potassium	12.72	10.52	7.34	6.13	18.14	32.40	122.03	18.24	35.84	15.13	81.15	16.86	31.90	35.18	55.33	25.23	23.87	26.73	6.73	6.36	5.00	18.26	31.47
Sodium	74.28	27.53	53.21	36.48	160.51	226.02	668.14	127.44	390.44	85.39	582.05	32.47	606.50	623.03	276.65	335.09	299.97	454.98	46.08	36.36	33.24	278.17	504.83
Sulfate	72.57	43.40	70.68	58.48	586.30	956.23	1681.58	1037.50	1078.83	395.83	1771.17	737.20	1932.00	1958.00	1011.20	1265.67	1262.40	1777.50	421.75	56.50	46.50	1059.50	2200.00
PHYSICAL PARAMETERS																							
Spec.Conductivity (umhos/cm)	1136	569	871	509	2270	3389	4956	3124	3601	1756	4967	2798	5090	4823	3257	3007	3633	3750	751	558	522	3147	4823
pH	(d)	(d)	(d)	7.47	6.40	6.16	6.10	6.48	6.19	6.94	6.15	6.77	6.14	6.13	6.35	6.41	6.26	5.88	7.18	7.49	7.49	6.34	6.10
Temperature (degrees Celcius)	(d)	(d)	(d)	15.1	16.2	17.3	14.9	15.6	16.1	15.3	14.6	16.6	16.3	15.7	19.3	19.7	15.8	16.8	17.1	15.9	14.5	17.1	15.7
Total Dissolved Solids (mg/l)	867	412	580	351	1651	2778	4098	2738	2943	1258	4005	2292	4488	4428	2758	2600	3016	3643	474	351	340	2470	4330
Redox (mV)	(d)	(d)	(d)	116	147	23	88	112	62	229	171	126	121	103	143	155	154	125	136	134	138	158	141
NUTRIENTS AND FLUORIDE (mg/l)																							
Ammonia (NH3 as N)	0.50	0.50	0.50	0.35	0.35	4.30	9.77	0.35	6.42	0.35	11.83	0.38	1.36	28.88	0.38	0.25	0.46	0.43	0.43	0.50	0.50	1.75	1.04
Nitrate (NO3 as N)	5.52	1.60	4.00	0.92	2.67	9.13	4.35	16.91	7.33	3.76	3.18	5.48	2.48	25.41	2.53	2.37	4.62	2.30	0.95	3.44	0.85	30.90	3.30
Orthophosphate (PO4 as P)	0.06	0.13	0.27	0.03	4.48	4.36	116.29	16.45	13.53	0.38	87.62	11.02	163.00	153.00	7.75	26.03	29.34	155.00	0.22	0.03	0.02	22.15	93.10
Phosphorous	0.33	0.31	0.15	0.08	8.18	4.46	96.85	0.03	14.60	1.10	85.63	11.51	157.60	144.20	8.27	31.45	29.14	126.75	0.23	0.03	0.02	27.20	89.05
Fluoride	0.80	0.60	0.41	0.83	0.27	0.76	1.66	0.15	0.38	0.46	0.83	0.17	0.17	1.34	0.53	0.21	0.22	0.15	0.73	0.85	0.55	0.20	0.20
METALS (mg/l)																							
Aluminum	0.0977	0.5472	0.9475	0.0447	0.0377	0.0446	0.0354	0.0347	0.0474	0.2872	0.1813	0.0244	0.0352	0.0438	0.1027	0.0403	0.0389	0.4452	0.0266	0.0300	0.0226	0.0226	0.0226
Antimony	0.1000	0.1340	0.1000	0.0631	0.0631	0.0596	0.0631	0.0631	0.0631	0.0754	0.0690	0.0557	0.0637	0.0557	0.0557	0.1002	0.0557	0.0546	0.0546	0.0482	0.0482	0.0482	0.0482
Arsenic	0.0149	0.0180	0.0104	0.0034	0.1197	0.5506	0.4622	0.0043	0.3514	0.0064	0.3631	0.0037	0.5970	0.5521	0.0897	0.1437	0.2377	0.6581	0.0108	0.0067	0.0055	0.2325	0.3409
Barium	0.2297	0.1204	0.1735	0.0684	0.0850	0.0634	0.0855	0.2457	0.0980	0.1010	0.0967	0.0870	0.0662	0.0480	0.0624	0.0759	0.1046	0.0502	0.0793	0.0687	0.0544	0.0715	0.0937
Beryllium	0.0020	0.0040	0.0026	0.0014	0.0014	0.0016	0.0011	0.0022	0.0011	0.0014	0.0014	0.0009	0.0009	0.0009	0.0009	0.0012	0.0010	0.0008	0.0008	0.0007	0.0007	0.0007	0.0007
Boron	0.2935	0.3078	0.2500	0.1868	0.7379	0.9638	0.7022	0.3299	1.0300	0.4261	0.7892	0.0913	0.7469	0.7373	0.4709	0.5135	0.7986	0.5901	0.1392	0.1085	0.0957	0.5225	0.6874
Cadmium	0.0050	0.0050	0.0050	0.0026	0.0026	0.0026	0.0027	0.0014	0.0055	0.0015	0.0015	0.0014	0.0018	0.0095	0.0014	0.0018	0.0016	0.0018	0.0018	0.0006	0.0007	0.0006	0.0006
Chromium	0.0114	0.0110	0.0100	0.0046	0.0046	0.0044	0.0046	0.0034	0.0025	0.0064	0.0032	0.0029	0.0031	0.0047	0.0033	0.0071	0.0029	0.0035	0.0040	0.0031	0.0022	0.0013	0.0011
Cobalt	0.0145	0.0108	0.0163	0.0067	0.0068	0.0087	0.0061	0.0054	0.0066	0.0144	0.0052	0.0043	0.0043	0.0043	0.0043	0.0063	0.0045	0.0031	0.0035	0.0027	0.0027	0.0027	0.0027
Copper	0.0085	0.0109	0.0130	0.0035	0.0061	0.0078	0.0135	0.0089	0.0092	0.0048	0.0104	0.0069	0.0089	0.0076	0.0079	0.0074	0.0109	0.0059	0.0040	0.0037	0.0037	0.0037	0.0037
Iron	0.7690	0.8402	1.0740	0.0292	0.1451	0.0443	0.0256	0.0386	0.0362	0.4633	0.1635	0.0321	0.0325	0.0471	0.0541	0.0353	0.5710	0.2700	0.0365	0.0726	0.0620	0.0620	0.0620
Lead	0.0020	0.0068	0.0024	0.0011	0.0027	0.0036	0.0033	0.0019	0.0013	0.0024	0.0023	0.0011	0.0011	0.0018	0.0015	0.0015	0.0011	0.0012	0.0011	0.0008	0.0011	0.0011	0.0008
Lithium	0.0610	0.0165	0.0400	0.0462	0.1360	0.2569	0.5077	0.0341	0.2834	0.0917	0.5118	0.0195	0.6073	0.5761	0.1943	0.1691	0.2567	0.1858	0.0507	0.0538	0.0471	0.2247	0.4097
Manganese	0.0518	0.0201	0.1097	0.0030	0.1360	0.5108	2.2659	0.0240	0.6135	0.1355	1.0662	0.0034	0.0997	0.5329	0.0028	0.0110	0.6429	0.0309	0.0080	0.0044	0.0009	0.1014	0.0182
Mercury	0.00074	0.00078	0.00054	0.00028	0.00022	0.00016	0.00020	0.00019	0.00020	0.00221	0.00048	0.00016	0.00023	0.00019	0.00017	0.00030	0.00018	0.00020	0.00018	0.00042	0.00011	0.00011	0.00015
Molybdenum	0.0245	0.0330	0.0300	0.0143	0.0143	0.0235	0.0146	0.0143	0.0167	0.0153	0.0202	0.0131	0.0137	0.0177	0.0274	0.0278	0.0233	0.0122	0.0122	0.0192	0.0113	0.0125	0.0113
Nickel	0.0200	0.0200	0.0247	0.0120	0.0120	0.0137	0.0341	0.0124	0.0580	0.0120	0.0235	0.0124	0.0144	0.0527	0.0124	0.0148	0.0309	0.0137	0.0137	0.0127	0.0124	0.0124	0.0124
Selenium	0.0057	0.0055	0.0060	0.0018	0.0686	0.2896	0.0863	0.0071	0.1925	0.0134	0.1167	0.0104	0.0115	0.0216	0.0072	0.0124	0.1543	0.0054	0.0036	0.0017	0.0014	0.0681	0.0123
Silver	0.0050	0.0052	0.0040	0.0038	0.0039	0.0037	0.0038	0.0031	0.0033	0.0036	0.0032	0.0031	0.0031	0.0031	0.0031	0.0039	0.0032	0.0037	0.0035	0.0039	0.0039	0.0039	0.0039
Thallium	0.0040	0.0400	0.0045	0.0017	0.0017	0.0016	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	0.0019	0.0019	0.0018	0.0019	0.0018	0.0022	0.0022	0.0009	0.0007	0.0008	0.0012
Vanadium	0.0745	0.1000	0.1987	0.0066	0.0196	0.2101	0.0240	0.0193	0.1093	0.0090	0.0145	0.0199	0.0540	0.0475	0.0055	0.0489	0.1016	0.0042	0.0033	0.0036	0.0022	0.0128	0.0183
Zinc	0.0501	0.9714	0.1615	0.0107	0.0095	0.0091	0.0266	0.0153	0.0078	0.0241	0.0094	0.0054	0.0047	0.0145	0.0124	0.0131	0.0078	0.0091	0.0072	0.0080	0.0042	0.0047	0.0050

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			EASTERN SIMPLOT AREA																		
	Michaud	Bannock	Portneuf	Well PEI-3 Mean (b)	Well PEI-4 Mean (b)	Well PEI-5 Mean (b)	Well 300 Mean (b)	Well 306 Mean (b)	Well 313 Mean (b)	Well 315 Mean (b)	Well 316 Mean (b)	Well 317 Mean (b)	Well 318 Mean (b)	Well 319 Mean (b)	Well 320 Mean (b)	Well 321 Mean (b)	Well 322 Mean (b)	Well 325 Mean (b)	Well 326 Mean (b)	Well 327 Mean (b)	Well 328 Mean (b)	Well 332 Mean (b)
MAJOR IONS (mg/l)																						
Alkalinity, bicarbonate	198	171	307	607	297	182	411	1285	854	1199	1286	1204	151	164	478	266	279	732	1307	352	293	1090
Calcium	97.71	68.75	91.93	356.58	76.56	159.73	409.69	563.59	547.59	482.95	472.61	364.93	656.82	47.63	327.39	79.73	49.00	420.78	440.18	133.03	86.60	501.28
Chloride	192.90	52.42	67.87	103.25	61.08	75.62	94.78	117.66	170.60	126.40	124.83	112.80	141.40	26.80	96.18	57.94	52.60	118.35	122.25	68.25	62.17	118.50
Magnesium	33.59	19.20	35.92	125.65	33.24	64.22	87.70	174.01	170.40	206.40	268.33	216.77	215.59	15.37	109.63	29.83	28.60	123.81	297.14	49.48	31.95	209.45
Potassium	12.72	10.52	7.34	10.83	6.39	3.67	15.32	29.94	38.95	28.26	32.60	19.44	241.65	4.99	27.81	6.29	6.10	33.38	23.49	11.92	6.31	35.92
Sodium	74.28	27.53	53.21	565.00	40.34	102.45	693.29	299.33	295.97	326.47	518.65	517.00	310.24	38.54	253.31	36.55	20.90	234.79	573.64	85.89	40.86	450.65
Sulfate	72.57	43.40	70.68	2107.83	54.16	678.67	2500.00	1898.00	1710.00	1598.00	2070.00	1820.00	2506.00	55.33	902.60	47.50	46.00	1191.25	2305.00	280.25	47.00	2130.00
PHYSICAL PARAMETERS																						
Spec.Conductivity (umhos/cm)	1136	569	871	4080	782	1553	4910	3976	4576	4239	4852	4663	7620	520	3492	797	798	3422	5412	1379	873	4836
pH	(d)	(d)	(d)	6.85	7.48	6.12	5.76	6.37	6.25	6.36	6.24	6.06	2.60	7.50	6.16	7.31	8.33	6.39	6.25	6.53	7.14	6.18
Temperature (degrees Celcius)	(d)	(d)	(d)	16.5	13.1	16.1	16.6	18.1	16.5	18.2	16.7	16.5	18.8	14.5	18.5	13.1	15.1	17.5	16.4	14.0	13.1	15.9
Total Dissolved Solids (mg/l)	867	412	580	4072	483	1532	4598	3834	4082	3872	4678	4168	10892	360	2302	416	390	2890	4554	913	483	4500
Redox (mV)	(d)	(d)	(d)	(e)	141	(e)	117	103	126	125	110	104	162	125	147	141	(e)	128	129	99	131	128
NUTRIENTS AND FLUORIDE (mg/l)																						
Ammonia (NH3 as N)	0.50	0.50	0.50	0.36	0.12	0.15	0.38	0.38	6.00	0.38	0.35	0.38	19.36	0.35	17.28	0.19	0.10	2.90	0.43	0.21	0.40	0.50
Nitrate (NO3 as N)	5.52	1.60	4.00	3.44	1.92	2.24	2.15	2.01	61.98	7.63	12.63	0.99	1.06	0.97	65.98	2.85	36.00	34.35	15.56	2.43	2.09	5.19
Orthophosphate (PO4 as P)	0.06	0.13	0.27	59.93	0.45	43.72	182.60	27.48	22.56	33.40	58.88	102.20	2304.20	0.08	37.96	0.02	0.01	8.24	116.68	6.36	0.04	35.25
Phosphorous	0.33	0.31	0.15	106.60	0.07	147.25	179.00	25.46	21.78	33.50	55.60	96.90	1916.48	0.07	36.70	0.03	0.02	7.80	95.35	6.45	0.05	40.05
Fluoride	0.80	0.60	0.41	0.17	0.26	4.15	0.14	0.16	0.38	0.18	0.13	0.16	1060.98	1.26	5.16	0.14	0.20	0.15	0.15	1.13	0.23	0.30
METALS (mg/l)																						
Aluminum	0.0977	0.5472	0.9475	0.1397	0.2829	2.7138	0.0472	0.0752	0.0401	0.1156	0.5329	0.0347	360.1069	0.0327	0.1227	0.0406	0.1200	0.0885	0.0266	0.0133	0.0280	0.0226
Antimony	0.1000	0.1340	0.1000	0.0900	0.0560	0.0800	0.0657	0.0557	0.0557	0.0557	0.0731	0.0577	0.0731	0.0747	0.0874	0.0475	0.0500	0.0546	0.0546	0.0348	0.0557	0.0482
Arsenic	0.0149	0.0180	0.0104	0.2837	0.0029	0.0434	0.6090	0.2747	0.2476	0.2305	0.3427	0.3799	0.3459	0.0129	0.0680	0.0027	0.0043	0.1096	0.4620	0.0292	0.0036	0.2429
Barium	0.2297	0.1204	0.1735	0.0357	0.1329	0.1360	0.0155	0.1138	0.0850	0.0758	0.1049	0.1012	0.2346	0.0665	0.0466	0.1541	0.1900	0.0653	0.0380	0.1007	0.1271	0.0383
Beryllium	0.0020	0.0040	0.0026	0.0020	0.0008	0.0107	0.0013	0.0009	0.0010	0.0009	0.0011	0.0009	0.0462	0.0014	0.0013	0.0007	0.0005	0.0009	0.0010	0.0004	0.0010	0.0007
Boron	0.2935	0.3078	0.2500	0.7404	0.1902	0.2292	0.5548	0.4635	0.4837	0.5025	0.6216	0.5961	2.8229	0.1726	0.3843	0.0873	0.0700	0.3724	0.6273	0.1488	0.1289	0.5541
Cadmium	0.0050	0.0050	0.0050	0.0006	0.0007	0.0057	0.0016	0.0015	0.0015	0.0015	0.0019	0.0014	2.6175	0.0014	0.0104	0.0007	0.0001	0.0018	0.0018	0.0026	0.0023	0.0048
Chromium	0.0114	0.0110	0.0100	0.0027	0.0018	0.0074	0.0032	0.0032	0.0041	0.0065	0.0093	0.0031	3.8110	0.0046	0.0042	0.0021	0.0006	0.0039	0.0037	0.0018	0.0042	0.0013
Cobalt	0.0145	0.0108	0.0163	0.0095	0.0028	0.0095	0.0053	0.0071	0.0073	0.0071	0.0084	0.0043	0.0719	0.0052	0.0058	0.0027	0.0070	0.0031	0.0031	0.0016	0.0033	0.0030
Copper	0.0085	0.0109	0.0130	0.0180	0.0042	0.0157	0.0126	0.0070	0.0058	0.0067	0.0131	0.0082	0.8031	0.0033	0.0053	0.0024	0.0015	0.0054	0.0045	0.0023	0.0037	0.0037
Iron	0.7690	0.8402	1.0740	0.1602	0.2730	0.1363	0.0380	0.0406	0.0413	0.0745	0.1038	0.0364	98.8849	0.0367	0.0874	0.0215	0.0385	0.1347	0.0365	0.0198	0.0303	0.0620
Lead	0.0020	0.0068	0.0024	0.0027	0.0037	0.0020	0.0011	0.0011	0.0011	0.0011	0.0017	0.0011	0.0087	0.0016	0.0018	0.0006	0.0014	0.0011	0.0011	0.0006	0.0013	0.0008
Lithium	0.0610	0.0165	0.0400	0.1323	0.0262	0.1573	0.0378	0.1079	0.1937	0.1769	0.3590	0.2522	0.4868	0.0424	0.1352	0.0194	0.0145	0.1379	0.3518	0.0427	0.0331	0.2464
Manganese	0.0518	0.0201	0.1097	0.0380	0.0165	0.6800	0.0033	0.0021	0.0592	0.0031	0.0194	0.0021	7.0779	0.0025	0.4824	0.0010	0.0020	0.0604	0.0068	0.0014	0.0014	0.0391
Mercury	0.00074	0.00078	0.00054	0.00030	0.00073	0.00060	0.00021	0.00033	0.00023	0.00021	0.00040	0.00031	0.00039	0.00022	0.00020	0.00010	0.00012	0.00020	0.00017	0.00009	0.00019	0.00011
Molybdenum	0.0245	0.0330	0.0300	0.0300	0.0073	0.0300	0.0205	0.0337	0.0131	0.0277	0.0148	0.0239	0.1067	0.0181	0.0211	0.0066	0.0085	0.0122	0.0122	0.0061	0.0130	0.0113
Nickel	0.0200	0.0200	0.0247	0.0120	0.0076	0.2315	0.0138	0.0124	0.0124	0.0124	0.0161	0.0130	2.3781	0.0120	0.1072	0.0088	0.0035	0.0137	0.0142	0.0088	0.0137	0.0318
Selenium	0.0057	0.0055	0.0060	0.0113	0.0013	0.0054	0.0099	0.0081	0.0235	0.0090	0.0308	0.0054	0.0254	0.0034	0.0161	0.0023	0.0018	0.0049	0.0208	0.0039	0.0030	0.0202
Silver	0.0050	0.0052	0.0040	0.0073	0.0016	0.0033	0.0031	0.0033	0.0032	0.0037	0.0062	0.0031	0.0032	0.0029	0.0045	0.0016	0.0010	0.0042	0.0036	0.0017	0.0033	0.0039
Thallium	0.0040	0.0400	0.0045	0.0203	0.0048	0.0203	0.0024	0.0018	0.0020	0.0018	0.0018	0.0019	0.0327	0.0082	0.0096	0.0009	0.0003	0.0022	0.0023	0.0011	0.0027	0.0010
Vanadium	0.0745	0.1000	0.1987	0.3765	0.0917	0.2028	0.0253	0.0206	0.0087	0.0138	0.0375	0.0541	14.9893	0.0174	0.0491	0.0139	0.0700	0.0080	0.0114	0.0034	0.0023	0.0108
Zinc	0.0501	0.9714	0.1615	0.7830	0.0218	0.2470	0.0067	0.0055	0.0111	0.0234	0.0196	0.0040	19.3397	0.0102	0.0598	0.0032	0.0225	0.0083	0.0051	0.0177	0.0064	0.0076

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			OFFSITE AREA																				
	Michaud	Bannock	Portneuf	Batiste Springs Mean (b)	Frontier Well Mean (b)	Lindley Well Mean (b)	NPH Well Mean (b)	OPH Well Mean (b)	Rowlands Well Mean (b)	Tank Farm Well Mean (b)	Well TW-9S Mean (b)	Well TW-11S Mean (b)	Well TW-11I Mean (b)	Well TW-12S Mean (b)	Well 500 Mean (b)	Well 501 Mean (b)	Well 502 Mean (b)	Well 503 Mean (b)	Well 504 Mean (b)	Well 505 Mean (b)	Well 506 Mean (b)	Well 507 Mean (b)	Well 508 Mean (b)	Well 509 Mean (b)	Well 516 Mean (b)
MAJOR IONS (mg/l)																									
Alkalinity, bicarbonate	198	171	307	209	275	274	160	338	248	178	332	202	199	246	151	170	165	319	162	289	253	291	168	274	163
Calcium	97.71	68.75	91.93	71.07	92.80	96.95	49.97	102.28	52.99	48.58	100.14	55.34	52.52	116.52	44.85	72.51	59.67	122.15	46.68	83.01	77.12	83.64	47.25	75.18	62.78
Chloride	192.90	52.42	67.87	50.76	42.12	262.75	29.05	260.83	23.39	16.94	249.83	26.44	24.48	62.17	30.72	107.48	79.28	66.00	29.98	57.30	58.08	54.46	31.16	49.24	78.00
Magnesium	33.59	19.20	35.92	25.60	31.40	38.38	15.60	55.81	19.64	15.78	50.41	17.84	17.21	44.61	15.19	24.78	20.33	39.46	14.29	31.12	30.28	31.09	15.11	28.82	20.13
Potassium	12.72	10.52	7.34	10.61	7.48	12.45	5.24	106.05	5.20	3.49	127.04	4.09	5.47	20.34	4.10	6.79	6.49	8.27	5.10	6.83	6.59	6.52	4.92	6.38	8.15
Sodium	74.28	27.53	53.21	57.22	60.95	143.33	30.86	151.90	47.75	17.83	139.49	31.03	35.77	98.18	27.82	42.44	53.04	72.08	32.87	44.89	42.65	39.94	31.46	39.31	40.82
Sulfate	72.57	43.40	70.68	115.22	175.80	177.50	50.35	205.50	40.20	36.37	177.50	49.98	40.80	316.17	49.02	71.74	60.58	238.40	48.94	65.60	53.02	61.44	47.74	51.86	67.00
PHYSICAL PARAMETERS																									
Spec.Conductivity (umhos/cm)	1136	569	871	813	981	1600	483	1859	721	561	1909	514	517	1327	492	815	752	1234	523	879	822	859	534	809	735
pH	(d)	(d)	(d)	6.93	6.88	7.17	7.49	6.84	7.47	7.73	6.89	7.40	7.47	6.37	8.00	7.71	7.47	6.69	7.58	7.15	7.22	7.10	7.87	7.53	7.47
Temperature (degrees Celcius)	(d)	(d)	(d)	12.3	13.6	10.9	13.5	14.7	13.6	12.6	17.4	12.4	13.7	15.2	13.4	12.2	12.5	13.8	14.5	13.1	13.4	12.8	14.1	13.3	13.8
Total Dissolved Solids (mg/l)	867	412	580	528	664	1043	312	1237	372	274	1173	316	307	907	296	493	454	798	318	514	490	495	315	466	422
Redox (mV)	(d)	(d)	(d)	91	94	83	15	69	107	96	-117	35	-64	0	116	109	111	171	146	150	160	151	154	155	176
NUTRIENTS AND FLUORIDE (mg/l)																									
Ammonia (NH3 as N)	0.50	0.50	0.50	0.72	0.38	0.28	0.35	0.35	0.35	0.35	0.35	0.35	0.35	18.33	0.38	0.38	0.38	3.04	0.38	0.38	0.19	0.19	0.38	0.19	0.50
Nitrate (NO3 as N)	5.52	1.60	4.00	3.42	1.81	6.34	1.06	12.63	1.60	1.35	12.64	1.55	1.39	13.36	1.04	1.74	3.07	4.47	1.29	2.77	3.76	1.89	1.30	3.16	1.97
Orthophosphate (PO4 as P)	0.06	0.13	0.27	1.90	2.26	0.03	0.02	7.11	0.02	0.03	2.83	0.03	0.04	27.47	0.04	0.03	0.03	4.03	0.02	0.08	0.03	0.03	0.02	0.03	0.08
Phosphorous	0.33	0.31	0.15	1.88	2.43	0.04	8.88	7.61	0.05	0.05	3.08	0.06	0.05	29.63	0.02	0.03	0.03	4.16	0.02	0.08	0.03	0.04	0.02	0.03	0.06
Fluoride	0.80	0.60	0.41	0.52	0.51	0.52	0.86	0.13	0.27	0.75	0.19	0.77	0.83	1.13	0.76	0.50	0.78	1.22	0.82	0.26	0.20	0.22	0.82	0.26	0.70
METALS (mg/l)																									
Aluminum	0.0977	0.5472	0.9475	0.0480	0.0244	0.0428	0.0394	0.0464	0.0467	0.0360	0.0344	0.0310	0.0344	0.0347	0.0258	0.0272	0.0249	0.0252	0.0244	0.0372	0.0122	0.0339	0.0372	0.0122	0.0226
Antimony	0.1000	0.1340	0.1000	0.0631	0.0637	0.0980	0.0631	0.0631	0.0681	0.0797	0.0631	0.0631	0.0667	0.0631	0.0557	0.0557	0.0637	0.0578	0.0585	0.0557	0.0278	0.0278	0.0557	0.0338	0.0482
Arsenic	0.0149	0.0180	0.0104	0.0150	0.0185	0.0056	0.0046	0.0410	0.0046	0.0039	0.0352	0.0034	0.0040	0.0378	0.0042	0.0052	0.0034	0.0169	0.0048	0.0047	0.0040	0.0028	0.0038	0.0033	0.0055
Barium	0.2297	0.1204	0.1735	0.0570	0.1348	0.1072	0.0697	0.2344	0.0930	0.0613	0.1281	0.0608	0.0619	0.0380	0.0661	0.5579	0.0805	0.1137	0.0637	0.1425	0.1540	0.1200	0.0679	0.1307	0.0878
Beryllium	0.0020	0.0040	0.0026	0.0011	0.0019	0.0013	0.0013	0.0014	0.0013	0.0011	0.0011	0.0011	0.0013	0.0013	0.0009	0.0010	0.0009	0.0009	0.0009	0.0009	0.0005	0.0005	0.0009	0.0004	0.0007
Boron	0.2935	0.3078	0.2500	0.1423	0.1561	0.3269	0.0956	0.7046	0.1139	0.0965	0.6443	0.0896	0.0958	0.2523	0.0854	0.1000	0.1239	0.1606	0.1115	0.1587	0.1135	0.1198	0.1000	0.1117	0.1137
Cadmium	0.0050	0.0050	0.0050	0.0017	0.0014	0.0020	0.0027	0.0014	0.0016	0.0017	0.0014	0.0026	0.0026	0.0045	0.0017	0.0014	0.0014	0.0024	0.0014	0.0014	0.0008	0.0007	0.0014	0.0008	0.0006
Chromium	0.0114	0.0110	0.0100	0.0030	0.0032	0.0049	0.0047	0.0028	0.0034	0.0030	0.0027	0.0051	0.0049	0.0029	0.0033	0.0040	0.0037	0.0026	0.0041	0.0032	0.0027	0.0015	0.0036	0.0023	0.0042
Cobalt	0.0145	0.0108	0.0163	0.0053	0.0043	0.0069	0.0052	0.0154	0.0054	0.0052	0.0134	0.0052	0.0052	0.0066	0.0053	0.0053	0.0047	0.0043	0.0043	0.0043	0.0021	0.0030	0.0085	0.0041	0.0027
Copper	0.0085	0.0109	0.0130	0.0035	0.0055	0.1107	0.0044	0.0059	0.0048	0.0082	0.0052	0.0042	0.0040	0.0050	0.0049	0.0049	0.0069	0.0053	0.0047	0.0053	0.0039	0.0030	0.0043	0.0024	0.0037
Iron	0.7690	0.8402	1.0740	0.0339	0.0458	0.1077	0.0771	0.0804	0.0263	0.0761	1.3756	0.1348	1.0564	0.3273	0.0336	0.0490	0.0709	0.0363	0.0384	0.0313	0.0203	0.0280	0.0326	0.0164	0.0620
Lead	0.0020	0.0068	0.0024	0.0016	0.0011	0.0016	0.0012	0.0013	0.0017	0.0017	0.0013	0.0011	0.0012	0.0016	0.0011	0.0013	0.0013	0.0012	0.0016	0.0011	0.0008	0.0008	0.0015	0.0006	0.0008
Lithium	0.0610	0.0165	0.0400	0.0535	0.0517	0.0621	0.0465	0.0857	0.0188	0.0341	0.0890	0.0453	0.0492	0.0845	0.0416	0.0389	0.0462	0.0476	0.0452	0.0339	0.0275	0.0257	0.0419	0.0217	0.0462
Manganese	0.0518	0.0201	0.1097	0.0070	0.0018	0.0048	0.0051	0.8802	0.0022	0.0032	1.1005	0.0022	0.0185	0.1848	0.0020	0.0028	0.0018	0.0450	0.0018	0.0018	0.0010	0.0011	0.0021	0.0011	0.0015
Mercury	0.00074	0.00078	0.00054	0.00018	0.00019	0.00030	0.00018	0.00022	0.00034	0.00031	0.00022	0.00025	0.00021	0.00034	0.00023	0.00024	0.00026	0.00027	0.00021	0.00029	0.00041	0.00016	0.00019	0.00009	0.00114
Molybdenum	0.0245	0.0330	0.0300	0.0143	0.0177	0.0240	0.0149	0.0243	0.0164	0.0164	0.0230	0.0143	0.0143	0.0143	0.0218	0.0177	0.0237	0.0157	0.0131	0.0131	0.0109	0.0069	0.0181	0.0066	0.0113
Nickel	0.0200	0.0200	0.0247	0.0134	0.0146	0.0123	0.0120	0.0122	0.0135	0.0143	0.0120	0.0122	0.0120	0.0606	0.0138	0.0128	0.0166	0.0164	0.0124	0.0140	0.0081	0.0071	0.0177	0.0062	0.0124
Selenium	0.0057	0.0055	0.0060	0.0069	0.0033	0.0025	0.0021	0.0040	0.0022	0.0024	0.0022	0.0017	0.0019	0.0112	0.0028	0.0029	0.0020	0.0039	0.0026	0.0028	0.0022	0.0014	0.0025	0.0021	0.0025
Silver	0.0050	0.0052	0.0040	0.0030	0.0034	0.0034	0.0039	0.0031	0.0033	0.0031	0.0035	0.0038	0.0039	0.0032	0.0036	0.0032	0.0032	0.0036	0.0032	0.0036	0.0016	0.0019	0.0034	0.0016	0.0039
Thallium	0.0040	0.0400	0.0045	0.0023	0.0018	0.0022	0.0017	0.0017	0.0016	0.0017	0.0017	0.0017	0.0017	0.0017	0.0018	0.0018	0.0019	0.0019	0.0018	0.0018	0.0010	0.0011	0.0018	0.0009	0.0009
Vanadium	0.0745	0.1000	0.1987	0.0111	0.0146	0.0108	0.0069	0.0128	0.0216	0.0168	0.0303	0.0068	0.0102	0.0101	0.0126	0.0284	0.0203	0.0317	0.0219	0.0259	0.0082	0.0101	0.0055	0.0025	0.0022
Zinc	0.0501	0.9714	0.1615	0.0123	0.0124	0.1260	0.0126	0.0138	0.0200	0.1359	0.0099	0.0090	0.0080	0.0220	0.0085	0.0067	0.0054	0.0118	0.0100	0.0095	0.0038	0.0052	0.0093	0.0039	0.0030

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-1 (continued)

Representative Groundwater Chemistry

ANALYTE (a)	95% Upper Confidence Level for Representative Groundwater in Each Hydrogeochemical Regime (c)			OFFSITE AREA			
	Michaud	Bannock	Portneuf	Well 517 Mean (b)	Well 518 Mean (b)	Well 519 Mean (b)	Well 520 Mean (b)
MAJOR IONS (mg/l)							
Alkalinity, bicarbonate	198	171	307	341	349	247	282
Calcium	97.71	68.75	91.93	116.03	120.14	57.10	99.09
Chloride	192.90	52.42	67.87	176.50	63.50	22.00	68.00
Magnesium	33.59	19.20	35.92	44.92	42.75	20.49	35.56
Potassium	12.72	10.52	7.34	76.52	9.30	5.26	7.39
Sodium	74.28	27.53	53.21	103.89	72.34	38.34	45.07
Sulfate	72.57	43.40	70.68	229.50	203.50	36.50	74.00
PHYSICAL PARAMETERS							
Spec.Conductivity (umhos/cm)	1136	569	871	1748	1255	633	980
pH	(d)	(d)	(d)	6.89	6.67	7.49	6.94
Temperature (degrees Celcius)	(d)	(d)	(d)	18.3	13.5	14.5	12.9
Total Dissolved Solids (mg/l)	867	412	580	1140	818	383	550
Redox (mV)	(d)	(d)	(d)	143	150	139	152
NUTRIENTS AND FLUORIDE (mg/l)							
Ammonia (NH3 as N)	0.50	0.50	0.50	0.50	0.50	0.50	0.25
Nitrate (NO3 as N)	5.52	1.60	4.00	9.63	2.83	1.69	2.09
Orthophosphate (PO4 as P)	0.06	0.13	0.27	0.86	3.16	0.02	0.02
Phosphorous	0.33	0.31	0.15	1.07	3.44	0.03	0.01
Fluoride	0.80	0.60	0.41	0.20	0.45	0.35	0.20
METALS (mg/l)							
Aluminum	0.0977	0.5472	0.9475	0.0226	0.0226	0.0226	0.0254
Antimony	0.1000	0.1340	0.1000	0.0482	0.0482	0.0482	0.0225
Arsenic	0.0149	0.0180	0.0104	0.0320	0.0196	0.0042	0.0017
Barium	0.2297	0.1204	0.1735	0.0892	0.1171	0.0874	0.1277
Beryllium	0.0020	0.0040	0.0026	0.0012	0.0011	0.0007	0.0005
Boron	0.2935	0.3078	0.2500	0.5674	0.1721	0.0878	0.1460
Cadmium	0.0050	0.0050	0.0050	0.0006	0.0012	0.0006	0.0005
Chromium	0.0114	0.0110	0.0100	0.0011	0.0007	0.0009	0.0005
Cobalt	0.0145	0.0108	0.0163	0.0061	0.0027	0.0027	0.0015
Copper	0.0085	0.0109	0.0130	0.0037	0.0037	0.0037	0.0020
Iron	0.7690	0.8402	1.0740	0.0620	0.0620	0.1027	0.0345
Lead	0.0020	0.0068	0.0024	0.0008	0.0008	0.0008	0.0005
Lithium	0.0610	0.0165	0.0400	0.0851	0.0493	0.0222	0.0163
Manganese	0.0518	0.0201	0.1097	0.0114	0.0043	0.0017	0.0015
Mercury	0.00074	0.00078	0.00054	0.00014	0.00019	0.00041	0.00042
Molybdenum	0.0245	0.0330	0.0300	0.0117	0.0113	0.0113	0.0065
Nickel	0.0200	0.0200	0.0247	0.0124	0.0160	0.0124	0.0055
Selenium	0.0057	0.0055	0.0060	0.0153	0.0031	0.0014	0.0010
Silver	0.0050	0.0052	0.0040	0.0039	0.0039	0.0039	0.0020
Thallium	0.0040	0.0400	0.0045	0.0009	0.0009	0.0010	0.0005
Vanadium	0.0745	0.1000	0.1987	0.0078	0.0040	0.0028	0.0010
Zinc	0.0501	0.9714	0.1615	0.0073	0.0061	0.0036	0.0029

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated.

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-2
Activities of Radiological Parameters in Representative EMF Groundwater

	CALCIUM-CHLORIDE WATER CHEMISTRY						CALCIUM-BICARBONATE WATER CHEMISTRY										
	Michaud Flats Hydrogeochemical Regime						Bannock Range Hydrogeochemical Regime						Portneuf River Hydrogeochemical Regime				
Radiological Parameter (pCi/l)	**Well 101**	**Well 102**	**TW-10S**	**Well 147**	**Well 514**	**Well 515**	**Well 158**	**Idaho Power**	**Well 106**	**Well 301**	**PEI-1**	**Well 305**	**PEI-6**	**Well 510**	**Well 511**	**Well 512**	**Well 513**
Gross alpha																	
Jun-92	2.6±1.9	ND	3.4±3	ND	NS	NS	NS	ND	ND	RS	2.4±1.3	RS	4.6±2.3	RS	RS	RS	RS
Sep-92	4.4±2.45	2.28±1.87	3.45±0.36	2.66±0.4	NS	NS	NS	2.65±0.58	4.59±1.95	4.57±0.89	2.78±0.41	3.08±0.45	3.39±0.35	ND	ND	2.21±0.64	2.07±0.73
Dec-92	7.34±2.38	4.5±1.72	5.36±2.52	5.18±1.14	NS	NS	NS	3.31±0.99	3.76±0.96	2.66±0.55	NS	2.98±1.02	2.31±0.59	ND	ND	ND	ND
Mar-93	2.94±1.6	3.94±1.24	5.82±2.07	4.39±1.05	NS	NS	NS	4.78±1.48	ND	4.94±1.06	NS	3.93±1.37	3.56±1.48	2.88±0.85	2.24±0.93	2.59±1.33	3.48±1.44
Jul-93	3.54±0.78	2.54±0.57	7.97±1.37	3.97±0.95	ND	5.26±1.31	3.8±0.98	3.83±1.29	2.23±0.78	2.5±0.80	NS	2.3±0.70	ND	ND	ND	ND	2.95±1.09
Dec-93	4.06±1.43	3.0±1.26	2.77±1.32	3.21±1.45	ND	6.25±1.62	2.05±1.41	5.72±1.92	3.52±1.5	2.35±0.50	NS	4.01±0.66	ND	2.47±1.46	ND	2.18±1.15	2.06±0.86
Gross beta																	
Jun-92	4.1±2.9	6.5±3	6.1±3.4	20.6±3.5	NS	NS	NS	14±3.1	ND	RS	11±3.7	RS	9.1±2.9	RS	RS	RS	RS
Sep-92	8.11±1.81	6.97±1.74	8.27±0.39	14.3±0.48	NS	NS	NS	10.9±0.91	9.04±1.82	6.29±0.82	7.95±0.49	6.89±0.52	4.44±0.46	6.11±0.7	ND	7.64±0.73	9.3±0.88
Dec-92	9.77±1.35	9.53±1.46	10.1±1.49	10.8±0.94	NS	NS	NS	7.17±0.88	8.43±0.757	5.87±0.72	NS	5.57±0.95	4.04±0.56	ND	ND	ND	ND
Mar-93	45.8±2.65	7.61±0.98	7.05±0.96	9.85±1.01	NS	NS	NS	ND	7.18±1.15	ND	NS	6.67±1.23	ND	7.44±1.45	7.47±1.42	ND	ND
Jul-93	7.14±0.79	5.42±0.73	9.58±0.89	8.91±0.9	2.93±1.06	6.35±1.34	8.03±0.96	5.78±1.24	5.28±1.03	10.8±1.1	NS	9.3±1.1	4.1±0.8	5.19±1.15	4.1±1.12	5.31±1.17	4.5±1.07
Dec-93	6.29±1.38	5.91±1.45	6.55±1.53	11.6±2.08	3.76±1.43	12.3±2.03	10.2±2.05	6.82±1.73	8.75±1.98	5.69±0.84	NS	7.83±0.91	6.07±1.72	6.78±1.8	7.73±1.86	ND	7.03±1.17
Radium-226																	
Jun-92	NA	NA	NA	NA	NS	NS	NS	NA	NA	RS	NH	RS	NA	RS	RS	RS	RS
Sep-92	ND	ND	6.35±0.57	ND	NS	NS	NS	ND	ND	1.65±0.53	ND	ND	ND	ND	ND	ND	ND
Dec-92	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND	NS	3.41±0.29	ND	ND	ND	ND	ND
Mar-93	ND	ND	ND	1.82±0.26	NS	NS	NS	ND	ND	ND	NS	ND	ND	ND	ND	ND	ND
Jul-93	1.57±0.34	1.84±0.23	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	1.18±0.19	ND	ND
Dec-93	ND	ND	3.83±0.32	ND	ND	ND	ND	ND	1.31±0.24	ND	NS	ND	ND	ND	ND	ND	ND
Radium-228																	
Jun-92	ND	ND	ND	ND	NS	NS	NS	ND	ND	RS	NH	RS	ND	RS	RS	RS	RS
Sep-92	1.2±0.8	1.8±0.9	4.2±1	ND	NS	NS	NS	1.2±0.7	1±0.8	2.7±1	ND	ND	ND	ND	ND	ND	2.1±0.5
Dec-92	ND	6.5±1.2	ND	ND	NS	NS	NS	ND	ND	1±0.6	NS	2±1	ND	ND	ND	ND	ND
Mar-93	ND	ND	ND	ND	NS	NS	NS	ND	ND	1±0.7	NS	ND	5.4±1	ND	7.2±1	ND	ND
Jul-93	ND	ND	ND	ND	ND	ND	ND	ND	ND	1±0.6	NS	ND	5.3±0.80	ND	ND	ND	ND
Dec-93	ND	ND	ND	ND	ND	ND	ND	ND	9.6±1	ND	NS	1.5±0.6	1±0.6	ND	ND	ND	10.8±1.1

Notes:
NA - Not analyzed.
ND - Not detected.
NS - Not sampled.
RS - Rejected sample.

TABLE 4.4-3
ORGANIC COMPOUNDS REPORTED IN GROUNDWATER FROM REPRESENTATIVE WELLS (mg/l)

		CALCIUM-CHLORIDE WATER CHEMISTRY			CALCIUM-BICARBONATE WATER CHEMISTRY					
		Michaud Flats Hydrogeochemical Regime			Bannock Range Hydrogeochemical Regime, Low-Chloride Subgroup			Portneuf River Hydrogeochemical Regime		
Parameter	**Sample Event**	**Well 101**	**Well 102**	**TW-10S**	**Well 106**	**Well 301**	**PEI-1**	**PEI-6**	**Well 511**	**Well 513**
2-Butanone	Sep-92						0.003J			0.004J
	Mar-93									
Acetone	Sep-92					0.361J	0.524J		0.044	0.1J
	Dec-92					0.12				
Bis(2-ethylhexyl) -phthalate	Sep-92							0.001J	0.017	
	Dec-92	0.004J	0.002J	0.004J	0.005J	0.026		0.013	0.013	0.003J
	Dec-92									0.001J
	Mar-93					0.054		0.025	0.012	
Carbon disulfide	Sep-92								0.027J	0.033J
Chlorobenzene	Sep-92	0.001J								
Di-n-butyl phthalate	Mar-93					0.001J			0.002	
Ethyl benzene	Sep-92					0.001				
Methylene chloride	Sep-92									
Tetrachloroethene	Sep-92								0.003J	
	Dec-92								0.001J	
	Mar-93								0.003	
Trichloroethene	Sep-92							0.005		
Xylenes, total	Sep-92					0.008	0.006			
	Mar-93			0.001J						

J = Validation qualifier indicating estimated quantity.

TABLE 4.4-4

FMC GROUNDWATER CHEMISTRY - COMMON IONS, METALS, PHYSICAL PARAMETERS, NUTRIENTS, AND FLUORIDE

TABLE 4.4-4

ANALYTE (a)	SOUTHWEST FMC AREA																	
	95% UCL FOR REPRESENTATIVE GROUNDWATER (c)	MICHAUD WELLS					UNDETERMINED WELL	95% UCL FOR REPRESENTATIVE GROUNDWATER (c)	BANNOCK WELLS									
	MICHAUD	Well 112 Mean (b)	Well 124 Mean (b)	Well 126 Mean (b)	Well 127 Mean (b)	Well 128 Mean (b)	Well 116 Mean (b)	BANNOCK	Well 103 Mean (b)	Well 104 Mean (b)	Well 113 Mean (b)	Well 114 Mean (b)	Well 115 Mean (b)	Well 117 Mean (b)	Well 118 Mean (b)	Well 119 Mean (b)	Well 120 Mean (b)	Well 125 Mean (b)
COMMON IONS (mg/l)																		
Alkalinity, bicarbonate	198	196	207	180	189	227	493	171	304	931	273	534	518	296	395	194	211	187
Calcium	97.71	93	73	93	138	92	192	68.75	105	74	83	50	51	121	121	77	68	46
Chloride	192.90	142	112	143	275	182	629	52.42	122	232	142	142	136	59	173	119	82	33
Magnesium	33.59	31.3	22.8	26.8	41.3	33.2	86.0	19.20	44.6	60.4	37.0	25.5	22.0	45.5	48.9	28.5	27.3	12.9
Potassium	12.72	8.8	11.2	10.2	15.2	15.1	167.9	10.52	13.2	431.2	37.9	10.7	8.7	15.4	29.5	10.4	8.7	8.7
Sodium	74.28	72	76	67	116	117	320	27.53	63	308	101	346	326	41	123	41	45	52
Sulfate	72.57	102	68	90	155	111	259	43.40	108	276	109	129	134	232	124	54	49	43
PHYSICAL PARAMETERS (d)																		
Spec. Conductivity (umhos/cm)	1136	1060	890	995	1549	1281	3351	569	1112	3132	1168	1618	1514	1086	1482	742	748	538
pH	7.29 to 7.70	7.22	7.33	7.34	7.18	7.21	6.79	7.37 to 8.37	7.07	7.05	7.18	7.06	7.37	6.91	6.71	7.21	7.14	7.46
Temperature (degrees Celcius)	11.8 to 16.7	12.8	13.6	16.0	13.8	12.3	14.7	14.5 to 16.6	14.1	13.3	11.4	10.7	11.0	18.2	15.9	16.1	15.5	17.9
Total Dissolved Solids (mg/l)	867	655	518	578	855	745	2285	412	734	2023	752	1046	1073	767	964	506	474	339
Redox (mV)	0 to 169	159	184	161	200	164	109	44 to 122	209	151	72	-52	23	132	42	67	80	91
NUTRIENTS AND FLUORIDE (mg/l)																		
Ammonia (NH3 as N)	0.50	0.35	0.37	0.37	0.37	0.37	0.81	0.50	0.43	5.93	0.37	0.47	0.37	0.37	0.37	0.37	0.37	0.37
Nitrate (NO3 as N)	5.52	4.67	1.94	1.21	2.39	4.14	6.59	1.60	0.82	11.9	6.11	2.63	3.89	0.61	0.34	1.46	1.40	0.63
Orthophosphate (PO4 as P)	0.06	0.19	0.16	0.06	0.18	0.36	1.51	0.13	1.13	16.8	0.29	4.22	3.37	0.06	14.6	1.55	2.48	0.03
Phosphorous	0.33	0.24	0.22	0.08	0.22	0.43	2.80	0.31	1.89	18.7	0.84	21.3	11.4	0.07	40.3	2.04	3.30	0.08
Fluoride	0.80	0.56	0.81	0.89	0.32	0.29	0.90	0.60	0.18	10.9	0.86	0.85	0.18	0.35	0.18	0.20	0.20	1.16
METALS - Not EMF-Related (mg/l)																		
Aluminum	0.0977	0.0517	0.0360	0.0402	0.0502	0.0397	0.7595	0.5472	0.0346	0.0548	0.0352	0.0520	0.0366	0.0455	0.0368	0.0295	0.0375	0.0350
Antimony	0.1000	0.0631	0.0673	0.0711	0.0596	0.0769	0.0596	0.1340	0.0596	0.0596	0.0596	0.0639U	0.0625	0.0596	0.0596	0.0596	0.0596	0.0725
Beryllium	0.0020	0.0017	0.0012	0.0010	0.0014	0.0012	0.0014	0.0040	0.0010	0.0013	0.0010	0.0010U	0.0010	0.0013	0.0013	0.0013	0.0012	0.0013
Cadmium	0.0050	0.0016	0.0035	0.0034	0.0035	0.0035	0.0027	0.0050	0.0027	0.0026	0.0038	0.0025U	0.0025	0.0031	0.0032	0.0025	0.0031	0.0035
Chromium	0.0114	0.0036	0.0057	0.0043	0.0050	0.0048	0.0063	0.0110	0.0039	0.0038	0.0053	0.0044U	0.0043	0.0040	0.0039	0.0042	0.0041	0.0048
Copper	0.0085	0.0036	0.0060	0.0037	0.0049	0.0035	0.0230	0.0109	0.0044	0.0056	0.0037	0.0042	0.0047	0.0041	0.0056	0.0061	0.0058	0.0038
Iron	0.7690	0.0483	0.0461	0.0417	0.0416	0.0386	0.7687	0.8402	0.2692	0.0654	0.0544	0.1503	0.1041	0.1043	0.0844	0.1464	0.1055	0.0397
Lead	0.0020	0.0013	0.0012	0.0012	0.0012	0.0013	0.0044	0.0068	0.0014	0.0011	0.0012	0.0011U	0.0011	0.0018	0.0019	0.0014	0.0015	0.0012
Mercury	0.00074	0.00025	0.00023	0.00033	0.00029	0.00024	0.00026	0.00078	0.00031	0.00024	0.00025	0.00031U	0.00040	0.00028	0.00035	0.00026	0.00026	0.00026
Molybdenum	0.0245	0.0143	0.0141	0.0141	0.0192	0.0141	0.0222	0.0330	0.0310	0.0290	0.0159	0.0274	0.0366	0.0141	0.0169	0.0141	0.0144	0.0145
Nickel	0.0200	0.0120	0.0120	0.0120	0.0134	0.0120	0.0120	0.0200	0.0129	0.0208	0.0120	0.0142	0.0129	0.0120	0.0134	0.0120	0.0120	0.0120
Silver	0.0050	0.0026	0.0044	0.0033	0.0039	0.0028	0.0039	0.0052	0.0038	0.0039	0.0038	0.0039U	0.0038	0.0037	0.0038	0.0037	0.0037	0.0037
Thallium	0.0040	0.0018	0.0016	0.0016	0.0016	0.0017	0.0017	0.0400	0.0018	0.0017	0.0016	0.0016U	0.0016	0.0016	0.0016	0.0017	0.0016	0.0016
Vanadium	0.0745	0.0083	0.0119	0.0698	0.0101	0.0209	0.0149	0.1000	0.0128	0.0251	0.0203	0.0198	0.0229	0.0071	0.0071	0.0081	0.0118	0.0151
Zinc	0.0501	0.0074	0.0164	0.0170	0.0148	0.0138	0.0194	0.1700	0.0143	0.0103	0.0131	0.0123U	0.0119	0.0083	0.0149	0.0076	0.0084	0.0137
METALS - EMF-Related (mg/l)																		
Arsenic	0.0149	0.0067	0.0134	0.0099	0.0210	0.0230	0.0729	0.0180	0.0351	0.1325	0.0344	0.1849	0.1855	0.0124	0.0320	0.0152	0.0195	0.0062
Barium	0.2297	0.1177	0.0702	0.1655	0.0952	0.0694	0.1452	0.1204	0.1248	0.3214	0.0578	0.1814	0.1012	0.1138	0.2119	0.1251	0.0856	0.0915
Boron	0.2935	0.1553	0.2206	0.1655	0.3098	0.5190	1.4509	0.3078	1.2311	1.9317	0.6927	1.8465	2.139	0.1039	0.7009	0.1643	0.2119	0.1607
Cobalt	0.0145	0.0053	0.0076	0.0053	0.0114	0.0113	0.0090	0.0108	0.1059	0.0329	0.0086	0.0381	0.0357	0.0053	0.0052	0.0051	0.0051	0.0076
Lithium	0.0610	0.0518	0.0546	0.0536	0.0708	0.0554	0.1838	0.0165	0.0304	0.1868	0.0441	0.1415	0.0353	0.0384	0.0671	0.0232	0.0241	0.0476
Manganese	0.0518	0.0024	0.0130	0.0029	0.0034	0.0031	0.226	0.0201	1.324	4.493	0.0088	1.830	0.509	0.0045	1.650	0.0101	0.0308	0.0038
Selenium	0.0057	0.0010	0.0024	0.0026	0.0055	0.0045	0.0150	0.0055	0.0028	0.0023	0.0042	0.0039	0.0049	0.0025	0.0033	0.0032	0.0031	0.0018

Notes:
(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.
(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.
(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.
(d) 95% UCLs for pH, temperature, and redox were not calculated. Ranges of these parameters are used for representative groundwater.
(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

TABLE 4.4-4 *(continued)*

TABLE 4.4-4

FMC GROUNDWATER CHEMISTRY - COMMON IONS, METALS, PHYSICAL PARAMETERS, NUTRIENTS, AND FLUORIDE

ANALYTE (a)	SOUTHWEST FMC AREA																	
	95% UCL FOR REPRESENTATIVE GROUNDWATER (c) MICHAUD	MICHAUD WELLS							95% UCL FOR REPRESENTATIVE GROUNDWATER (c) BANNOCK	BANNOCK WELLS								
		Well 131 Mean (b)	Well 132 Mean (b)	Well 137 Mean (b)	Well 139 Mean (b)	Well 140 Mean (b)	Well 141 Mean (b)	Well 148 Mean (b)		Well 129 Mean (b)	Well 130 Mean (b)	Well 149 Mean (b)	Well 150 Mean (b)	Well 151 Mean (b)	Well 152 Mean (b)	Well 153 Mean (b)	Well 154 Mean (b)	Well 159 Mean (b)
COMMON IONS (mg/l)																		
Alkalinity, bicarbonate	198	461	820	236	196	336	547	208	171	229	206	200	1490	333	1415	188	195	802
Calcium	97.71	175	56	69	376	234	150	86	68.75	85	79	58	31	88	59	64	66	179
Chloride	192.90	146	261	156	980	276	258	155	52.42	106	87	91	409	120	371	70	125	312
Magnesium	33.59	64.1	64.5	28.0	137.0	93.4	68.7	27.8	19.20	34.6	31.9	17.4	97.4	40.4	95.4	15.6	19.1	95.6
Potassium	12.72	14.0	251.9	8.3	33.1	38.2	27.1	11.9	10.52	11.3	10.0	10.3	1293.6	21.7	1087.0	14.2	11.0	27.9
Sodium	74.28	149	370	123	213	406	237	81	27.53	50	26	70	536	133	542	75	63	352
Sulfate	72.57	151	246	113	592	843	211	89	43.40	83	61	50	253	94	226	42	42	238
PHYSICAL PARAMETERS (d)																		
Spec. Conductivity (umhos/cm)	1136	1581	2794	1228	4091	2828	2179	1069	569	914	773	774	6105	1256	5246	726	791	3080
pH	7.29 to 7.70	6.95	6.74	7.54	6.93	6.90	6.78	7.30	7.37 to 8.37	7.31	7.25	7.40	7.02	6.90	6.92	8.99	7.37	6.63
Temperature (degrees Celcius)	11.8 to 16.7	13.3	14.3	11.6	13.5	16.7	17.1	15.8	14.5 to 16.6	12.9	14.1	15.8	15.0	16.9	15.1	17.2	17.0	17.0
Total Dissolved Solids(mg/l)	867	1111	1736	747	2863	2145	1487	655	412	559	497	484	5271	882	4580	440	565	2145
Redox (mV)	0 to 169	-113	-15	191	265	154	-17	82	44 to 122	188	216	69	-239	18	-238	(e)	99	-119
NUTRIENTS AND FLUORIDE (mg/l)																		
Ammonia (NH3 as N)	0.50	0.39	4.75	0.37	0.35	0.35	0.82	0.37	0.50	0.35	0.39	0.37	9.52	0.69	8.69	0.05	0.44	1.62
Nitrate (NO3 as N)	5.52	3.24	0.26	6.08	32.5	8.31	0.06	2.57	1.60	2.49	37.55	1.18	0.05	0.05	0.05	0.96	1.14	0.05
Orthophosphate (PO4 as P)	0.06	4.47	7.21	2.67	0.09	1.04	18.8	0.10	0.13	0.37	0.58	0.11	387	11.0	271	0.02	0.03	8.70
Phosphorous	0.33	32.2	27.5	3.79	0.11	5.13	52.6	0.15	0.31	0.61	0.73	0.16	665	55.4	489	0.06	0.02	192
Fluoride	0.80	0.33	1.19	0.16	1.13	2.98	0.14	0.79	0.60	0.30	0.28	1.05	8.65	0.14	8.58	1.17	1.12	0.20
METALS - Not EMF-Related (mg/l)																		
Aluminum	0.0977	10.1454	0.0351	0.0349	0.0374	0.1496	0.0470	0.0359	0.5472	0.0341	0.0429	0.0283	0.0344	0.0290	0.0373	0.0700	0.0325	0.0255
Antimony	0.1000	0.0596	0.0596	0.0596	0.0847	0.0631	0.0764	0.0711	0.1340	0.0631	0.0596	0.0696	0.0596	0.0631	0.0890	0.1000	0.0515	0.0482
Beryllium	0.0020	0.0014	0.0012	0.0015	0.0017	0.0011	0.0011	0.0010	0.0040	0.0011	0.0012	0.0010	0.0013	0.0011	0.0012	0.0030	0.0009	0.0007
Cadmium	0.0050	0.0026	0.0027	0.0038	0.0014	0.0014	0.0014	0.0013	0.0050	0.0027	0.0026	0.0013	0.0013	0.0015	0.0019	0.0010	0.0016	0.0006
Chromium	0.0114	0.0052	0.0039	0.0039	0.0072	0.0056	0.0024	0.0064	0.0110	0.0045	0.0041	0.0047	0.0038	0.0024	0.0029	0.0160	0.0045	0.0007
Copper	0.0085	0.0091	0.0096	0.0037	0.0068	0.0048	0.0045	0.0037	0.0109	0.0045	0.0048	0.0036	0.0065	0.0041	0.0056	0.0030	0.0037	0.0037
Iron	0.7690	4.9496	0.2474	0.0418	0.0956	0.0983	0.0529	0.0398	0.8402	0.1531	0.0934	0.0341	0.7739	0.0356	0.5201	0.0230	0.0417	1.3509
Lead	0.0020	0.0040	0.0029	0.0012	0.0013	0.0013	0.0027	0.0012	0.0068	0.0011	0.0011	0.0012	0.0015	0.0013	0.0012	0.0020	0.0012	0.0008
Mercury	0.00074	0.00032	0.00022	0.00030	0.00051	0.00043	0.00031	0.00027	0.00078	0.00031	0.00024	0.00025	0.00023	0.00029	0.00021	0.00020	0.00015	0.00008
Molybdenum	0.0245	0.0152	0.0259	0.0178	0.0181	0.0153	0.0242	0.0147	0.0330	0.0148	0.0151	0.0175	0.0319	0.0168	0.0322	0.0200	0.0149	0.0430
Nickel	0.0200	0.0209	0.0221	0.0120	0.0120	0.0120	0.0209	0.0120	0.0200	0.0133	0.0121	0.0120	0.0195	0.0169	0.0203	0.0100	0.0134	0.0124
Silver	0.0050	0.0038	0.0039	0.0027	0.0036	0.0026	0.0032	0.0029	0.0052	0.0038	0.0038	0.0033	0.0031	0.0032	0.0033	0.0032	0.0037	0.0039
Thallium	0.0040	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0016	0.0400	0.0018	0.0017	0.0016	0.0016	0.0017	0.0018	0.0400	0.0019	0.0009
Vanadium	0.0745	0.0187	0.0077	0.0176	0.0310	0.0142	0.0285	0.0229	0.1000	0.0143	0.0152	0.0234	0.0069	0.0185	0.0076	0.0200	0.0040	0.0022
Zinc	0.0501	0.0270	0.0215	0.0071	0.0168	0.0071	0.0171	0.0149	0.1700	0.0202	0.0086	0.0144	0.0088	0.0065	0.0078	0.0128	0.0080	0.0026
METALS - EMF-Related (mg/l)																		
Arsenic	0.0149	0.0451	0.1467	0.0862	0.0113	0.0350	0.0820	0.0085	0.0180	0.0241	0.0305	0.0148	0.1878	0.0543	0.1506	0.0030	0.0061	0.0795
Barium	0.2297	0.1286	0.0873	0.0583	0.0880	0.0559	0.3494	0.1324	0.1204	0.0620	0.0714	0.0834	0.0117	0.2165	0.0313	0.1280	0.2317	0.4096
Boron	0.2935	2.0177	2.0991	0.5847	0.7867	1.1107	1.4865	0.3204	0.3078	0.3919	0.2472	0.1635	14.4936	0.9757	17.1035	0.1670	0.1223	2.2939
Cobalt	0.0145	0.0214	0.0243	0.0110	0.0422	0.0143	0.0190	0.0083	0.0108	0.0278	0.0235	0.0051	0.0323	0.0063	0.0150	0.0100	0.0033	0.0442
Lithium	0.0610	0.0547	0.1475	0.0683	0.1147	0.1347	0.0728	0.0546	0.0165	0.0239	0.0207	0.0551	0.1699	0.0522	0.1919	0.0440	0.0596	0.0916
Manganese	0.0518	0.4675	1.3213	0.1103	0.0089	0.2618	22.7002	0.0076	0.0201	0.0212	0.0052	0.0028	1.8572	5.3680	1.5421	0.0050	0.0030	10.8648
Selenium	0.0057	0.0043	0.0025	0.0046	0.0166	0.0248	0.0044	0.0046	0.0055	0.0042	0.0040	0.0037	0.0025	0.0021	0.0062	0.0035	0.0018	0.0016

Notes: (a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.
(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.
(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.
(d) 95% UCLs for pH, temperature, and redox were not calculated. Ranges of these parameters are used for representative groundwater.
(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

TABLE 4.4-4 *(continued)*

TABLE 4.4-4

FMC GROUNDWATER CHEMISTRY - COMMON IONS, METALS, PHYSICAL PARAMETERS, NUTRIENTS, AND FLUORIDE

ANALYTE (a)	CENTRAL FMC AREA											
	95% UCL FOR REPRESENTATIVE GROUNDWATER (c)	MICHAUD WELLS					95% UCL FOR REPRESENTATIVE GROUNDWATER (c)	BANNOCK WELLS				
	Michaud	Well TW-5S Mean (b)	Well 108 Mean (b)	Well 111 Mean (b)	Well 122 Mean (b)	Well 146 Mean (b)	Bannock	Well 107 Mean (b)	Well 121 Mean (b)	Well 133 Mean (b)	Well 134 Mean (b)	Well 135 Mean (b)
COMMON IONS (mg/l)												
Alkalinity, bicarbonate	198	329	356	353	284	244	171	177	271	210	538	233
Calcium	97.71	90.20	99.06	96.0	64.62	82.35	68.75	69.84	113	83.41	112	145
Chloride	192.90	291	173	298	225	110	52.42	46.08	200	51.23	311	247
Magnesium	33.59	46.51	36.97	61.90	37.33	29.05	19.20	21.45	41.11	27.88	74.43	54.91
Potassium	12.72	208	180	139	231	68.95	10.52	8.42	160	13.31	197	20.26
Sodium	74.28	129	125	165	102	74.09	27.53	30.72	93.01	40.51	228	86.94
Sulfate	72.57	137	242	203	118	135	43.40	66.45	215	129.8	245	95.05
PHYSICAL PARAMETERS												
Spec. Conductivity (umhos/cm)	1136	2093	1888	2064	1830	1141	569	634	1853	788	2263	1507
pH	(d)	6.95	7.05	6.84	7.02	7.05	(d)	7.39	6.94	7.31	6.73	6.92
Temperature (degrees Celcius)	(d)	19.6	30.4	16.0	21.8	22.8	(d)	19.5	19.2	18.5	17.8	16.1
Total Dissolved Solids (mg/l)	867	1257	1163	1350	1106	707	412	411	1179	534	1533	1036
Redox (mV)	(d)	-79	-27	160	-19	134	(d)	59	175	106	90	86
NUTRIENTS AND FLUORIDE (mg/l)												
Ammonia (NH3 as N)	0.50	0.44	0.37	0.35	1.23	0.35	0.50	0.37	0.37	0.35	0.35	0.35
Nitrate (NO3 as N)	5.52	24.70	11.96	17.16	19.08	5.37	1.60	0.86	23.36	10.13	4.32	19.93
Orthophosphate (PO4 as P)	0.06	7.12	0.45	10.63	8.95	0.23	0.13	0.11	0.63	14.09	32.93	6.94
Phosphorous	0.33	8.02	0.72	15.05	8.08	0.29	0.31	0.08	0.61	0.24	34.25	5.24
Fluoride	0.80	0.13	2.88	0.14	0.27	0.76	0.60	0.60	2.41	0.52	0.17	0.22
METALS - Not EMF-Related (mg/l)												
Aluminum	0.0977	0.0230	0.0571	0.0494	0.0372	0.0357	0.5472	0.0397	0.0460	0.0374	0.0307	0.0324
Antimony	0.1000	0.0631	0.0596	0.0631	0.0596	0.0631	0.1340	0.0617	0.0596	0.0631	0.0631	0.0631
Beryllium	0.0020	0.0011	0.0015	0.0013	0.0012	0.0014	0.0040	0.0017	0.0012	0.0011	0.0011	0.0011
Cadmium	0.0050	0.0017	0.0026	0.0014	0.0015	0.0014	0.0050	0.0025	0.0013	0.0028	0.0029	0.0016
Chromium	0.0114	0.0025	0.0062	0.0023	0.0023	0.0028	0.0110	0.0041	0.0029	0.0043	0.0041	0.0033
Cobalt	0.0145	0.0100	0.0074	0.0195	0.0089	0.0081	0.0108	0.0051	0.0057	0.0052	0.0161	0.0052
Copper	0.0085	0.0045	0.0052	0.0050	0.0043	0.0040	0.0109	0.0040	0.0050	0.0051	0.0105	0.0053
Iron	0.7690	0.3034	0.0878	0.0555	0.0352	0.0390	0.8402	0.2455	0.0484	0.0458	0.0478	0.0395
Lead	0.0020	0.0013	0.0022	0.0016	0.0013	0.0013	0.0068	0.0014	0.0012	0.0017	0.0030	0.0013
Mercury	0.00074	0.00073	0.00022	0.00026	0.00018	0.00027	0.00078	0.00017	0.00020	0.00036	0.00031	0.00057
Molybdenum	0.0245	0.0453	0.0159	0.0295	0.0478	0.0162	0.0330	0.0141	0.0159	0.0143	0.0158	0.0143
Nickel	0.0200	0.0136	0.0130	0.0165	0.0145	0.0127	0.0200	0.0120	0.0120	0.0149	0.0183	0.0120
Silver	0.0050	0.0029	0.0037	0.0026	0.0029	0.0034	0.0052	0.0037	0.0030	0.0039	0.0040	0.0026
Thallium	0.0040	0.0018	0.0016	0.0017	0.0016	0.0018	0.0400	0.0016	0.0022	0.0017	0.0017	0.0024
Vanadium	0.0745	0.0116	0.0184	0.0110	0.0105	0.0137	0.1000	0.0077	0.0090	0.0071	0.0229	0.0099
Zinc	0.0501	0.0110	0.0226	0.0078	0.0062	0.0074	0.1700	0.0072	0.0110	0.0084	0.0124	0.0076
METALS - EMF-Related (mg/l)												
Arsenic	0.0149	0.0558	0.0350	0.0501	0.0595	0.0213	0.0180	0.0059	0.0171	0.0100	0.1244	0.0465
Barium	0.2297	0.1949	0.1115	0.2188	0.1206	0.0899	0.1204	0.1075	0.0791	0.1539	0.1481	0.1649
Boron	0.2935	0.5519	0.6669	0.9510	0.4886	0.3917	0.3078	0.0938	0.5538	0.1067	1.3679	0.3396
Lithium	0.0610	0.0871	0.0737	0.0917	0.0945	0.0688	0.0165	0.0403	0.0552	0.0332	0.0948	0.0375
Manganese	0.0518	0.4245	0.5087	1.1368	0.6300	0.4614	0.0201	0.0207	0.0542	0.0028	3.3961	0.0032
Selenium	0.0057	0.0034	0.0079	0.0028	0.0027	0.0063	0.0055	0.0022	0.0500	0.0017	0.0041	0.0067
RADIOLOGICAL PARAMETERS (pCi/l)												
Gross Alpha	5.57	-1.26	6.87	6.32	4.11	4.60	4.80	2.85	2.96	4.26	3.52	-1.13
Gross Beta	17.14	138.10	144.75	79.92	132.59	53.25	14.10	14.28	92.21	14.62	137.40	6.38
Radium-226	1.83	0.88	1.00	1.08	0.97	1.32	1.66	1.35	1.26	1.00	1.00	1.30
Radium-228	2.88	0.90	2.28	1.00	1.60	2.36	2.25	1.74	1.64	1.60	1.62	3.43

Notes: (a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.
(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.
(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.
(d) 95% UCLs for pH, temperature, and redox were not calculated. Ranges of these parameters are used for representative groundwater.
(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

Table 4.4-5
Activities of Radiological Parameters in Groundwater at FMC (pCi/l)

		Michaud Flats Regime																			
	Sampling	Representative Wells																			
Parameter	Event	101		102		147		TW-10S		112		126		127		128		139		148	
Gross alpha	Jun-92	2.6	±1.9	ND		ND		3.4	±3.0	ND		ND		ND		ND		ND		ND	
Gross alpha	Jul-92																				
Gross alpha	Sep-92	4.40	±2.45	2.28	±1.87	2.66	±0.40	3.45	±0.36	2.2	±1.6	2.4	±0.35	ND		ND		2.65	±0.56	4.23	±2.79
Gross alpha	Dec-92	7.34	±2.38	4.50	±1.72	5.18	±1.14	5.36	±2.52	2.95	±0.40	ND		2.19	±1.16	ND		ND		6.57	±1.04
Gross alpha	Mar-93	2.94	±1.60	3.94	±1.24	4.39	±1.05	5.82	±2.07	ND		ND		ND		ND		2.27	±2.95	3.31	±1.00
Gross alpha	Jul-93	3.54	±0.78	2.54	±0.57	3.97	±0.95	7.97	±1.37	ND		ND		ND		ND		ND		5.58	±1.06
Gross beta	Jun-92	4.1	±2.9	6.5	±3.0	20.6	±3.50	6.1	±3.40	ND		11.8	±3.30	8.3	±3.00	15.9	±3.4	22.1	±4.0	5.8	±3.4
Gross beta	Jul-92																				
Gross beta	Sep-92	8.11	±1.81	6.97	±1.74	14.3	±0.48	8.27	±0.39	8.40	±1.80	10.2	±0.41	15	±0.72	14.0	±0.51	36.6	±1.74	10.8	±1.93
Gross beta	Dec-92	9.77	±1.35	9.53	±1.46	10.8	±0.94	10.1	±1.49	6.59	±0.42	9.74	±1.66	7.57	±1.27	9.02	±0.46	41.4	±1.68	9.87	±0.91
Gross beta	Mar-93	45.8	±2.65	7.61	±0.98	9.85	±1.01	7.05	±0.96	5.77	±1.16	ND		10.1	±1.61	12.4	±1.89	37.4	±5.24	9.77	±1.03
Gross beta	Jul-93	7.14	±0.79	5.42	±0.73	8.91	±0.90	9.58	±0.89	ND		ND		ND		ND		ND		10.4	±0.88
Radium-226	Sep-92	ND		ND		ND		6.35	±0.57	1.57	±0.44	2.28	±0.53	ND		7.09	±0.82	ND		3.19	±0.50
Radium-226	Dec-92	ND		ND		ND		ND		ND		ND		ND		1.01	±0.20	ND		ND	
Radium-226	Mar-93	ND		ND		1.82	±0.26	ND		2.3	±0.23	ND		ND		1.40	±0.23	ND		ND	
Radium-226	Jul-93	1.57	±0.34	1.84	±0.23	ND		ND		ND		ND		ND		ND		ND		3.81	±0.51
Radium-228	Sep-92	1.2	±0.8	1.8	±0.9	ND		4.2	±1.0	ND		ND		ND		1.3	±0.8	ND		ND	
Radium-228	Dec-92	ND		6.5	±1.2	ND		ND		ND		1.4	±0.9	7.8	±1.4	1.1	±0.9	ND		ND	
Radium-228	Mar-93	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Radium-228	Jul-93	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	

		Bannock Range Regime																													
	Sampling	Representative Well																													
Parameter	Event	106		120		130		107		109		119		124		125		129		149		153		154		FMC-6		TW-3D		TW-5D		TW-5I	
Gross alpha	Jun-92	ND		ND		3.7	±2.4	ND		12.2	±2.7	ND		ND		3.7	±2.3	ND		ND		3.4	±2.0	NS		NS		ND		ND		ND	
Gross alpha	Jul-92																									2.8	±1.8						
Gross alpha	Sep-92	4.59	±1.95	ND		ND		2.92	±0.74	5.12	±1.21	ND		ND		ND		2	±1.60	ND		NS		NS		NS		2.8	±1.40	ND		ND	
Gross alpha	Dec-92	3.76	±0.96	ND		3.74	±1.94	3.14	±0.91	3.20	±0.60	ND		3.12	±1.83	3.48	±1.47	ND		ND		NS		2.92	±1.50	NS		5.92	±1.51	2.8	±0.89	ND	
Gross alpha	Mar-93	ND		3.5	±3.89	3.14	±1.08	4.69	±1.20	2.59	±1.05	ND		ND		ND		ND		2.46	±1.54	NS		4.20	±1.60	NS		5.94	±1.56	2.8	±1.05	ND	
Gross alpha	Jul-93	ND		ND		ND		ND		2.27	±0.57	ND		ND		ND		ND		2.13	±0.70	NS		5.10	±1.13	NS		3.43	±0.60	ND		ND	
Gross beta	Jun-92	ND		3.8	±3.5	7.6	±3.5	6.7	±3.6	22.9	±3.8	6.3	±3.6	10.4	±3.2	10.2	±3.2	7.2	±3.5	9.4	±3.6	11.7	±3.0	NS		NS		ND		ND		ND	
Gross beta	Jul-92																									8.0	±1.7						
Gross beta	Sep-92	9.04	±1.82	9.53	±1.75	8.9	±1.80	6.70	±1.19	6.36	±1.23	11.1	±1.81	14	±0.49	5.85	±1.69	ND		7.90	±0.37	NS		NS		NS		9.5	±1.8	10.5	±1.8	7.1	±1.5
Gross beta	Dec-92	8.43	±0.76	5.22	±0.41	7.66	±1.37	ND		5.9	±0.71	9.48	±0.47	11.5	±1.40	6.69	±1.27	24.5	±1.95	9.08	±1.36	NS		9.01	±1.30	NS		8.23	±1.31	7.78	±1.05	5.75	±0.85
Gross beta	Mar-93	7.18	±1.15	30	±5.12	7.3	±1.72	7.83	±1.77	5.37	±1.03	11.6	±1.86	8.26	±1.17	7.10	±1.20	6.24	±1.76	8.26	±1.01	NS		8.24	±1.00	NS		9.06	±1.27	4.63	±1.82	ND	
Gross beta	Jul-93	ND		ND		ND		ND		4.73	±0.65	ND		ND		ND		ND		8.40	±0.81	NS		8.10	±0.88	NS		6.67	±0.70	ND		ND	
Radium-226	Sep-92	ND		1.55	±0.42	ND		ND		ND		ND		ND		ND		ND		ND		NS		NS		NS		ND		ND		ND	
Radium-226	Dec-92	ND		ND		ND		ND		ND		ND		ND		ND		1.35	±0.21	ND		NS		1.83	±0.30	NS		ND		ND		ND	
Radium-226	Mar-93	ND		ND		ND		2.24	±0.27	ND		ND		ND		ND		ND		ND		NS		ND		NS		ND		2.21	±0.27	ND	
Radium-226	Jul-93	ND		ND		ND		ND		3.83	±0.50	ND		ND		ND		ND		1.15	±0.34	NS		1.06	±0.30	NS		ND		ND		ND	
Radium-228	Sep-92	1.0	±0.8	ND		ND		ND		ND		10.7	±1.1	ND		ND		ND		ND		NS		NS		NS		ND		ND		ND	
Radium-228	Dec-92	ND		1.3	±0.7	ND		ND		3.0	±1.0	ND		ND		ND		ND		ND		NS		5.6	±1.3	NS		7.2	±1.3	ND		ND	
Radium-228	Mar-93	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NS		ND		NS		ND		ND		ND	
Radium-228	Jul-93	ND		ND		ND		ND		ND		ND		ND		ND		ND		1.8	±1.2	NS		1.0	±0.9	NS		ND		ND		ND	

Table 4.4-5 (continued)
Activities of Radiological Parameters in Groundwater at FMC (pCi/l) (continued)

Table 4.4-5

		Former Ponds/8S Area (Includes Southwestern Area former Ponds 1E-6E, 5S-7S, and 10S and Central Area former Ponds 1S-3S)																																			
		Michaud Flats Regime												Bannock Range Regime																							Undetermined
Parameter	**Sampling Event**	111		122		135		137		140		TW-5S		103		104		113		114		115		117		118		131		132		133		134		141		150		151		152		116
Gross alpha	Jun-92	25.9	±6.1	16.8	±7.6	ND		ND		11.5	±6.9	ND		ND		ND		ND		ND		ND		ND		ND		ND		11.5	±8.00	ND		10.1	±7.90	ND		33.1	±11.0	ND		2.5	±2.00	ND
Gross alpha	Jul-92																																													
Gross alpha	Sep-92	ND		ND		ND		ND		6.05	±0.90	ND		3.39	±0.38	7.22	±1.69	ND		2.84	±0.61	2.12	±0.34	5.96	±2.11	ND		4.64	±0.61	ND		2.1	±1.47	ND		ND		ND		ND		2.48	±1.52	ND
Gross alpha	Dec-92	ND		ND		ND		2.06	±1.47	6.54	±1.50	ND		3.05	±0.30	2.19	±1.23	4.78	±0.53	ND		2.27	±0.23	8.05	±0.62	ND		6.09	±0.56	4.63	±1.04	8.76	±1.29	ND		ND		11.2	±6.95	ND		41.2	±11.90	ND
Gross alpha	Mar-93	ND		ND		ND		ND		4.52	±2.23	ND		4.65	±1.28	2.87	±2.22	ND		ND		2.19	±2.15	10.1	±2.10	ND		3.38	±1.66	ND		5.14	±1.43	ND		ND		ND		ND		ND		ND
Gross alpha	Jul-93	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		5	±1.76	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND
Gross beta	Jun-92	108.1	±6.5	155.1	±8.2	ND		7.8	±2.90	24.9	±4.2	119.4	±7.9	7.1	±3.5	260.9	±10.0	26.9	±3.9	ND		ND		13	±3.9	18.8	±4.2	14.4	±3.8	148.6	±8.00	15.9	±3.90	120	±7.30	19.7	±3.90	407.8	±12.7	ND		355.2	±11.2	92.4
Gross beta	Jul-92																																													
Gross beta	Sep-92	80.8	±1.41	171	±4.67	14	±1.95	7.89	±0.56	38	±1.22	167	±2.52	12.8	±0.52	384	±5.11	29.8	±0.71	7.83	±0.88	10.8	±1.37	18.5	±2.10	27.8	±1.35	15.4	±0.81	240	±4.23	10.1	±1.79	181	±2.46	21	±1.59	1110	±11.1	16.3	±2.0	508	±6.36	145
Gross beta	Dec-92	96.0	±3.73	158	±3.21	12	±0.93	4.48	±1.21	26.5	±1.73	163	±3.57	18.7	±0.60	325	±3.99	27.9	±0.66	8.7	±2.54	ND		14.6	±0.58	22.1	±0.99	ND		196	±3.26	21.3	±1.03	144	±4.33	19.8	±0.98	334	±11.3	18.4	±1.7	80.6	±8.17	125
Gross beta	Mar-93	115	±5.35	162	±4.76	12.3	±1.94	5.66	±1.70	21.4	±3.38	174	±6.26	11.0	±1.72	300	±11.0	23.7	±1.51	7.63	±1.69	11.0	±3.42	15.6	±1.84	81.4	±3.06	8.35	±2.78	176	±9.17	16.2	±1.98	139	±5.61	15.7	±1.64	1100	±27.3	19.2	±2.0	991	±27.3	300
Gross beta	Jul-93	ND		ND		ND		ND		ND		ND		ND		ND		14.9	±1.65	6.57	±1.24	6.67	±1.34	ND		ND		ND		ND		ND		ND		ND		938	±19.9	ND		783	±18.0	ND
Radium-226	Sep-92	2.50	±0.50	2.76	±0.57	ND		ND		ND		ND		ND		ND		2.39	±0.37	ND		ND		ND		3.27	±0.42	ND		ND		ND		ND		ND		1.94	±0.35	1.09	±0.35	ND		ND
Radium-226	Dec-92	ND		ND		ND		1.53	±0.20	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND
Radium-226	Mar-93	ND		ND		3.77	±0.36	ND		ND		ND		ND		1.15	±0.18	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND
Radium-226	Jul-93	ND		ND		ND		ND		ND		ND		ND		ND		2.2	±0.42	ND		1.96	±0.43	ND		ND		ND		ND		ND		ND		ND		1.32	±0.36	ND		ND		ND
Radium-228	Sep-92	ND		6.2	±1.3	ND		ND		ND		ND		ND		ND		ND		ND		ND		2.7	±0.90	ND		ND		ND		1.6	±0.90	1.1	±0.70	ND		ND		ND		1.7	±0.8	ND
Radium-228	Dec-92	ND		ND		5.1	±1.3	ND		ND		1.1	±0.9	3.1	±0.8	4.3	±1.0	1.3	±0.8	ND		2.0	±0.8	ND		ND		1.6	±0.8	ND		ND		ND		ND		ND		ND		ND		ND
Radium-228	Mar-93	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		3.0	±1.0	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND
Radium-228	Jul-93	ND		ND		ND		ND		ND		ND		ND		ND		1.6	±0.8	1.5	±1.0	6.0	±1.2	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND

		Slag Pit Area (includes railroad swale)					
		Michaud Flats Regime		Bannock Range Regime			
Parameter	**Sampling Event**	121		108		146	
Gross alpha	Jun-92	ND		11.2	±8.3	17.6	±3.8
Gross alpha	Jul-92						
Gross alpha	Sep-92	ND		2.12	±0.82	ND	
Gross alpha	Dec-92	ND		3.94	±2.93	ND	
Gross alpha	Mar-93	7.88	±2.25	4.15	±1.60	ND	
Gross alpha	Jul-93	ND		ND		ND	
Gross beta	Jun-92	89.2	±6.6	105.5	±7.0	66.4	±5.4
Gross beta	Jul-92						
Gross beta	Sep-92	119	±1.73	186	±2.22	55.1	±2.53
Gross beta	Dec-92	99.8	±2.57	156	±4.92	41.7	±1.67
Gross beta	Mar-93	3.27	±1.60	145	±5.21	52.6	±2.58
Gross beta	Jul-93	ND		ND		ND	
Radium-226	Sep-92	ND		ND		ND	
Radium-226	Dec-92	ND		ND		ND	
Radium-226	Mar-93	ND		ND		1.79	±0.28
Radium-226	Jul-93	ND		ND		ND	
Radium-228	Sep-92	2.8	±1.1	ND		7.2	±1.3
Radium-228	Dec-92	ND		ND		ND	
Radium-228	Mar-93	ND		ND		ND	
Radium-228	Jul-93	ND		ND		ND	

NS = Not sampled.

Table 4.4-6

Table 4.4-6
Organic Compounds Detected in Groundwater at FMC (mg/l)

Parameter	Sampling Event	Representative Concentrations/ Unimpacted Areas					Former Ponds/8S Area (Includes Southwestern Area former Ponds 1E-6E, 5S-7S, and Central Area former Ponds 1S-3S)									Slag Pit Area (Includes Railroad Swale)			Practical Quantitation Limits (mg/l)
		Representative Wells																	
		101	102	106	TW-10S	112	104	111	134	135	139	140	141	150	TW-5S	108	121	146	
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	Jun-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.007	ND	ND	ND	ND	ND	ND	ND	0.1
2-Butanone	Mar-93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	
Chlorobenzene	Jun-92	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
Chloroform	Jun-92	ND	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND	0.005
Ethyl benzene	Jun-92	ND	ND	ND	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	0.002	0.005
Tetrachloroethene	Jun-92	ND	ND	ND	ND	ND	ND	0.035	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
Toluene	Jun-92	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	0.002	ND	ND	ND	ND	0.002	ND	0.005
Toluene	Sep-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	0.001	ND	
Trichloroethene	Jun-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.003	0.015	0.003	0.005
Trichloroethene	Sep-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002	0.01	0.002	
Trichloroethene	Dec-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.008	ND	
Xylenes, total	Jun-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
Xylenes, total	Sep-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002	ND	
Xylenes, total	Dec-92	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
SEMIVOLATILE ORGANIC COMPOUNDS																			
Bis(2-ethylhexyl)phthalate	Jun-92	ND	ND	ND	ND	0.003	0.003	ND	ND	ND	ND	ND	ND	ND	ND	0.005	0.002	ND	0.01
Bis(2-ethylhexyl)phthalate	Sep-92	0.004	0.002	0.005	0.004	0.003	ND	0.006	0.006	0.006	0.003	0.005	0.004	ND	0.012	0.015	0.008	0.003	
Bis(2-ethylhexyl)phthalate	Dec-92	ND	ND	ND	ND	ND	ND	ND	0.039	ND	ND	ND	ND	ND	ND	0.019	0.017	ND	
Di-n-butyl phthalate	Dec-92	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	0.001	ND	0.002	ND	ND	ND	ND	0.01
Dimethyl phthalate	Dec-92	ND	ND	ND	ND	ND	0.024	ND	0.053	0.067	ND	ND	ND	0.054	0.005	ND	0.088	ND	0.01

ND = Below detection limit/not detected.

Table 4.4-9

Table 4.4-9
Organic Compounds Detected in Groundwater at Simplot (mg/l)

Parameter	Sampling Event	Representative Wells/Unimpacted Areas 301	PEI-1	PEI-6	PEI-4	Wells 310	312	300	304	307	316	PEI-5	320	318	Practical Quantitation Limits (mg/l)
VOLATILE ORGANIC COMPOUNDS															
2-Butanone	Jun-92		0.003												0.1
2-Butanone	Dec-92													0.01	
Acetone	Jun-92	0.361	0.524		0.217		0.394				0.22	1.85			0.005
Acetone	Sep-92	0.12			0.073	0.026		0.12	0.43	0.017	0.21			0.032	
Acetone	Dec-92													0.061	0.005
Ethyl benzene	Jun-92	0.001													0.005
Methylene chloride	Jun-92											0.001		0.004	0.005
Tetrachloroethene	Jun-92										0.001				0.005
1,1,1-Trichloroethane	Sep-92				0.009										
1,1,1-Trichloroethane	Dec-92						0.008								0.005
Trichloroethene	Jun-92			0.005						0.028					
Xylenes, total	Jun-92	0.008	0.006												0.005
SEMIVOLATILE ORGANIC COMPOUNDS															
Benzoic acid	Sep-92													0.003	0.01
Benzoic acid	Dec-92													0.001	
Bis(2-ethylhexyl)phthalate	Jun-92			0.001			0.005				0.003				
Bis(2-ethylhexyl)phthalate	Sep-92	0.026		0.013				0.016							0.01
Bis(2-ethylhexyl)phthalate	Dec-92	0.054		0.025				0.026	0.023		0.017		0.006		
Di-n-butyl phthalate	Jun-92										0.001				0.01
Di-n-butyl phthalate	Dec-92	0.001													
Di-n-octyl phthalate	Sep-92						0.001								
Diethyl phthalate	Sep-92										0.001				
Dimethyl phthalate	Jun-92										0.001				
PCBS AND FURANS															
Tetrahydrofuran	Dec-92						0.292								

Table 4.4-11

Table 4.4-11
Joint Fenceline Groundwater Chemistry - Common Ions, Physical Parameters, Nutrients, and Fluoride

ANALYTE (a)	95% UCL for Representative Groundwater (c) Bannock Range	JOINT FENCELINE AREA																					
		Well 109 Mean (b)	Well 110 Mean (b)	Well 123 Mean (b)	Well 136 Mean (b)	Well 142 Mean (b)	Well 143 Mean (b)	Well 144 Mean (b)	Well 145 Mean (b)	Well 161 Mean (f)	Well 164 Mean (f)	Well 304 Mean (b)	Well 307 Mean (b)	Well 308 Mean (b)	Well 309 Mean (b)	Well 310 Mean (b)	Well 312 Mean (b)	Well 323 Mean (b)	Well 324 Mean (b)	Well 329 Mean (b)	Well 330 Mean (b)	Well 331 Mean (b)	Well 333 Mean (b)
COMMON IONS (mg/l)																							
Alkalinity, bicarbonate	171	167	552	737	1197	936	796	397	1125	646	1130	664	1187	1177	811	722	830	562	216	166	164	664	1050
Calcium	68.75	55.9	243	391	303	442	402	212	365	431	502	426	205	243	369	311	363	425	73.0	52.2	48.1	283	319
Chloride	52.42	35.1	138	339	152	116	283	149	147	195	171	191	129	134	117	117	160	97.8	44.1	29.0	25.0	129	146
Magnesium	19.20	16.58	85.2	170	280	127	174	70.1	209	113	152	119	404	300	92.2	97.3	142	127	21.18	15.81	14.97	106	279
Potassium	10.52	6.13	18.14	32.40	122.0	18.24	35.84	15.13	81.15	19.40	19.40	16.86	31.90	35.18	55.33	25.23	23.87	26.73	6.73	6.36	5.00	18.26	31.47
Sodium	27.53	36.5	161	226	668	127	390	85.4	582	31	381	32.47	606	623	277	335	300	455	46.1	36.36	33.24	278	505
Sulfate	43.40	58.5	586	956	1682	1038	1079	396	1771	812	1683	737	1932	1958	1011	1266	1262	1778	422	56.50	46.50	1060	2200
PHYSICAL PARAMETERS (d)																							
Spec.Conductivity (umhos/cm)	569	509	2270	3389	4956	3124	3601	1756	4967	2798	4738	2798	5090	4823	3257	3007	3633	3750	751	558	522	3147	4823
pH	7.37 to 8.37	7.47	6.40	6.16	6.10	6.48	6.19	6.94	6.15	6.80	6.17	6.77	6.14	6.13	6.35	6.41	6.26	5.88	7.18	7.49	7.49	6.34	6.10
Temperature (degrees Celcius)	14.5 to 16.6	15.1	16.2	17.3	14.9	15.6	16.1	15.3	14.6	17.0	16.3	16.6	16.3	15.7	19.3	19.7	15.8	16.8	17.1	15.9	14.5	17.1	15.7
Total Dissolved Solids (mg/l)	412	351	1651	2778	4098	2738	2943	1258	4005	2310	4320	2292	4488	4428	2758	2600	3016	3643	474	351	340	2470	4330
Redox (mV)	44 to 122	116	147	23	88	112	62	229	171	-	-	126	121	103	143	155	154	125	136	134	138	158	141
NUTRIENTS AND FLUORIDE (mg/l)																							
Ammonia (NH3 as N)	0.50	0.35	0.35	4.30	9.77	0.35	6.42	0.35	11.83	0.50	0.50	0.38	1.60	28.88	0.38	0.25	0.46	0.43	0.43	0.50	0.50	1.75	1.04
Nitrate (NO3 as N)	1.60	0.92	2.67	9.13	4.35	1.96	7.33	3.76	3.18	3.75	4.40	5.48	2.90	25.41	2.53	2.37	4.62	2.30	0.95	3.44	0.85	30.90	3.30
Orthophosphate (PO4 as P)	0.13	0.03	4.48	4.36	116	0.03	13.53	0.38	87.6	0.02	40.4	11.02	163	153	7.75	26.03	29.34	155	0.22	0.03	0.02	22.15	93.10
Phosphorous	0.31	0.08	8.18	4.46	96.8	0.03	14.60	1.10	85.6	0.02	40.6	11.51	158	144	8.27	31.45	29.14	127	0.23	0.03	0.02	27.20	89.05
Fluoride	0.60	0.83	0.27	0.76	1.66	0.15	0.38	0.46	0.83	0.27	0.23	0.17	0.50	1.34	0.53	0.21	0.22	0.15	0.73	0.85	0.55	0.20	0.20
METALS - Not EMF-Related Concentrations (mg/l)																							
Aluminum	0.5472	0.0447	0.0377	0.0446	0.0354	0.0347	0.0474	0.2872	0.1813	0.0243	0.0243	0.0244	0.0352	0.0431	0.1027	0.0403	0.0389	0.4452	0.0266	0.0300	0.0226	0.0226	0.0226
Antimony	0.1340	0.0631	0.0631	0.0596	0.0631	0.0631	0.0631	0.0754	0.0690	0.0483	0.0483	0.0557	0.0637	0.0557	0.0557	0.1002	0.0557	0.0546	0.0546	0.0482	0.0482	0.0482	0.0482
Beryllium	0.0040	0.0014	0.0014	0.0016	0.0011	0.0022	0.0011	0.0014	0.0014	0.0002	0.0002	0.0009	0.0009	0.0009	0.0009	0.0012	0.0010	0.0008	0.0008	0.0007	0.0007	0.0007	0.0007
Cadmium	0.0050	0.0026	0.0026	0.0026	0.0027	0.0014	0.0055	0.0015	0.0015	0.0001	0.0001	0.0014	0.0018	0.0020	0.0014	0.0018	0.0016	0.0018	0.0018	0.0006	0.0007	0.0006	0.0006
Chromium	0.0110	0.0046	0.0046	0.0044	0.0046	0.0034	0.0025	0.0064	0.0032	0.0010	0.0005	0.0029	0.0031	0.0047	0.0033	0.0071	0.0029	0.0035	0.0040	0.0031	0.0022	0.0013	0.0011
Cobalt	0.0108	0.0067	0.0068	0.0087	0.0061	0.0054	0.0066	0.0144	0.0052	0.0027	0.0027	0.0043	0.0043	0.0043	0.0043	0.0063	0.0045	0.0031	0.0035	0.0027	0.0027	0.0027	0.0027
Copper	0.0109	0.0035	0.0061	0.0078	0.0135	0.0089	0.0092	0.0048	0.0104	0.0031	0.0031	0.0069	0.0089	0.0076	0.0079	0.0074	0.0109	0.0059	0.0040	0.0037	0.0037	0.0037	0.0037
Iron	0.8402	0.0292	0.1451	0.0443	0.0256	0.0386	0.0362	0.4633	0.1635	0.0487	0.0487	0.0321	0.0325	0.0348	0.0541	0.0353	0.5710	0.2700	0.0365	0.0726	0.0620	0.0620	0.0620
Lead	0.0068	0.0011	0.0027	0.0036	0.0033	0.0019	0.0013	0.0024	0.0023	0.001	0.0005	0.0011	0.0011	0.0018	0.0015	0.0015	0.0011	0.0012	0.0011	0.0008	0.0011	0.0011	0.0008
Mercury	0.00078	0.00028	0.00022	0.00016	0.00020	0.00019	0.00020	0.00221	0.00048	0.0001	0.0001	0.00016	0.00023	0.00019	0.00017	0.00030	0.00018	0.00020	0.00018	0.00042	0.00011	0.00011	0.00015
Molybdenum	0.0330	0.0143	0.0143	0.0235	0.0146	0.0143	0.0167	0.0153	0.0202	0.0101	0.0101	0.0131	0.0137	0.0177	0.0274	0.0278	0.0233	0.0122	0.0122	0.0192	0.0113	0.0125	0.0113
Silver	0.0052	0.0038	0.0039	0.0037	0.0038	0.0031	0.0033	0.0036	0.0032	0.0041	0.0041	0.0031	0.0031	0.0031	0.0031	0.0039	0.0032	0.0037	0.0035	0.0039	0.0039	0.0039	0.0039
Thallium	0.0400	0.0017	0.0017	0.0016	0.0017	0.0017	0.0017	0.0017	0.0017	0.0006	0.0006	0.0018	0.0019	0.0019	0.0018	0.0019	0.0018	0.0022	0.0022	0.0009	0.0007	0.0008	0.0012
Zinc	0.1700	0.0107	0.0095	0.0091	0.0266	0.0153	0.0078	0.0241	0.0094	0.0109	0.0064	0.0054	0.0047	0.0043	0.0124	0.0131	0.0078	0.0091	0.0072	0.0080	0.0042	0.0047	0.0050
METALS - EMF-Related Concentrations (mg/l)																							
Arsenic	0.0180	0.0034	0.1197	0.5506	0.4622	0.0043	0.3514	0.0064	0.3631	0.0029	0.1810	0.0037	0.5970	0.5521	0.0897	0.1437	0.2377	0.6581	0.0108	0.0067	0.0055	0.2325	0.3409
Barium	0.1204	0.0684	0.0850	0.0634	0.0855	0.2457	0.0980	0.1010	0.0967	0.088	0.0764	0.0870	0.0662	0.0480	0.0624	0.0759	0.1046	0.0502	0.0793	0.0687	0.0544	0.0715	0.0937
Boron	0.3078	0.1868	0.7379	0.9638	0.7022	0.3299	1.0300	0.4261	0.7892	0.0482	0.5141	0.0913	0.7469	0.7373	0.4709	0.5135	0.7986	0.5901	0.1392	0.1085	0.0957	0.5225	0.6874
Lithium	0.0165	0.0462	0.1360	0.2569	0.5077	0.0341	0.2834	0.0917	0.5118	0.017	0.1062	0.0195	0.6073	0.5761	0.1943	0.1691	0.2567	0.1858	0.0507	0.0538	0.0471	0.2247	0.4097
Manganese	0.0201	0.0030	0.1360	0.5108	2.2659	0.0240	0.6135	0.1355	1.0662	0.0425	0.0214	0.0034	0.0997	0.4328	0.0028	0.0110	0.6429	0.0309	0.0080	0.0044	0.0009	0.1014	0.0182
Nickel	0.0200	0.0120	0.0120	0.0137	0.0341	0.0124	0.0580	0.0120	0.0235	0.0105	0.0105	0.0124	0.0144	0.0167	0.0124	0.0148	0.0309	0.0137	0.0137	0.0127	0.0124	0.0124	0.0124
Selenium	0.0055	0.0018	0.0686	0.2896	0.0863	0.0071	0.1925	0.0134	0.1167	0.0083	0.0139	0.0104	0.0115	0.0216	0.0072	0.0124	0.1543	0.0054	0.0036	0.0017	0.0014	0.0681	0.0123
Vanadium	0.1000	0.0066	0.0196	0.2101	0.0240	0.0193	0.1093	0.0090	0.0145	0.0023	0.0085	0.0199	0.0540	0.0475	0.0055	0.0489	0.1016	0.0042	0.0033	0.0036	0.0022	0.0128	0.0183

Notes:
(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.
(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.
(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.
(d) 95% UCLs for pH, temperature, and redox were not calculated. Ranges of these parameters are used for representative groundwater
(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.
(f) Wells 161 and 164 were installed in June 1994. Means were calculated from data collected in June and September 1994.

Table 4.4-12

Table 4.4-12
Activities of Radiological Parameters in Groundwater - Joint Fenceline Area (pCi/l)

Parameter	Sampling Event	109	123	110	136	143	144	145	142	301**	PEI-1**
		Deep Well					Deep Well		Upgradient of FMC Potential Sources		
Gross alpha	Jun-92	12.2 ±2.7	ND	34 ±7.7	ND	ND	ND	6.00 ±5.90	5.5 ±5.1	ND	2.4 ±1.30
	Sep-92	5.12 ±1.21	ND	2.65 ±0.70	4.11 ±1.37	2.44 ±0.54	7.34 ±0.77	2.73 ±1.40	36.3 ±1.93	4.57 ±0.89	2.78 ±0.41
	Dec-92	3.20 ±0.60	3.89 ±3.35	7.22 ±3.19	4.4 ±0.96	7.59 ±2.75	26.80 ±3.03	ND	49 ±6.11	2.66 ±0.55	ND
	Mar-93	2.59 ±1.05	ND	3.63 ±3.27	ND	7.21 ±4.59	27.20 ±4.31	8.71 ±5.75	31.4 ±6.66	4.94 ±1.06	ND
	Jul-93	2.27 ±0.57	ND	ND	ND	ND	ND	ND	ND	2.5 ±0.80	
Gross beta	Jun-92	22.9 ±3.8	21.7 ±4.30	31.9 ±4.1	49.1 ±5.2	24.2 ±4.3	9.30 ±3.7	43.80 ±5.1	15.1 ±3.2	ND	11 ±3.70
	Sep-92	6.36 ±1.23	29.8 ±2.13	21.8 ±1.10	85.7 ±2.76	17.9 ±1.72	22.40 ±0.92	77.40 ±3.20	23.7 ±1.28	6.29 ±0.82	7.95 ±0.49
	Dec-92	5.9 ±0.71	34.4 ±6.33	ND	9.9 ±0.74	ND	22.20 ±1.74	65.70 ±6.97	29.9 ±3.37	5.87 ±0.7	ND
	Mar-93	5.37 ±1.03	21.3 ±5.69	16.3 ±3.13	79.7 ±8.31	29.4 ±5.67	77.40 ±4.49	70.50 ±8.04	18.8 ±4.71	ND	ND
	Jul-93	4.73 ±0.65	ND	ND	ND	ND	ND	ND	ND	10.8 ±1.10	
Radium-226	Sep-92	ND	ND	ND	ND	2.49 ±0.61	1.19 ±0.35	±1.23 ±0.31	2.75 ±0.57	1.65 ±0.53	ND
	Dec-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Mar-93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-93	3.83 ±0.50	ND	ND	ND	ND	ND	ND	ND	ND	
Radium-228	Sep-92	ND	ND	6 ±1.3	ND	ND	12.90 ±1.30	ND	1.1 ±0.7	2.7 ±1.00	ND
	Dec-92	3.0 ±1.0	ND	ND	2.8 ±1.1	ND	ND	ND	ND	1 ±0.60	ND
	Mar-93	ND	ND	ND	ND	ND	ND	ND	ND	1 ±0.70	ND
	Jul-93	ND	ND	ND	ND	ND	ND	ND	ND	1 ±0.60	

Parameter	Samplline Event	304	307	308	309	310	312	323	324	329	330	331	333
						Deep Well				Deep Well	Deep Well		
Gross alpha	Jun-92	ND	ND	ND	8.8 ±5.70	8.35 ±4.7	ND						
	Sep-92	170 ±3.52	11 ±0.03	ND	17.49 ±2.30	13.5 ±1.54	8.63 ±1.95						
	Dec-92	250 ±12	ND	ND	23.7 ±5.14	6.55 ±5.00	ND	ND	2.26 ±1.66				
	Mar-93	182 ±14	3.67 ±10.9	11 ±7.32	21.9 ±7.08	ND	ND	ND	ND				
	Jul-93	166 ±12.9	ND	ND	23.9 ±4.15	ND	5.98 ±2.34	ND	ND	2.01 ±1.05	ND	4.34 ±2.32	ND
Gross beta	Jun-92	ND	ND	ND	ND	16.95 ±3.50	15.8 ±3.30		ND				
	Sep-92	92.4 ±1.69	16.4 ±2.98	35.76 ±2.60	43.86 ±1.97	10.7 ±1.79	30.4 ±1.67		ND				
	Dec-92	57.6 ±3.35	58.7 ±5.47	24.7 ±4.67	30.8 ±3.92	19.6 ±5.8	28.5 ±6.1	21.9 ±5.10	8.12 ±1.42				
	Mar-93	59.1 ±7.01	17.4 ±9.31	54.7 ±12	44.5 ±6.61	19.2 ±6.45	16.8 ±8.67	17.9 ±8.94	5.75 ±1.47				
	Jul-93	78.3 ±8.6	30 ±6.0	41.1 ±7.90	33.3 ±4.73	9.27 ±2.45	18.4 ±4.53	26.2 ±7.50	4.73 ±0.92	4.55 ±1.17	3.36 ±0.81	9.59 ±4.04	19.5 ±4.51
Radium-226	Sep-92	ND	ND	ND	ND	ND	ND						
	Dec-92	ND	ND	ND	ND	ND	ND	3.63 ±0.32	ND				
	Mar-93	ND	ND	ND	ND	ND	ND	ND	ND				
	Jul-93	1.67 ±0.21	1.15 ±0.16	ND	ND	ND	ND	ND	ND	1.26 ±0.2	ND	ND	ND
Radium-228	Sep-92	ND	ND	ND	ND	ND	3 ±1.10						
	Dec-92	13.8 ±1.80	ND	ND	1 ±1.00	ND	ND	1.1 ±0.90	ND				
	Mar-93	1.9 ±0.70	4.1 ±1.0	ND	ND	6.1 ±0.90	ND	7.4 ±1.20	ND				
	Jul-93	ND	ND	1.3 ±0.60	ND	ND	ND	ND	ND	1.00 ±0.7	ND	ND	ND

Notes:
** These wells are part of representative groundwater network.
Means were calculated only where two or more values were reported.
Blanks = Not analyzed
ND = Not Detected

Table 4.4-13

Northern FMC/Simplot Properties Area Groundwater Chemistry - Common Ions, Physical Parameters, Nutrients and Fluoride

ANALYTE (a)		Michaud Wells						Bannock Wells								Portneuf Wells							
	95% UCL for Representative Groundwater (c)	Lindley Well Mean (b)	Old Pilot Well Mean (b)	Well TW-9S Mean (b)	Well 501 Mean (b)	Well 522 Mean (f)	95% UCL for Representative Groundwater (c)	New Pilot Well Mean (b)	Well TW-12S Mean (b)	Well 500 Mean (b)	Well 517 Mean (b)	Well 518 Mean (b)	Well 521 Mean (f)	Well 523 Mean (f)	95% UCL for Representative Groundwater (c)	Frontier Well Mean (b)	Well 504 Mean (b)	Well 505 Mean (b)	Well 506 Mean (b)	Well 507 Mean (b)	Well 508 Mean (b)	Well 509 Mean (b)	Well 520 Mean (b)
COMMON IONS (mg/l)																							
Alkalinity, bicarbonate	198	274	338	332	170		171	160	246	151	341	349			307	275	162	289	253	291	168	274	282
Calcium	97.71	96.95	102.28	100.14	72.51		68.75	49.97	116.52	44.85	116.03	120.14			91.93	92.80	46.68	83.01	77.12	83.64	47.25	75.18	99.09
Chloride	192.90	262.75	260.83	249.83	107.48		52.42	29.05	62.17	30.72	176.50	63.50			67.87	42.12	29.98	57.30	58.08	54.46	31.16	49.24	68.00
Magnesium	33.59	38.38	55.81	50.41	24.78		19.20	15.60	44.61	15.19	44.92	42.75			35.92	31.40	14.29	31.12	30.28	31.09	15.11	28.82	35.56
Potassium	12.72	12.45	106.05	127.04	6.79	9.69	10.52	5.24	20.34	4.10	76.52	9.30	5.65	7.70	7.34	7.48	5.10	6.83	6.59	6.52	4.92	6.38	7.39
Sodium	74.28	143.33	151.90	139.49	42.44		27.53	30.86	98.18	27.82	103.89	72.34			53.21	60.95	32.87	44.89	42.65	39.94	31.46	39.31	45.07
Sulfate	72.57	177.50	205.50	177.50	71.74	63.00	43.40	50.35	316.17	49.02	229.50	203.50	44	36.00	70.68	175.80	48.94	65.60	53.02	61.44	47.74	51.86	74.00
PHYSICAL PARAMETERS (d)																							
Spec.Conductivity (umhos/cm)	1136	1600	1859	1909	815	904	569	483	1327	492	1748	1255	440	797	871	981	523	879	822	859	534	809	980
pH	7.29 to 7.70	7.17	6.84	6.89	7.71	7.3	7.37 to 8.37	7.49	6.37	8.00	6.89	6.67	7.6	7.34	7.27 to 7.52	6.88	7.58	7.15	7.22	7.10	7.87	7.53	6.94
Temperature (degrees Celcius)	11.8 to 16.7	10.9	14.7	17.4	12.2	14.2	14.5 to 16.6	13.5	15.2	13.4	18.3	13.5	13.55	13.4	12.7 to 13.3	13.6	14.5	13.1	13.4	12.8	14.1	13.3	12.9
Total Dissolved Solids (mg/l)	867	1043	1237	1173	493		412	312	907	296	1140	818			580	664	318	514	490	495	315	466	550
Redox (mV)	0 to 169	83	69	-117	109		44 to 122	15	0	116	143	150			127 to 171	94	146	150	160	151	154	155	152
NUTRIENTS AND FLUORIDE (mg/l)																							
Ammonia (NH3 as N)	0.50	0.28	0.35	0.35	0.38		0.50	0.35	18.33	0.38	0.50	0.50			0.50	0.38	0.38	0.38	0.19	0.19	0.38	0.19	0.25
Nitrate (NO3 as N)	5.52	6.34	12.63	12.64	1.74	3.87	1.60	1.06	13.36	1.04	9.63	2.83	0.845	3.01	4.00	1.81	1.29	2.77	3.76	1.89	1.30	3.16	2.09
Orthophosphate (PO4 as P)	0.06	0.03	7.11	2.83	0.03	0.03	0.13	0.02	27.47	0.04	0.86	3.16	0.02	0.02	0.27	2.26	0.02	0.08	0.03	0.03	0.02	0.03	0.02
Phosphorous	0.33	0.04	7.61	3.08	0.03		0.31	8.88	29.63	0.02	1.07	3.44			0.15	2.43	0.02	0.08	0.03	0.04	0.02	0.03	0.01
Fluoride	0.80	0.52	0.13	0.19	0.50	0.65	0.60	0.86	1.13	0.76	0.20	0.45	0.81	0.58	0.41	0.51	0.82	0.26	0.20	0.22	0.82	0.26	0.20
METALS - Not EMF-Related Concentrations (mg/l)																							
Aluminum	0.0977	0.0428	0.0464	0.0344	0.0272		0.5472	0.0394	0.0347	0.0258	0.0226	0.0226			0.9475	0.0244	0.0244	0.0372	0.0122	0.0339	0.0372	0.0122	0.0254
Antimony	0.1000	0.0980	0.0631	0.0631	0.0557		0.1340	0.0631	0.0631	0.0557	0.0482	0.0482			0.1000	0.0637	0.0585	0.0557	0.0278	0.0278	0.0557	0.0338	0.0225
Beryllium	0.0020	0.0013	0.0014	0.0011	0.0010		0.0040	0.0013	0.0013	0.0009	0.0012	0.0011			0.0026	0.0019	0.0009	0.0009	0.0005	0.0005	0.0009	0.0004	0.0005
Cadmium	0.0050	0.0020	0.0014	0.0014	0.0014		0.0050	0.0027	0.0045	0.0017	0.0006	0.0012			0.0050	0.0014	0.0014	0.0014	0.0008	0.0007	0.0014	0.0008	0.0005
Chromium	0.0114	0.0049	0.0028	0.0027	0.0040		0.0110	0.0047	0.0029	0.0033	0.0011	0.0007			0.0100	0.0032	0.0041	0.0032	0.0027	0.0015	0.0036	0.0023	0.0005
Copper	0.0085	0.1107	0.0059	0.0052	0.0049		0.0109	0.0044	0.0050	0.0049	0.0037	0.0037			0.0130	0.0055	0.0047	0.0053	0.0039	0.0030	0.0043	0.0024	0.0020
Iron	0.7690	0.1077	0.0804	1.3756	0.0490		0.8402	0.0771	0.3273	0.0336	0.0620	0.0620			1.0740	0.0458	0.0384	0.0313	0.0203	0.0280	0.0326	0.0164	0.0345
Lead	0.0020	0.0016	0.0013	0.0013	0.0013		0.0068	0.0012	0.0016	0.0011	0.0008	0.0008			0.0024	0.0011	0.0016	0.0011	0.0008	0.0008	0.0015	0.0006	0.0005
Mercury	0.00074	0.00030	0.00022	0.00022	0.00024		0.00078	0.00018	0.00034	0.00023	0.00014	0.00019			0.00054	0.00019	0.00021	0.00029	0.00041	0.00016	0.00019	0.00009	0.00042
Molybdenum	0.0245	0.0240	0.0243	0.0230	0.0177		0.0330	0.0149	0.0143	0.0218	0.0117	0.0113			0.0300	0.0177	0.0131	0.0131	0.0109	0.0069	0.0181	0.0066	0.0065
Silver	0.0050	0.0034	0.0031	0.0035	0.0032		0.0052	0.0039	0.0032	0.0036	0.0039	0.0039			0.0040	0.0034	0.0032	0.0036	0.0016	0.0019	0.0034	0.0016	0.0020
Thallium	0.0040	0.0022	0.0017	0.0017	0.0018		0.0400	0.0017	0.0017	0.0018	0.0009	0.0009			0.0045	0.0018	0.0018	0.0018	0.0010	0.0011	0.0018	0.0009	0.0005
Vanadium	0.0745	0.0108	0.0128	0.0303	0.0284		0.1000	0.0069	0.0101	0.0126	0.0078	0.0040			0.1987	0.0146	0.0219	0.0259	0.0082	0.0101	0.0055	0.0025	0.0010
METALS - EMF-Related Concentrations (mg/l)																							
Arsenic	0.0149	0.0056	0.0410	0.0352	0.0052	0.0060	0.0180	0.0046	0.0378	0.0042	0.0320	0.0196	0.0042	0.0080	0.0104	0.0185	0.0048	0.0047	0.0040	0.0028	0.0038	0.0033	0.0017
Barium	0.2297	0.1072	0.2344	0.1281	0.5579	0.1600	0.1204	0.0697	0.0380	0.0661	0.0892	0.1171	0.0665	0.1670	0.1735	0.1348	0.0637	0.1425	0.1540	0.1200	0.0679	0.1307	0.1277
Boron	0.2935	0.3269	0.7046	0.6443	0.1000		0.3078	0.0956	0.2523	0.0854	0.5674	0.1721			0.2500	0.1561	0.1115	0.1587	0.1135	0.1198	0.1000	0.1117	0.146
Cobalt	0.0145	0.0069	0.0154	0.0134	0.0053		0.0108	0.0052	0.0066	0.0053	0.0061	0.0027			0.0163	0.0043	0.0043	0.0043	0.0021	0.0030	0.0085	0.0041	0.0015
Lithium	0.0610	0.0621	0.0857	0.0890	0.0389		0.0165	0.0465	0.0845	0.0416	0.0851	0.0493			0.0400	0.0517	0.0452	0.0339	0.0275	0.0257	0.0419	0.0217	0.0163
Manganese	0.0518	0.0048	0.8802	1.1005	0.0028	0.0008	0.0201	0.0051	0.1848	0.0020	0.0114	0.0043	0.1204	0.0032	0.1097	0.0018	0.0018	0.0018	0.0010	0.0011	0.0021	0.0011	0.0015
Nickel	0.0200	0.0123	0.0122	0.0120	0.0128		0.0200	0.0120	0.0606	0.0138	0.0124	0.0160			0.0247	0.0146	0.0124	0.0140	0.0081	0.0071	0.0177	0.0062	0.0055
Selenium	0.0057	0.0025	0.0040	0.0022	0.0029	0.0035	0.0055	0.0021	0.0112	0.0028	0.0153	0.0031	0.0035	0.0035	0.0060	0.0033	0.0026	0.0028	0.0022	0.0014	0.0025	0.0021	0.0010
Zinc	0.0501	0.1260	0.0138	0.0099	0.0067		0.1700	0.0126	0.0220	0.0085	0.0073	0.0061			0.1615	0.0124	0.0100	0.0095	0.0038	0.0052	0.0093	0.0039	0.0029

Notes:

(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.

(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.

(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.

(d) 95% UCLs for pH, temperature, and redox were not calculated. Ranges of these parameters are used for representative groundwater

(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.

(f) Wells 521, 522, and 523 were installed in June 1994. Means were calcuated from data collected in June and September 1994.

Table 4.4-14
Activities of Radiological Parameters in Groundwater - Northern FMC/Simplot Properties (pCi/l)

Parameter	Sampling Event	500	501	504	505	506	507	508	509	510	511
Gross alpha	Jun-92	13.5 ±9.0	4.0 ±1.9	ND	ND	ND	3.8 ±2.40	3.0 ±1.60	2.20 ±1.90	ND	ND
	Sep-92	2.67 ±0.57	2.85 ±0.68	ND	ND	ND	2.37 ±0.61	ND	ND	ND	ND
	Dec-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Mar-93	3.65 ±0.85	3.53 ±0.91	2.62 ±0.76	2.4 ±0.70	3.22 ±0.85	3.42 ±2.68	3.37 ±0.85	ND	2.88 ±0.85	2.24 ±0.93
	Jul-93	ND	ND	2.25 ±0.83	ND	2.06 ±1.08	ND	ND	2.31 ±0.97	ND	ND
Gross beta	Jun-92	67.5 ±8.1	12.4 ±2.8	6.7 ±3.40	ND	5.7 ±2.7	8.9 ±2.9	10 ±2.7	10.50 ±3.0	4.40 ±2.9	12.5 ±3.30
	Sep-92	4.65 ±0.64	7.82 ±0.76	6.37 ±0.73	6.24 ±0.79	10.1 ±0.92	7.57 ±0.74	ND	ND	6.11 ±0.70	ND
	Dec-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Mar-93	4.51 ±1.34	6.1 ±1.39	ND	ND	6.57 ±1.43	6.64 ±4.13	5.59 ±1.38	6.10 ±1.39	7.44 ±1.45	7.47 ±1.42
	Jul-93	3.66 ±0.95	4.89 ±1.04	2.86 ±0.98	4.5 ±1.29	4.64 ±1.17	5.51 ±1.17	3.61 ±0.98	4.32 ±0.99	5.19 ±1.15	4.1 ±1.12
Radium-226	Sep-92	ND	ND	ND	ND	ND	ND	5.39 ±0.63	ND	ND	ND
	Dec-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Mar-93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Jul-93	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.18 0.19
Radium-228	Sep-92	ND	ND	ND	ND	ND	3.6 ±0.80	ND	2.2 ±1.00	ND	ND
	Dec-92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Mar-93	ND	ND	ND	ND	ND	ND	2.7 ±0.80	ND	ND	7.20 ±1.00
	Jul-93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes: ND = Not Detected
Means were not calculated if only ND was reported or if only positive value has been reported.

Parameter	Sampling Event	517	518	520	Old Pilot House	New Pilot House	Lindley	Frontier	TW-9S	TW-12S
Gross alpha	Jun-92				20.7 ±6.0	ND	5.8 ±4.00	ND	ND	ND
	Sep-92				3.09 ±1.40	ND	8 ±0.70	ND	ND	4.09 ±1.24
	Dec-92				ND	2.96 ±0.54	13.2 ±2.05	ND	ND	ND
	Mar-93				ND	ND	14.3 ±3.73	2.12 ±1.62	ND	ND
	Jul-93	ND	ND	ND	2.94 ±1.24	ND		ND	13.7 ±2.78	15.2 ±3.17
Gross beta	Jun-92				96.5 ±5.10	4.2 ±2.60	18 ±3.4	ND	94.6 ±6.6	18 ±4.10
	Sep-92				90.6 ±3.27	4.12 ±0.59	20.4 ±0.73	9.24 ±0.80	101 ±1.32	20.2 ±2.06
	Dec-92				90.2 ±2.56	4.8 ±0.64	15.3 ±1.32	ND	85.5 ±2.37	11.8 ±1.71
	Mar-93				75.8 ±4.06	110 ±3.85	ND	ND	88.0 ±4.52	11.8 ±1.87
	Jul-93	47.5 ±3.63	8.68 ±1.27	3.6 ±0.69	72.8 ±3.63	4.12 ±0.81		4.88 ±1.04	85.7 ±4.73	31.9 ±3.50
Radium-226	Sep-92				ND	ND		ND	ND	ND
	Dec-92				ND	ND	ND	ND	ND	ND
	Mar-93				ND	2.2 ±0.29	ND	ND	ND	ND
	Jul-93	ND	1.11 ±0.28	ND	ND	ND	ND	ND	ND	ND
Radium-228	Sep-92				7.1 ±1.40	3.3 ±1.10		ND	1.00 ±0.90	4.8 ±1.00
	Dec-92				1.5 ±1.00	1.7 ±1.00	1.9 ±0.80	ND	ND	ND
	Mar-93				ND	ND	ND	ND	ND	ND
	Jul-93	8.3 ±0.60	ND	ND	5.1 ±1.00	ND	ND	ND	ND	ND

Table 4.4-15
Organic Compounds Detected in Groundwater in Northern FMC/Simplot Properties (mg/l)

Parameter	Sampling Date	Representative Wells 511	Representative Wells 513	Unimpacted Wells 501	Unimpacted Wells 507	Unimpacted Wells 509	505	Frontier	Old Pilot	TW-12S	TW-9S	Practical Quantitation Limits (mg/l)
VOLATILE ORGANIC COMPOUNDS												
2-Butanone	Jun-92		0.004		0.006			0.007				
Acetone	Jun-92	0.044	0.1	1.04	0.481	1.656						
Acetone	Sep-92											0.1
Acetone	Dec-92									3.275		
Carbon disulfide	Jun-92	0.027	0.033		0.026	0.168						0.005
Ethyl benzene	Jun-92			0.002								0.005
Tetrachloroethene	Jun-92	0.003			0.003	0.002	0.001					
Tetrachloroethene	Sep-92	0.001			0.002	0.003						
Tetrachloroethene	Dec-92	0.003			0.002	0.003						0.01
Toluene	Jun-92									0.002		
Trichloroethene	Jun-92								0.001		0.001	
Trichloroethene	Sep-92										0.001	0.01
Xylenes, total	Jun-92			0.011								0.01
Xylenes, total	Sep-92			0.001								
SEMIVOLATILE ORGANIC COMPOUNDS												
Bis(2-ethylhexyl)phthalate	Jun-92	0.017		0.002		0.005	0.002				0.001	0.005
Bis(2-ethylhexyl)phthalate	Sep-92	0.013	0.002	0.01	0.004	0.006	0.011		0.001	0.002	0.005	
Bis(2-ethylhexyl)phthalate	Dec-92	0.012		0.014	0.003	0.011	0.007					0.005
Di-n-butyl phthalate	Dec-92	0.002					0.001				0.004	0.005
Di-n-octyl phthalate	Dec-92						0.002					0.005
Diethyl phthalate	Jun-92									0.001		0.005
Dimethyl phthalate	Dec-92									0.019	0.004	

Table 4.4-16

Table 4.4-16

Area North of I-86 Groundwater Chemistry - Common Ions, Physical Parameters, Nutrients, and Fluoride

ANALYTE (a)	Michaud			Bannock								Portneuf			
	95% UCL for Representative Groundwater (c)	Well 502 Mean (b)	Well 516 Mean (b)	95% UCL for Representative Groundwater (c)	Well 524 Mean (f)	Well 525 Mean (f)	Batiste Springs Mean (b)	Rowlands Well Mean (b)	Tank Farm Well Mean (b)	Well TW-11S Mean (b)	Well TW-11I Mean (b)	95% UCL for Representative Groundwater (c)	Well 503 Mean (b)	Well 519 Mean (b)	Swanson Road Spring Mean (b)
COMMON IONS (mg/l)															
Alkalinity, bicarbonate	198	165	163	171			209	248	178	202	199	307	319	247	286
Calcium	97.71	59.67	62.78	68.75			71.07	52.99	48.58	55.34	52.52	91.93	122.15	57.10	92.70
Chloride	192.90	79.28	78.00	52.42			50.76	23.39	16.94	26.44	24.48	67.87	66.00	22.00	49.30
Magnesium	33.59	20.33	20.13	19.20			25.60	19.64	15.78	17.84	17.21	35.92	39.46	20.49	33.50
Potassium	12.72	6.49	8.15	10.52	4.31	4.21	10.61	5.20	3.49	4.09	5.47	7.34	8.27	5.26	7.37
Sodium	74.28	53.04	40.82	27.53			57.22	47.75	17.83	31.03	35.77	53.21	72.08	38.34	55.70
Sulfate	72.57	60.58	67.00	43.40	64.00	50.00	115.22	40.20	36.37	49.98	40.80	70.68	238.40	36.50	104.00
PHYSICAL PARAMETERS (d)															
Spec.Conductivity (umhos/cm)	1136	752	735	569	548	552	813	721	561	514	517	871	1234	633	908
pH	7.29 to 7.70	7.47	7.47	7.37 to 8.37	7.52	7.53	6.93	7.47	7.73	7.40	7.47	7.27 to 7.52	6.69	7.49	7.30
Temperature (degrees Celcius)	11.8 to 16.7	12.5	13.8	14.5 to 16.6	12.95	13.4	12.3	13.6	12.6	12.4	13.7	12.7 to 13.3	13.8	14.5	13.6
Total Dissolved Solids (mg/l)	867	454	422	412			528	372	274	316	307	580	798	383	540
Redox (mV)	0 to 169	111	176	44 to 122			91	107	96	35	-64	127 to 171	171	139	NA
NUTRIENTS AND FLUORIDE (mg/l)															
Ammonia (NH3 as N)	0.50	0.38	0.50	0.50			0.72	0.35	0.35	0.35	0.35	0.50	3.04	0.50	0.40
Nitrate (NO3 as N)	5.52	3.07	1.97	1.60	2.22	1.95	3.42	1.60	1.35	1.55	1.39	4.00	4.47	1.69	2.64
Orthophosphate (PO4 as P)	0.06	0.03	0.08	0.13	0.02	0.02	1.90	0.02	0.03	0.03	0.04	0.27	4.03	0.02	0.99
Phosphorous	0.33	0.03	0.06	0.31			1.88	0.05	0.05	0.06	0.05	0.15	4.16	0.03	1.05
Fluoride	0.80	0.78	0.70	0.60	0.84	0.86	0.52	0.27	0.75	0.77	0.83	0.41	1.22	0.35	0.50
METALS - Not EMF-Related Concentrations (mg/l)															
Aluminum	0.0977	0.0249	0.0226	0.5472			0.0480	0.0467	0.0360	0.0310	0.0344	0.9475	0.0252	0.0226	0.0280
Antimony	0.1000	0.0637	0.0482	0.1340			0.0631	0.0681	0.0797	0.0631	0.0667	0.1000	0.0578	0.0482	0.0428
Beryllium	0.0020	0.0009	0.0007	0.0040			0.0011	0.0013	0.0011	0.0011	0.0013	0.0026	0.0009	0.0007	0.0009
Cadmium	0.0050	0.0014	0.0006	0.0050			0.0017	0.0016	0.0017	0.0026	0.0026	0.0050	0.0024	0.0006	0.0003
Chromium	0.0114	0.0037	0.0042	0.0110			0.0030	0.0034	0.0030	0.0051	0.0049	0.0100	0.0026	0.0009	0.0015
Copper	0.0085	0.0069	0.0037	0.0109			0.0035	0.0048	0.0082	0.0042	0.0040	0.0130	0.0053	0.0037	0.0035
Iron	0.7690	0.0709	0.0620	0.8402			0.0339	0.0263	0.0761	0.1348	1.0564	1.0740	0.0363	0.1027	0.0380
Lead	0.0020	0.0013	0.0008	0.0068			0.0016	0.0017	0.0017	0.0011	0.0012	0.0024	0.0012	0.0008	0.0005
Mercury	0.00074	0.00026	0.00114	0.00078			0.00018	0.00034	0.00031	0.00025	0.00021	0.00054	0.00027	0.00041	0.00007
Molybdenum	0.0245	0.0237	0.0113	0.0330			0.0143	0.0164	0.0164	0.0143	0.0143	0.0300	0.0157	0.0113	0.0088
Silver	0.0050	0.0032	0.0039	0.0052			0.0030	0.0033	0.0031	0.0038	0.0039	0.0040	0.0036	0.0039	0.0020
Thallium	0.0040	0.0019	0.0009	0.0400			0.0023	0.0016	0.0017	0.0017	0.0017	0.0045	0.0019	0.0010	0.0011
Vanadium	0.0745	0.0203	0.0022	0.1000			0.0111	0.0216	0.0168	0.0068	0.0102	0.1987	0.0317	0.0028	0.0260
METALS - EMF-Related Concentrations (mg/l)															
Arsenic	0.0149	0.0034	0.0055	0.0180	0.0034	0.0032	0.0150	0.0046	0.0039	0.0034	0.0040	0.0104	0.0169	0.0042	0.0070
Barium	0.2297	0.0805	0.0878	0.1204	0.0633	0.0626	0.0570	0.0930	0.0613	0.0608	0.0619	0.1735	0.1137	0.0874	0.1230
Boron	0.2935	0.1239	0.1137	0.3078			0.1423	0.1139	0.0965	0.0896	0.0958	0.2500	0.1606	0.0878	0.28
Cobalt	0.0145	0.0047	0.0027	0.0108			0.0053	0.0054	0.0052	0.0052	0.0052	0.0163	0.0043	0.0027	0.0025
Lithium	0.0610	0.0462	0.0462	0.0165			0.0535	0.0188	0.0341	0.0453	0.0492	0.0400	0.0476	0.0222	0.0440
Manganese	0.0518	0.0018	0.0015	0.0201			0.0070	0.0022	0.0032	0.0022	0.0185	0.1097	0.0450	0.0017	0.0036
Nickel	0.0200	0.0166	0.0124	0.0200	0.0083	0.0027	0.0134	0.0135	0.0143	0.0122	0.0120	0.0247	0.0164	0.0124	0.0081
Selenium	0.0057	0.0020	0.0025	0.0055	0.0035	0.0035	0.0069	0.0022	0.0024	0.0017	0.0019	0.0060	0.0039	0.0014	0.0021
Zinc	0.0501	0.0054	0.0030	0.1700			0.0123	0.0200	0.1359	0.0090	0.0080	0.1615	0.0118	0.0036	0.0119

Notes:
(a) Chemical concentrations shown on this table are mean values and 95% upper confidence levels (95% UCL) and were calculated from analytical data for groundwater samples collected prior to 1994.
(b) Mean concentrations are shown for each parameter in each well in order to simplify presentation and analysis of data. Instrument detection limits were used for non-detect results in the calculation of mean concentrations.
(c) The 95% UCLs are based on the total population of analytical results for representative groundwater.
(d) 95% UCLs for pH, temperature, and redox were not calculated. Ranges of these parameters are used for representative groundwater
(e) Redox was not analyzed in wells PEI-1, PEI-3, PEI-5, 153, and 322.
(f) Wells 524 and 525 were installed in June 1994. Means were calculated from data collected in June and September 1994

Table 4.4-17

Table 4.4-17
Activities of Radiological Parameters in Groundwater - Area North of I-86 (pCi/l)

Parameter	Sampling Event	502	503	516	519	TW-11S	TW-11I	BATISTE	SWANSON	ROWLANDS	TANK FARM
Gross alpha	Jun-92	4.4 ±2.4	ND			ND	10 ±2.70	ND	2.20 ±1.90	ND	ND
	Sep-92	3.55 ±0.68	2.07 ±0.48			5.35 ±1.61	ND	ND	ND	2.25 ±0.63	2.25 ±0.50
	Dec-92	4.08 ±1.01	ND			2.55 ±0.57	2.4 ±0.78	ND	ND	3.28 ±0.87	2.41 ±0.72
	Mar-93	3.66 ±0.88	2.54 ±0.94			2.74 ±0.86	2.31 ±1.00	ND	ND	2.10 ±1.56	ND
	Jul-93	3.94 ±1.38	2.95 ±1.07	ND	2.03 ±1.13	2.94 ±0.75	ND	ND	2.31 ±0.97	ND	ND
Gross beta	Jun-92	9.2 ±2.9	16.1 ±3.3			7.4 ±2.8	21.6 ±3.6	ND	10.50 ±3.0	ND	ND
	Sep-92	6.74 ±0.77	10.2 ±0.68			6.36 ±1.63	4.34 ±1.56	5.2 ±1.60	ND	6.71 ±0.78	4.48 ±0.64
	Dec-92	7.75 ±0.73	ND			ND	ND	6.46 ±1.67	ND	5.39 ±0.80	3.0 ±0.67
	Mar-93	4.89 ±1.31	7.91 ±1.48			4.03 ±0.80	9.57 ±2.43	7.2 ±1.26	6.10 ±1.39	ND	ND
	Jul-93	5.67 ±1.19	5.4 ±1.30	6.28 ±1.27	4.38 ±1.16	3.22 ±0.92	3.73 ±0.83	9.45 ±0.78	4.32 ±0.99	3.78 ±1.12	2.21 ±1.01
Radium-226	Sep-92	ND	ND			ND	ND	ND	ND	ND	ND
	Dec-92	ND	ND			ND	ND	ND	ND	ND	ND
	Mar-93	ND	ND			ND	ND	ND	ND	ND	ND
	Jul-93	ND	ND	ND	ND	ND	ND	1.07 ±0.29	ND	ND	ND
Radium-228	Sep-92	ND	ND			ND	ND	ND	2.2 ±1.00	1.60 ±0.70	7.90 ±1.00
	Dec-92	ND	ND			ND	ND	4.1 ±1.0	ND	9.00 ±1.20	3.10 ±0.90
	Mar-93	ND	ND			ND	ND	7.4 ±1.00	ND	ND	ND
	Jul-93	ND	ND	ND	ND	ND	ND	2.2 ±1.10	ND	ND	ND

Notes: ND = Not Detected
Means were not calculated if only ND was reported or if only positive value has been reported.
Blanks = no analyses performed
* Wells in representative network

Well locations are shown in Figure 4.4-2.

Table 4.4-18
Organic Compounds Detected in Groundwater North of I-86 (mg/l)

Parameter	Sampling Date	Unimpacted Wells		Impacted Wells
		502	TW-11S	503
VOLATILE ORGANIC COMPOUNDS				
2-Butanone	Jun-92			
Acetone	Jun-92	0.108		
Acetone	Sep-92	0.12		0.21
Acetone	Dec-92			
Carbon disulfide	Jun-92	0.005	0.001	
Ethyl benzene	Jun-92			
Tetrachloroethene	Jun-92			
Tetrachloroethene	Sep-92			
Tetrachloroethene	Dec-92			
Toluene	Jun-92			
Trichloroethene	Jun-92			0.004
Trichloroethene	Sep-92			
Xylenes, total	Jun-92			
Xylenes, total	Sep-92			
SEMIVOLATILE ORGANIC COMPOUNDS				
Bis(2-ethylhexyl)phthalate	Jun-92			0.001
Bis(2-ethylhexyl)phthalate	Sep-92	0.004	0.005	0.003
Bis(2-ethylhexyl)phthalate	Dec-92	0.003		0.012
Di-n-butyl phthalate	Dec-92			
Di-n-octyl phthalate	Dec-92			
Diethyl phthalate	Jun-92			
Dimethyl phthalate	Dec-92			

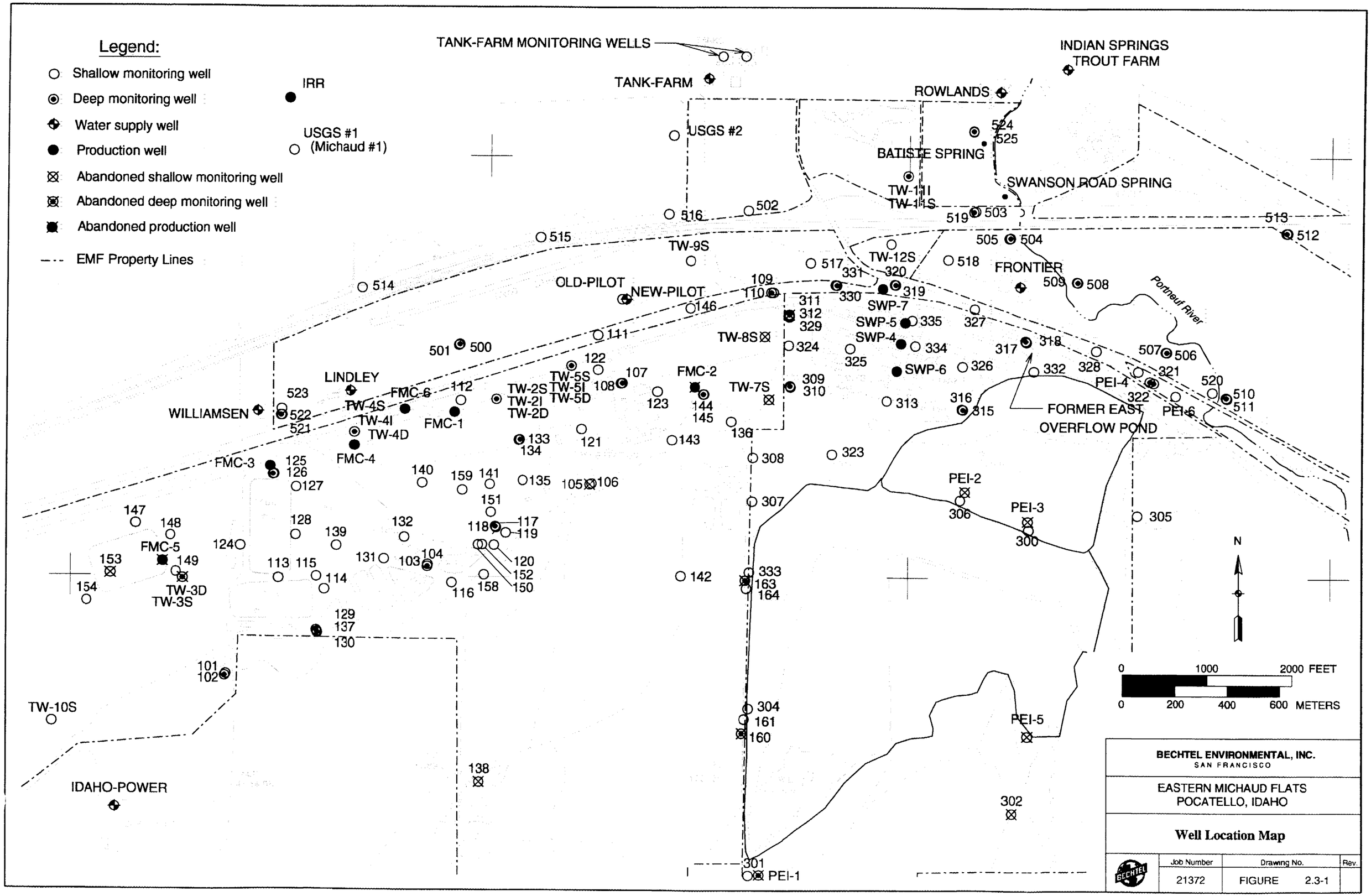
TABLE 4.4-19
RADIOLOGICAL PARAMETER SPECIATION RESULTS (pCi/l)

TABLE 4.4-19

PARAMETER	WELL 121	WELL 123	WELL 136	WELL 146	WELL 150	WELL 152	WELL 306	WELL 309	BATISTE SPRING	LINDLEY WELL	NEW PILOT	OLD PILOT
Gross Alpha	ND	ND	ND	ND	ND	ND	28.3 ± 4.99	77.5 ± 8.33	ND	12.9 ± 1.77	3.1 ± 0.7	ND
Gross Beta	120 ± 10.7	27.3 ± 3.5	64.9 ± 17.3	40.5 ± 2.36	1,110 ± 22.9	849 ± 20.3	60.3 ± 6.65	90.9 ± 7.68	10.4 ± 1.2	12.7 ± 1.66	4.4 ± 0.8	85 ± 5.82
Potassium-40	184 ± 82	ND	126 ± 81.2	ND	1,310 ± 143	1,190 ± 133	ND	ND	ND	ND	ND	112 ± 61.5
Radium 226	ND	2.14 ± 0.26	1.42 ± 0.56	ND	ND	ND	ND	1.39 ± 0.23	4.55 ± 0.35	1.78 ± 0.55	ND	1.56 ± 0.18
Radium 228	4.7 ± 1	ND	8.4 ± 1	1.7 ± 0.8	ND	4.5 ± 0.8	ND	ND	1.3 ± 0.4	4.2 ± 0.8	ND	ND
Uranium 233/234	ND	ND	ND	ND	ND	ND	29.4 ± 3.63	20.7 ± 2.55	1.52 ± 0.452	7.53 ± 1.12	1.99 ± 0.469	ND
Uranium 238 (alpha)	ND	ND	ND	ND	ND	1.35 ± 0.393	11.2 ± 1.59	7.17 ± 1.09	1.09 ± 0.375	3.71 ± 0.682	ND	ND

Note: No other radioisotopes were detected.

EMF RI FIGURES



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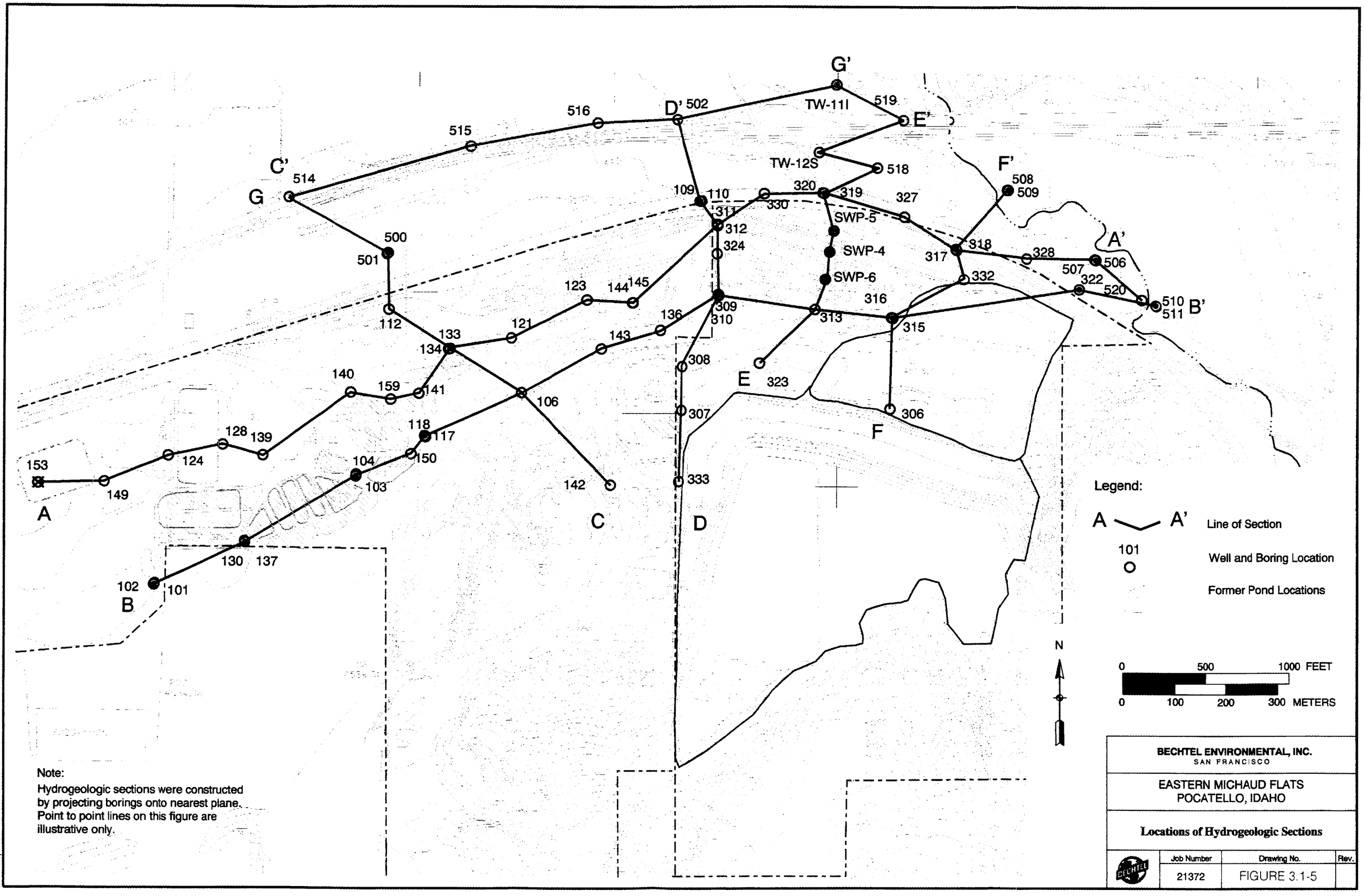

Note:
Hydrogeologic sections were constructed by projecting borings onto nearest plane. Point to point lines on this figure are illustrative only.

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Locations of Hydrogeologic Sections

Job Number	Drawing No.	Rev.
21372	FIGURE 3.1-5	

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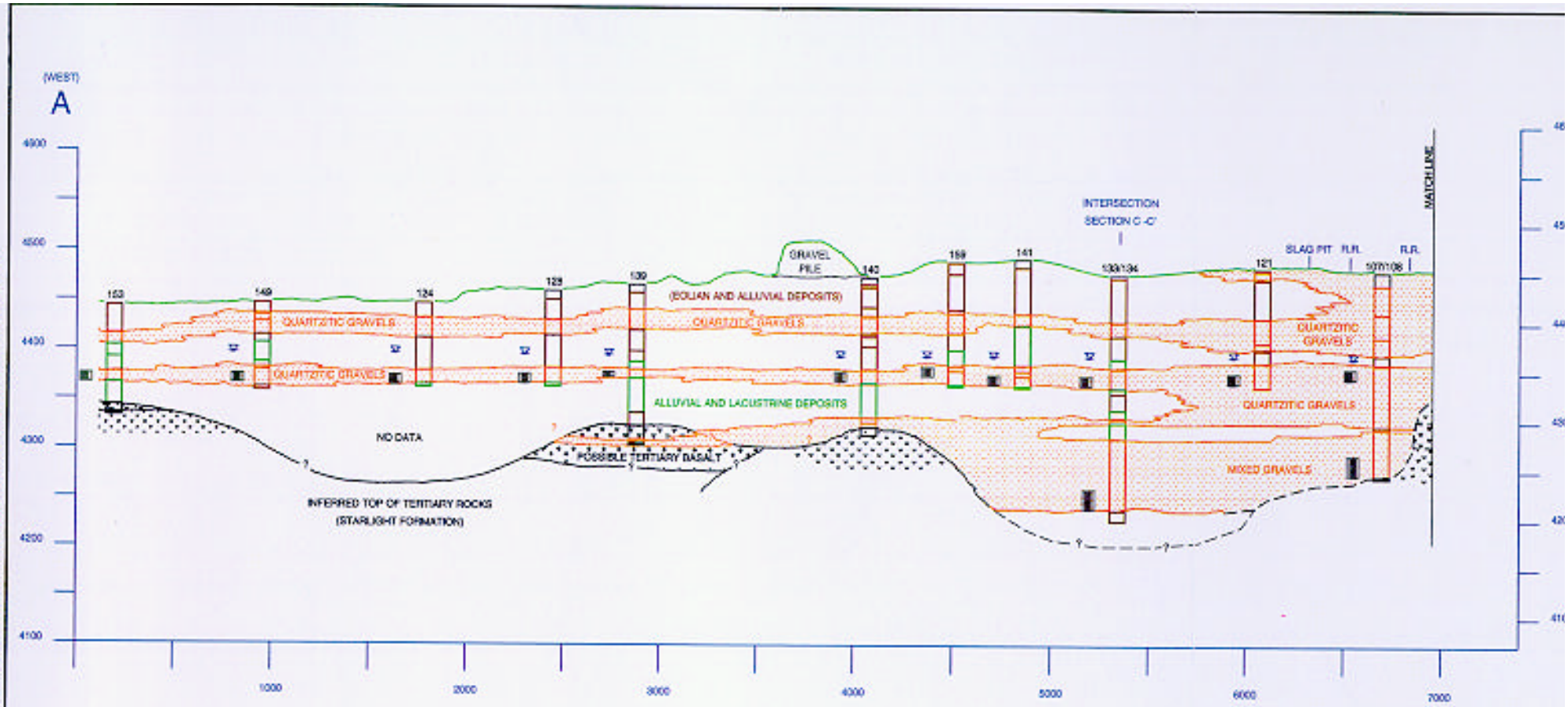
EMF emfxsqv2 1/7/94



Legend:

- Water level
- Well screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration = 5x
3) Cross-section is generalized.
See boring logs in Appendix for further details.

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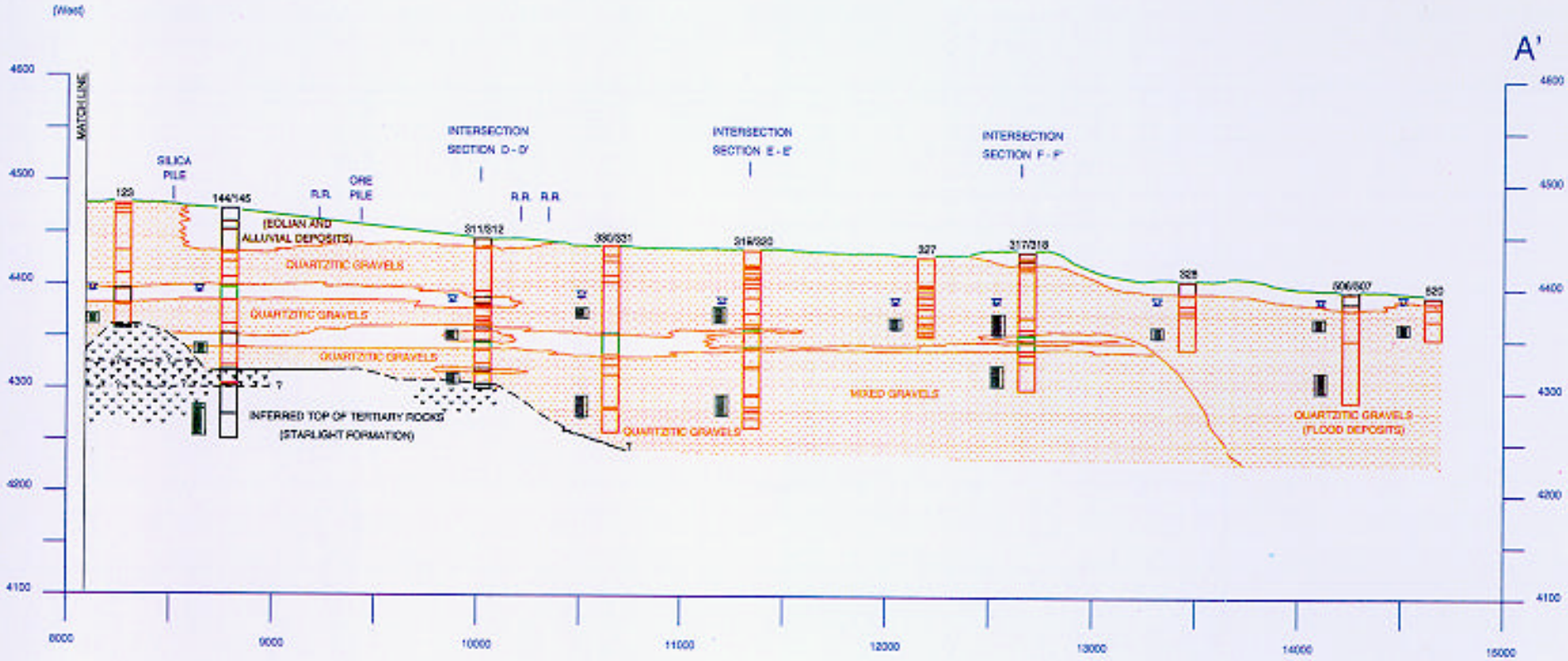
POCATELLO, IDAHO

Hydrogeologic Cross-Section A-A'
sheet 1 of 2

Job Number	Drawing No.
21372	FIGURE 3.1-6A



Legend:

- Water Level
- Well Screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration = 5x
3) Cross-section is generalized. See boring logs in Appendix for further details.

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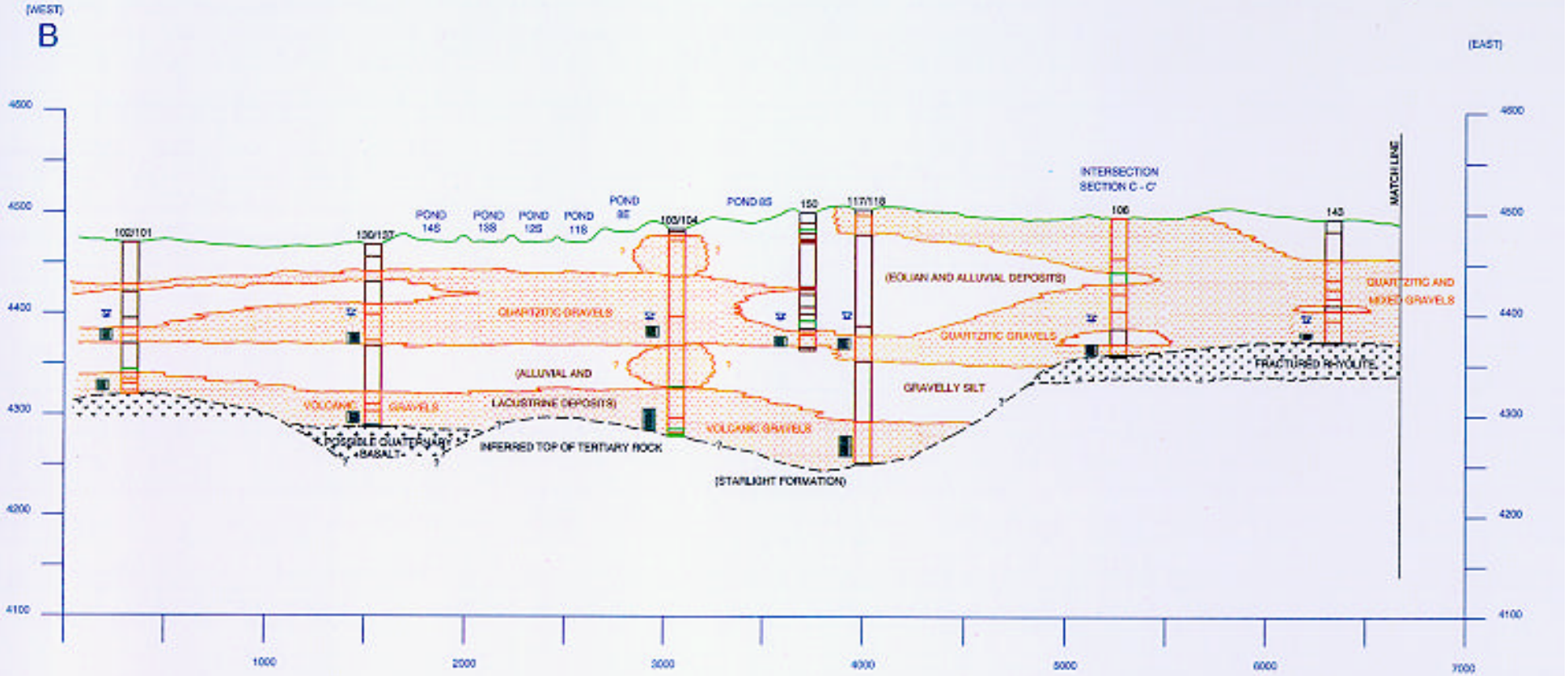
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Hydrogeologic Cross-Section A-A'
sheet 2 of 2

Job Number	Drawing No.	Re
21372	FIGURE 3.1-6B	



Legend:

- Water level
- Well screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration = 5x
3) Cross-section is generalized. See boring logs in Appendix for further details.

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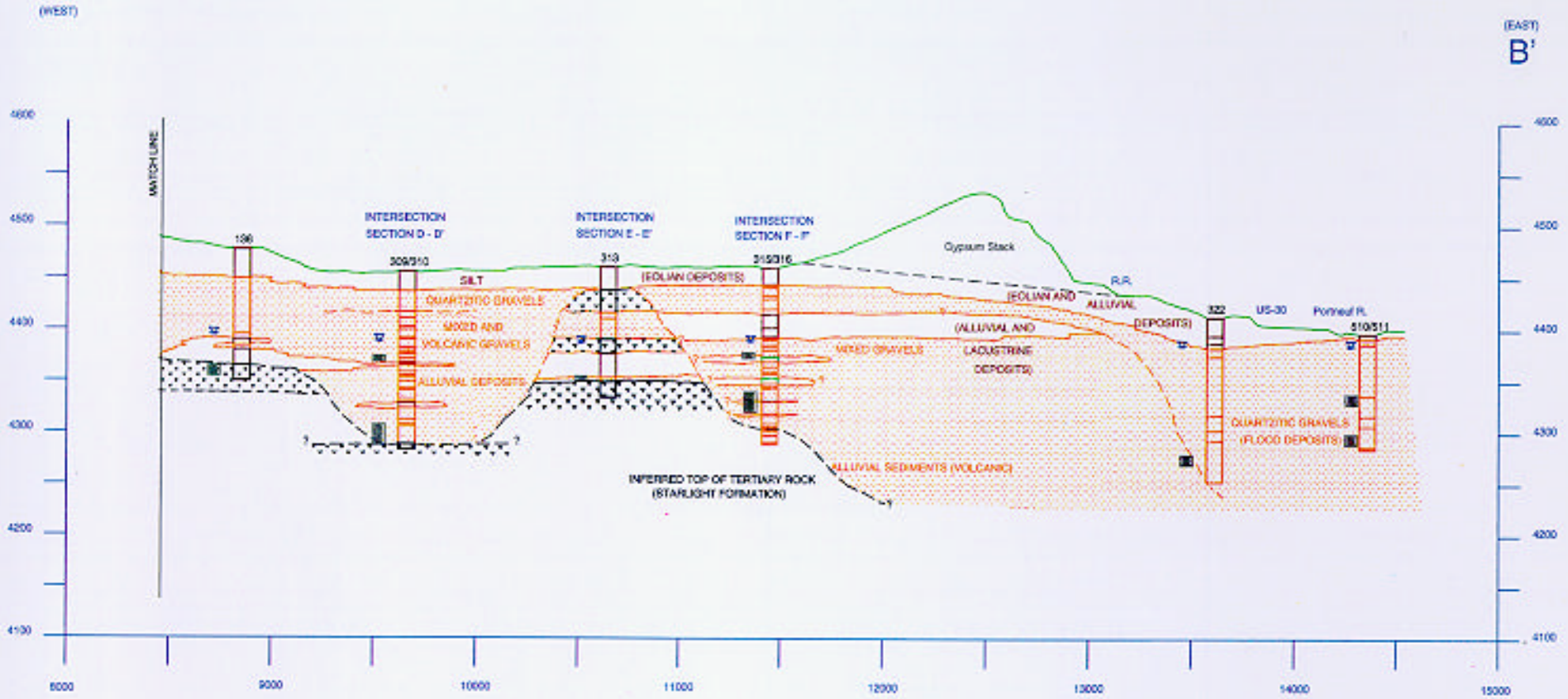
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Hydrogeologic Cross-Section B-B'
sheet 1 of 2

Job Number	Drawing No.
21372	FIGURE 3.1-7A



Legend:

- Water level
- Well screen

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GRAVELLY SAND
SILTY SAND
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SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration = 5x
3) Cross-section is generalized. See boring logs in Appendix for further details.

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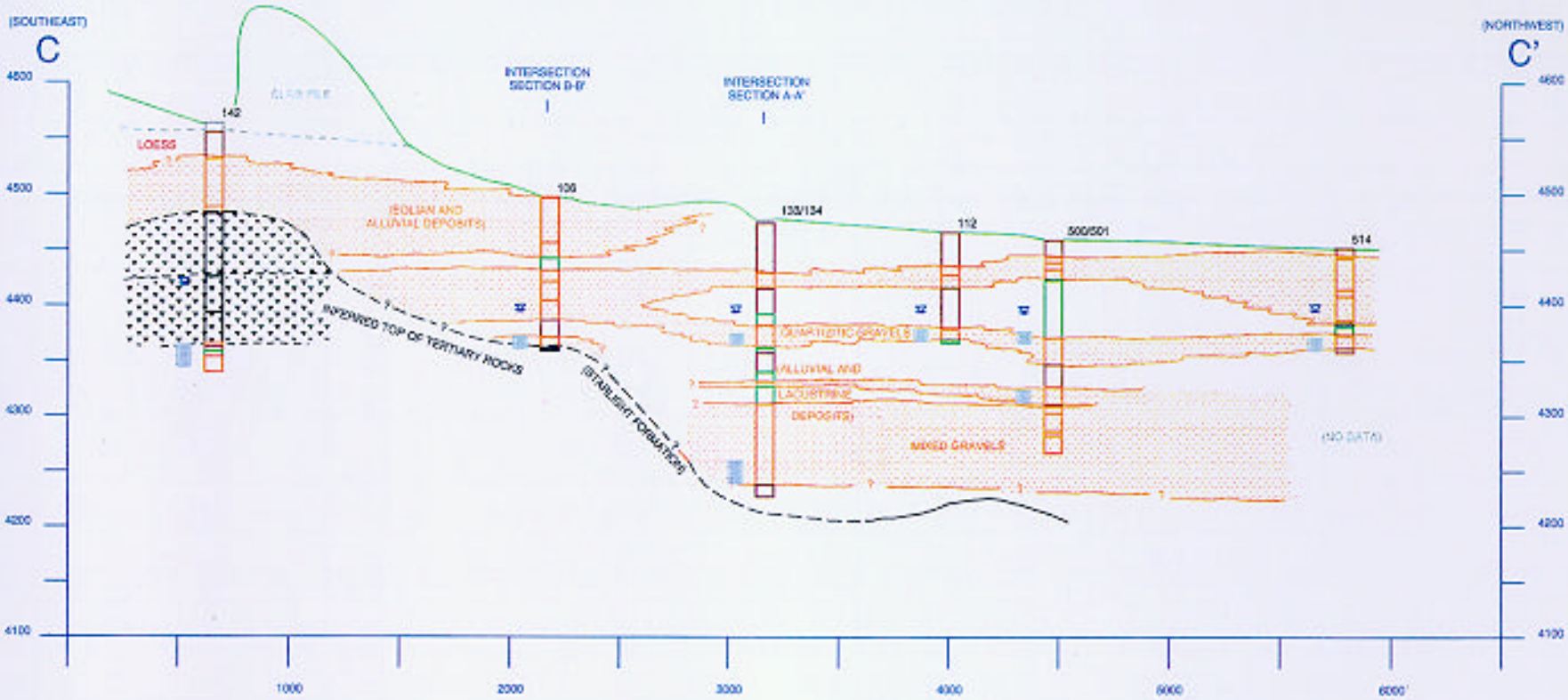
POCATELLO, IDAHO

Hydrogeologic Cross-Section B-B'
sheet 2 of 2

Job Number	Drawing No.
21372	FIGURE 3.1-7b



Notes:

1) Ground surface line is generalized.

2) Vertical exaggeration = 5x

3) Cross-section is generalized.
See boring logs in Appendix for further details.

Legend:

- Water level
- Well screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

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SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
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PEAT

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CONCRETE
FILL

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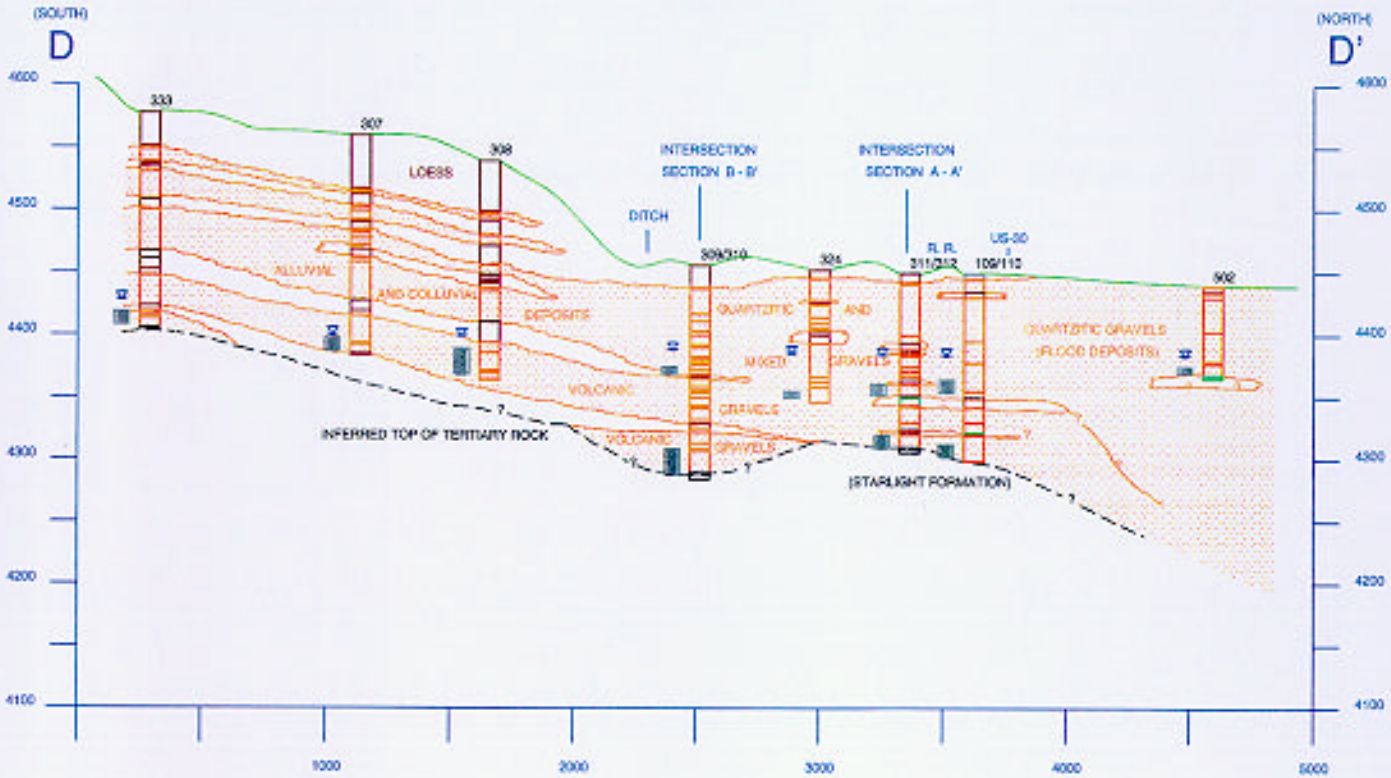
POCATELLO, IDAHO

Hydrogeologic Cross-Section C-C'

Job Number	Drawing No.
21372	FIGURE 3.1-5



Legend:

- Water level
- Well screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration =6x
3) Cross-section is generalized.
See boring logs in Appendix for further details.

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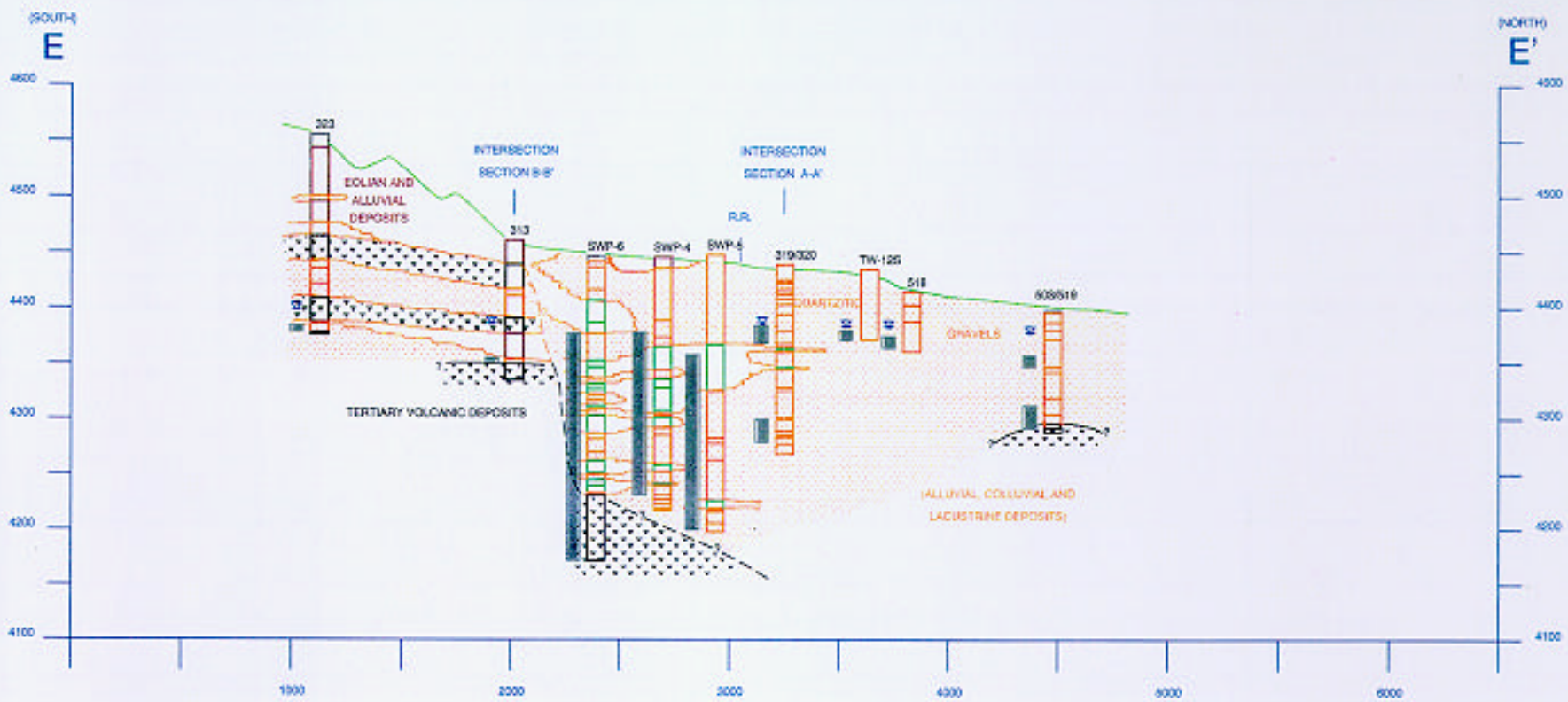
Hydrogeologic Cross-Section D-D'

Job Number	Drawing No.
21372	FIGURE 3.1-9



Legend:

- Water Level
- Well Screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration = 5x
3) Cross-section is generalized.
See boring logs in Appendix for further details.

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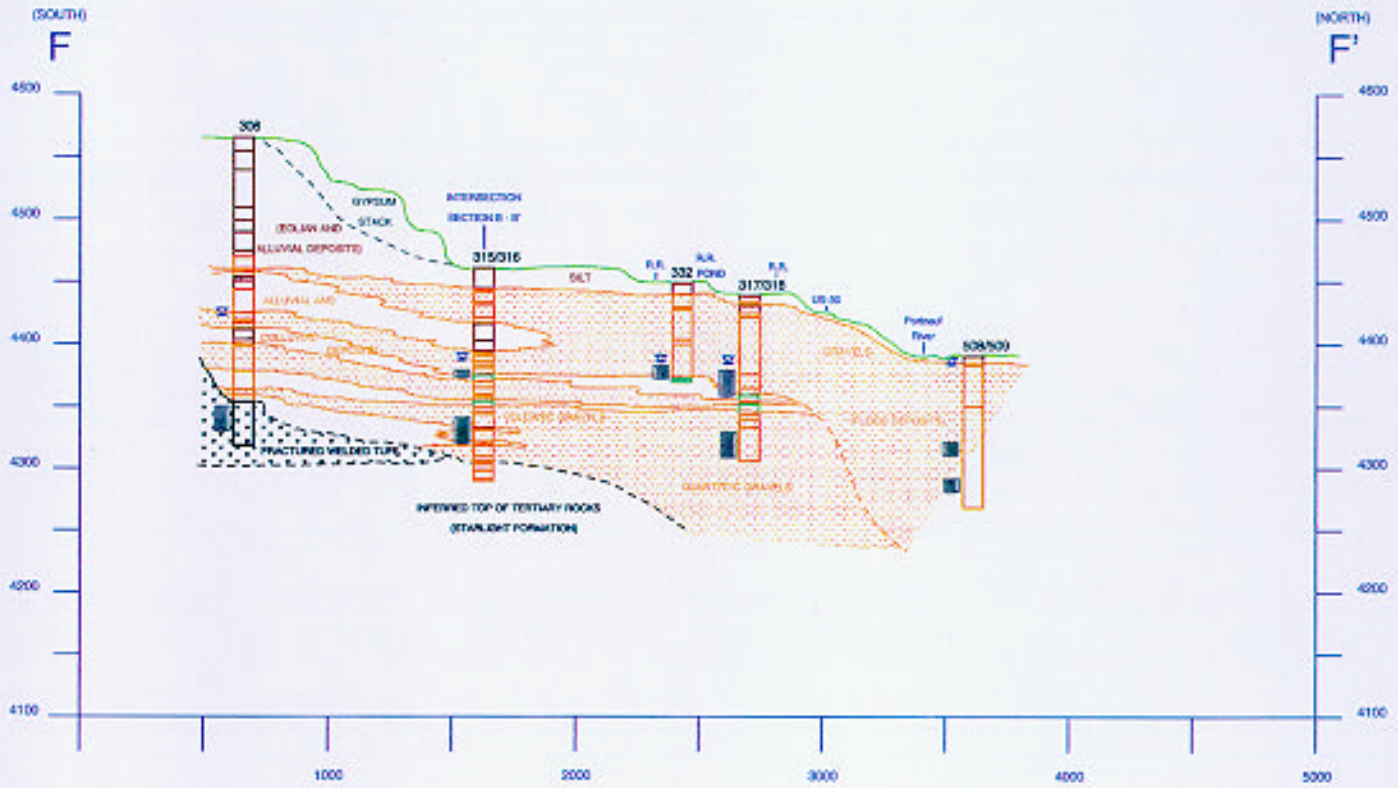
Hydrogeologic Cross-Section E-E'

Job Number	Drawing No.
21372	FIGURE 3.1-10

NOTES:

1) Ground surface line is generalized
2) Vertical exaggeration = 5x
3) Cross-section is generalized.
See boring logs in Appendix for further details.



Legend:

- Water Level
- Well Screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

SILT
CLAYEY SILT
SANDY SILT
GRAVELLY SILT

CLAY
SILTY CLAY
SANDY CLAY
GRAVELLY CLAY

BASALT
RHYOLITE
TUFF

CALICHE
PEAT

ASPHALT
CONCRETE
FILL

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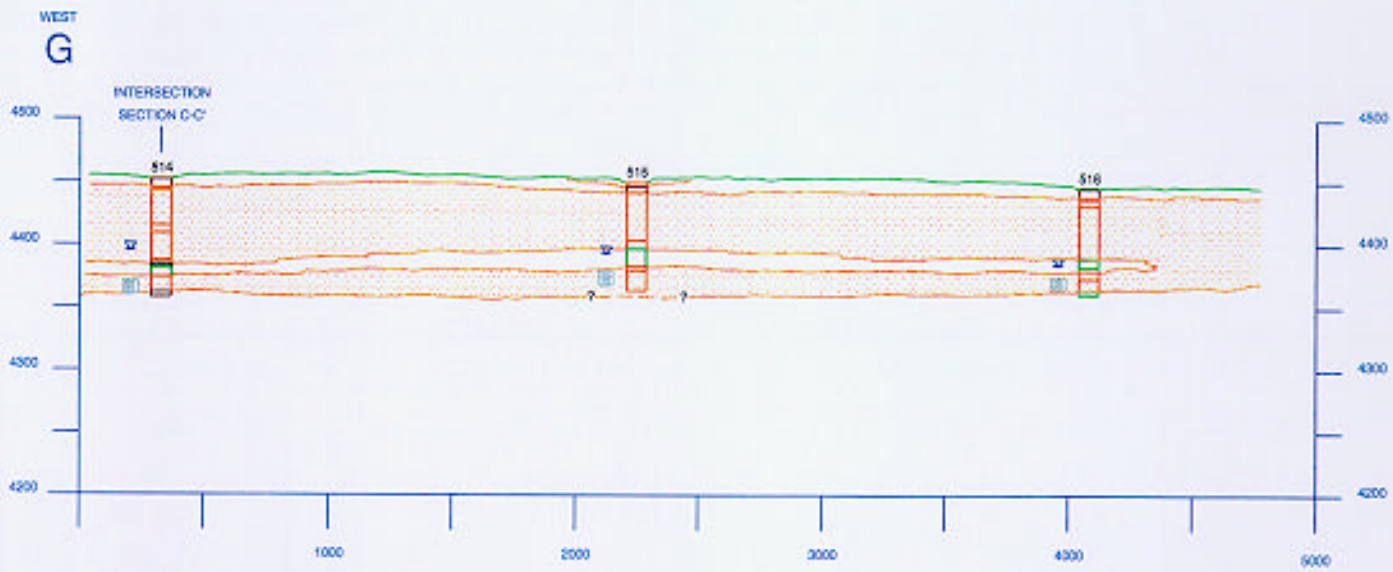
POCATELLO, IDAHO

Hydrogeologic Cross-Section F-F'

Job Number	Drawing No.
21372	FIGURE 3.1-11



Notes:

1) Ground surface line is generalized.
2) Vertical exaggeration = 5x
3) Cross-section is generalized.
See boring logs in Appendix for further details.

Legend:

Water Level
Well Screen

SAND
GRAVELLY SAND
SILTY SAND
CLAYEY SAND
SANDSTONE
GRAVEL
SAND AND GRAVEL
SILTY, SANDY GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL

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BASALT
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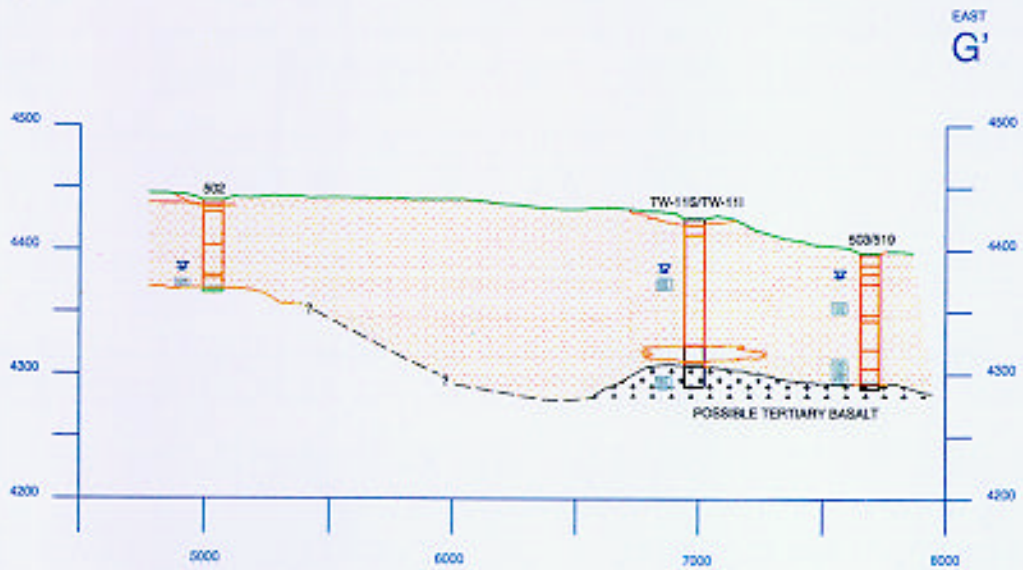
CONCRETE
FILL



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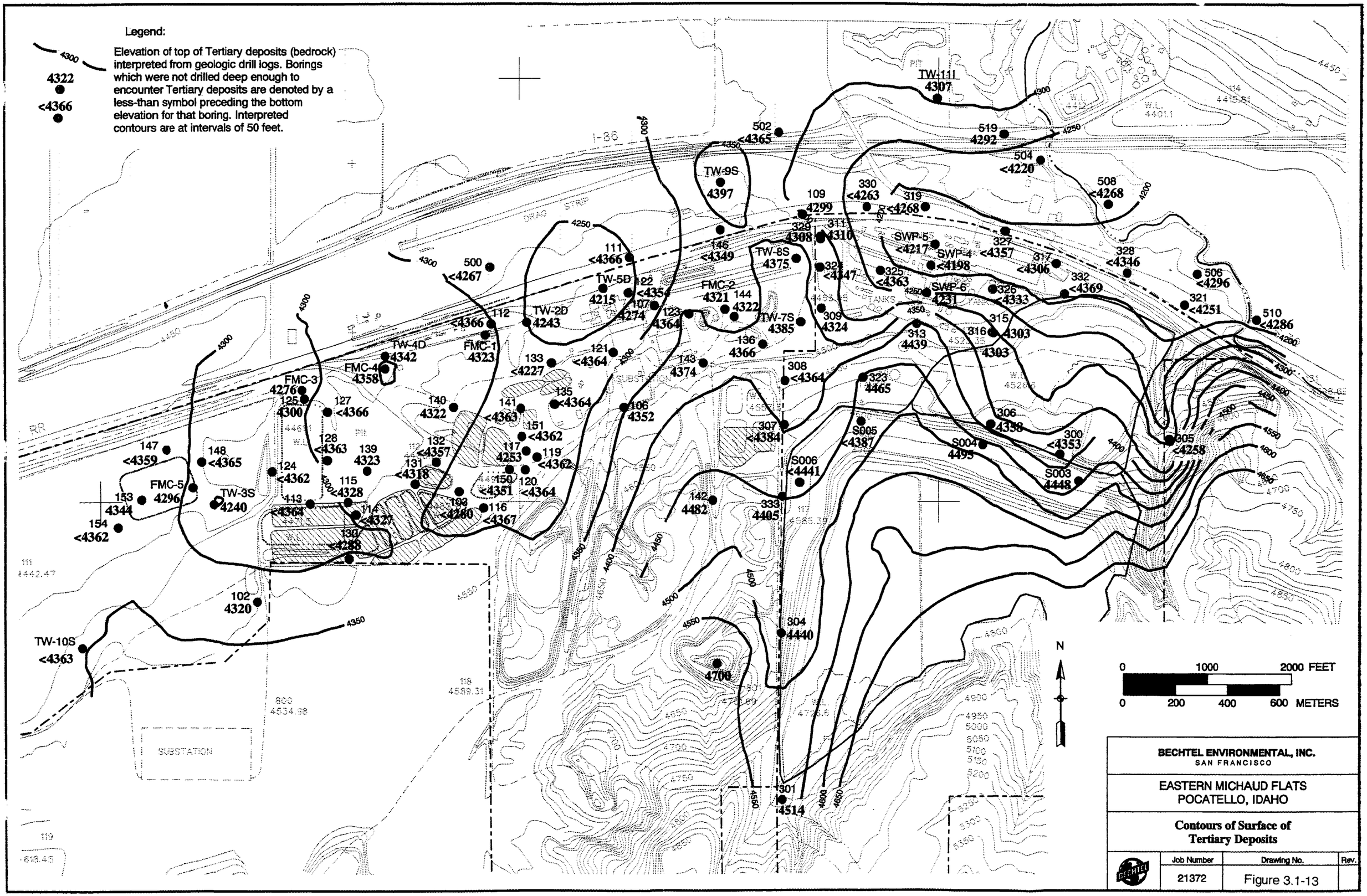
Hydrogeologic Cross-Section G-G'

Job Number	Drawing No.
21372	FIGURE 3.1-12



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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Contours of Surface of Tertiary Deposits

Job Number	Drawing No.	Rev.
21372	Figure 3.1-13	

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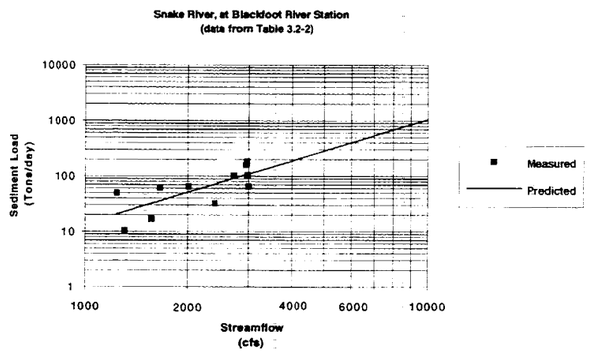
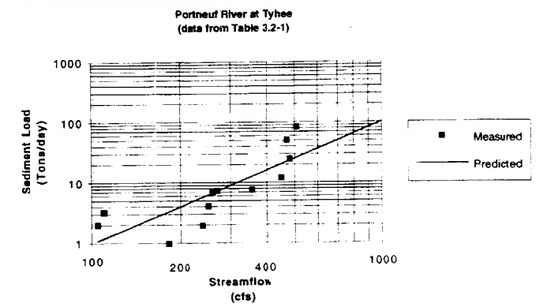
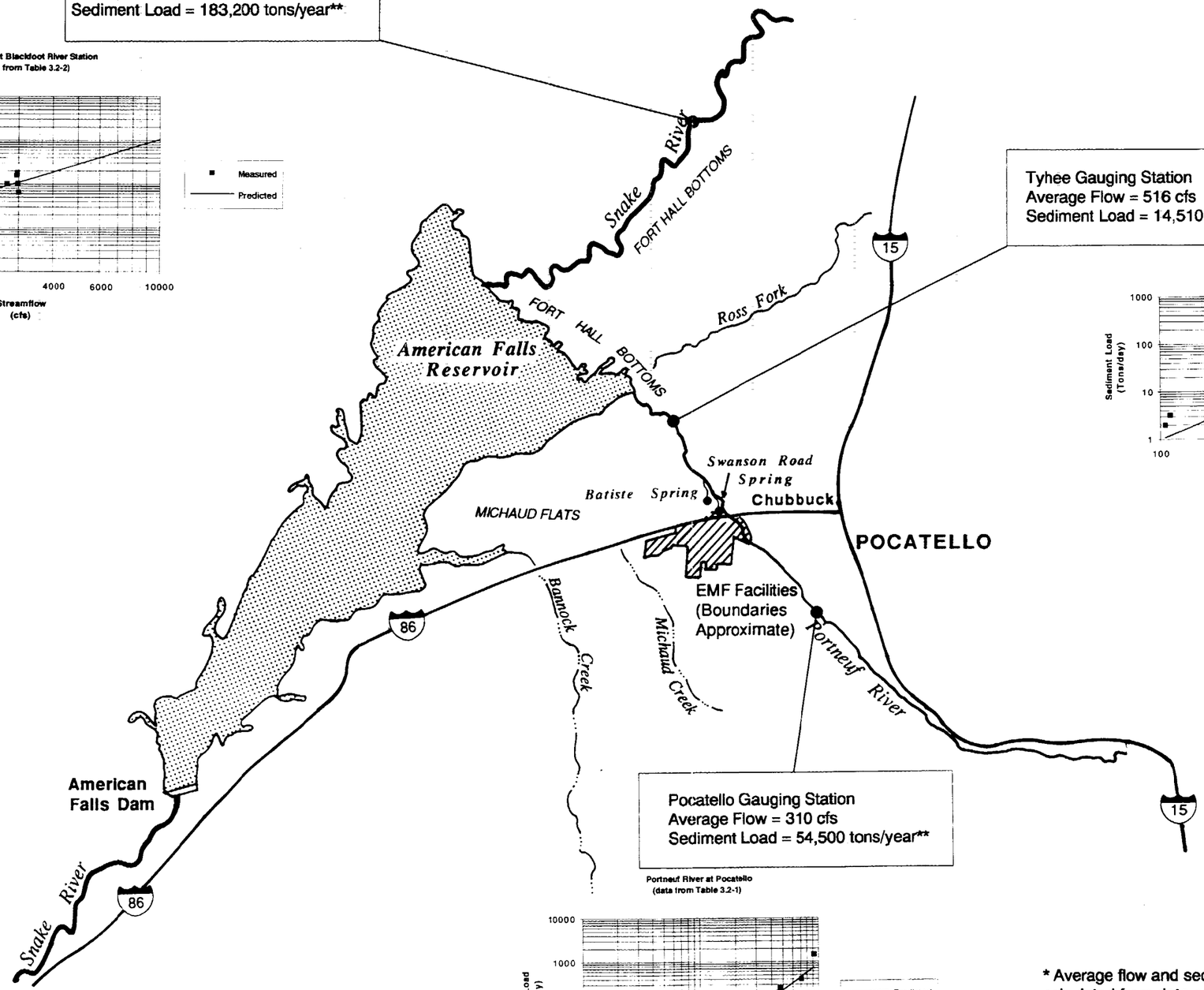
Blackfoot Gauging Station - Snake River
Average Flow = 5160 cfs
Sediment Load = 183,200 tons/year**

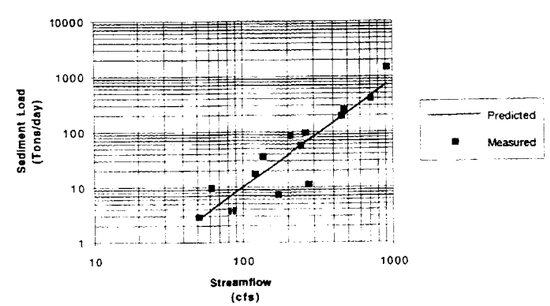


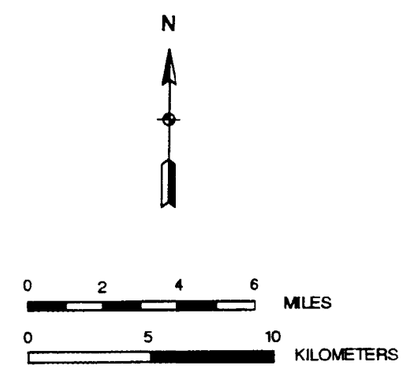
Tyhee Gauging Station
Average Flow = 516 cfs
Sediment Load = 14,510 tons/year*





Pocatello Gauging Station
Average Flow = 310 cfs
Sediment Load = 54,500 tons/year**





* Average flow and sediment load calculated from data collected from 1985-1990

** Average flow and sediment load calculated from data collected from 1950-1989

Reference: USGS Idaho Falls and Pocatello Topographic Maps, 1962 - 1:250,000 series

BECHTEL ENVIRONMENTAL, INC.
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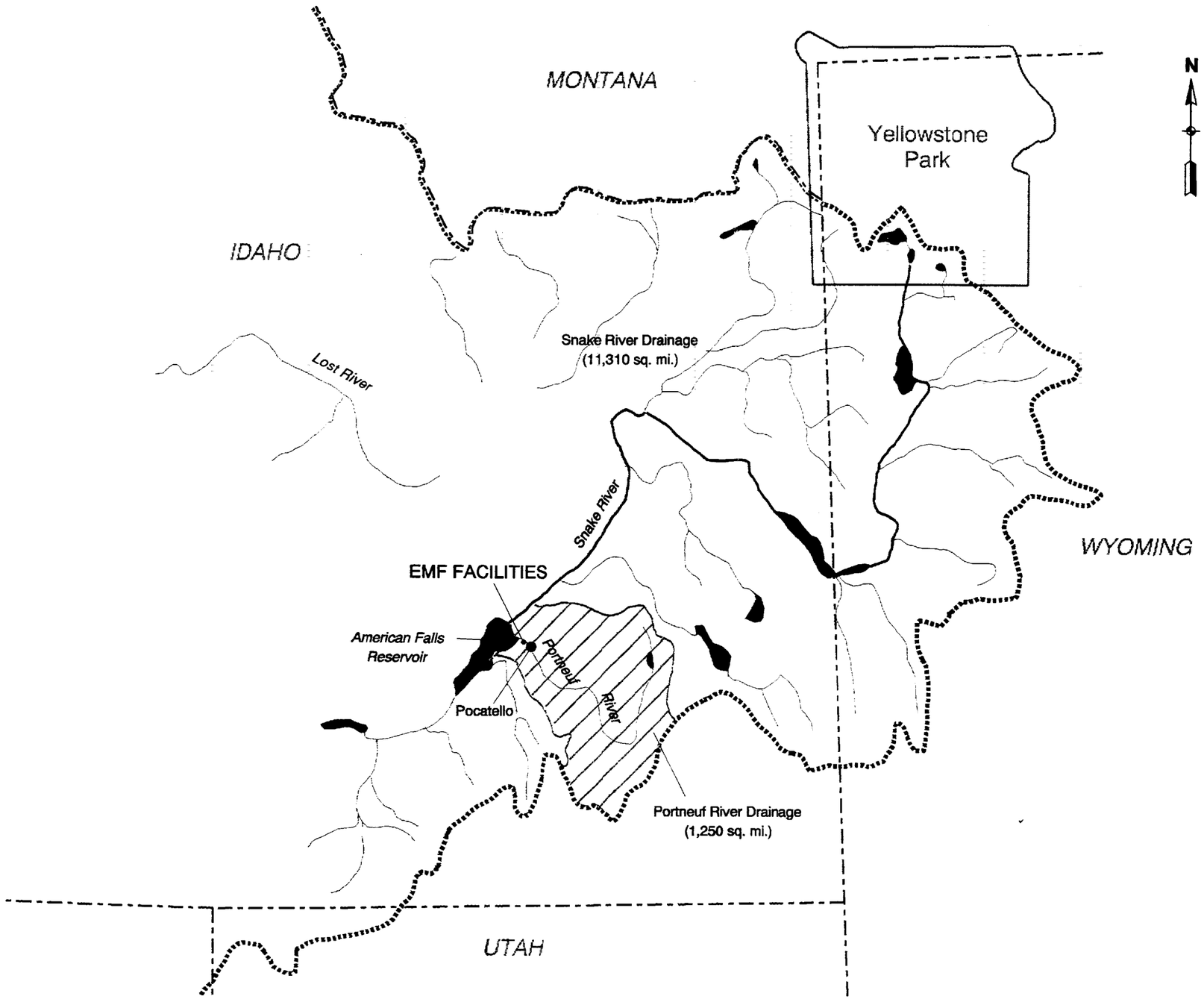
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

American Falls Reservoir and Environs

Job Number	Drawing No.	Rev.
21372	FIGURE 3.2-1	



Legend:

- Rivers
- Portneuf River Drainage
- Snake River Drainage
- State boundaries

Reference: USGS Water Supply Paper 657, Plate 1

0 25 50 75 MILES

0 25 50 75 KM

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Drainage Basins of Snake and Portneuf Rivers

Job Number	Drawing No.	Rev.
21372	FIGURE 3.2-2	

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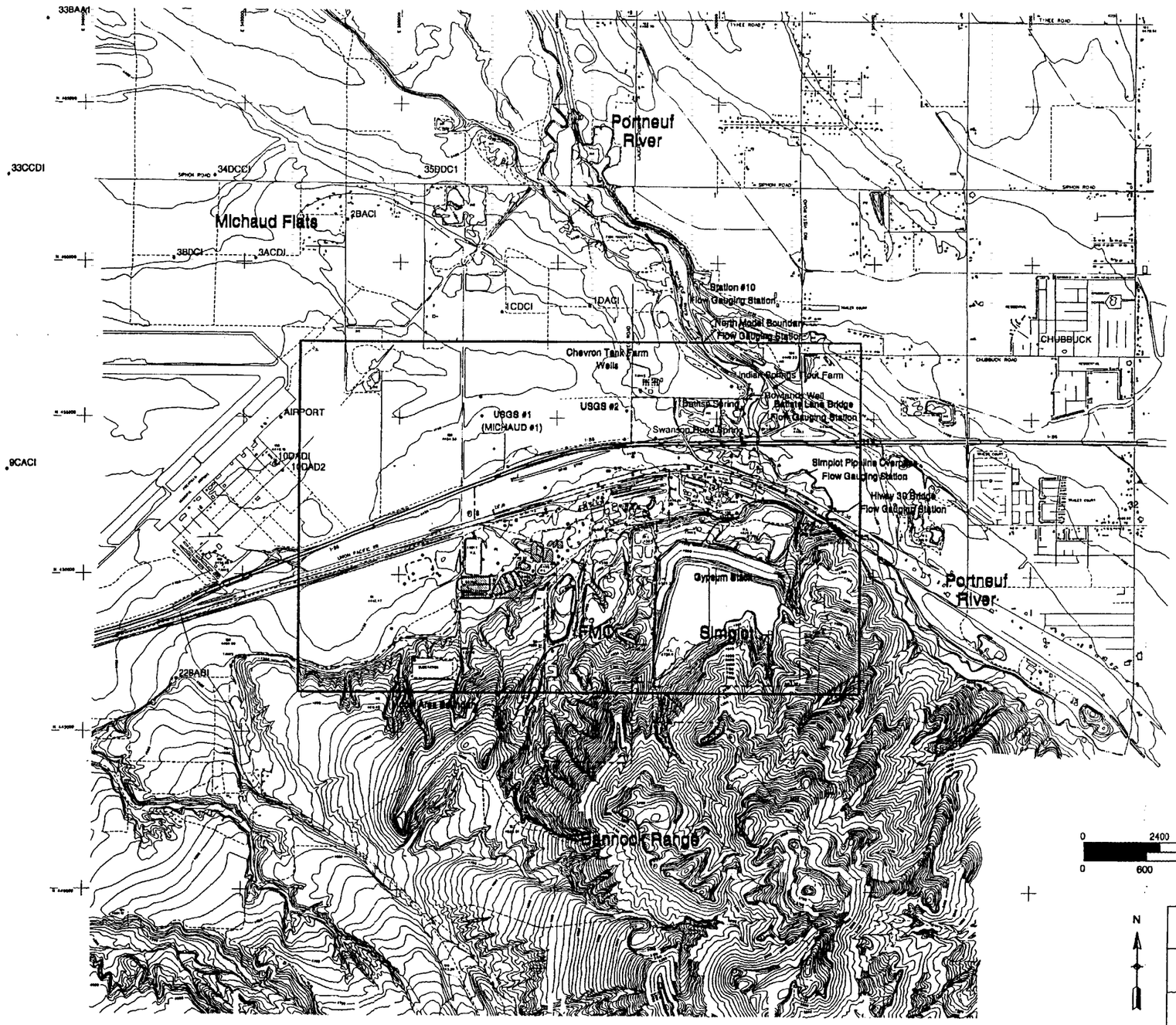

Legend

35DDC1 • Boring and Well Locations
(See Figure 3.3-3 for Base Map & Well Designations Within Model Boundary)

Old Ponds (FMC)

Model Boundary

EMF Property Boundary

BECHTEL ENVIRONMENTAL, INC.
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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

EMF Flow Model Study Area

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-2	

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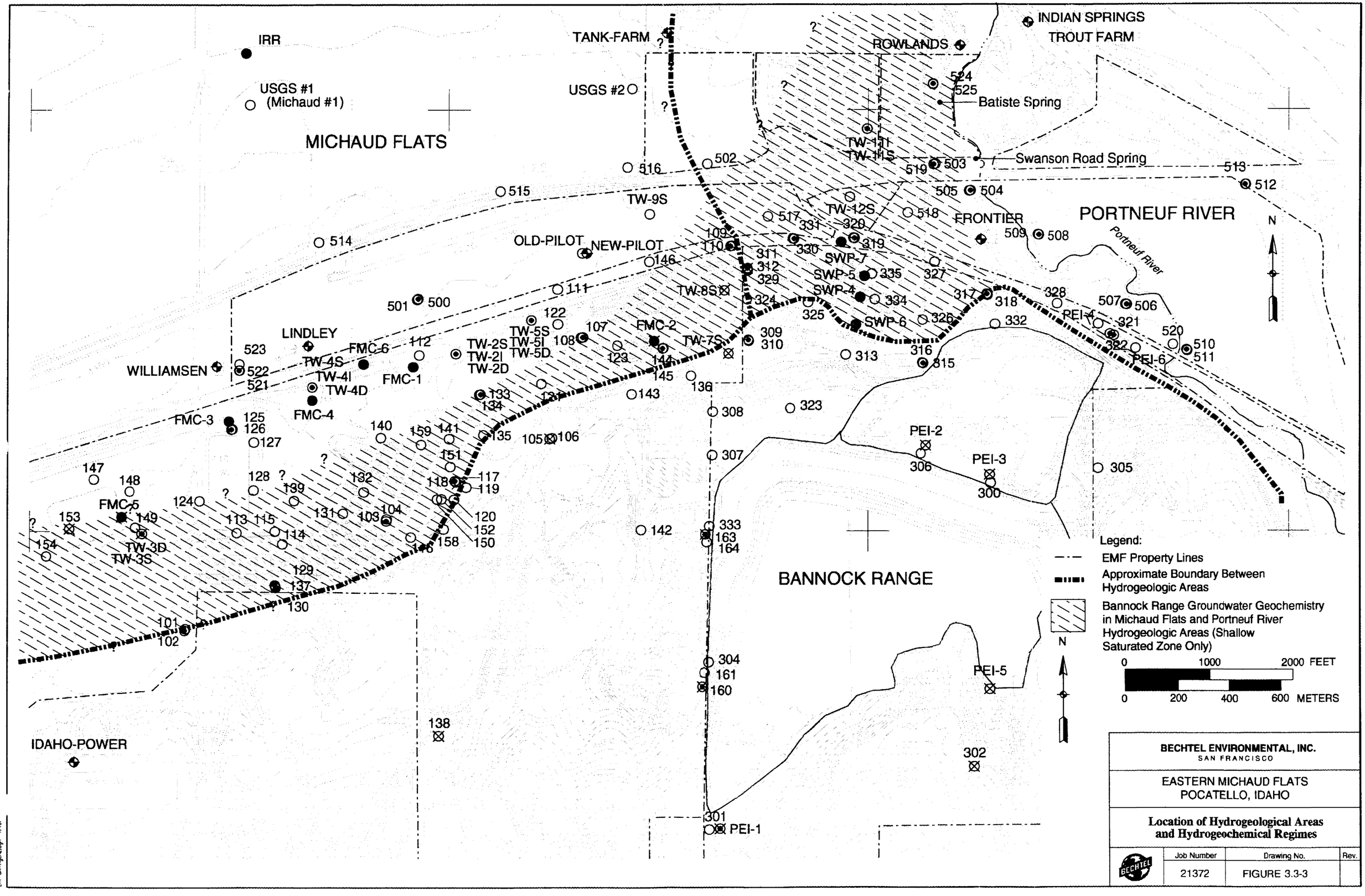

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Location of Hydrogeological Areas and Hydrogeochemical Regimes

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-3	

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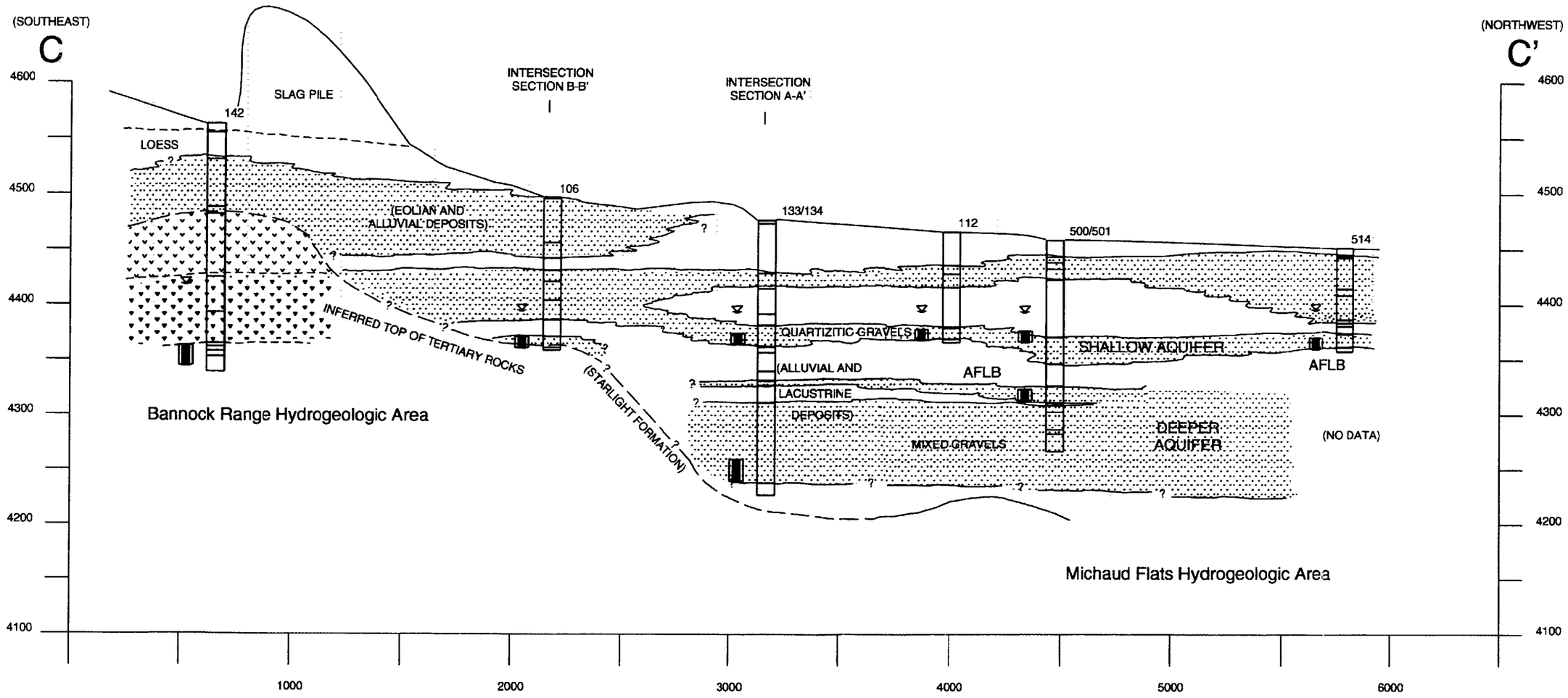

Notes:

1) Ground surface line generalized.
2) Vertical exaggeration = 5x
3) Cross-section is generalized. See boring logs in Appendix for further details.
4) Cross-section lines are shown in Figure 3.1-5.
5) AFLB = American Falls Lake Beds

Legend:

- Water level
- Well screen

SAND, GRAVELLY SAND, SILTY SAND, CLAYEY SAND, SANDSTONE, GRAVEL, SAND AND GRAVEL, SILTY, SANDY GRAVEL, SILTY GRAVEL, CLAYEY GRAVEL

SILT, CLAYEY SILT, SANDY SILT, GRAVELLY SILT

CLAY, SILTY CLAY, SANDY CLAY, GRAVELLY CLAY

BASALT, RHYOLITE, TUFF

CALICHE, PEAT

ASPHALT, CONCRETE, FILL

BECHTEL ENVIRONMENTAL, INC.
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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Hydrogeologic Cross-Section C-C'

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-4	

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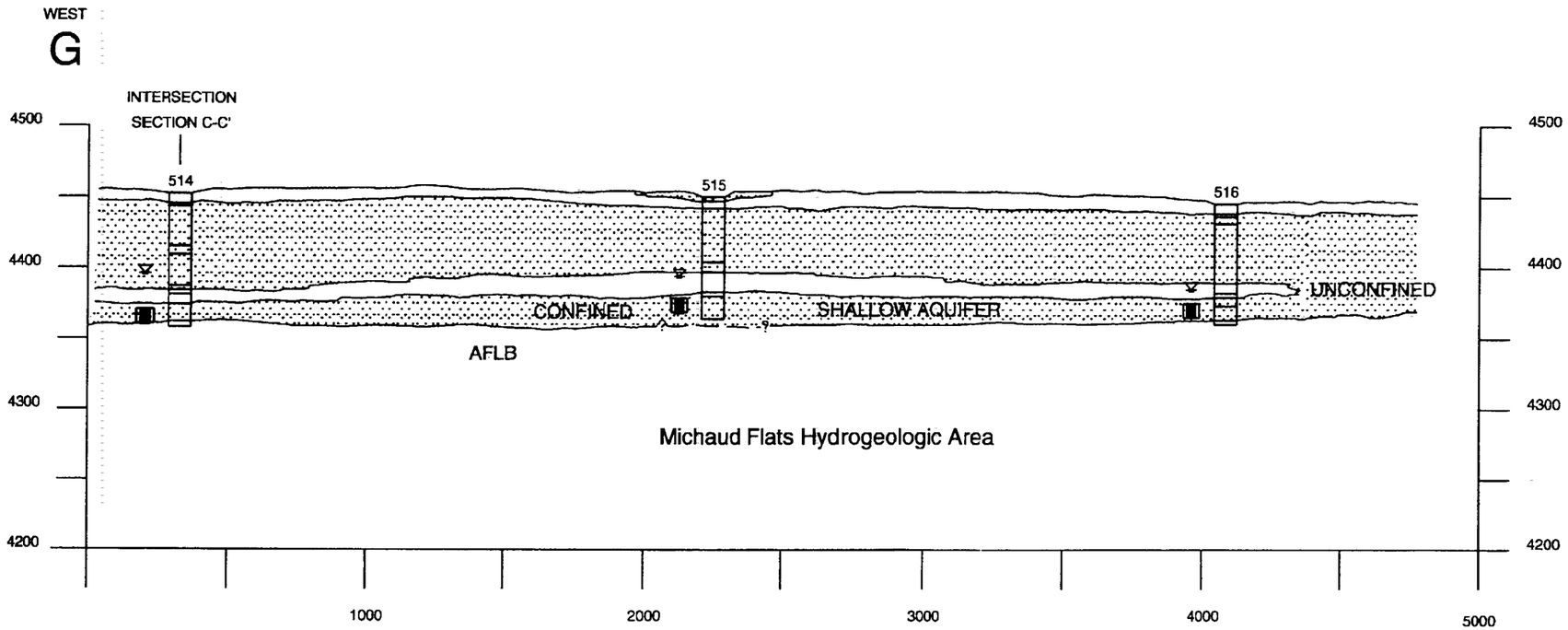
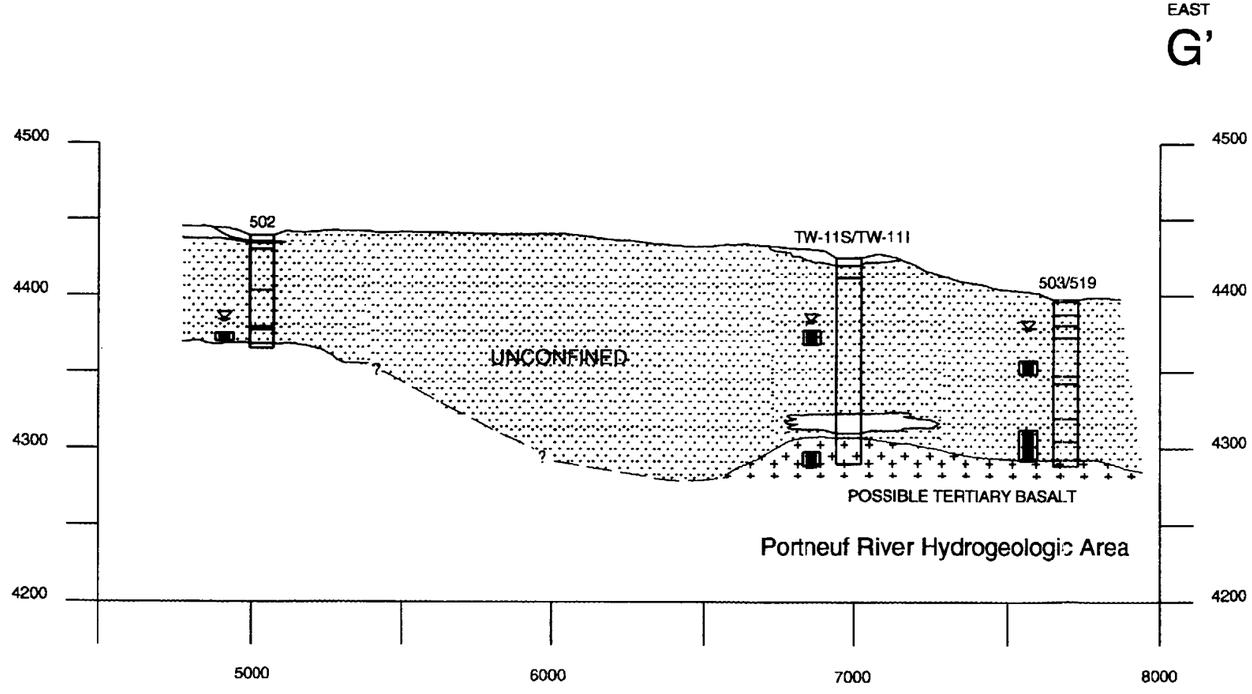


Notes:

1) Ground surface line is generalized.
2) Vertical exaggeration = 5x
3) Cross-section is generalized. See boring logs in Appendix for further details.
4) Cross-section lines are shown in Figure 3.1-5.
5) AFLB = American Falls Lake Beds

Legend:

- Water Level
- Well Screen



- SAND
- GRAVELLY SAND
- SILTY SAND
- CLAYEY SAND
- SANDSTONE
- GRAVEL
- SAND AND GRAVEL
- SILTY, SANDY GRAVEL
- SILTY GRAVEL
- CLAYEY GRAVEL
- SILT
- CLAYEY SILT
- SANDY SILT
- GRAVELLY SILT
- CLAY
- SILTY CLAY
- SANDY CLAY
- GRAVELLY CLAY
- BASALT
- RHYOLITE
- TUFF
- CALICHE
- PEAT
- ASPHALT
- CONCRETE
- FILL

BECHTEL ENVIRONMENTAL, INC.
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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Hydrogeologic Cross-Section G-G'

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-5	

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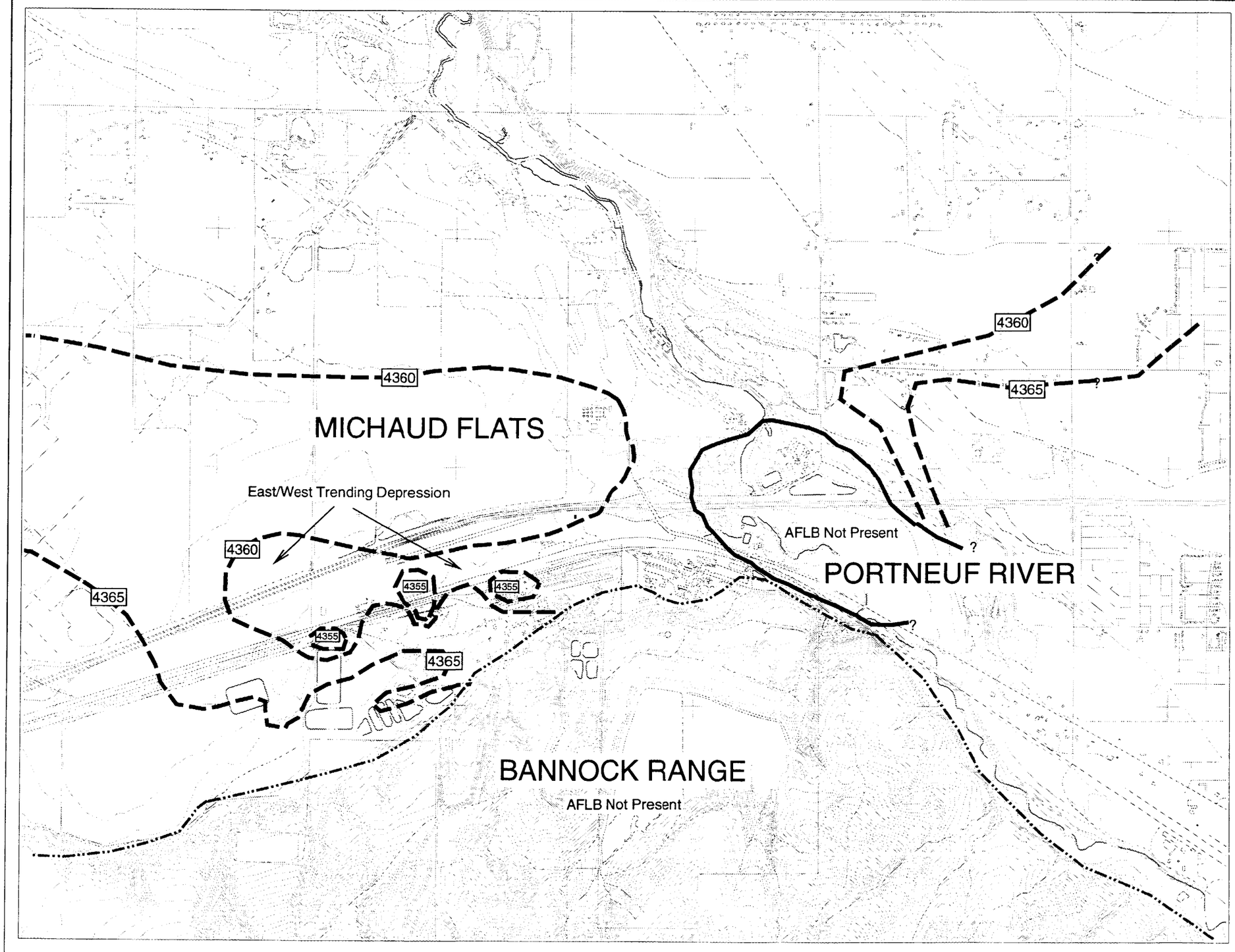


EXPLANATION

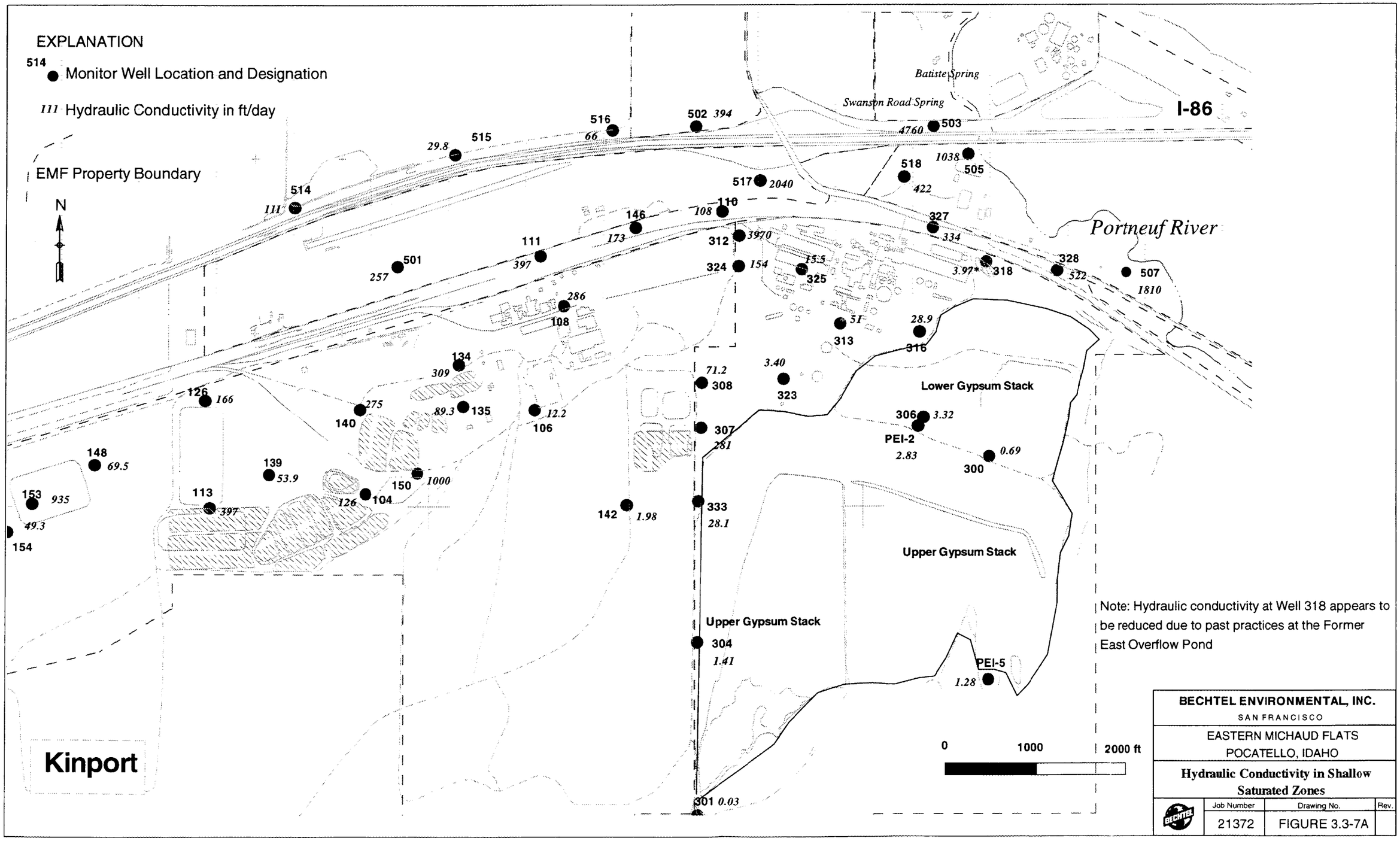
Elevation Contour on Top Surface of AFLB (in feet above msl)

4360

0 2500 5000 feet

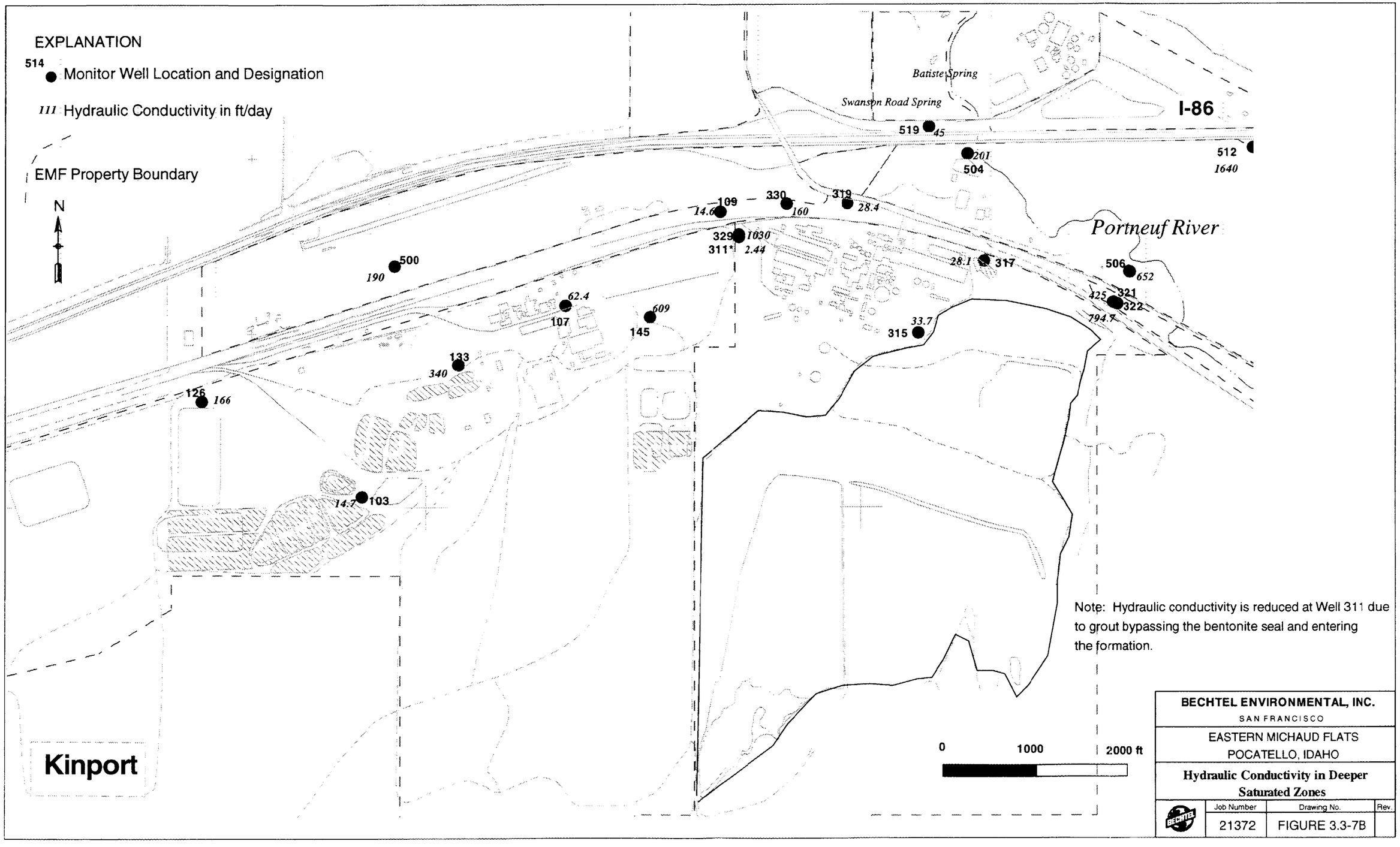
N

BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO		
EASTERN MICHAUD FLATS POCATELLO, IDAHO		
Configuration of American Falls Lake Beds		
Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-6	

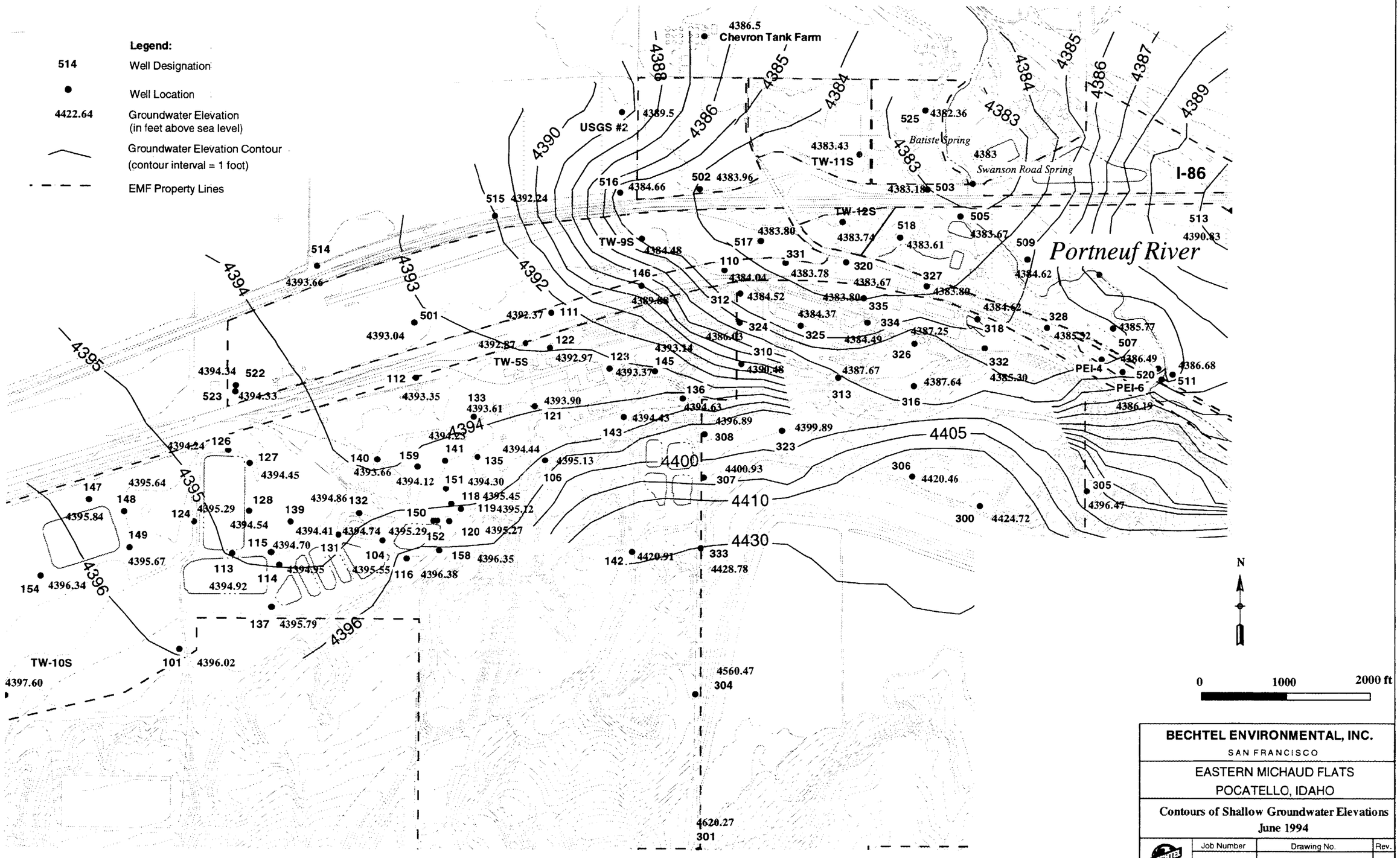


Note: Hydraulic conductivity at Well 318 appears to be reduced due to past practices at the Former East Overflow Pond

BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO			
EASTERN MICHAUD FLATS POCATELLO, IDAHO			
Hydraulic Conductivity in Shallow Saturated Zones			
	Job Number	Drawing No.	Rev.
	21372	FIGURE 3.3-7A	



BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO			
EASTERN MICHAUD FLATS POCATELLO, IDAHO			
Hydraulic Conductivity in Deeper Saturated Zones			
	Job Number	Drawing No.	Rev.
	21372	FIGURE 3.3-7B	



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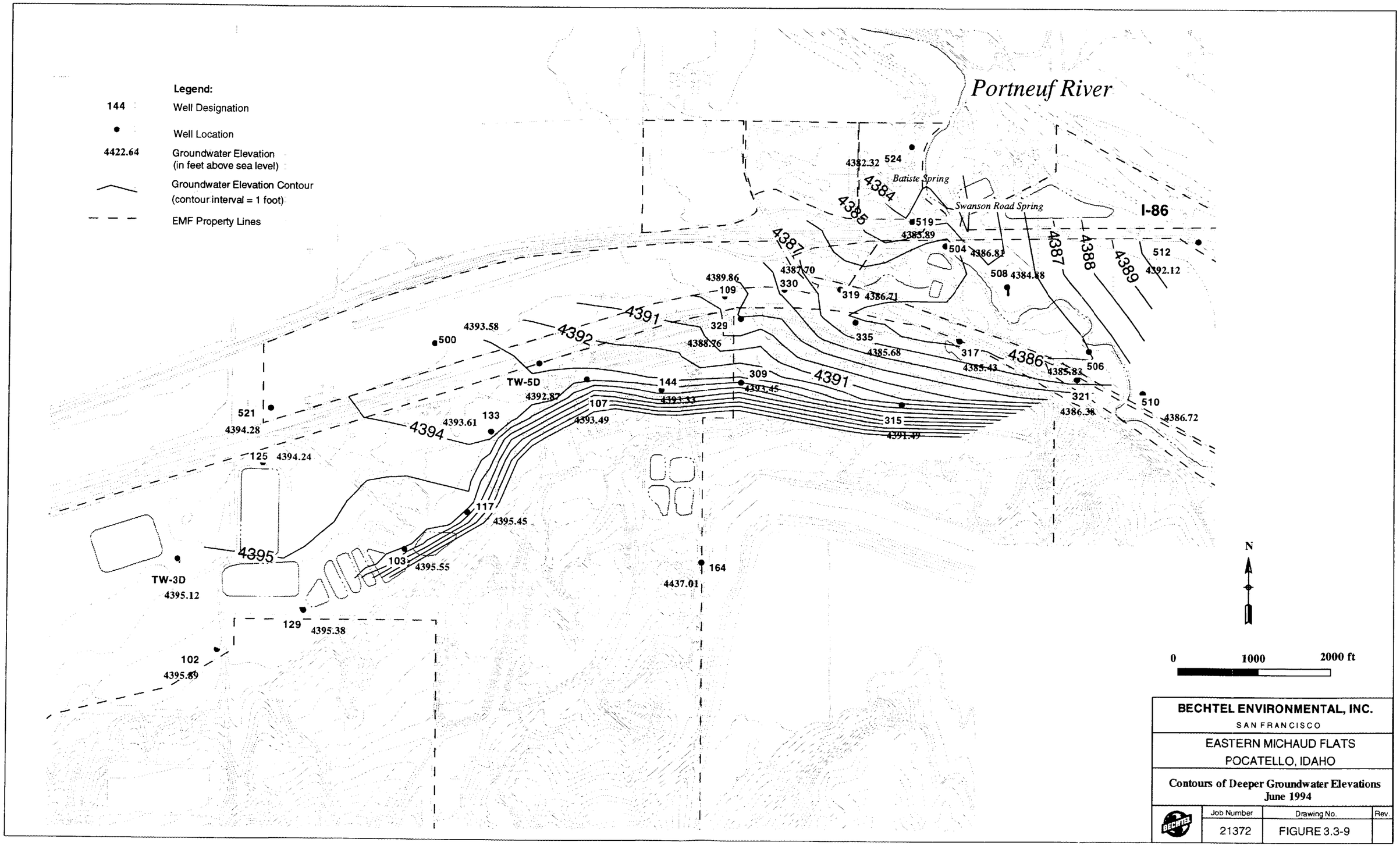
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Contours of Shallow Groundwater Elevations
June 1994

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-8F	



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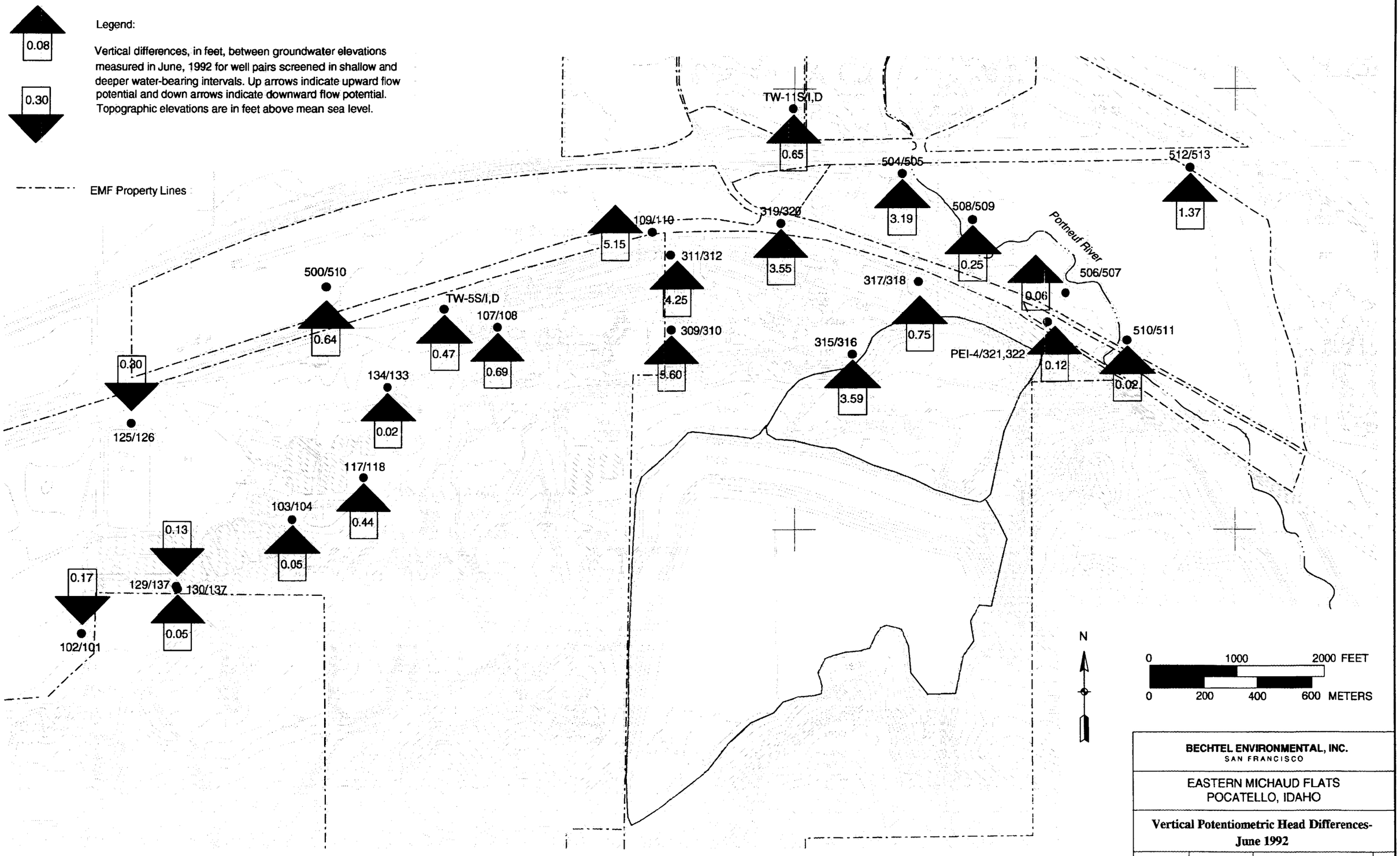
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Contours of Deeper Groundwater Elevations
June 1994

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-9	



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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences-June 1992

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10A	

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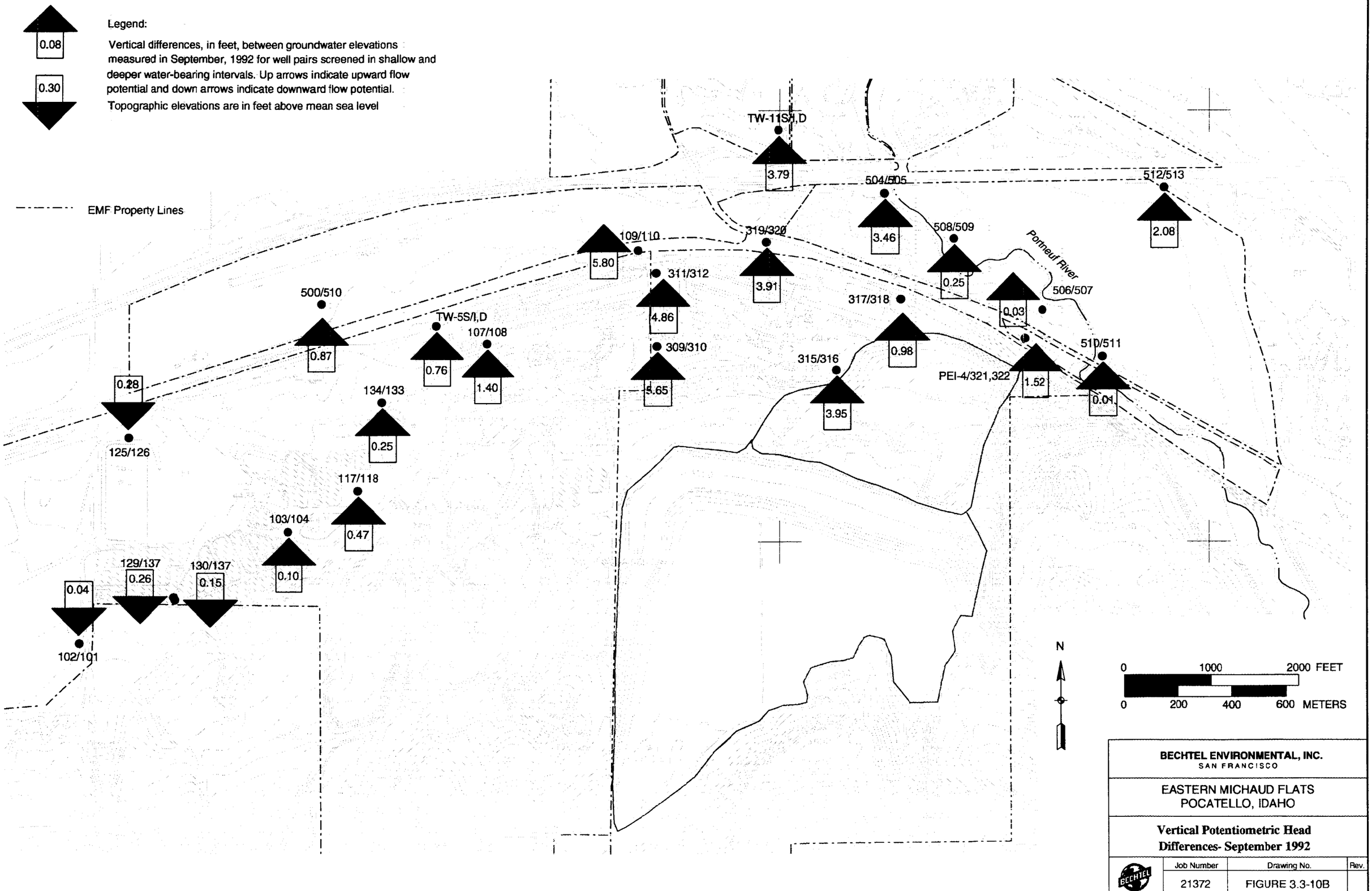

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences- September 1992

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10B	

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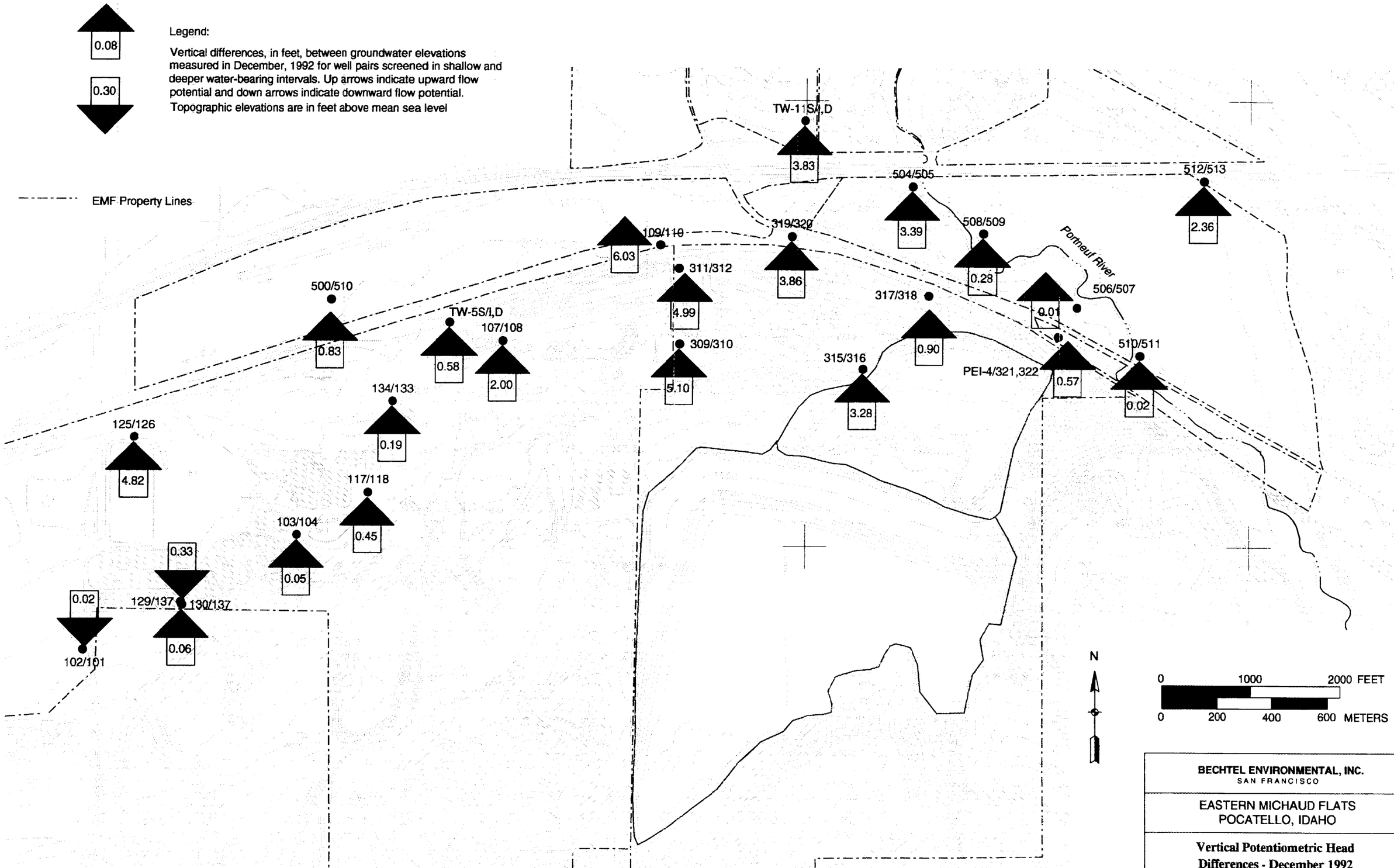

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences - December 1992

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10C	

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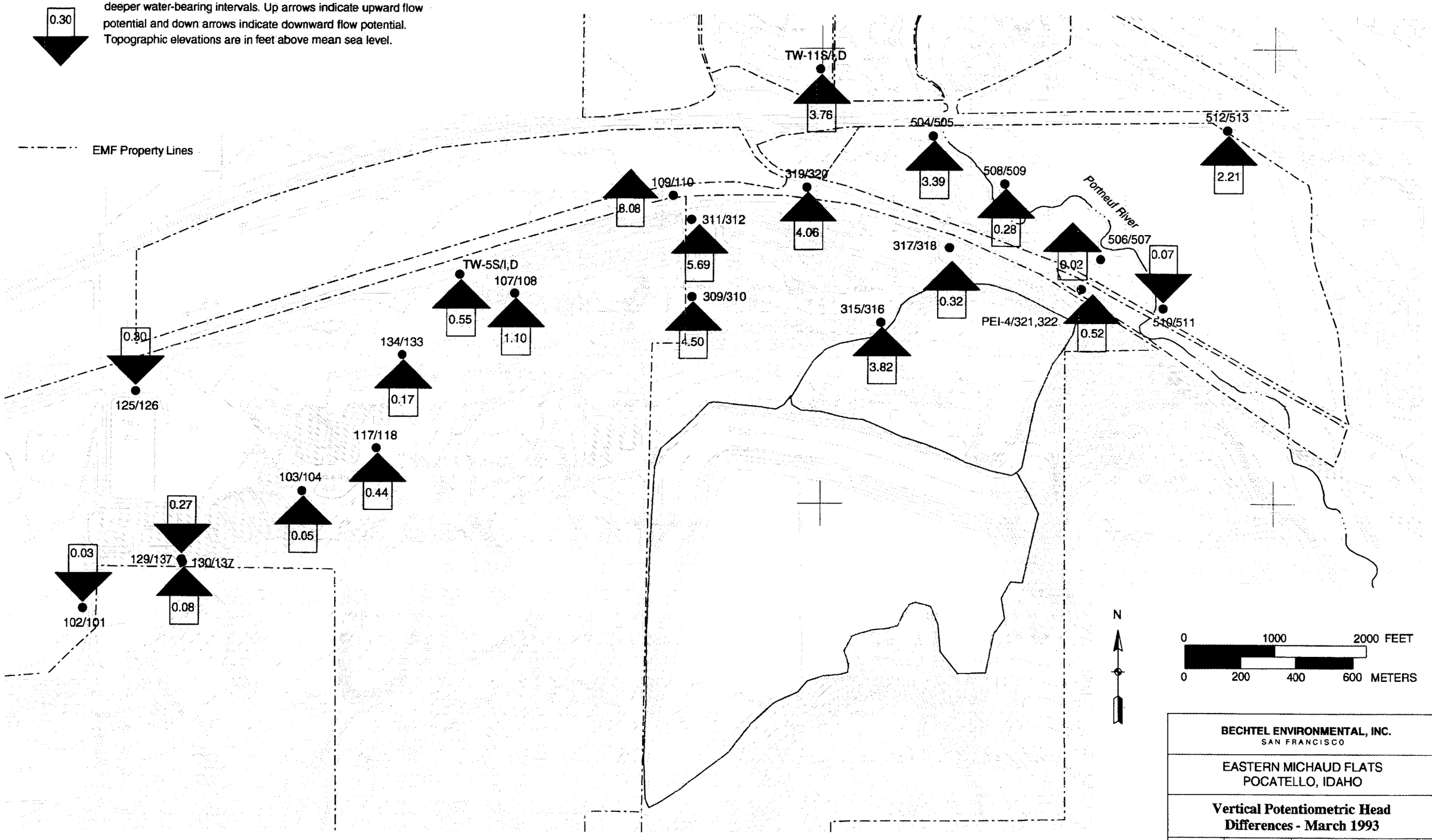

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences - March 1993

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10D	

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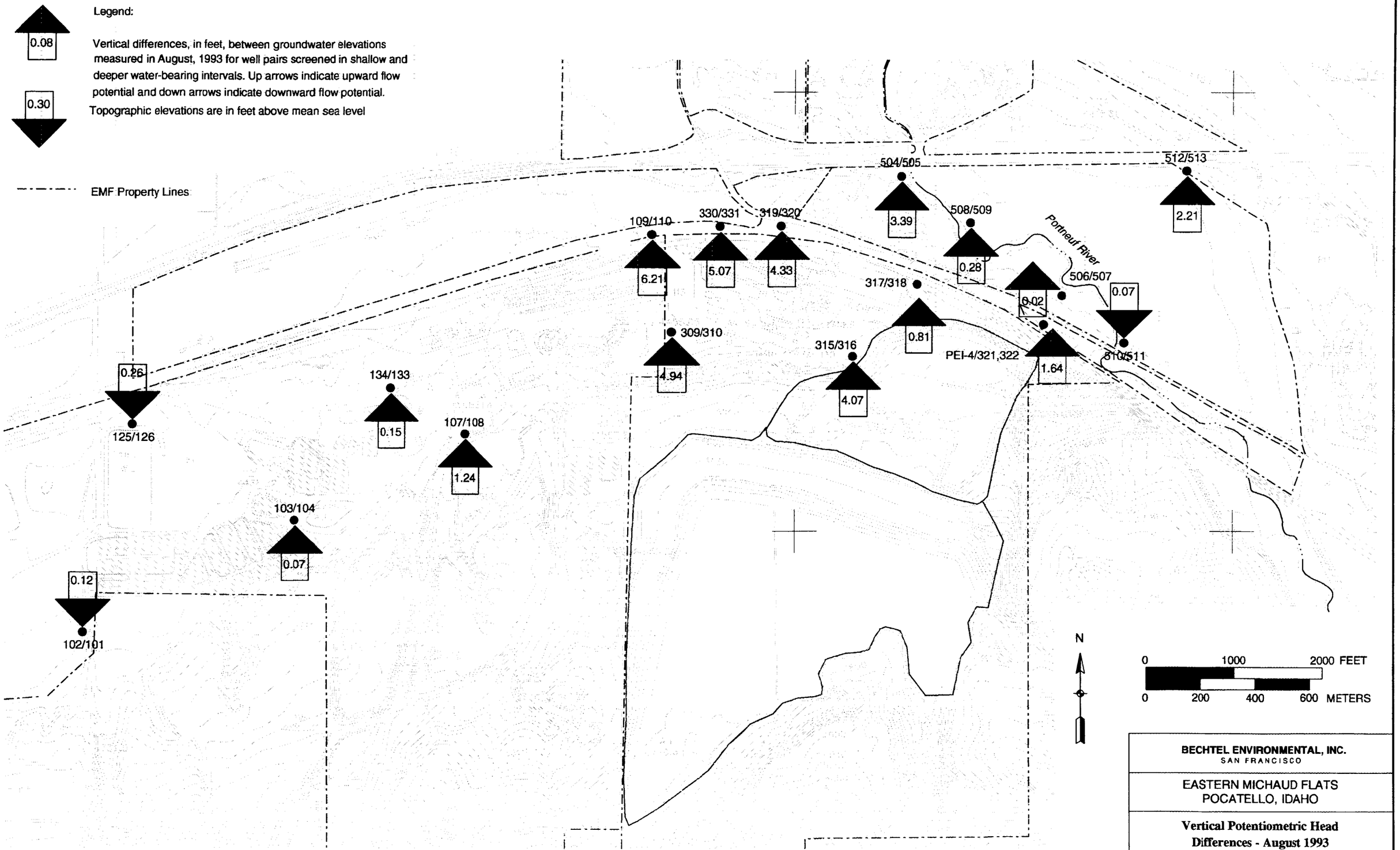

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences - August 1993

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10E	

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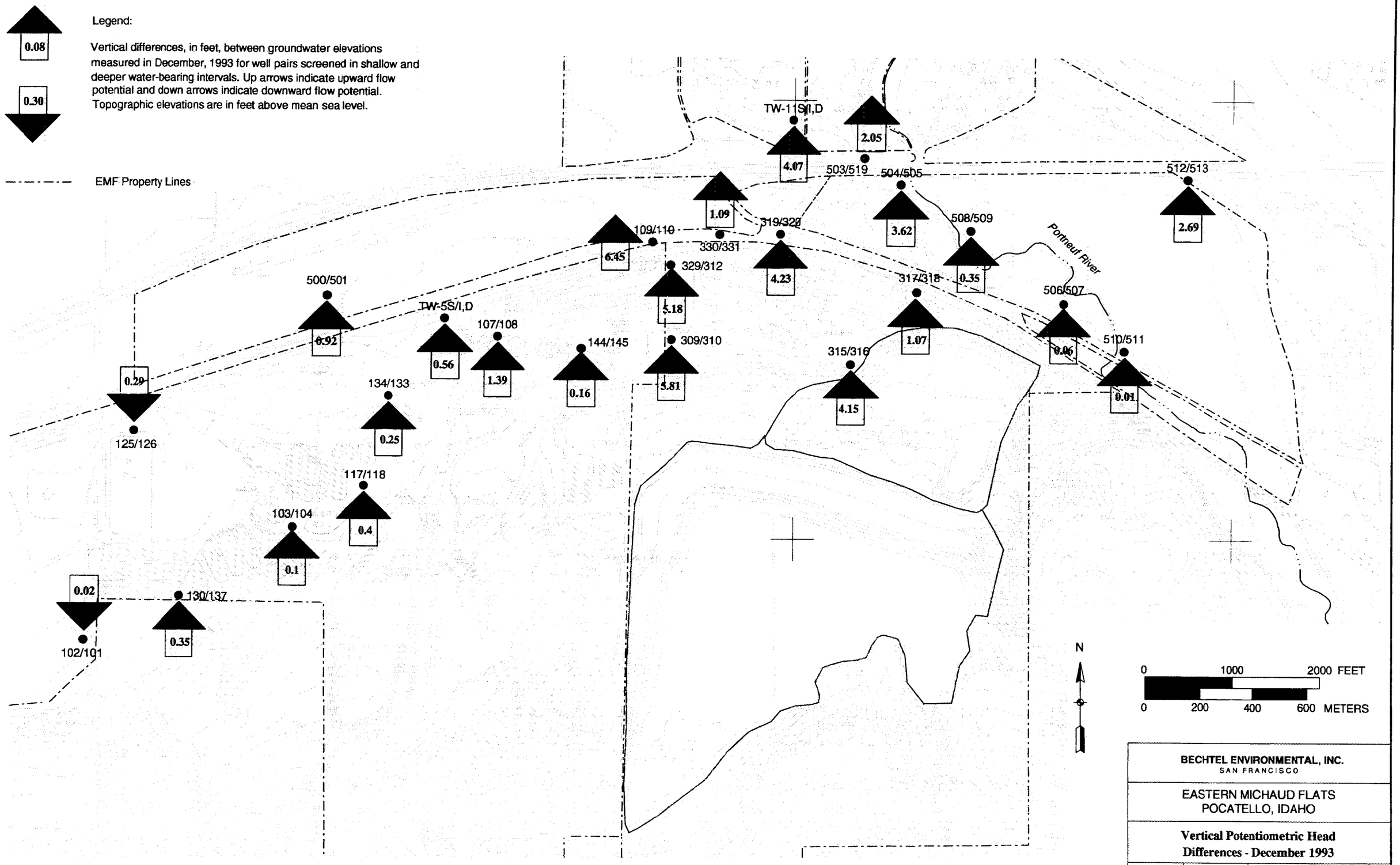

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences - December 1993

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10F	

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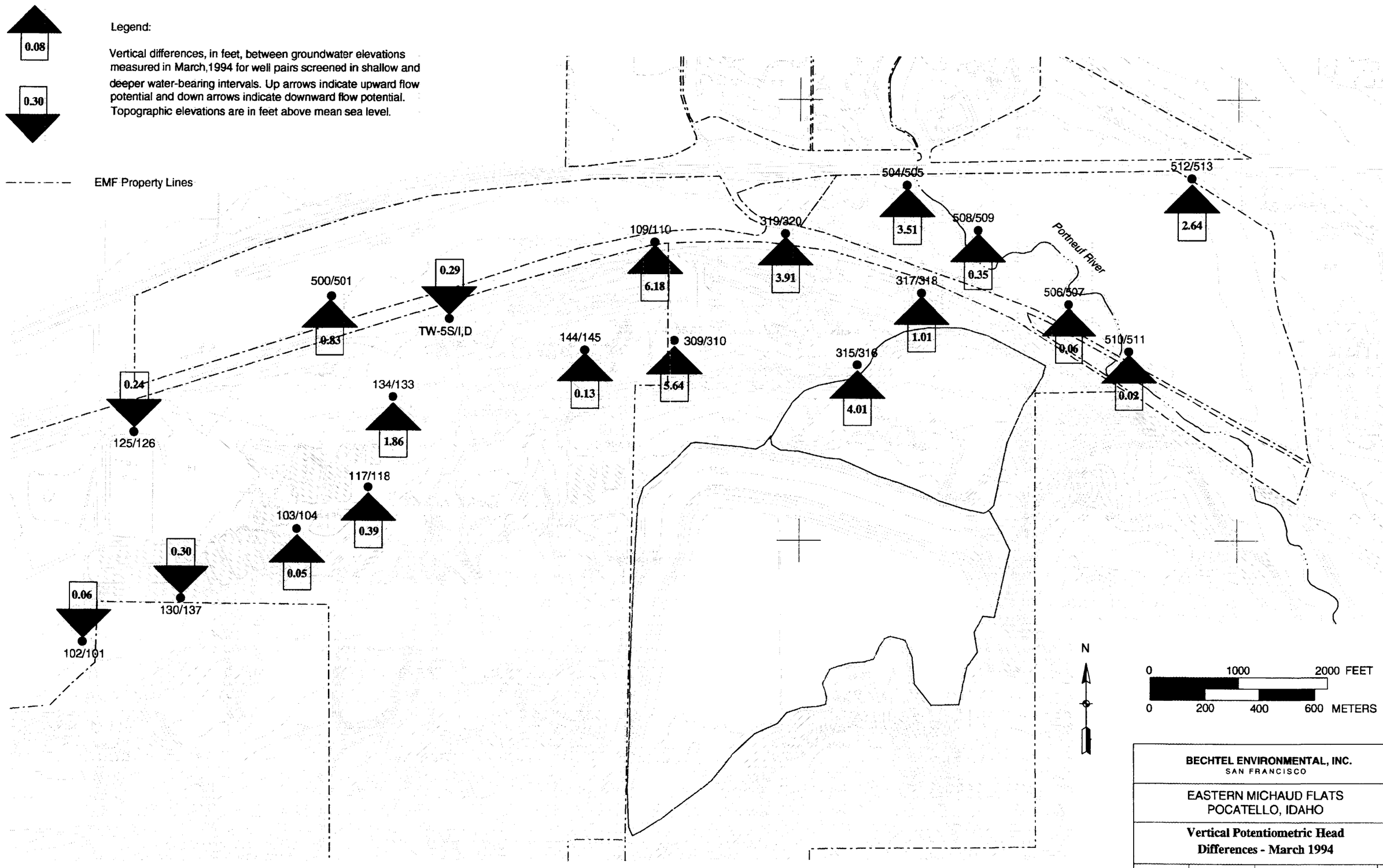

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences - March 1994

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10G	

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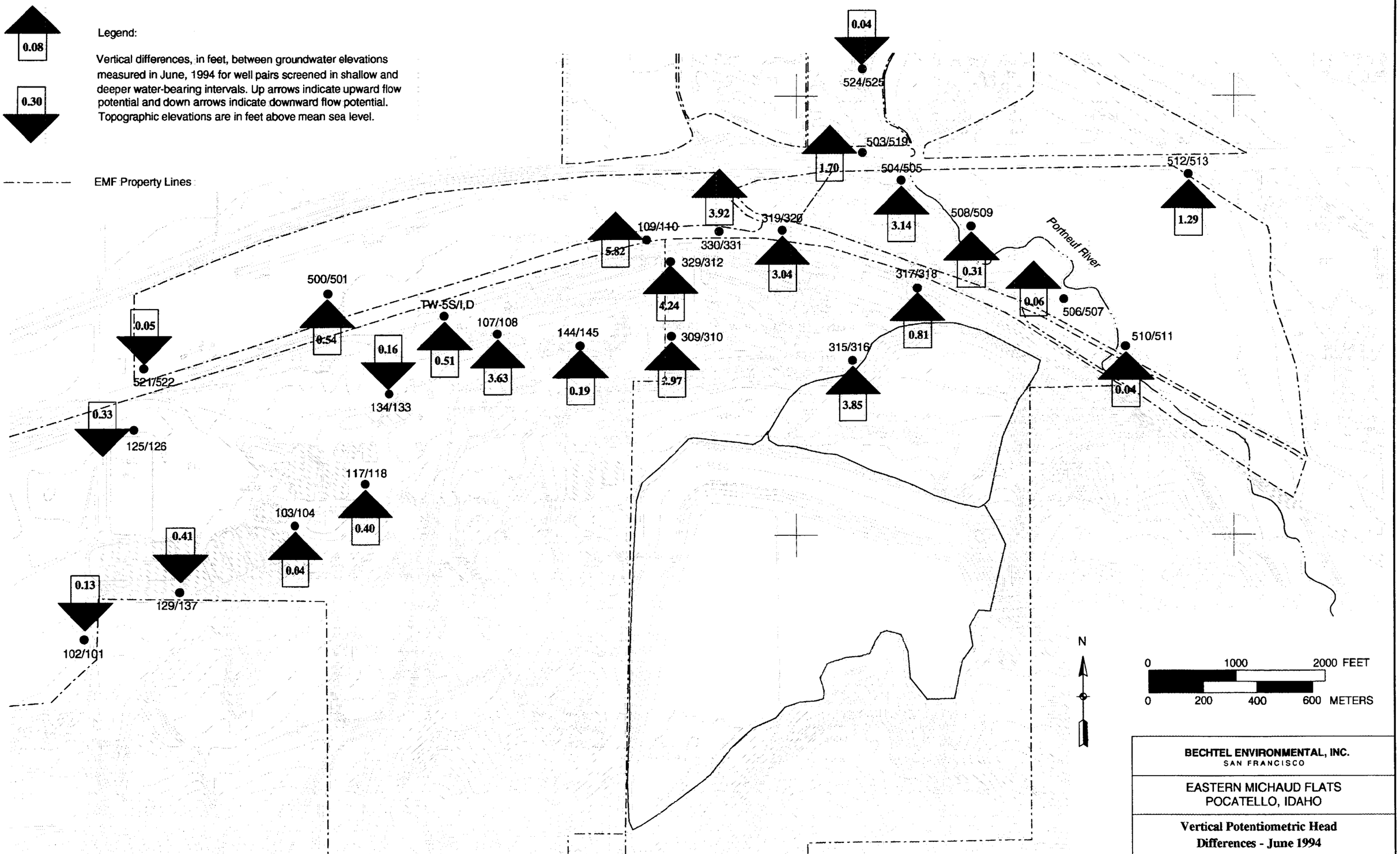

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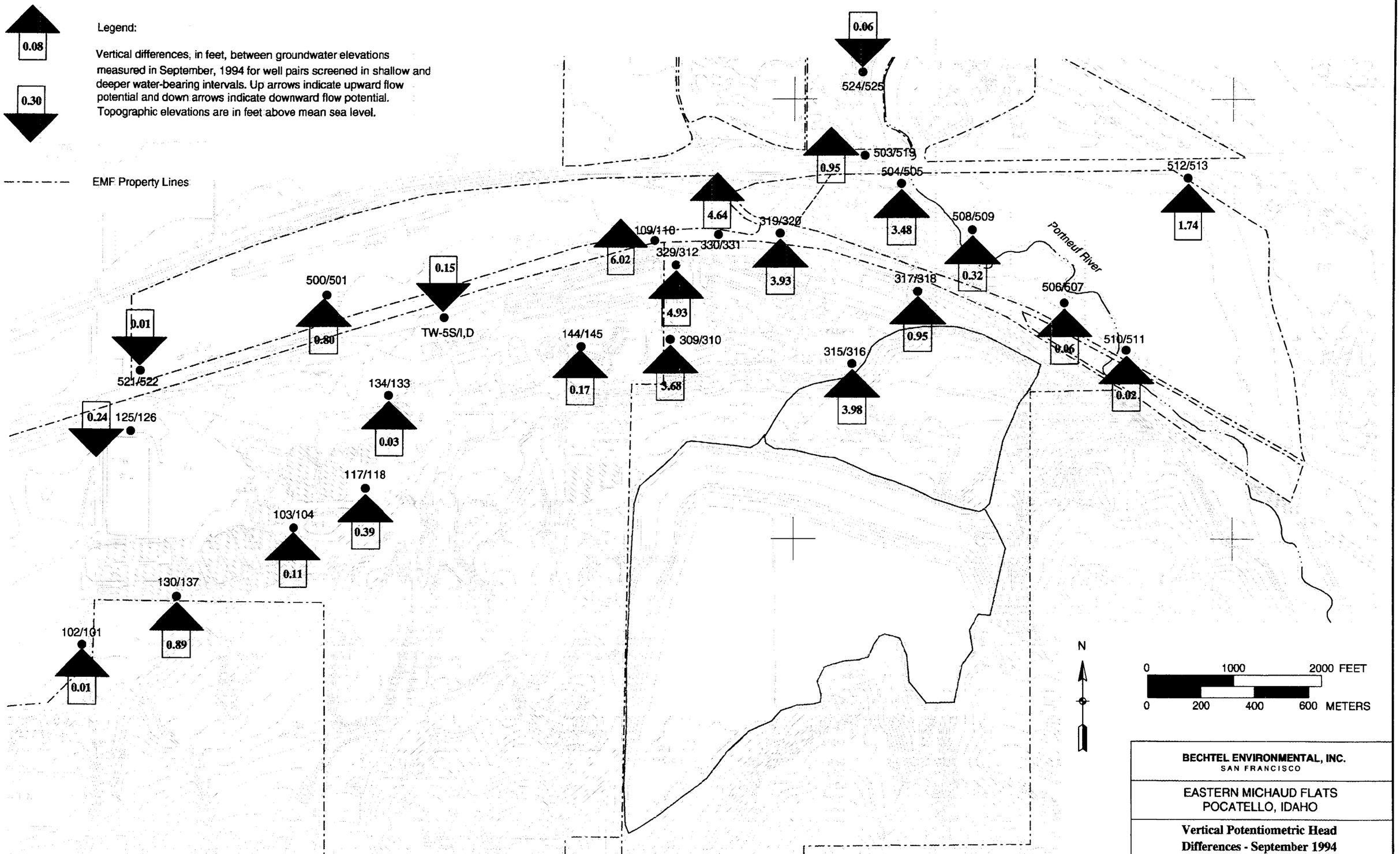

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EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Vertical Potentiometric Head Differences - September 1994

Job Number	Drawing No.	Rev.
21372	FIGURE 3.3-10I	

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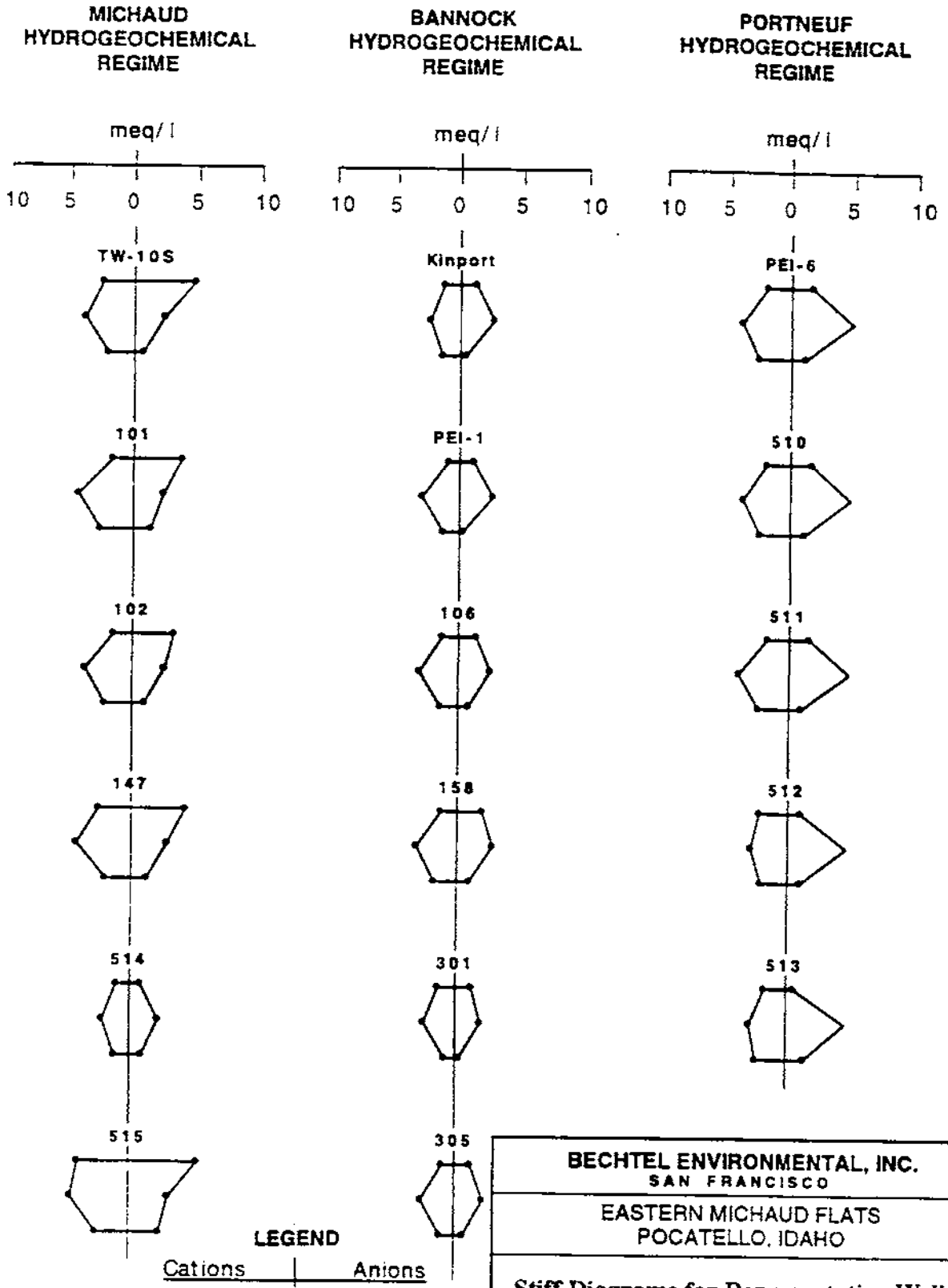

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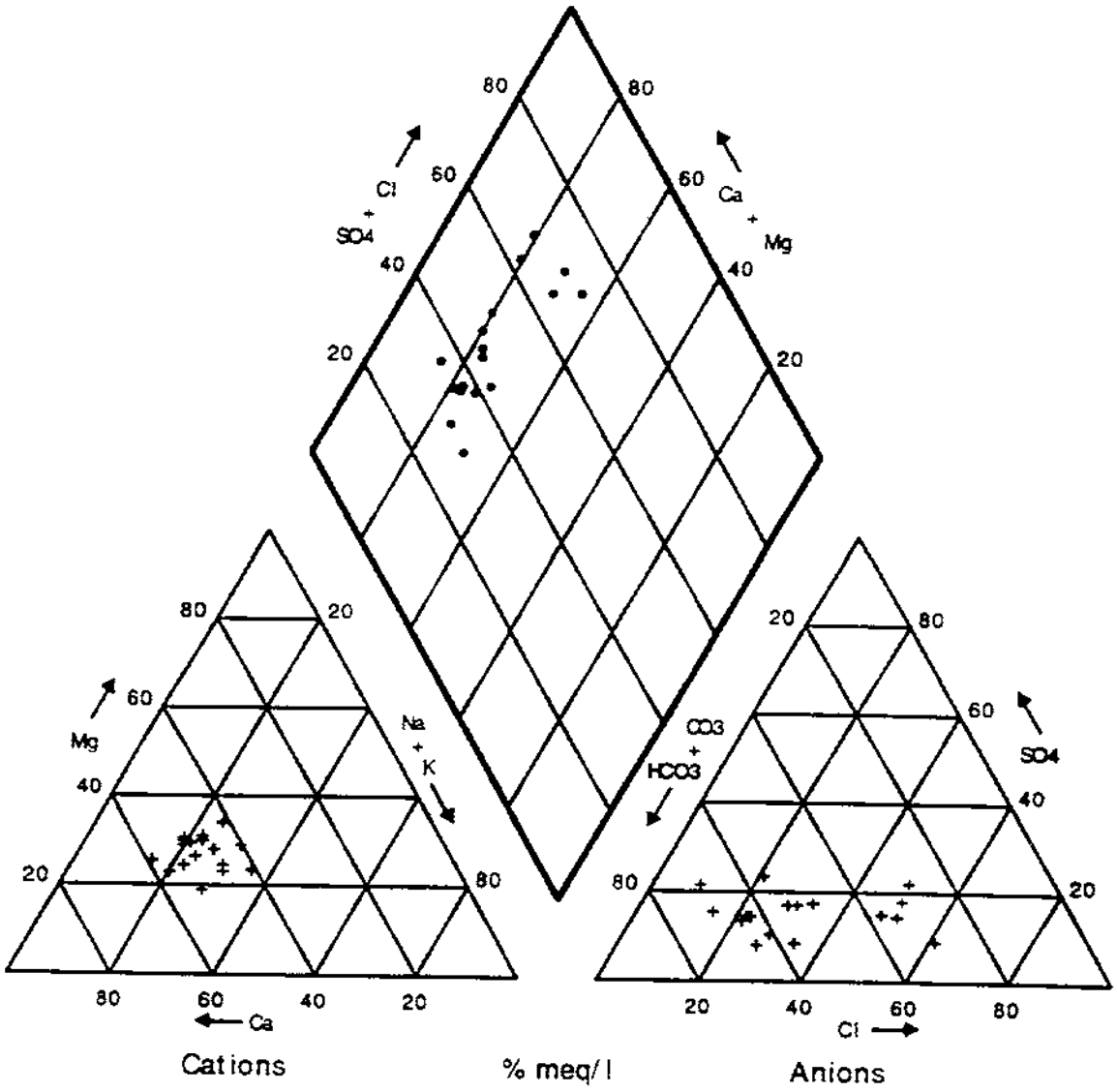
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Stiff Diagrams for Representative Wells

Job No.	DRAWING No.	REV.
21372	FIGURE 3.3-11	



No	TDS	Sample Site
M1	512	TW-10S
M2	498	101
M3	448	102
M4	553	147
M5	290	514
M6	713	515
B1	329	Kinport
B2	309	PEI-1
B3	349	106
B4	403	158
B5	271	301
B6	310	305
P1	566	PEI-6
P2	549	510
P3	551	511
P4	509	512
P5	505	513

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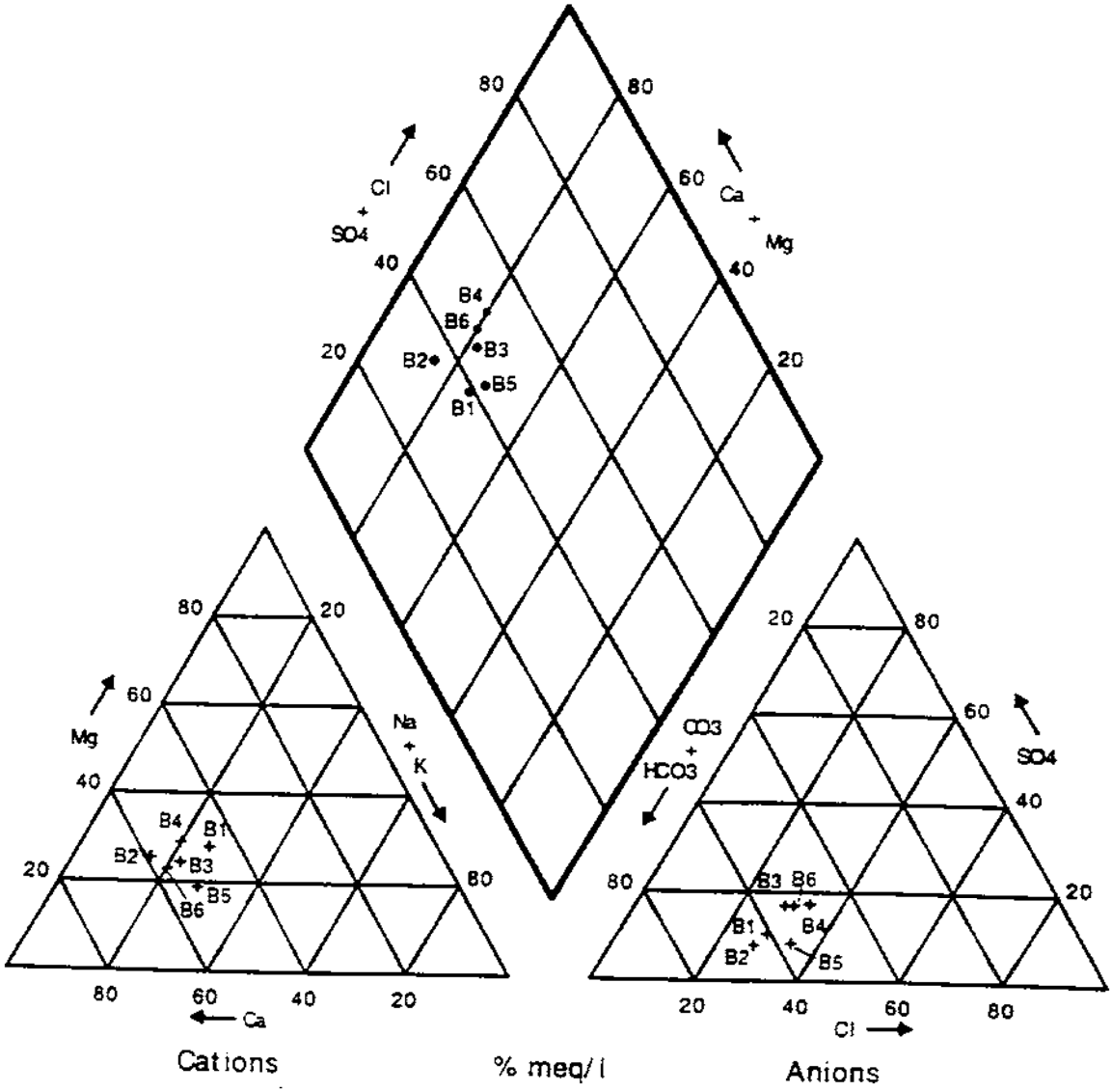
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Piper Diagrams for Michaud, Bannock, and Portneuf Hydrogeochemical Regimes

Job No.	DRAWING No.	REV.
21372	FIGURE 3.3-12A	



No.	TDS	Sample Site
B1	329	Kinport
B2	309	PEI-1
B3	349	106
B4	403	158
B5	271	301
B6	310	305

BECHTEL ENVIRONMENTAL, INC.
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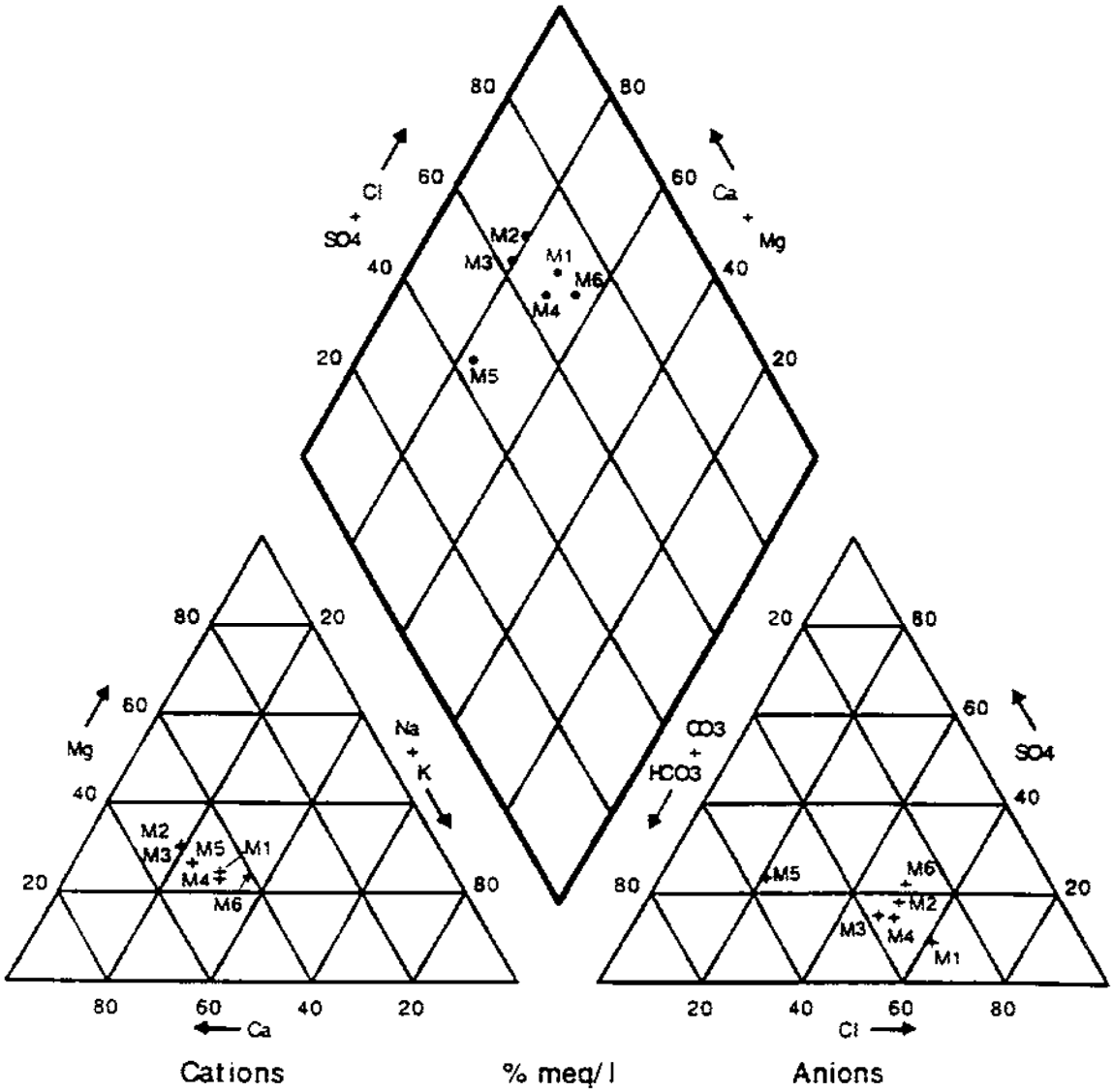
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Piper Diagram for Representative Wells of Bannock Hydrogeochemical Regime

Job No.	DRAWING No.	REV.
21372	FIGURE 3.3-12B	



No.	TDS	Sample Site
M1	512	TW-10S
M2	498	101
M3	448	102
M4	553	147
M5	290	514
M6	713	515

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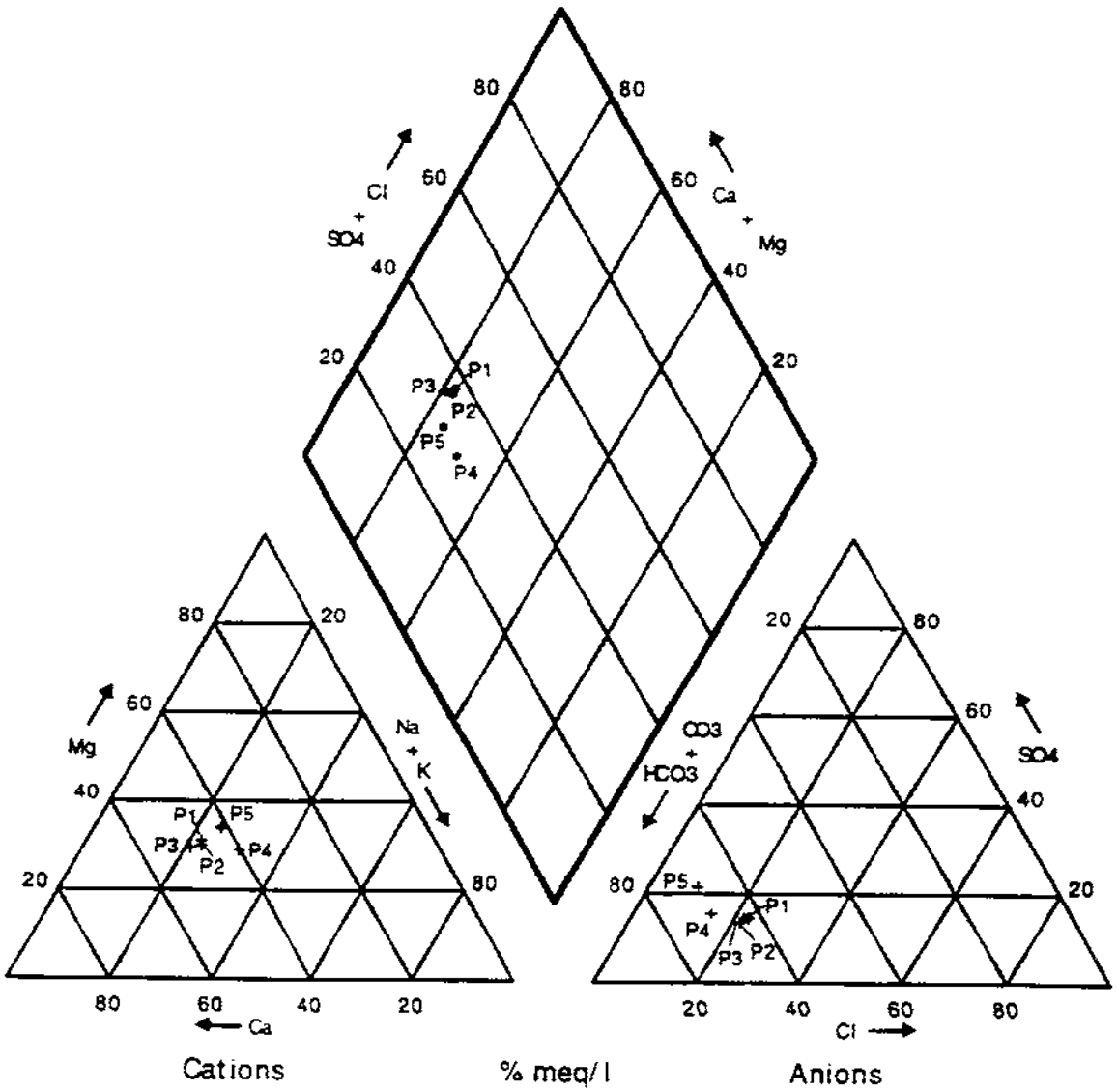
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Piper Diagram for Representative Wells of Michaud Hydrogeochemical Regime

Job No.	DRAWING No.	REV.
21372	FIGURE 3.3-12C	



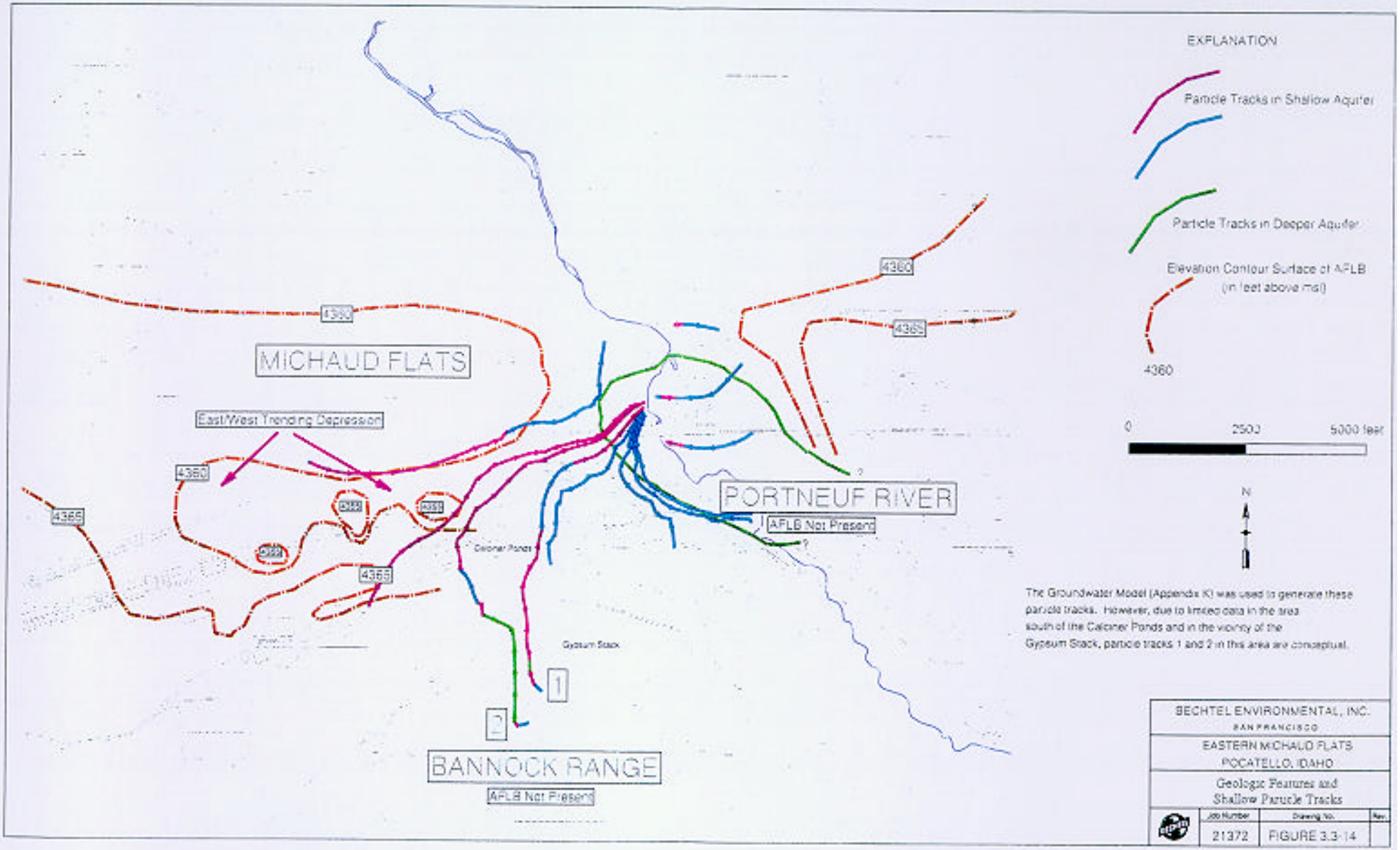
No.	TDS	Sample Site
P1	566	PEI-6
P2	549	510
P3	551	511
P4	509	512
P5	505	513

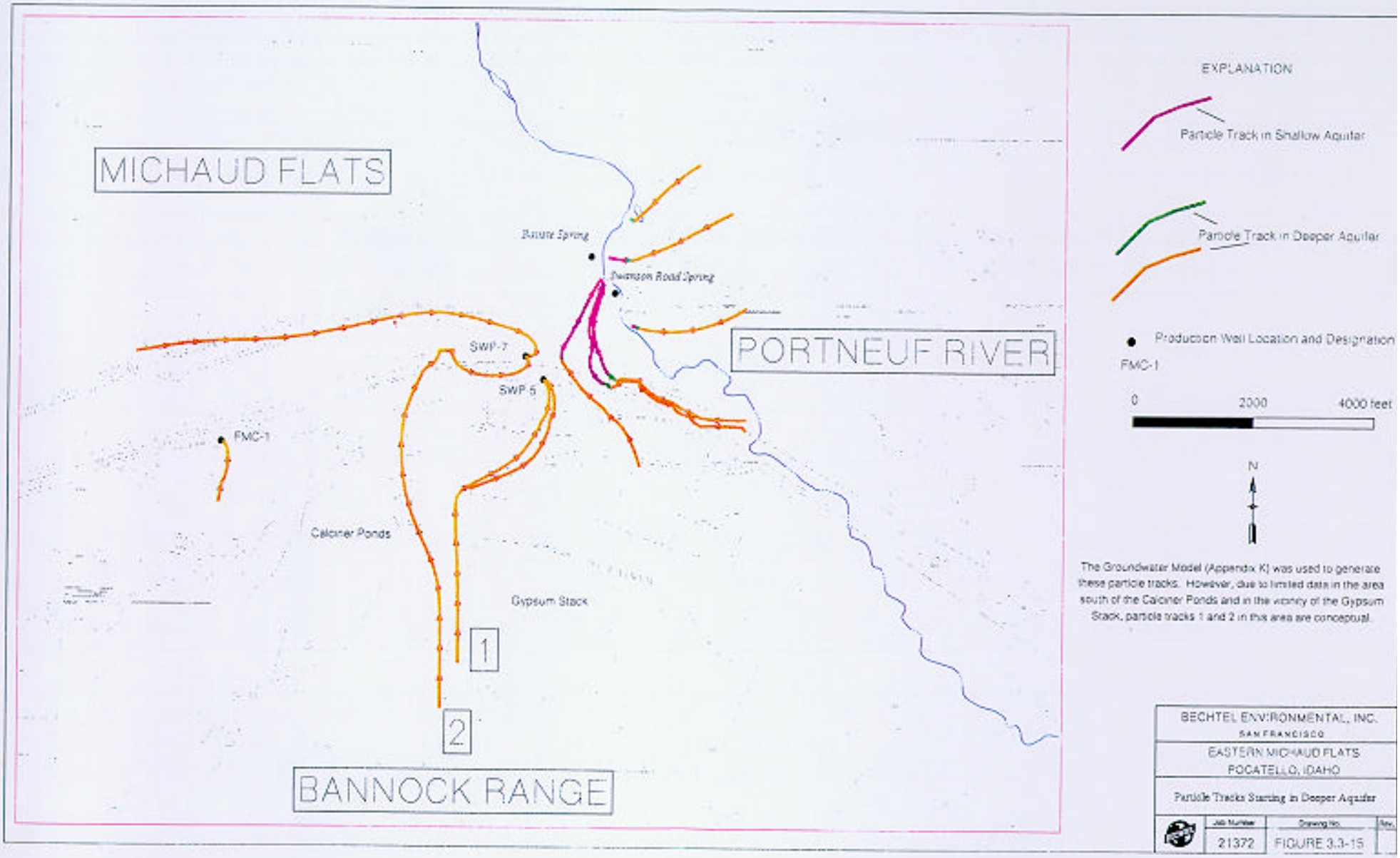
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO

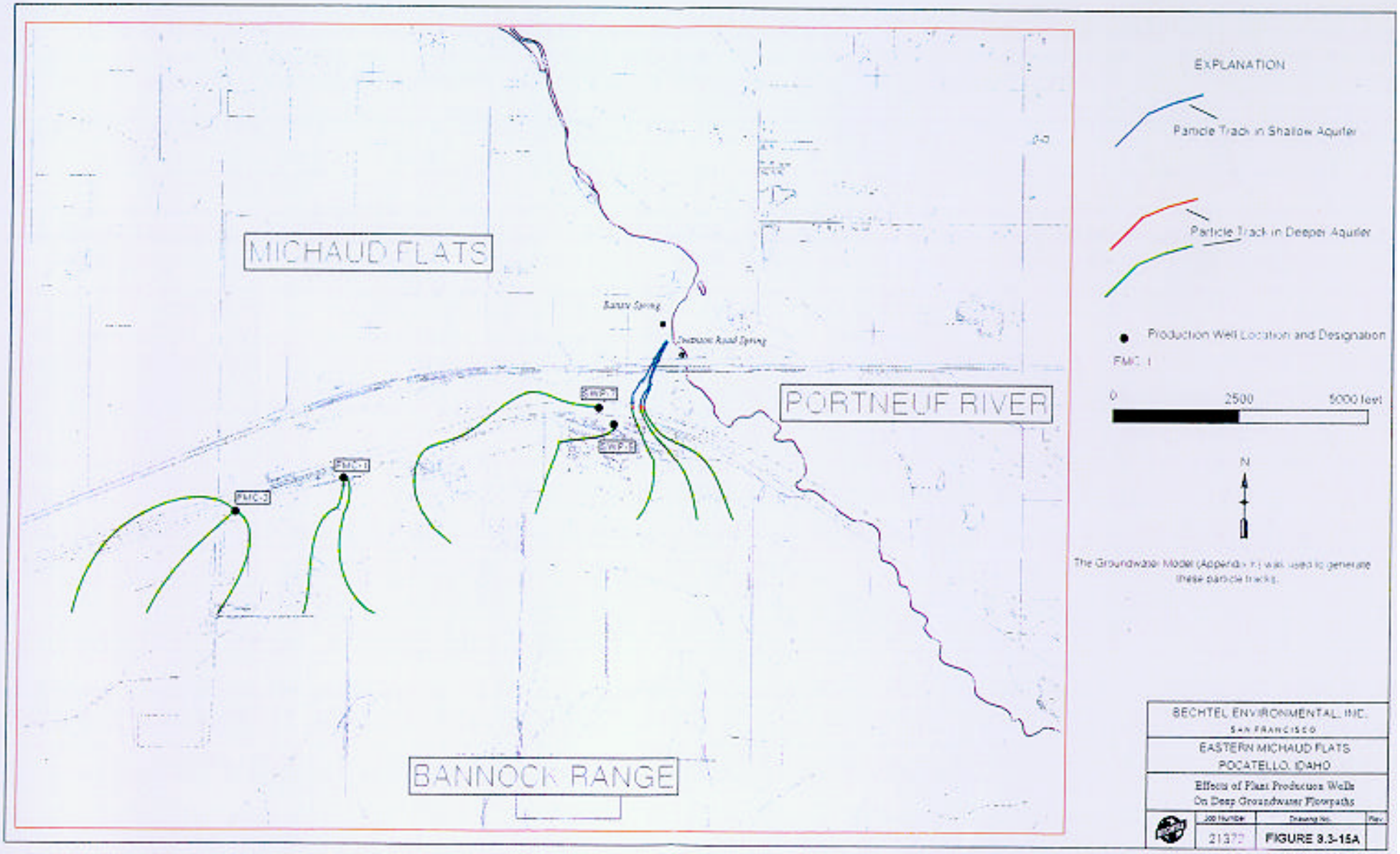
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

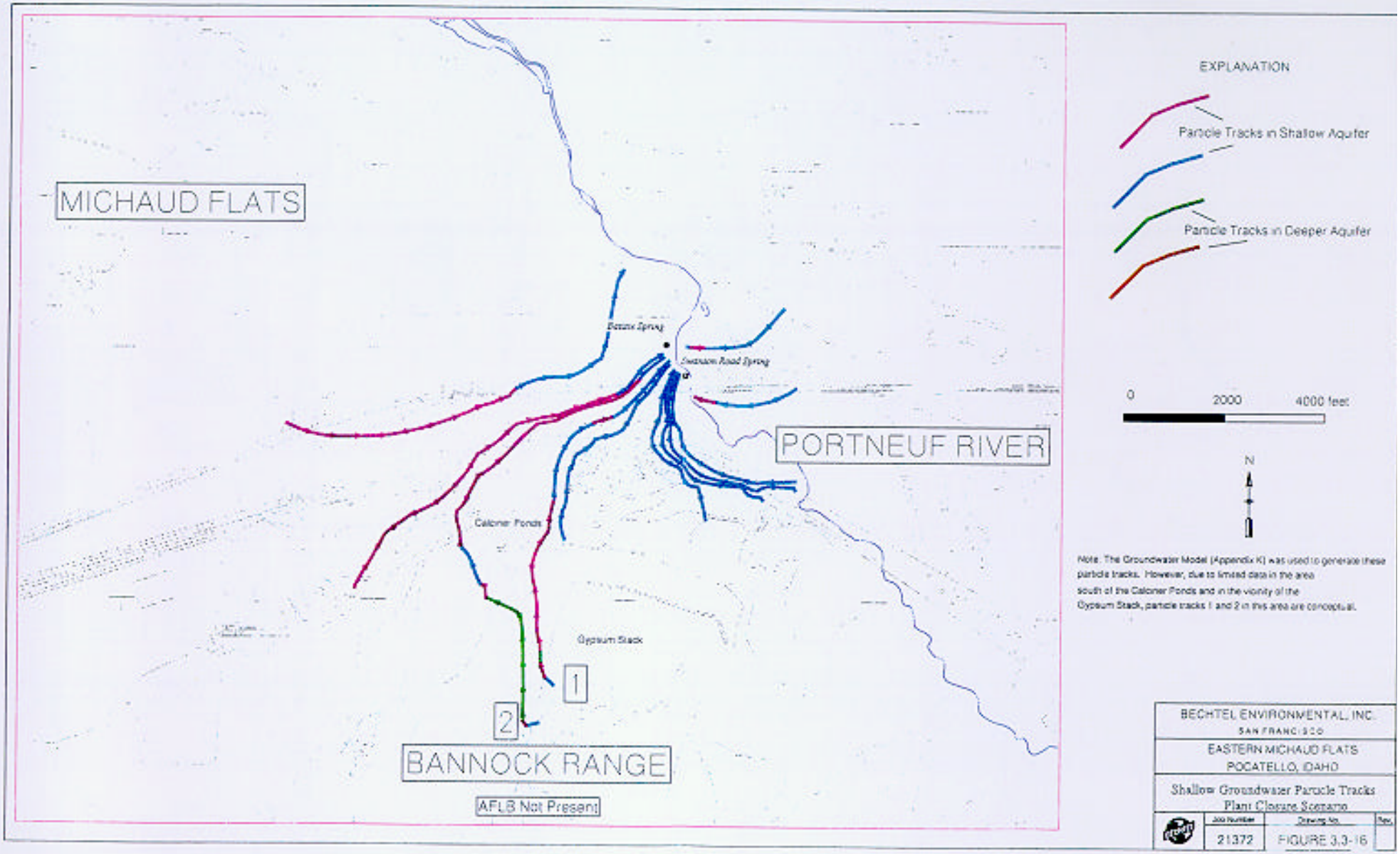
Piper Diagram for Representative Wells of Portneuf Hydrogeochemical Regime

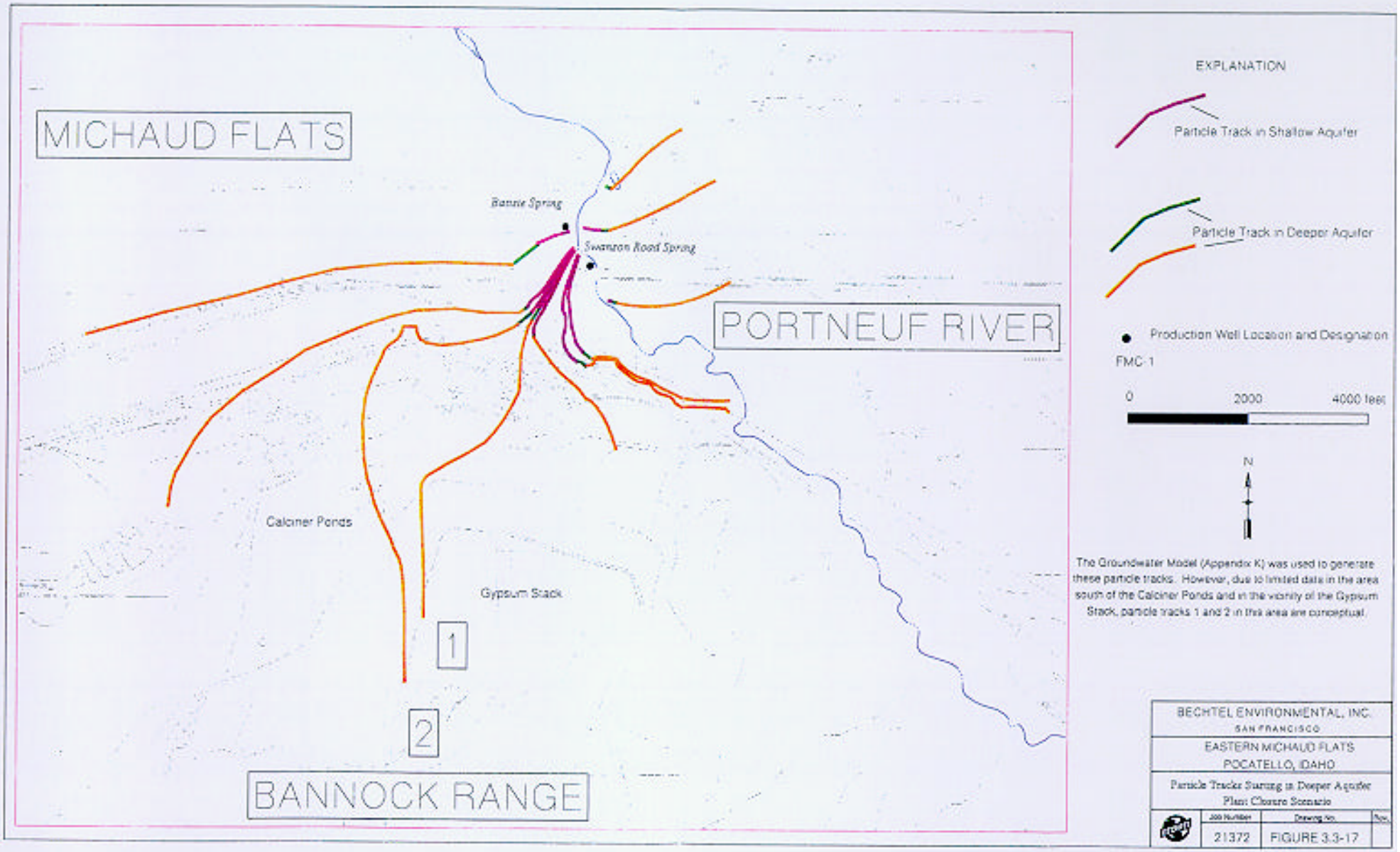
Job No.	DRAWING No.	REV.
21372	FIGURE 3.3-12D	

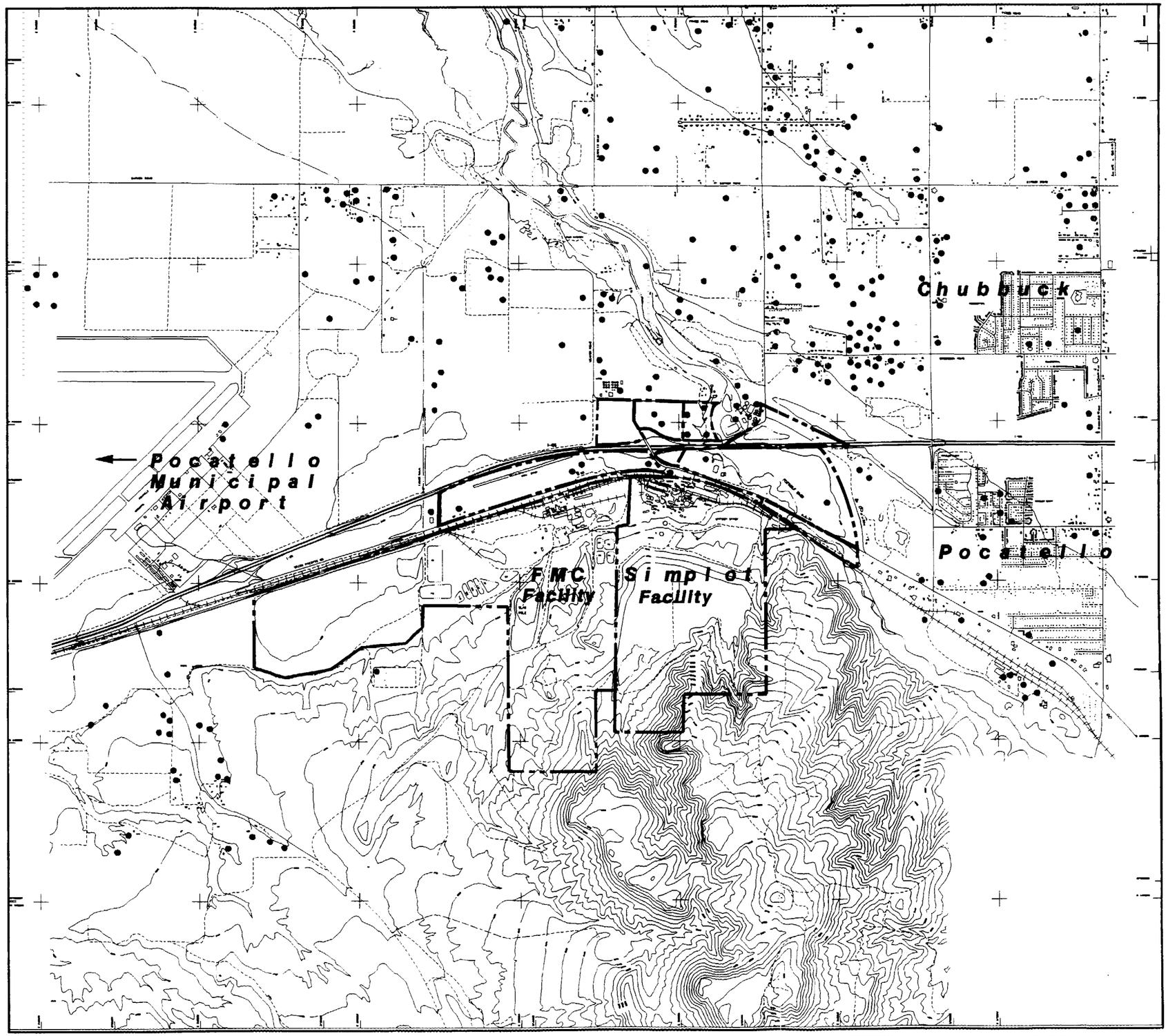

EXPLANATION
Particle Tracks in Shallow Aquifer
Particle Tracks in Deeper Aquifer
Elevation Contour Surface of AFLB
(in feet above msl)
4360
0
2500
5000 feet
N
MICHAUD FLATS
East/West Trending Depression
4380
4365
4360
4365
4380
4365
PORTNEUF RIVER
AFLB Not Present
Calciner Ponds
Gypsum Stack
1
2
BANNOCK RANGE
AFLB Not Present
The Groundwater Model (Appendix K) was used to generate these particle tracks. However, due to limited data in the area south of the Calciner Ponds and in the vicinity of the Gypsum Stack, particle tracks 1 and 2 in this area are conceptual.
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Geologic Features and
Shallow Particle Tracks
Job Number
21372
Drawing No.
FIGURE 3.3-14
Rev.


MICHAUD FLATS
PORTNEUF RIVER
BANNOCK RANGE
Swanson Road Spring
SWP-7
SWP 5
FMC-1
Calciner Ponds
Gypsum Stack
1
2
EXPLANATION
Particle Track in Shallow Aquifer
Particle Track in Deeper Aquifer
Production Well Location and Designation
FMC-1
0
2000
4000 feet
N
The Groundwater Model (Appendix K) was used to generate these particle tracks. However, due to limited data in the area south of the Calciner Ponds and in the vicinity of the Gypsum Stack, particle tracks 1 and 2 in this area are conceptual.
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Particle Tracks Starting in Deeper Aquifer
Job Number
21372
Drawing No.
FIGURE 3.3-15
Rev.


MICHAUD FLATS
PORTNEUF RIVER
BANNOCK RANGE
Banks Spring
Swanson Road Spring
EWP-1
EWP-2
FMC-1
FMC-2
EXPLANATION
Particle Track in Shallow Aquifer
Particle Track in Deeper Aquifer
Production Well Location and Designation
FMC-1
0
2500
5000 feet
N
The Groundwater Model (Appendix H) was used to generate these particle tracks.
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Effects of Plant Production Wells
On Deep Groundwater Flowpaths
Job Number
21372
Drawing No.
FIGURE 3.3-15A
Rev.


MICHAUD FLATS
PORTNEUF RIVER
Batiste Spring
Swanson Road Spring
Calciner Ponds
Gypsum Stack
1
2
BANNOCK RANGE
AFLB Not Present
EXPLANATION
Particle Tracks in Shallow Aquifer
Particle Tracks in Deeper Aquifer
0
2000
4000 feet
N
Note: The Groundwater Model (Appendix K) was used to generate these particle tracks. However, due to limited data in the area south of the Calciner Ponds and in the vicinity of the Gypsum Stack, particle tracks 1 and 2 in this area are conceptual.
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Shallow Groundwater Particle Tracks
Plant Closure Scenario
Job Number
21372
Drawing No.
FIGURE 3.3-16
Rev.


MICHAUD FLATS
Bannie Spring
Swanson Road Spring
PORTNEUF RIVER
Calciner Ponds
Gypsum Stack
1
2
BANNOCK RANGE
EXPLANATION
Particle Track in Shallow Aquifer
Particle Track in Deeper Aquifer
Production Well Location and Designation
FMC-1
0
2000
4000 feet
N
The Groundwater Model (Appendix K) was used to generate these particle tracks. However, due to limited data in the area south of the Calciner Ponds and in the vicinity of the Gypsum Stack, particle tracks 1 and 2 in this area are conceptual.
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Particle Tracks Starting in Deeper Aquifer
Plant Closure Scenario
Job Number
21372
Drawing No.
FIGURE 3.3-17
Rev.



Legend:

● Groundwater well location. Wells may be used for drinking, livestock, or irrigation.

EMF Property Lines

Note:

See Figure 2.4-1 for well location within FMC and Simplot Facility Boundary.

Source: Idaho Department of Water Resources data files, 1992.

0 1 2 MILES

0 1 2 3 KM

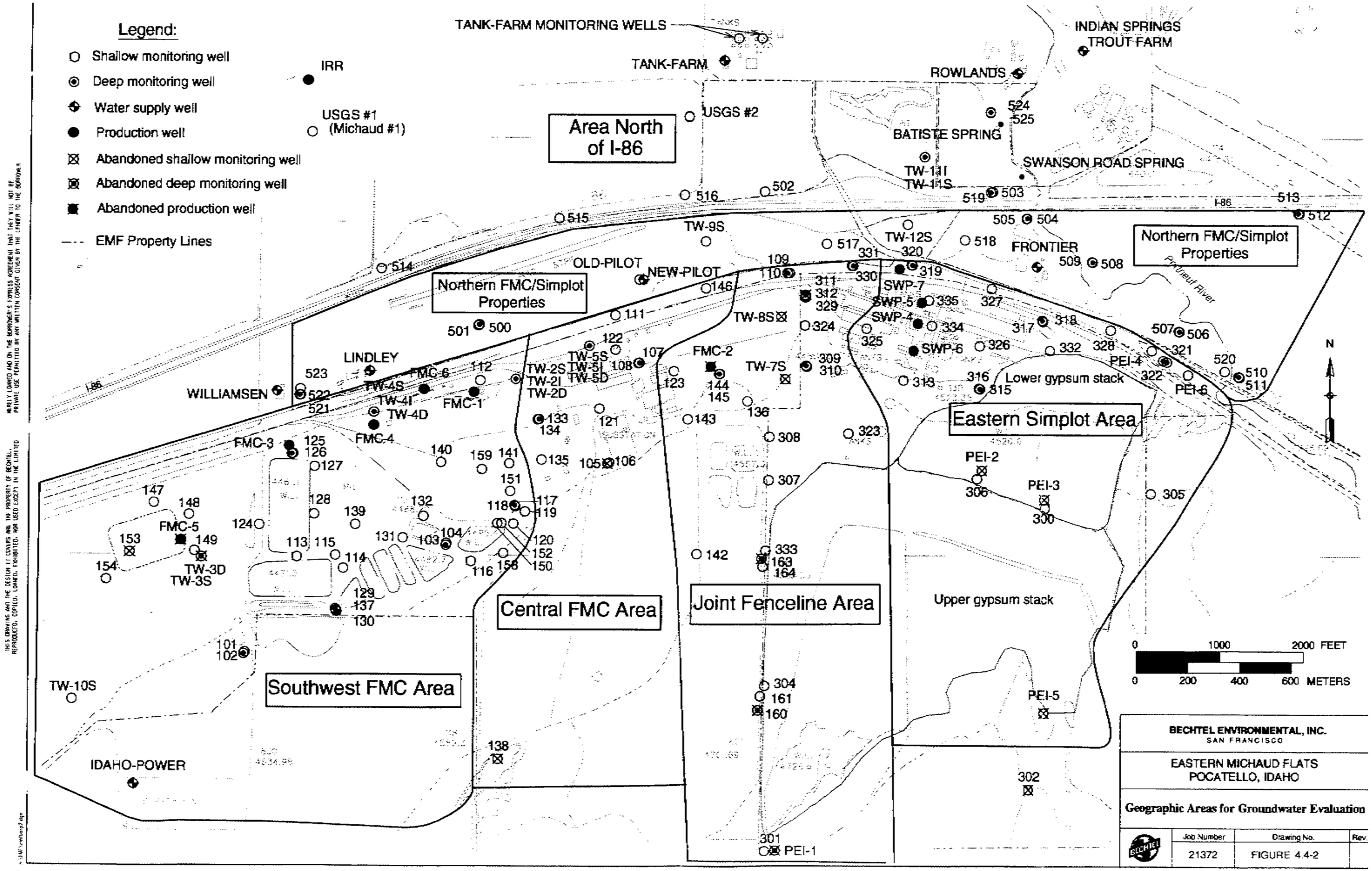
N

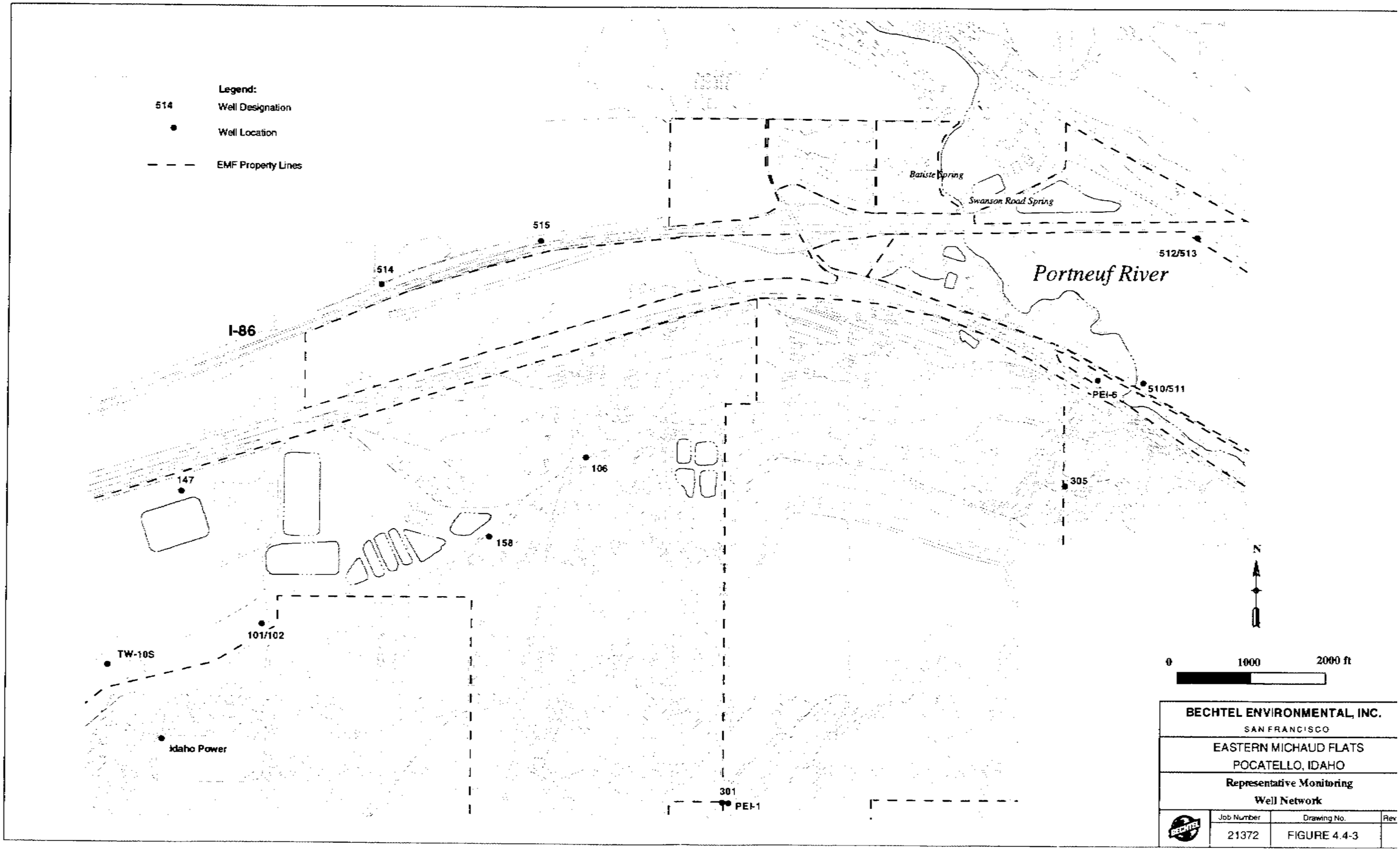
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO

EASTERN MICHAUD FLATS
POCATELLO, IDAHO

Wells in the EMF Study Area

Job Number	Drawing No.	Rev.
21372	FIGURE 3.6-5	


Legend:
Shallow monitoring well
Deep monitoring well
Water supply well
Production well
Abandoned shallow monitoring well
Abandoned deep monitoring well
Abandoned production well
EMF Property Lines
TANK-FARM MONITORING WELLS
TANK-FARM
IRR
USGS #1 (Michaud #1)
USGS #2
Area North of I-86
INDIAN SPRINGS TROUT FARM
ROWLANDS
BATISTE SPRING
SWANSON ROAD SPRING
TW-11I
TW-11S
I-86
Northern FMC/Simplot Properties
FRONTIER
Portneuf River
TW-9S
TW-12S
OLD-PILOT
NEW-PILOT
SWP-7
SWP-5
SWP-4
SWP-6
TW-8S
FMC-2
TW-7S
LINDLEY
WILLIAMSEN
FMC-6
FMC-1
FMC-3
FMC-4
FMC-5
TW-4S
TW-4I
TW-4D
TW-2S
TW-2I
TW-2D
TW-5S
TW-5I
TW-5D
TW-3D
TW-3S
TW-10S
IDAHO-POWER
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Lower gypsum stack
Upper gypsum stack
PEI-1
PEI-2
PEI-3
PEI-4
PEI-5
PEI-6
N
0 1000 2000 FEET
0 200 400 600 METERS
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Geographic Areas for Groundwater Evaluation
Job Number
21372
Drawing No.
FIGURE 4.4-2
Rev.

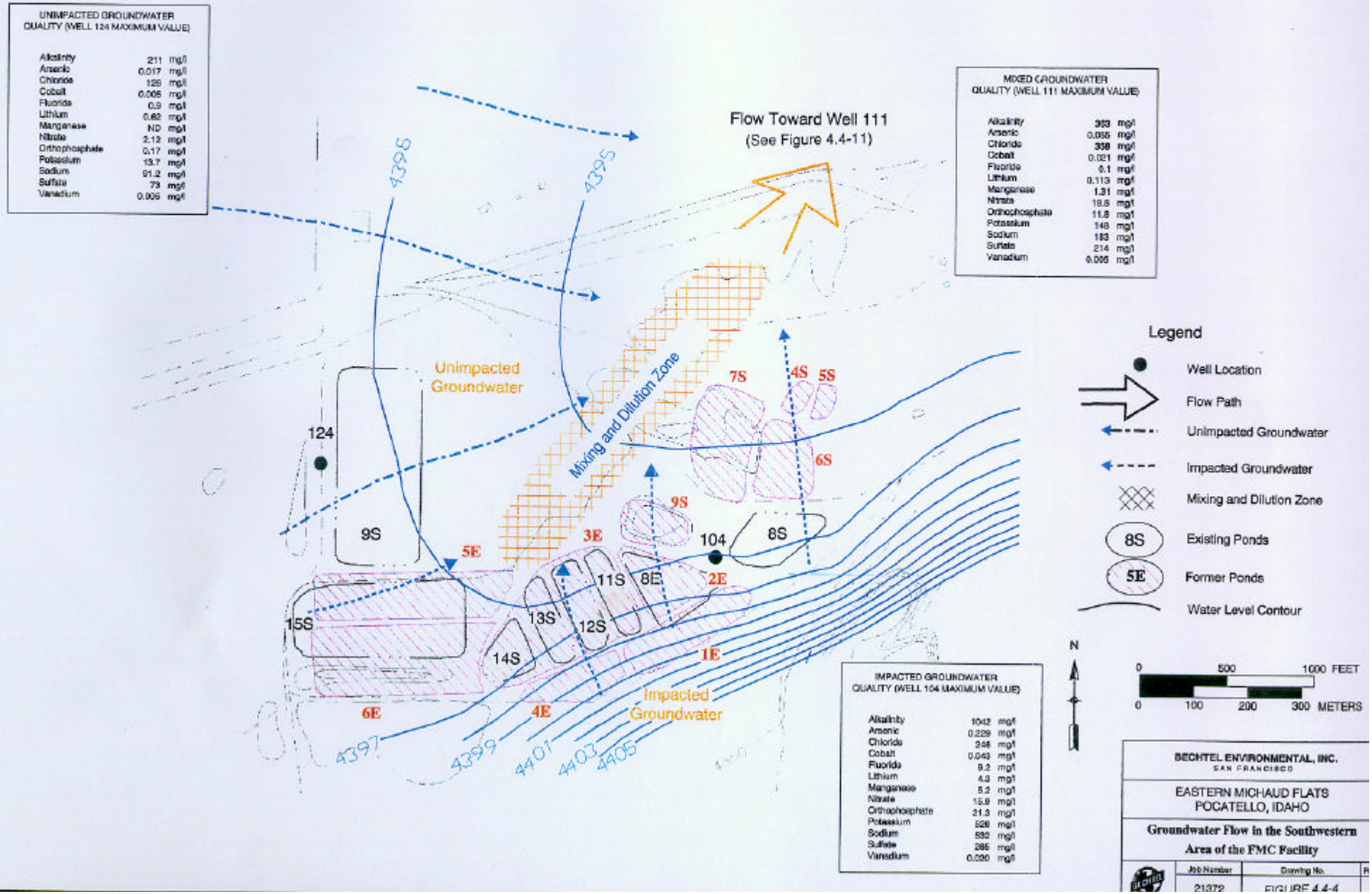


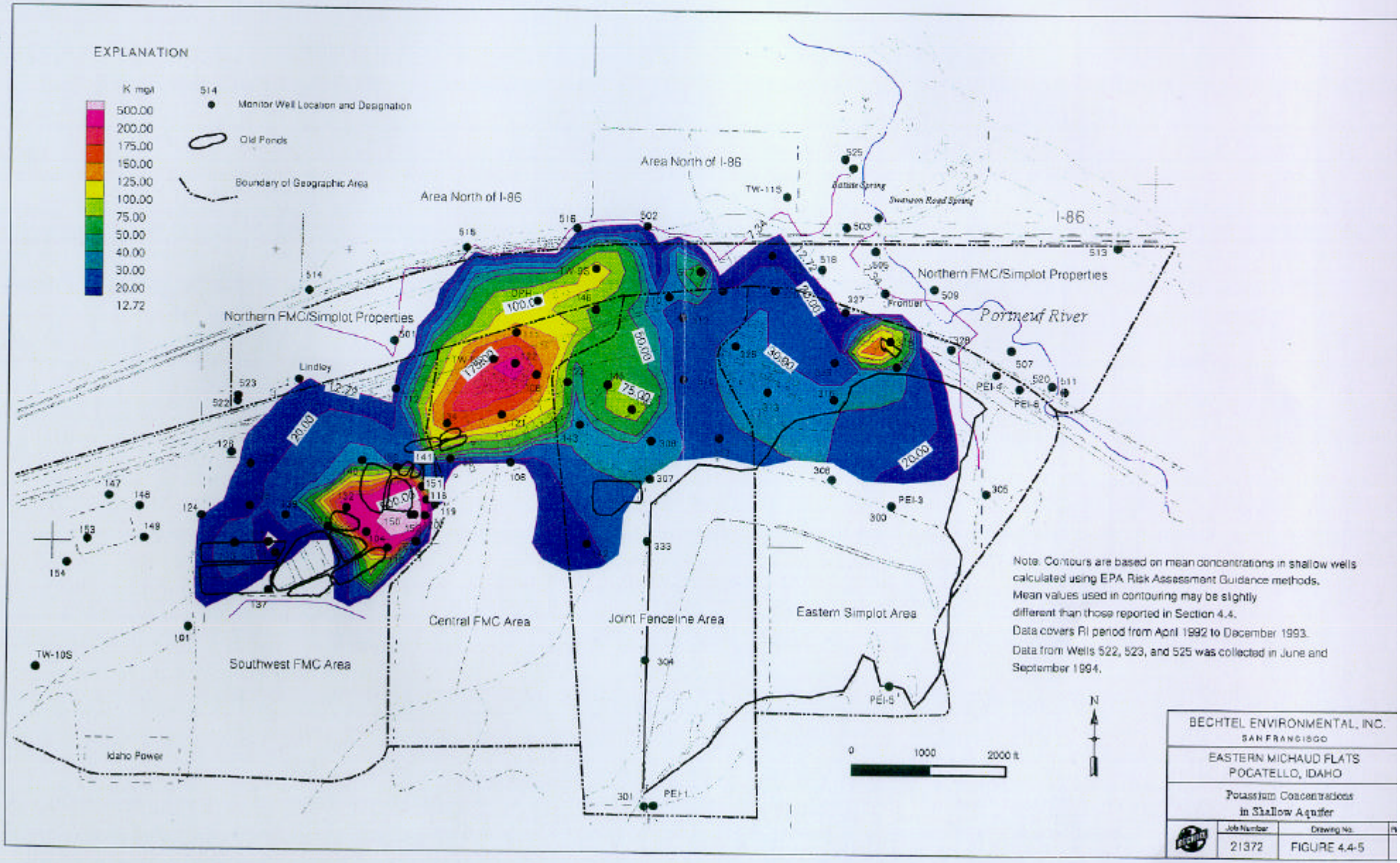
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO

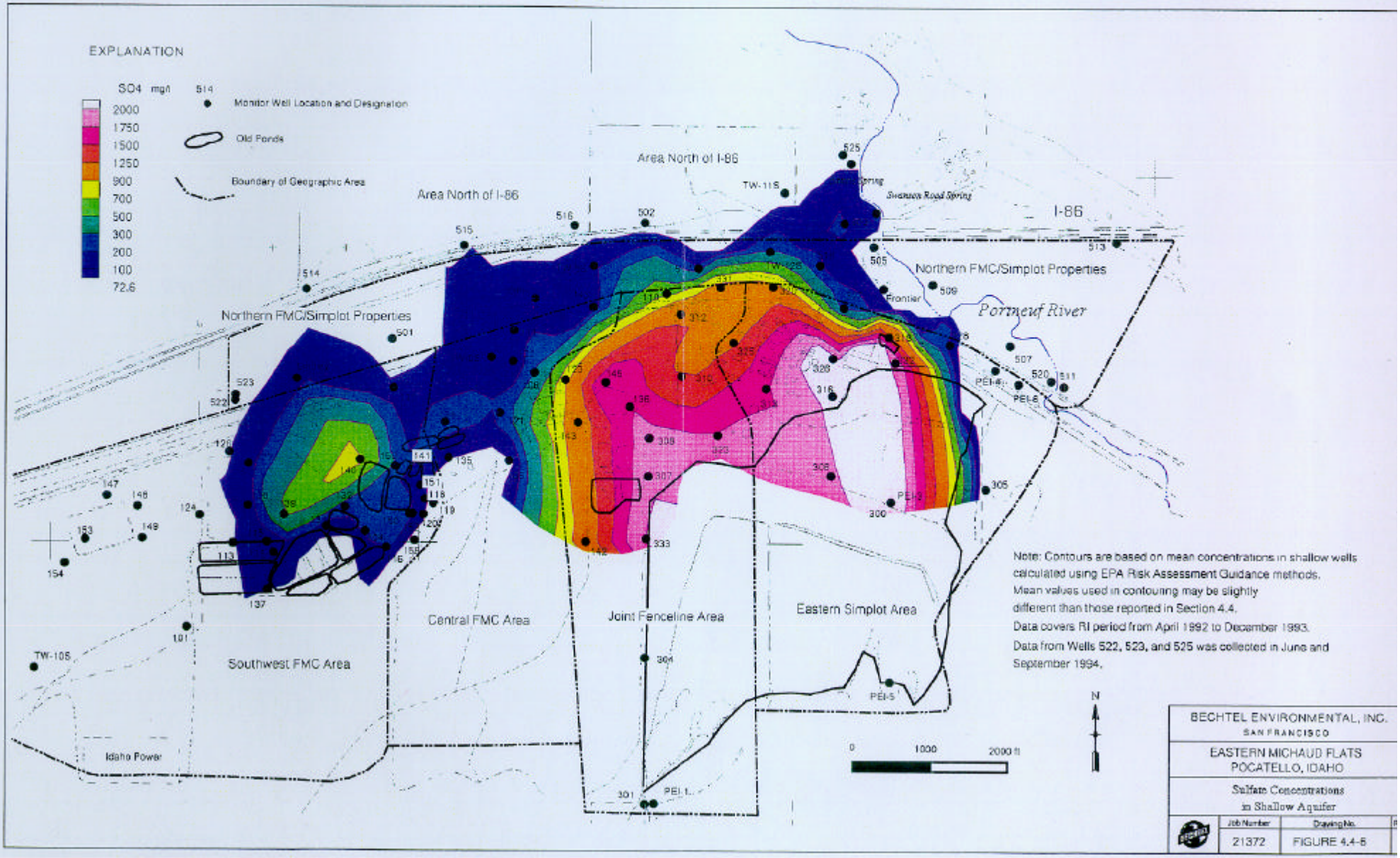
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

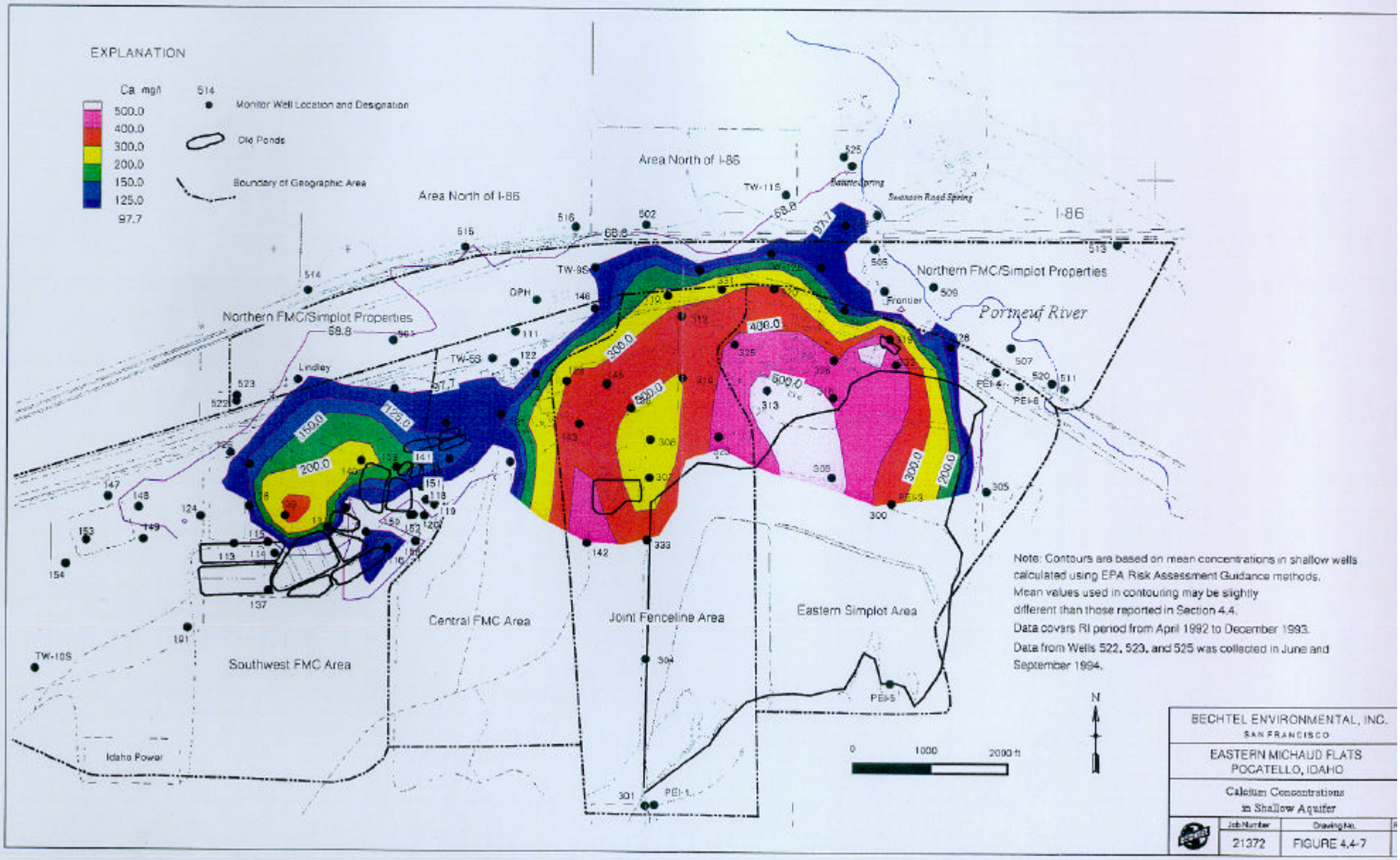
Representative Monitoring Well Network

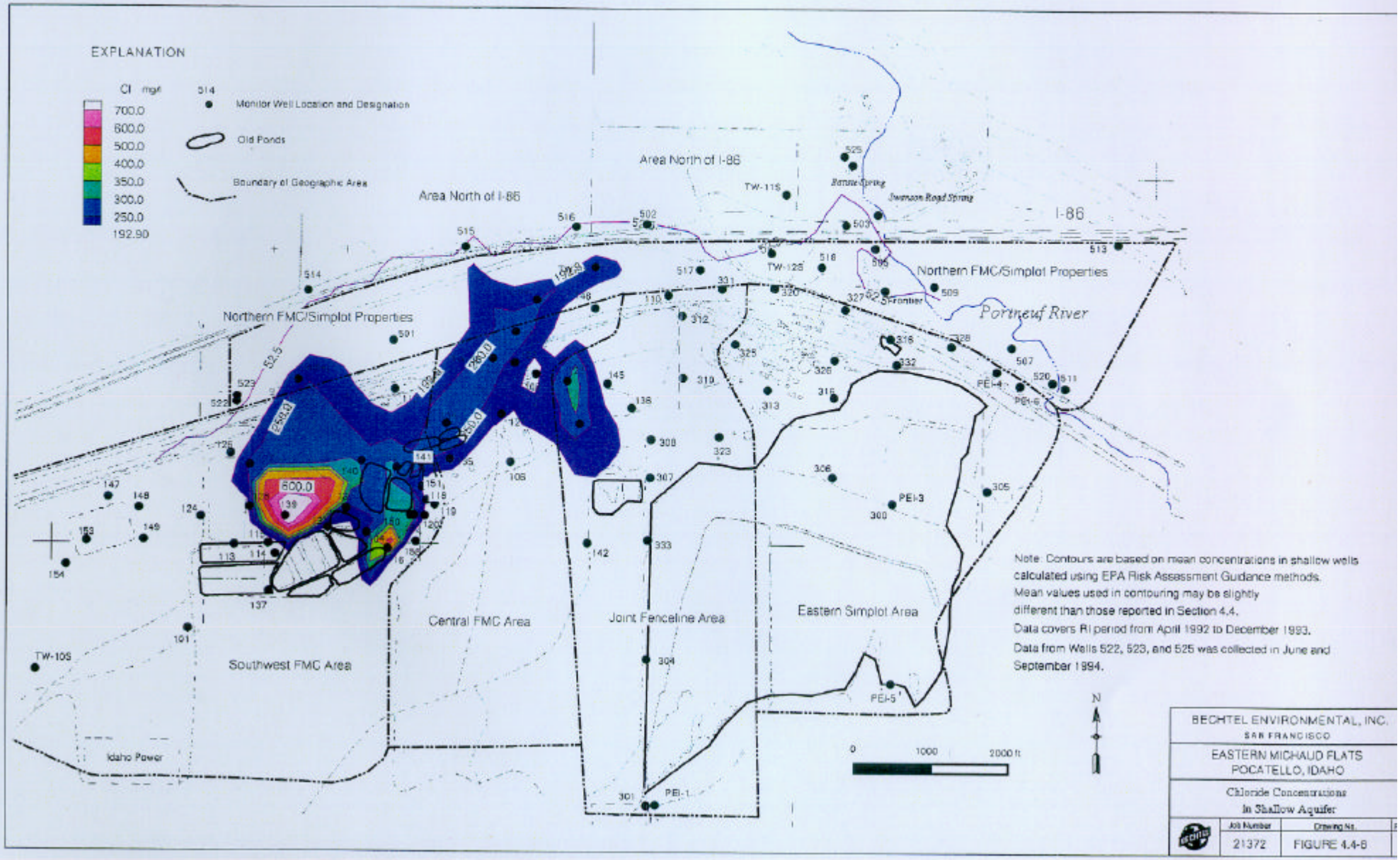
Job Number	Drawing No.	Rev
21372	FIGURE 4.4-3	

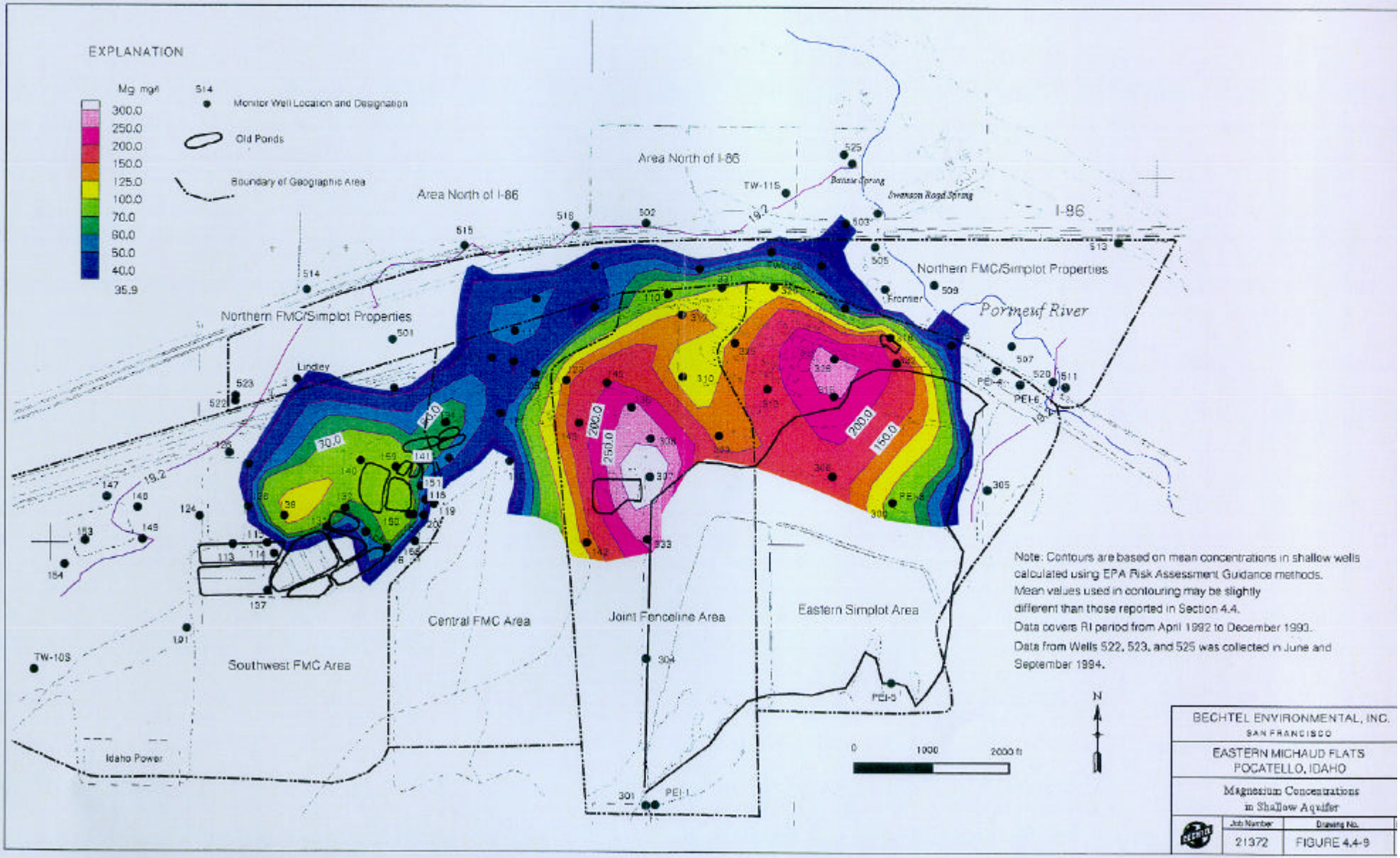

UNIMPACTED GROUNDWATER QUALITY (WELL 124 MAXIMUM VALUE)
Alkalinity 211 mg/l
Arsenic 0.017 mg/l
Chloride 128 mg/l
Cobalt 0.005 mg/l
Fluoride 0.9 mg/l
Lithium 0.62 mg/l
Manganese ND mg/l
Nitrate 2.12 mg/l
Orthophosphate 0.17 mg/l
Potassium 13.7 mg/l
Sodium 91.2 mg/l
Sulfate 73 mg/l
Vanadium 0.006 mg/l
Flow Toward Well 111
(See Figure 4.4-11)
MIXED GROUNDWATER QUALITY (WELL 111 MAXIMUM VALUE)
Alkalinity 353 mg/l
Arsenic 0.055 mg/l
Chloride 358 mg/l
Cobalt 0.021 mg/l
Fluoride 0.1 mg/l
Lithium 0.113 mg/l
Manganese 1.31 mg/l
Nitrate 18.8 mg/l
Orthophosphate 11.8 mg/l
Potassium 148 mg/l
Sodium 183 mg/l
Sulfate 214 mg/l
Vanadium 0.006 mg/l
Legend
Well Location
Flow Path
Unimpacted Groundwater
Impacted Groundwater
Mixing and Dilution Zone
8S Existing Ponds
5E Former Ponds
Water Level Contour
Unimpacted Groundwater
Mixing and Dilution Zone
Impacted Groundwater
124
104
9S
8S
7S
4S
5S
6S
5E
3E
9S
11S
8E
2E
15S
13S
12S
14S
1E
6E
4E
4395
4396
4397
4399
4401
4403
4405
N
0 500 1000 FEET
0 100 200 300 METERS
IMPACTED GROUNDWATER QUALITY (WELL 104 MAXIMUM VALUE)
Alkalinity 1042 mg/l
Arsenic 0.229 mg/l
Chloride 246 mg/l
Cobalt 0.043 mg/l
Fluoride 9.2 mg/l
Lithium 4.3 mg/l
Manganese 5.2 mg/l
Nitrate 15.9 mg/l
Orthophosphate 21.3 mg/l
Potassium 526 mg/l
Sodium 532 mg/l
Sulfate 285 mg/l
Vanadium 0.020 mg/l
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Groundwater Flow in the Southwestern Area of the FMC Facility
Job Number
21372
Drawing No.
FIGURE 4.4-4

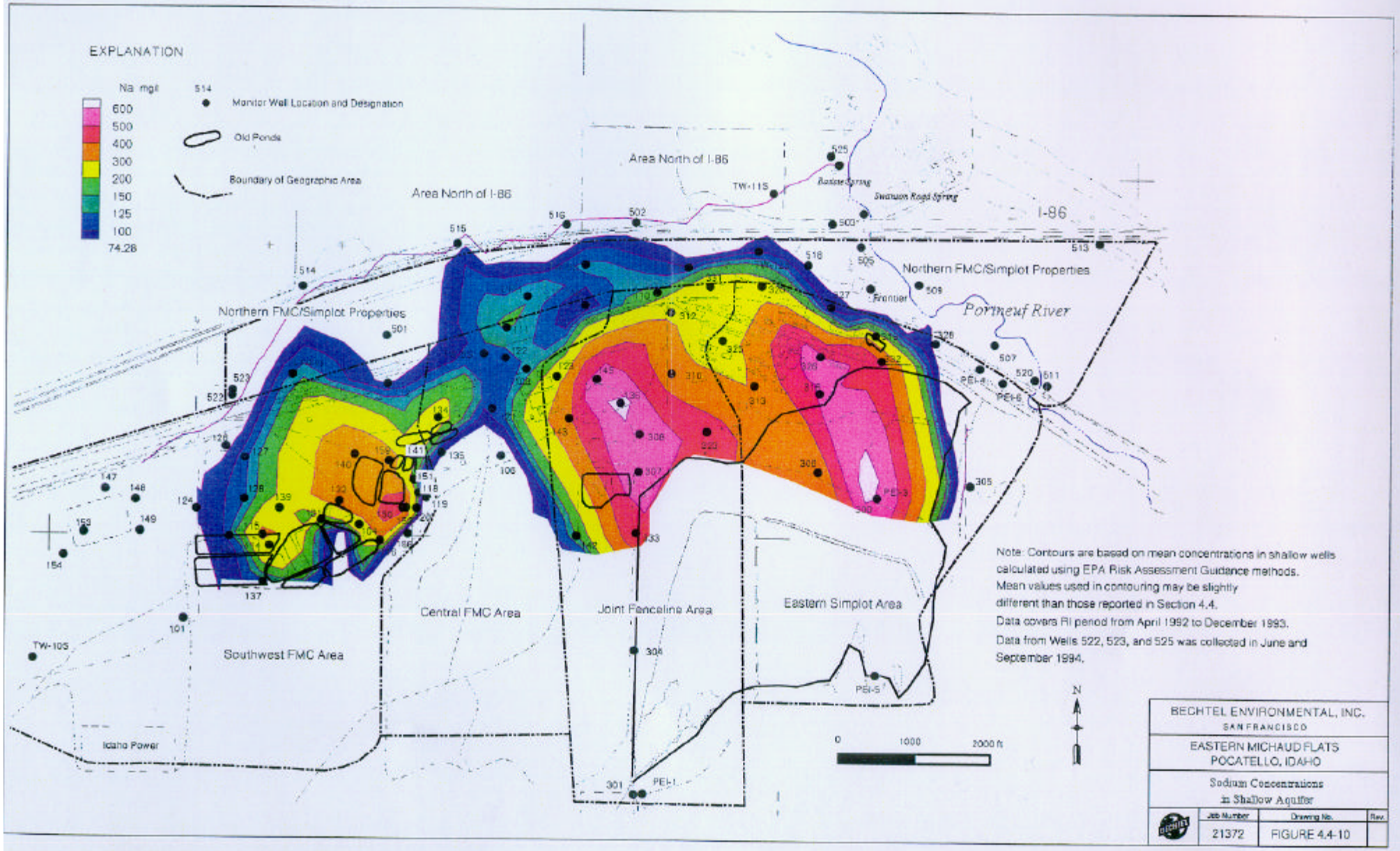

EXPLANATION
K mg/l
500.00
200.00
175.00
150.00
125.00
100.00
75.00
50.00
40.00
30.00
20.00
12.72
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Swanson Road Spring
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-10S
TW-11S
PEI-1
PEI-3
PEI-4
PEI-5
PEI-6
100.0
175.00
150.00
75.00
50.00
40.00
30.00
20.00
12.72
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
N
0
1000
2000 ft
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Potassium Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-5

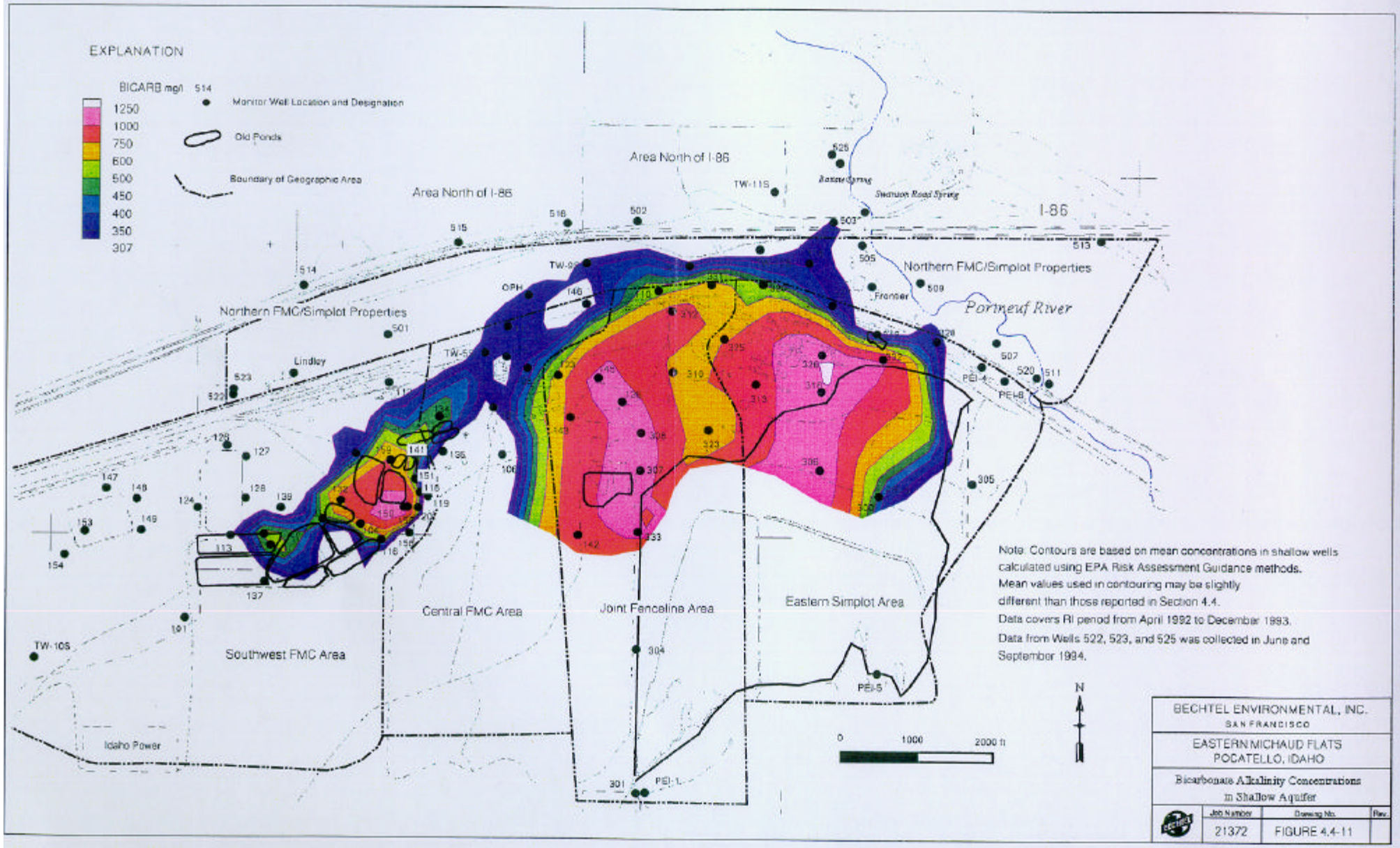

EXPLANATION
SO4 mg/l
2000
1750
1500
1250
900
700
500
300
200
100
72.6
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Swanson Road Spring
Frontier
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-11S
TW-12S
TW-10S
PEI-1
PEI-2
PEI-3
PEI-4
PEI-5
PEI-6
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Sulfate Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-5


EXPLANATION
Ca mg/l
500.0
400.0
300.0
200.0
150.0
125.0
97.7
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Swanson Road Spring
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-11S
TW-9S
TW-8S
TW-10S
DPH
PEI-1
PEI-3
PEI-4
PEI-5
PEI-6
68.8
97.7
125.0
150.0
200.0
300.0
400.0
500.0
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
N
0
1000
2000 ft
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Calcium Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-7


EXPLANATION
Cl mg/l
700.0
600.0
500.0
400.0
350.0
300.0
250.0
192.90
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
N
0
1000
2000 ft
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Chloride Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-8


EXPLANATION
Mg mg/l
300.0
250.0
200.0
150.0
125.0
100.0
70.0
60.0
50.0
40.0
35.9
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-10S
TW-11S
PEI-1
PEI-4
PEI-5
PEI-6
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Magnesium Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-9


EXPLANATION
Na mg/l
600
500
400
300
200
150
125
100
74.28
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Swanson Road Spring
Frontier
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Idaho Power
TW-10S
TW-11S
PEI-1
PEI-3
PEI-4
PEI-5
PEI-6
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Sodium Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-10
Rev.


EXPLANATION
BICARB mg/l
1250
1000
750
600
500
450
400
350
307
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Station Road Spring
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Bicarbonate Alkalinity Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-11
Rev.

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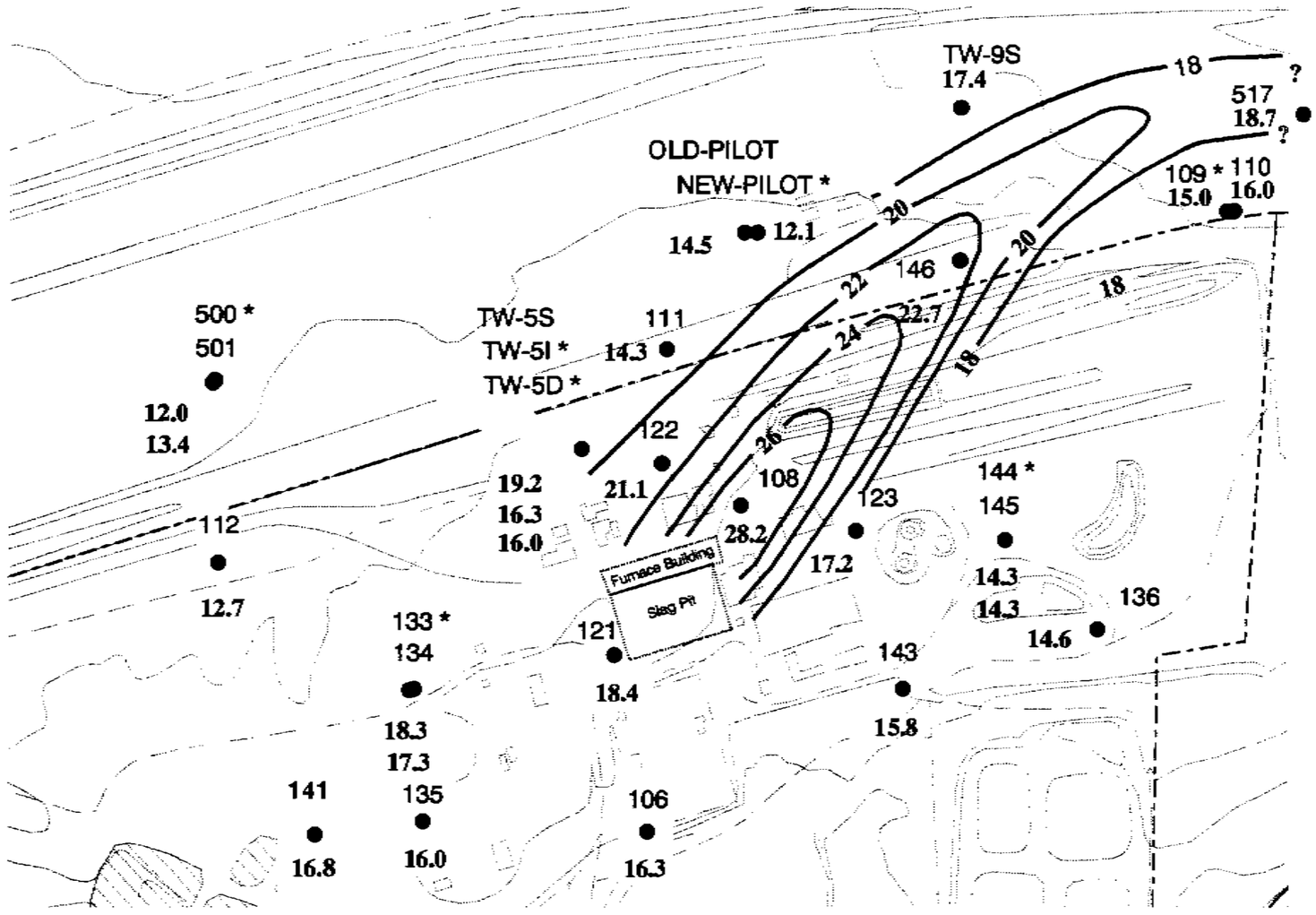


Legend:

122 Well Designation

● Well Location

21.1 Temperature (degrees C) (August 1993)

* Deeper Well

0 500 1000 FEET

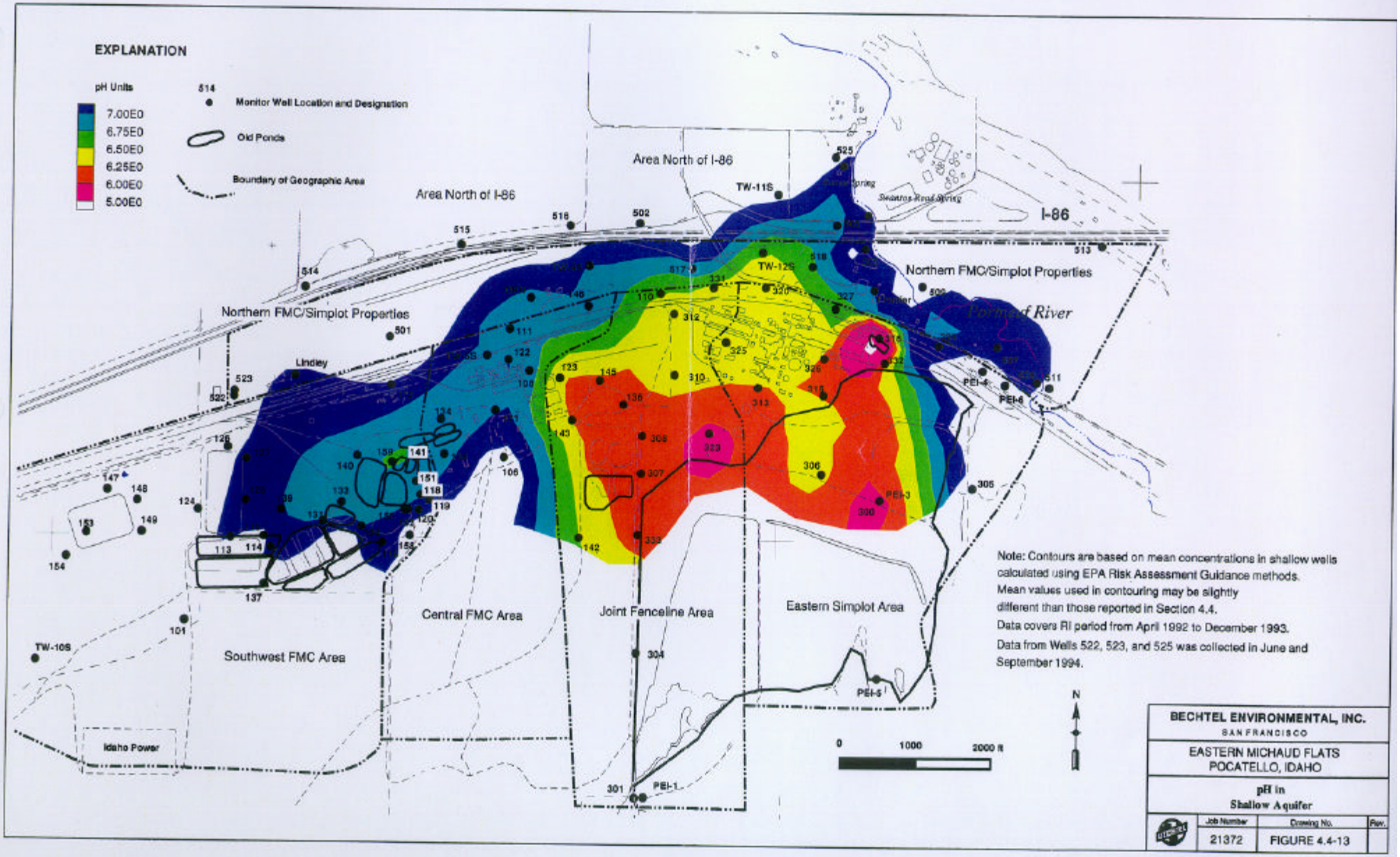
0 100 200 300 METERS

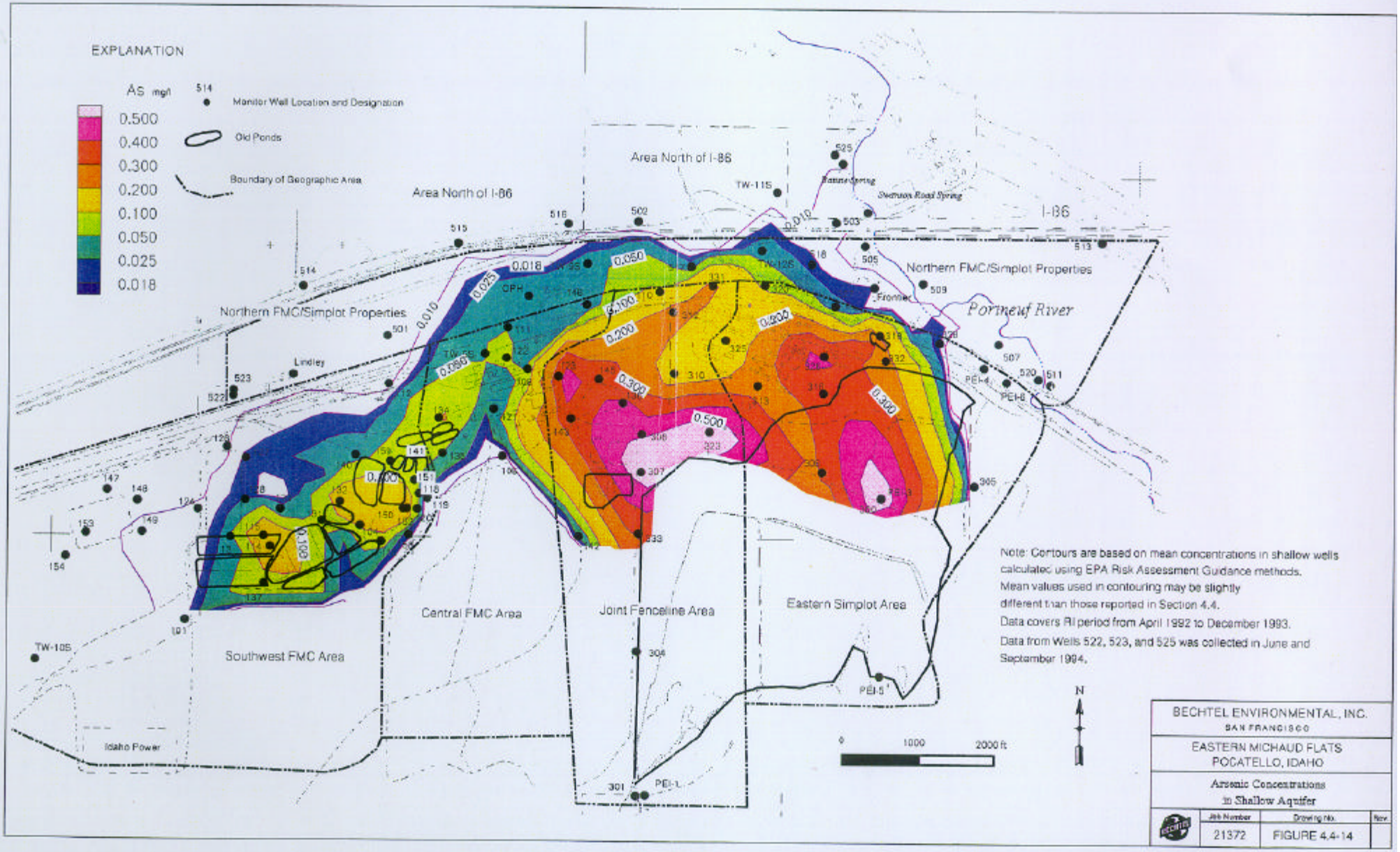
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO

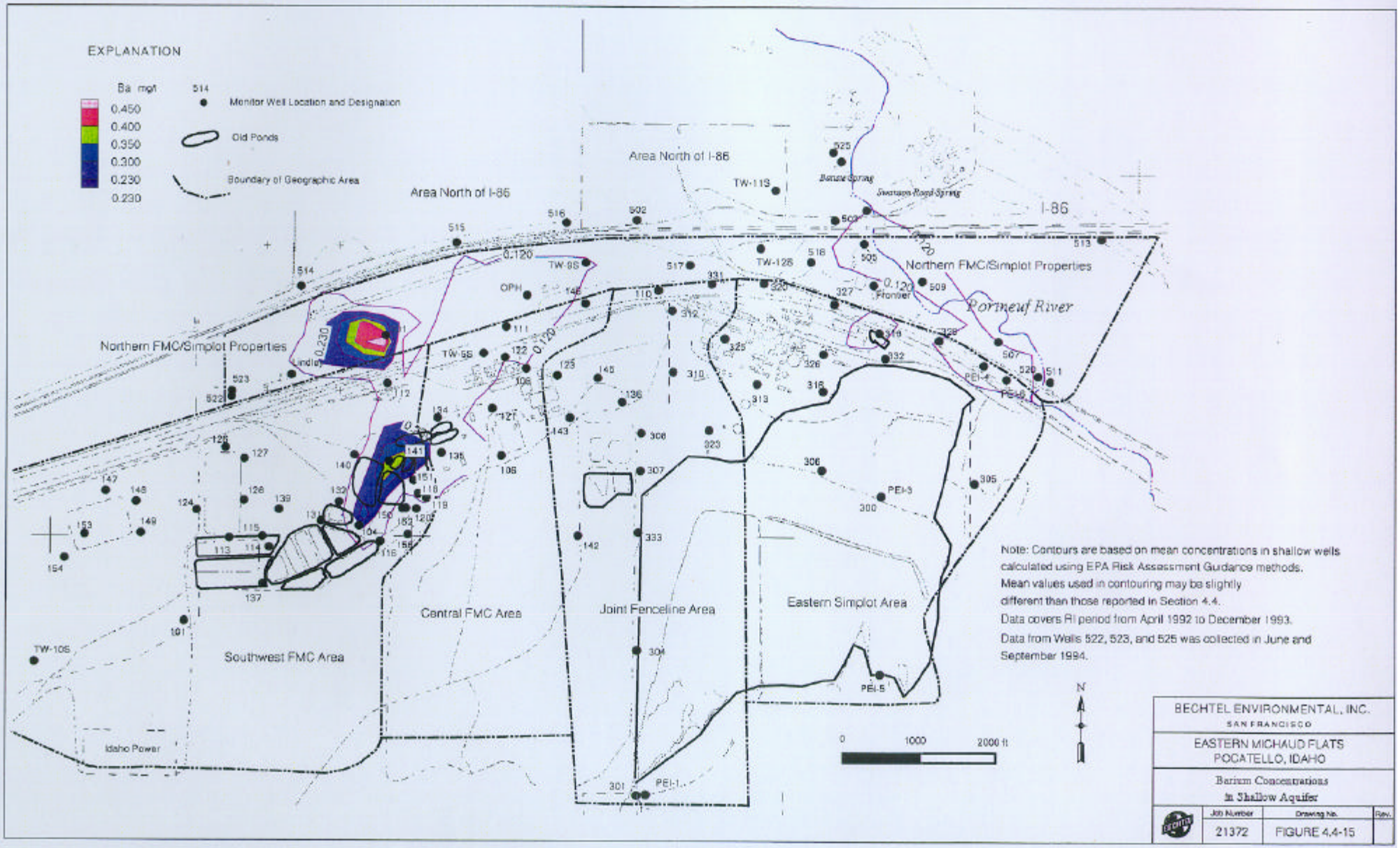
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

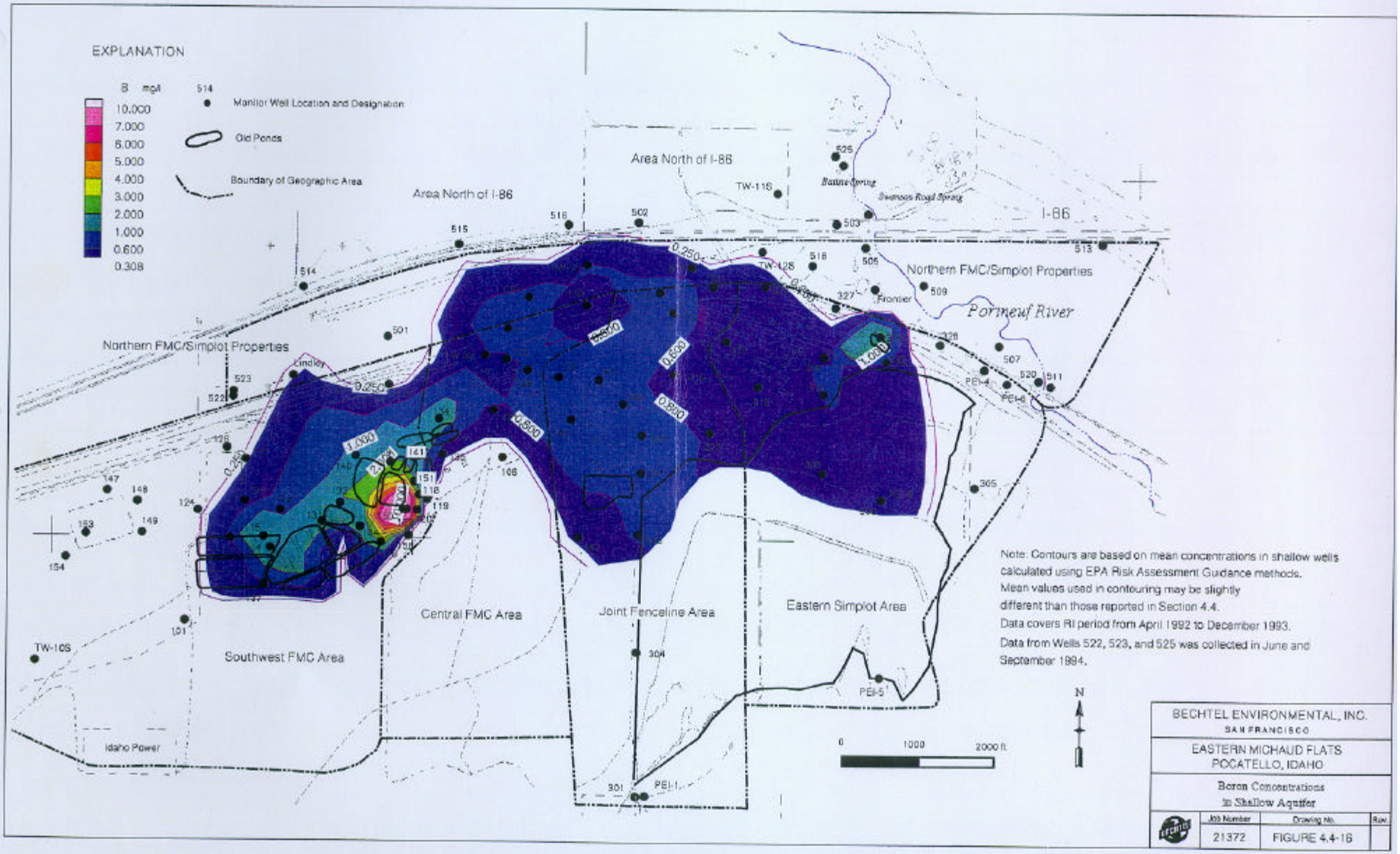
Temperature Pattern in Groundwater at FMC

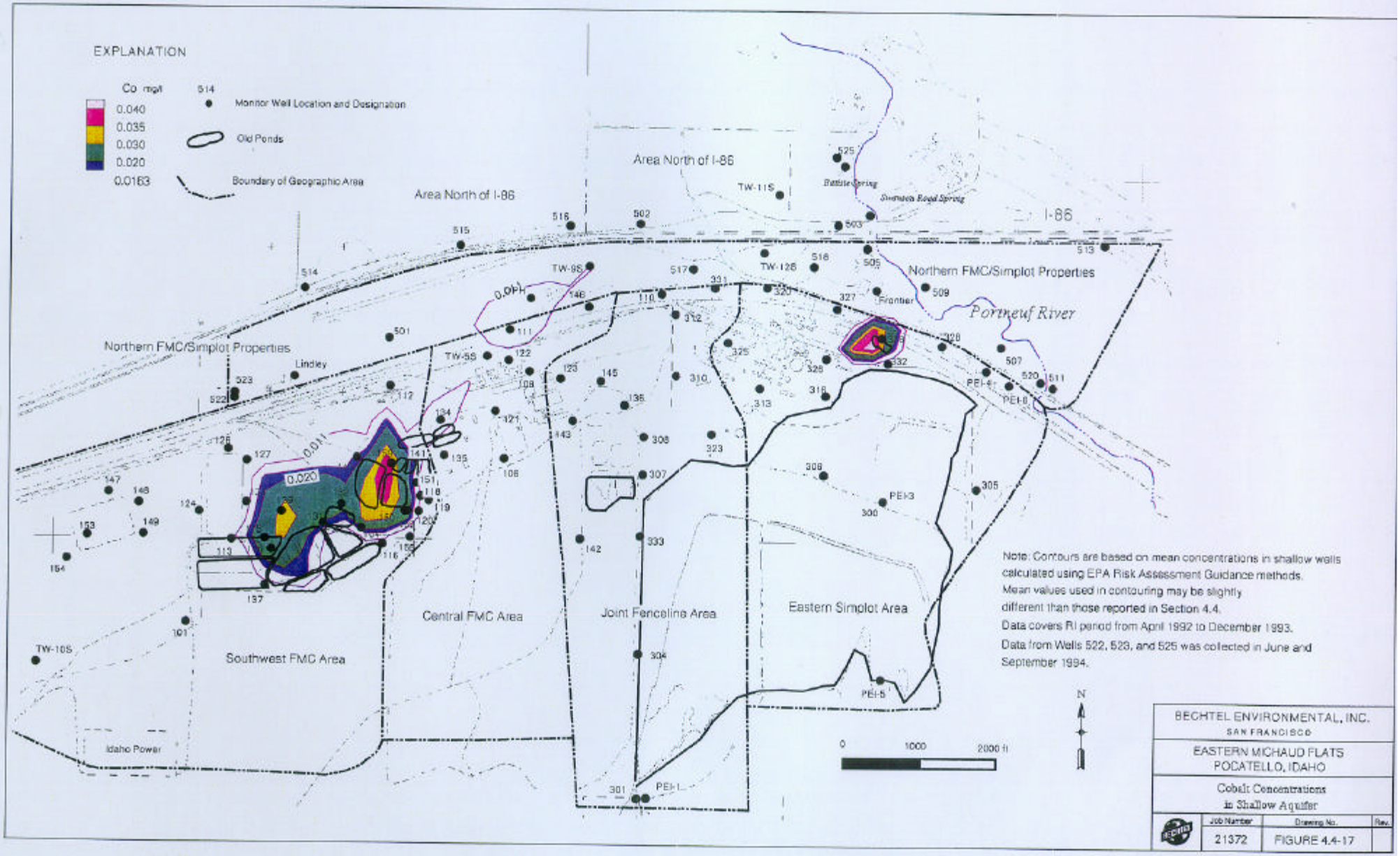
Job Number	Drawing No.	Re
21372	*FIGURE 4.4-12*	

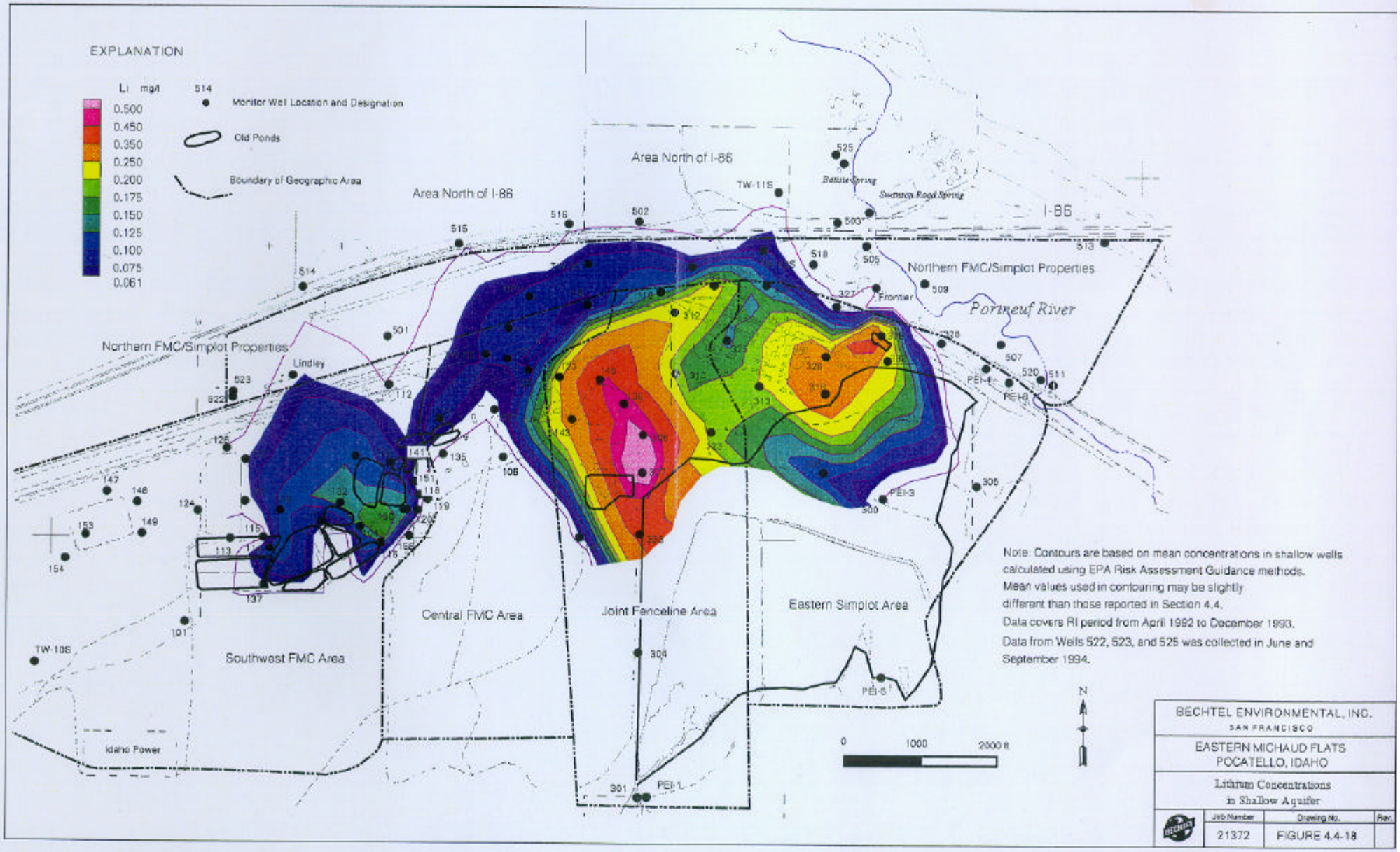

EXPLANATION
pH Units
7.00E0
6.75E0
6.50E0
6.25E0
6.00E0
5.00E0
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Lindley
Fort of River
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-11S
TW-12S
TW-10S
PEI-1
PEI-3
PEI-4
PEI-5
PEI-6
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
pH in
Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-13
Rev.

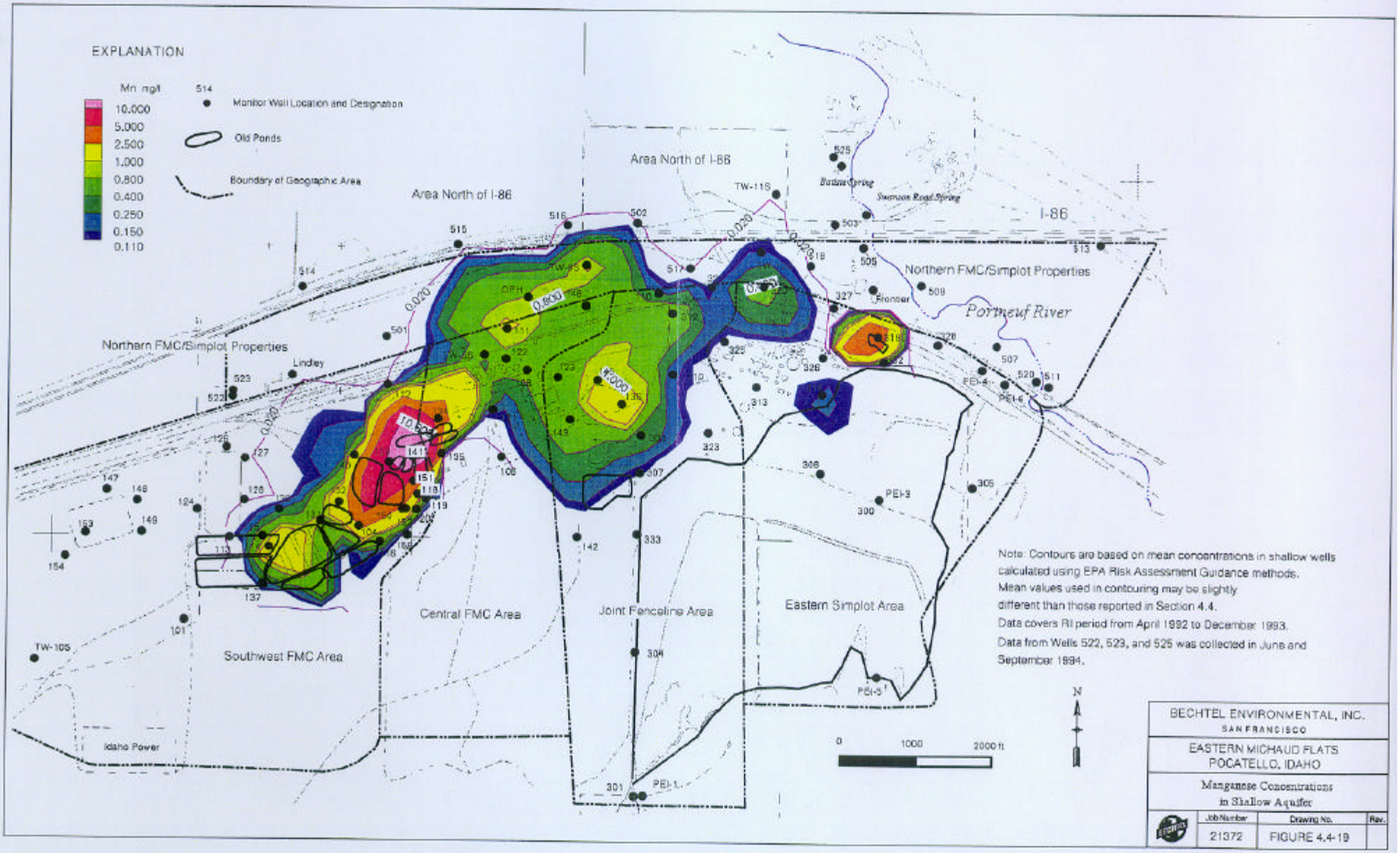

EXPLANATION
AS mg/l
0.500
0.400
0.300
0.200
0.100
0.050
0.025
0.018
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods. Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Arsenic Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-14
Rev.

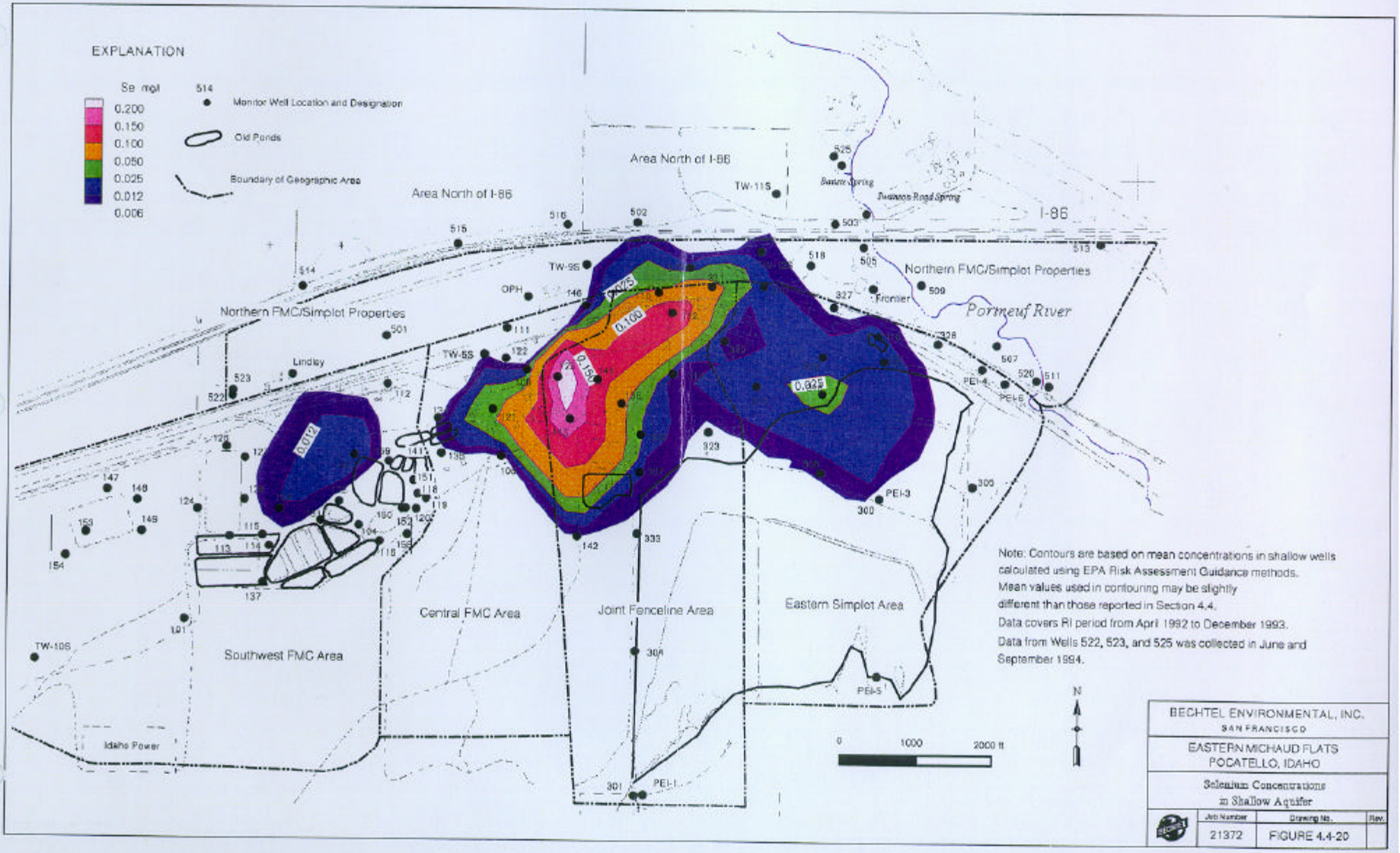

EXPLANATION
Ba mg/l
0.450
0.400
0.350
0.300
0.230
0.230
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Barium Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-15
Rev.

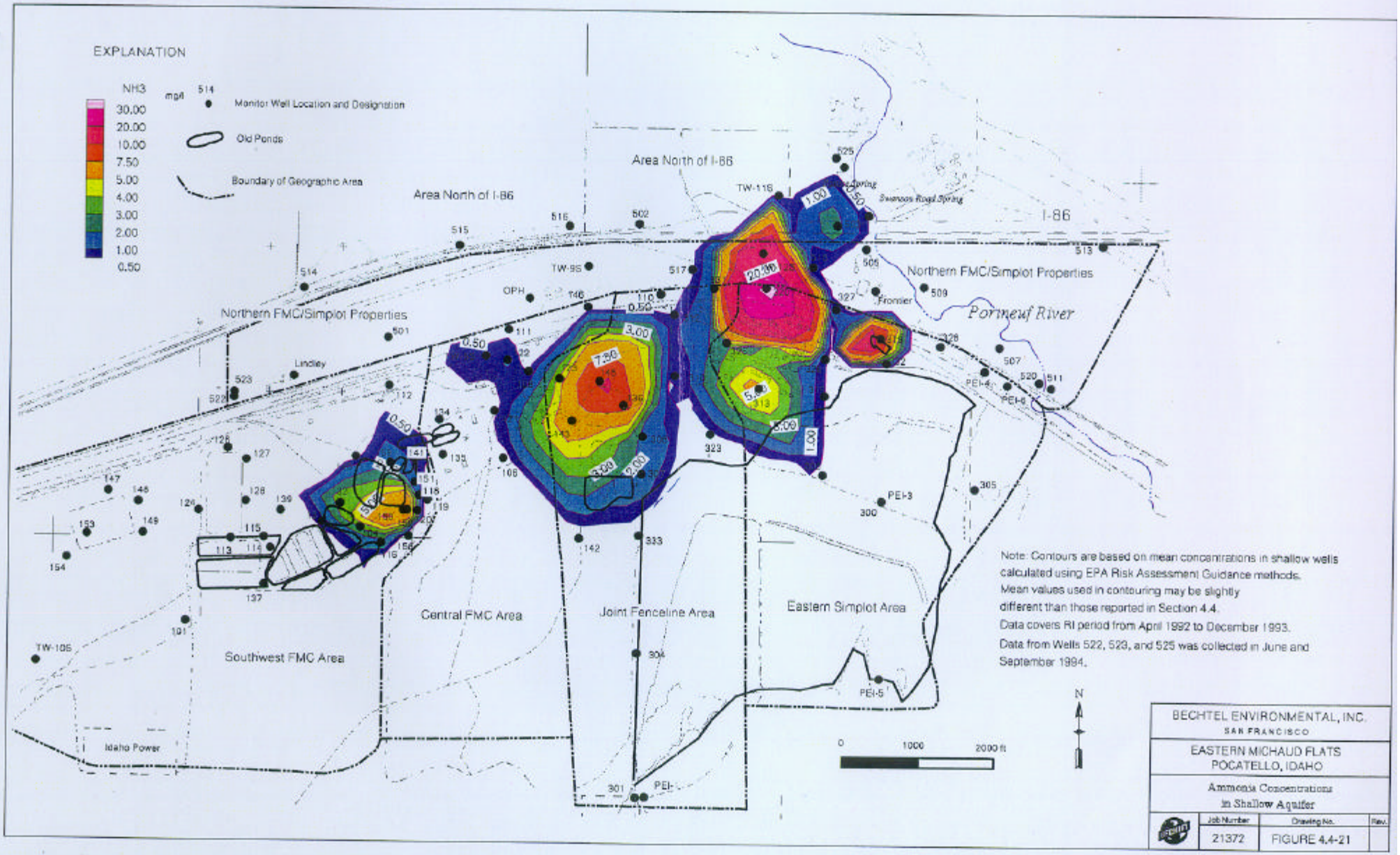

EXPLANATION
B mg/l
10.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0.600
0.308
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Frontier
Cindley
Idaho Power
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Boron Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-16
Rev.

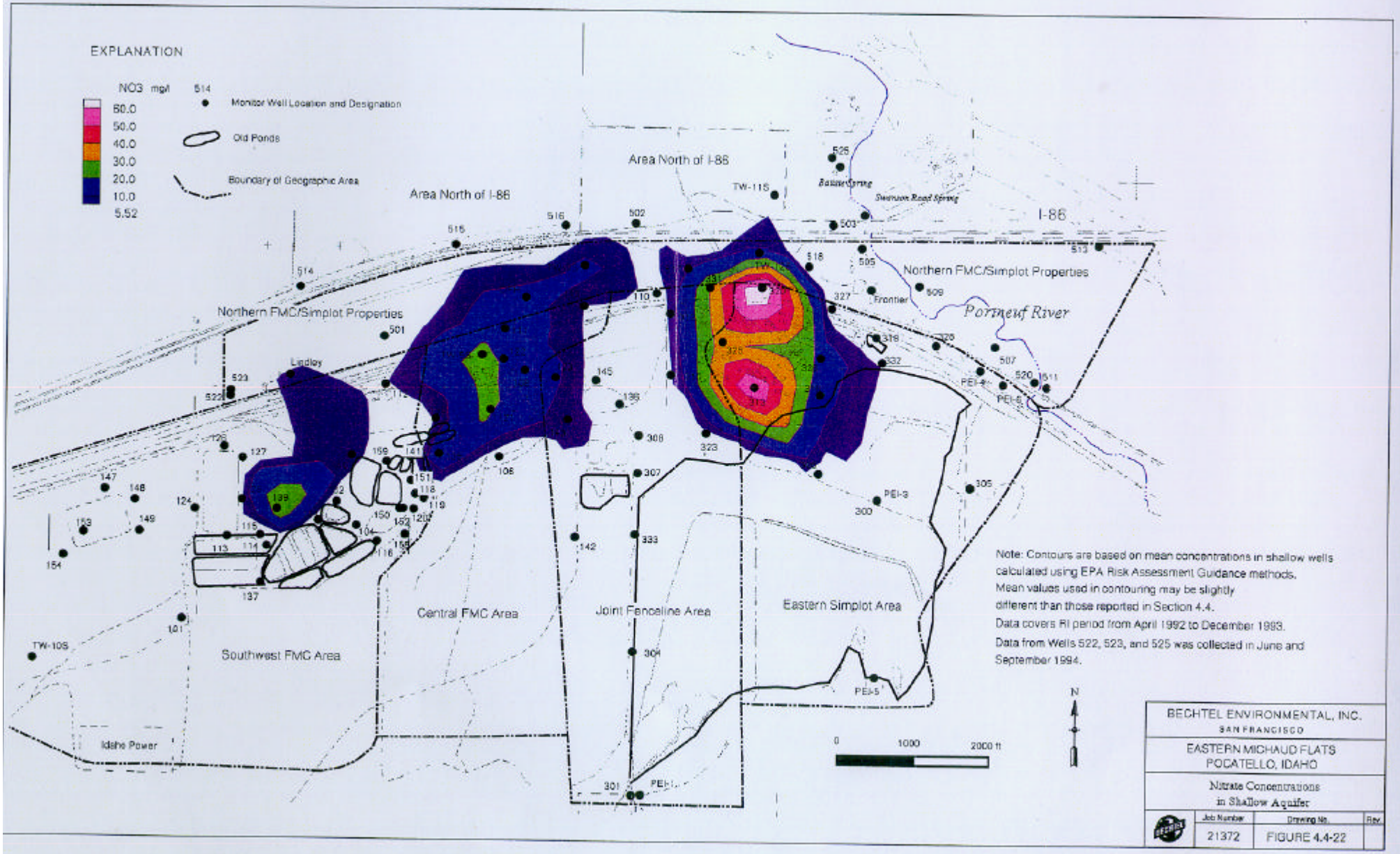

EXPLANATION
Co mg/l
0.040
0.035
0.030
0.020
0.0163
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Battle Spring
Swanson Road Spring
Frontier
Lindley
Idaho Power
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
0.020
0.011
0.0PH
TW-11S
TW-9S
TW-12S
TW-5S
TW-10S
PEI-1
PEI-3
PEI-5
PEI-6
PEI-8
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
N
0
1000
2000 ft
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Cobalt Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-17
Rev.

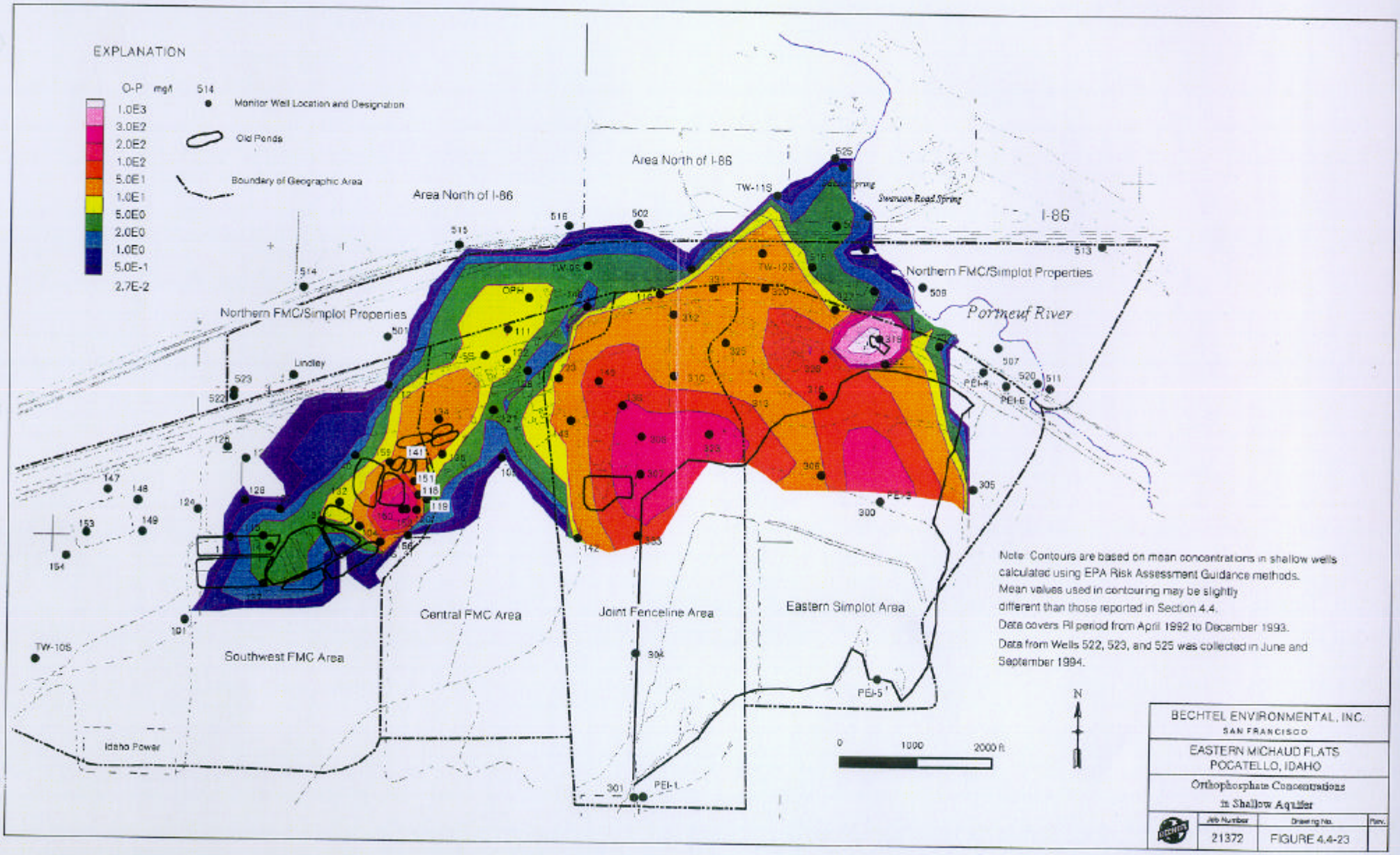

EXPLANATION
Li mg/l
0.500
0.450
0.350
0.250
0.200
0.175
0.150
0.125
0.100
0.075
0.061
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Idaho Power
TW-11S
TW-10S
PEI-1
PEI-3
PEI-5
PEI-6
PEI-8
PEI-L
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Lithium Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-18
Rev.

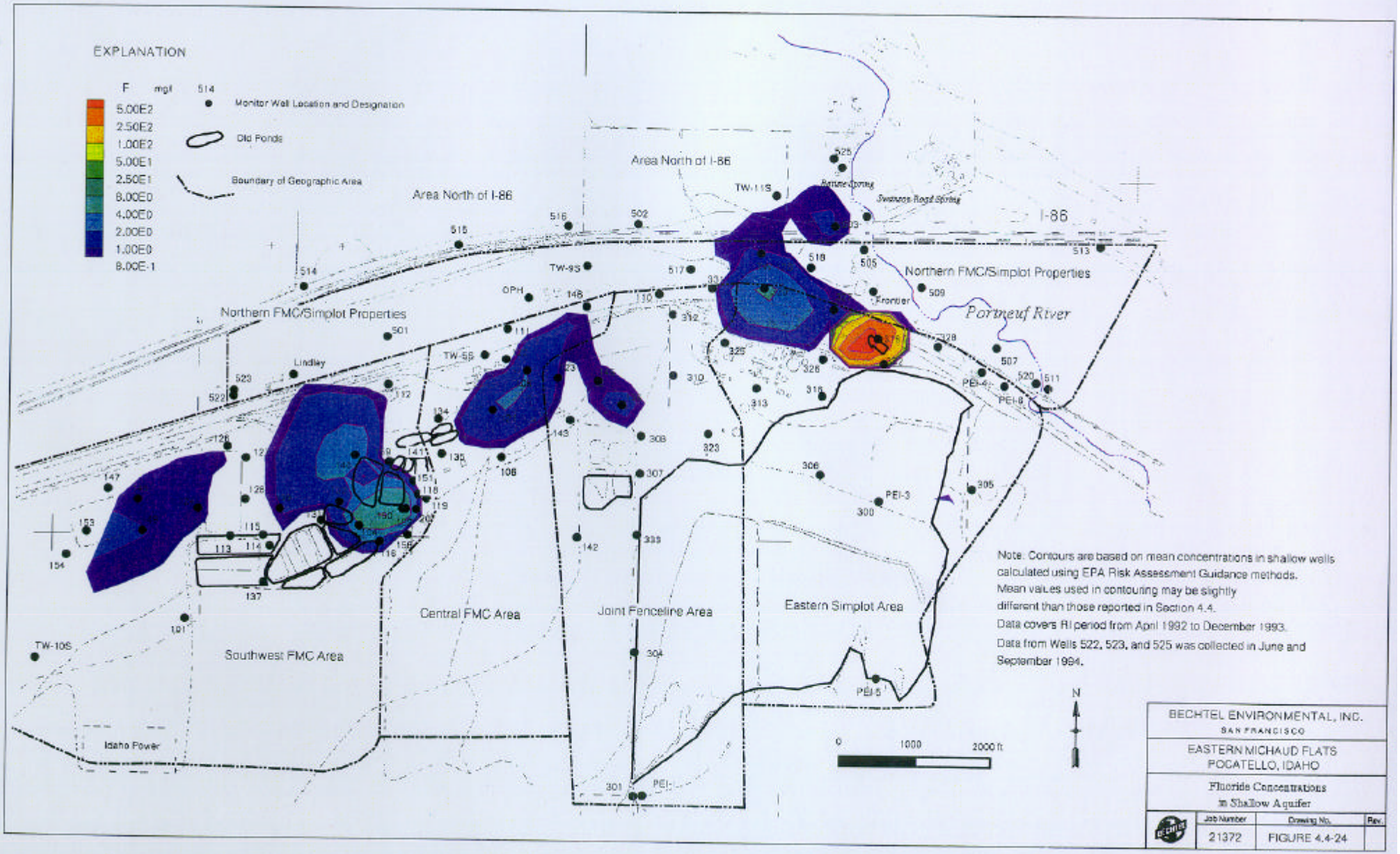

EXPLANATION
Mn mg/l
10.000
5.000
2.500
1.000
0.800
0.400
0.250
0.150
0.110
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Manganese Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-19
Rev.

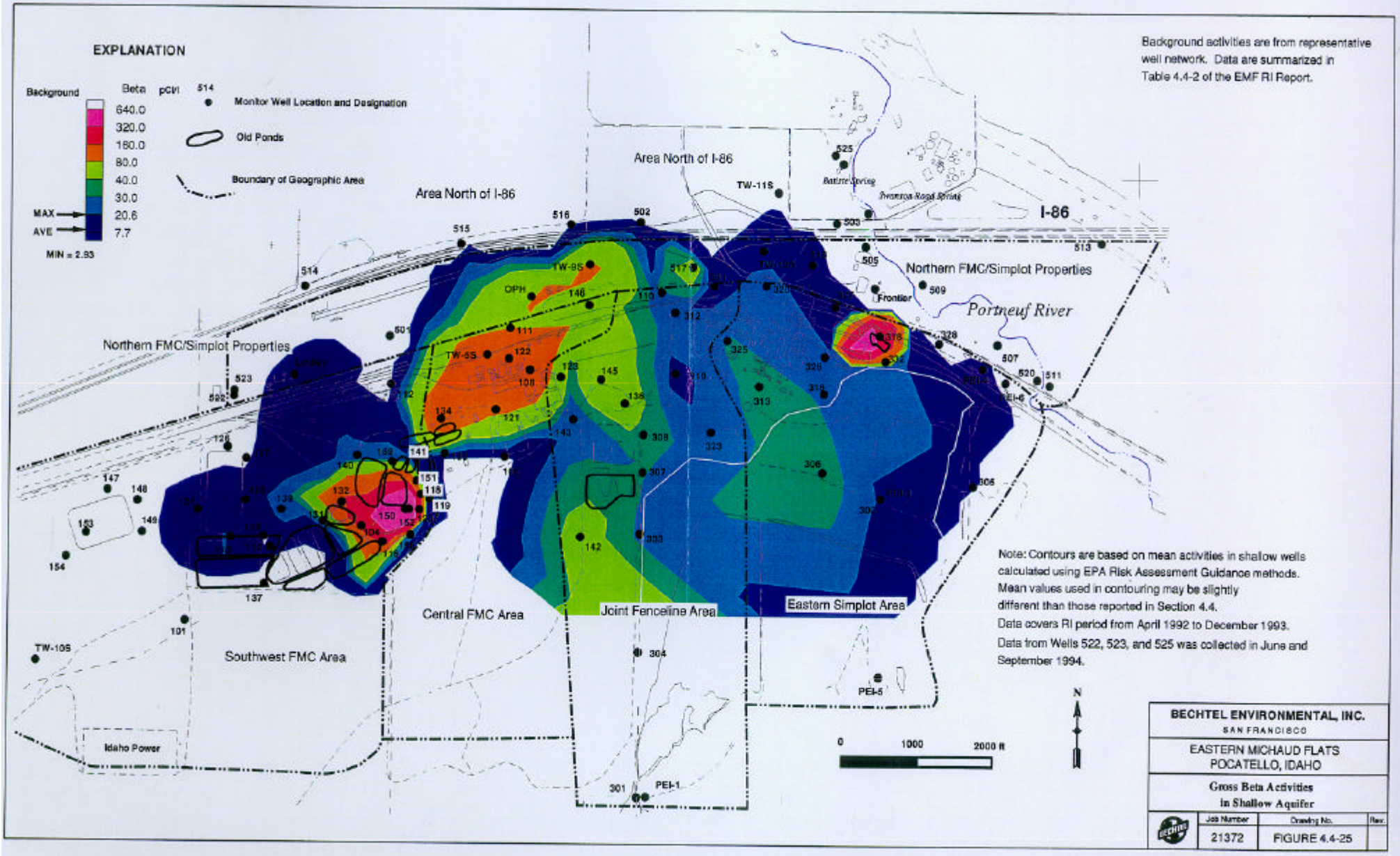

EXPLANATION
Se mg/l
0.200
0.150
0.100
0.050
0.025
0.012
0.006
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Swanson Spring
Swanson Road Spring
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Idaho Power
TW-11S
TW-9S
TW-5S
TW-10S
OPH
PEI-1
PEI-3
PEI-4
PEI-5
PEI-6
0.012
0.100
0.150
0.025
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods. Mean values used in contouring may be slightly different than those reported in Section 4.4. Data covers RI period from April 1992 to December 1993. Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Selenium Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-20
Rev.

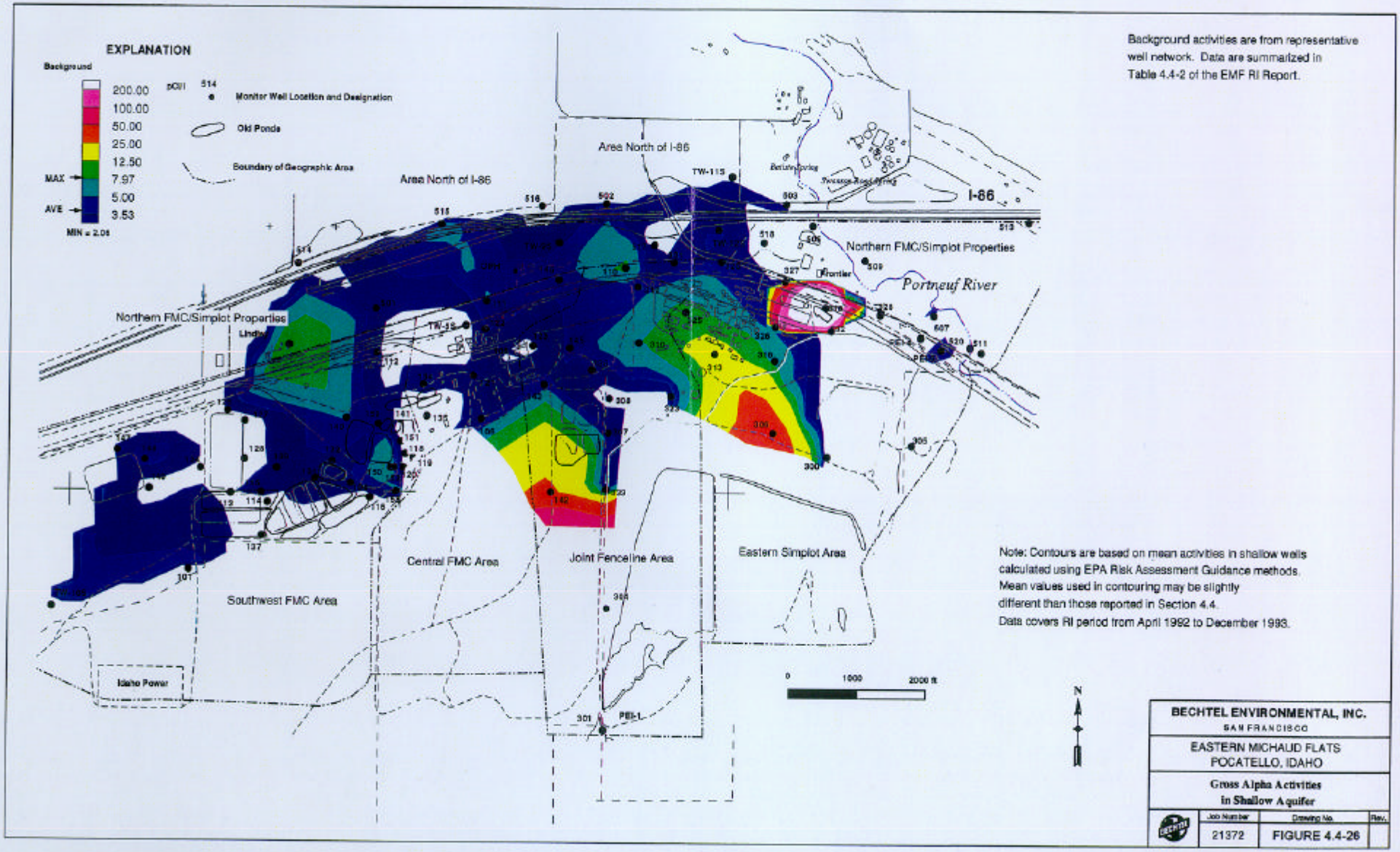

EXPLANATION
NH3 mg/l
30.00
20.00
10.00
7.50
5.00
4.00
3.00
2.00
1.00
0.50
514 Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Swanson Road Spring
Spring
Idaho Power
Southwest FMC Area
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
N
0
1000
2000 ft
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Ammonia Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-21
Rev.


EXPLANATION
NO3 mg/l
60.0
50.0
40.0
30.0
20.0
10.0
5.52
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-10S
TW-11S
PEI-1
PEI-3
PEI-4
PEI-5
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
N
0
1000
2000 ft
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Nitrate Concentrations in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-22
Rev.


EXPLANATION
O-P mg/l
1.0E3
3.0E2
2.0E2
1.0E2
5.0E1
1.0E1
5.0E0
2.0E0
1.0E0
5.0E-1
2.7E-2
514
Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Swanson Road Spring
Lindley
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods.
Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0
1000
2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Orthophosphate Concentrations
in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-23
Rev.


EXPLANATION
F mgl
5.00E2
2.50E2
1.00E2
5.00E1
2.50E1
8.00E0
4.00E0
2.00E0
1.00E0
8.00E-1
514 Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Lindley
Frontier
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
Note: Contours are based on mean concentrations in shallow wells calculated using EPA Risk Assessment Guidance methods. Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0 1000 2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Fluoride Concentrations in Shallow Aquifer
Job Number 21372
Drawing No. FIGURE 4.4-24
Rev.

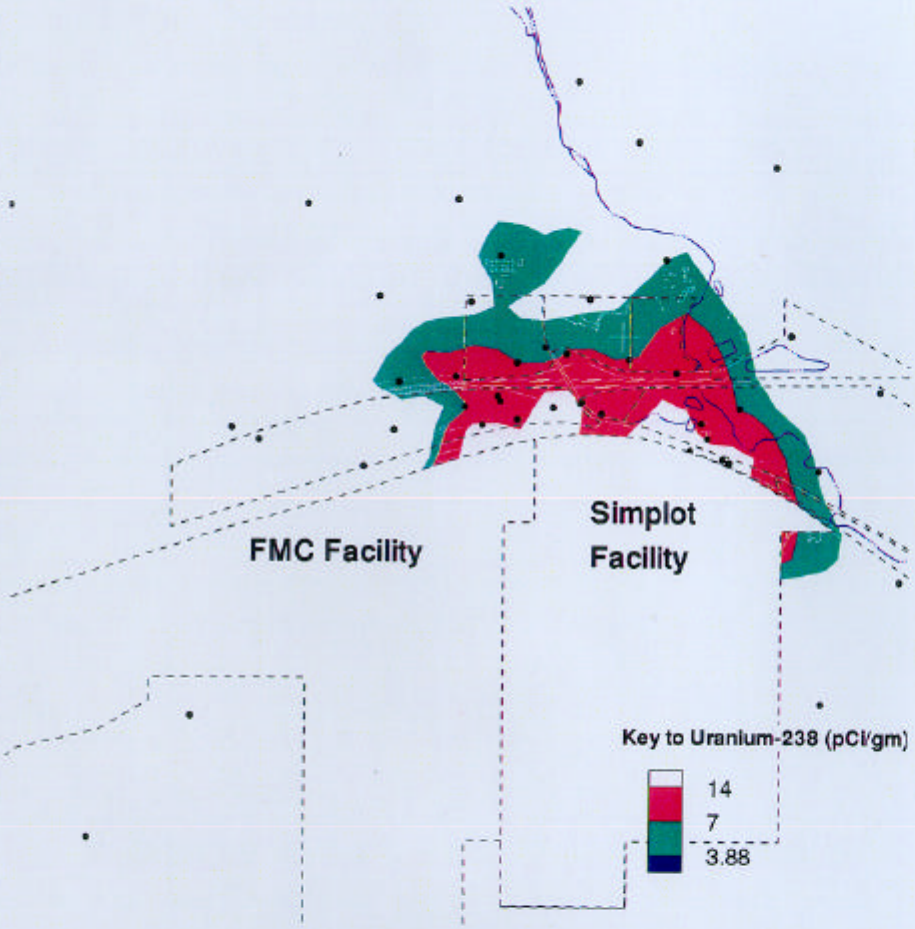

EXPLANATION
Background
Beta pCi/l
640.0
320.0
160.0
80.0
40.0
30.0
20.6
7.7
MAX
AVE
MIN = 2.93
514 Monitor Well Location and Designation
Old Ponds
Boundary of Geographic Area
Background activities are from representative well network. Data are summarized in Table 4.4-2 of the EMF RI Report.
Area North of I-86
Area North of I-86
I-86
Northern FMC/Simplot Properties
Northern FMC/Simplot Properties
Portneuf River
Frontier
Batiste Spring
Pocatello Road Spring
Central FMC Area
Joint Fenceline Area
Eastern Simplot Area
Southwest FMC Area
Idaho Power
TW-11S
TW-9S
TW-5S
OPH
TW-10S
PEI-5
PEI-1
Note: Contours are based on mean activities in shallow wells calculated using EPA Risk Assessment Guidance methods. Mean values used in contouring may be slightly different than those reported in Section 4.4.
Data covers RI period from April 1992 to December 1993.
Data from Wells 522, 523, and 525 was collected in June and September 1994.
0 1000 2000 ft
N
BECHTEL ENVIRONMENTAL, INC.
SAN FRANCISCO
EASTERN MICHAUD FLATS
POCATELLO, IDAHO
Gross Beta Activities in Shallow Aquifer
Job Number
21372
Drawing No.
FIGURE 4.4-25
Rev.



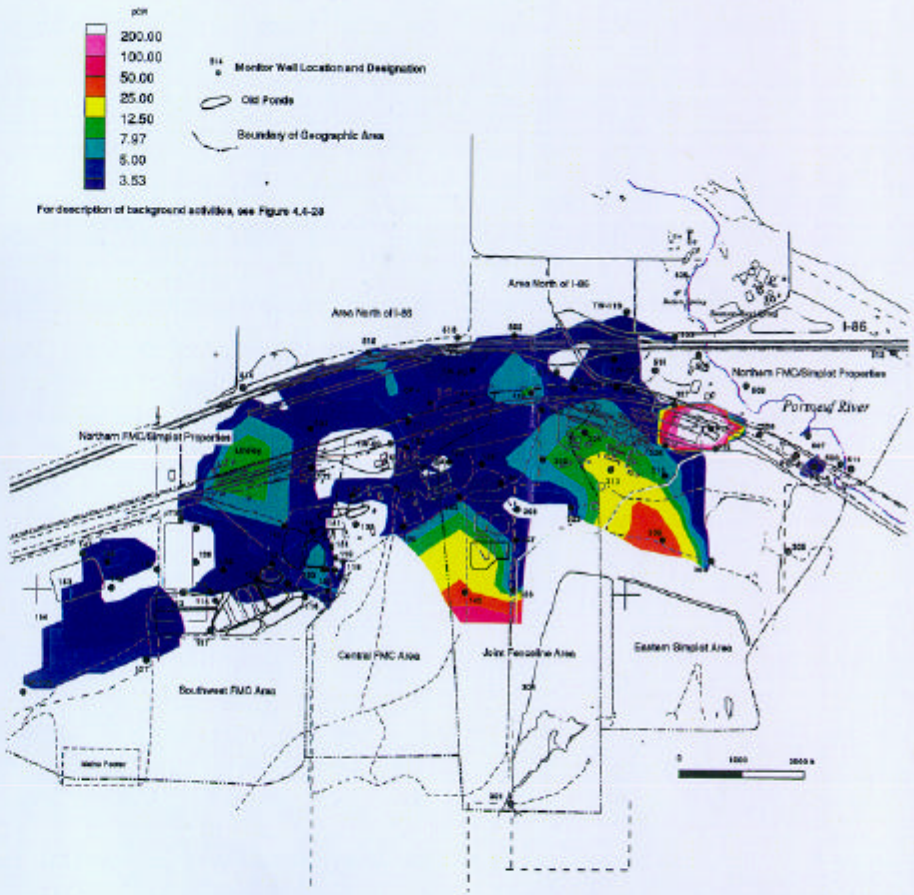
Background activities are from representative well network. Data are summarized in Table 4.4-2 of the EMF RI Report.

Note: Contours are based on mean activities in shallow wells calculated using EPA Risk Assessment Guidance methods. Mean values used in contouring may be slightly different than those reported in Section 4.4. Data covers RI period from April 1992 to December 1993.

BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO		
EASTERN MICHAUD FLATS POCATELLO, IDAHO		
Gross Alpha Activities in Shallow Aquifer		
Job Number	Drawing No.	Rev.
21372	FIGURE 4.4-26	

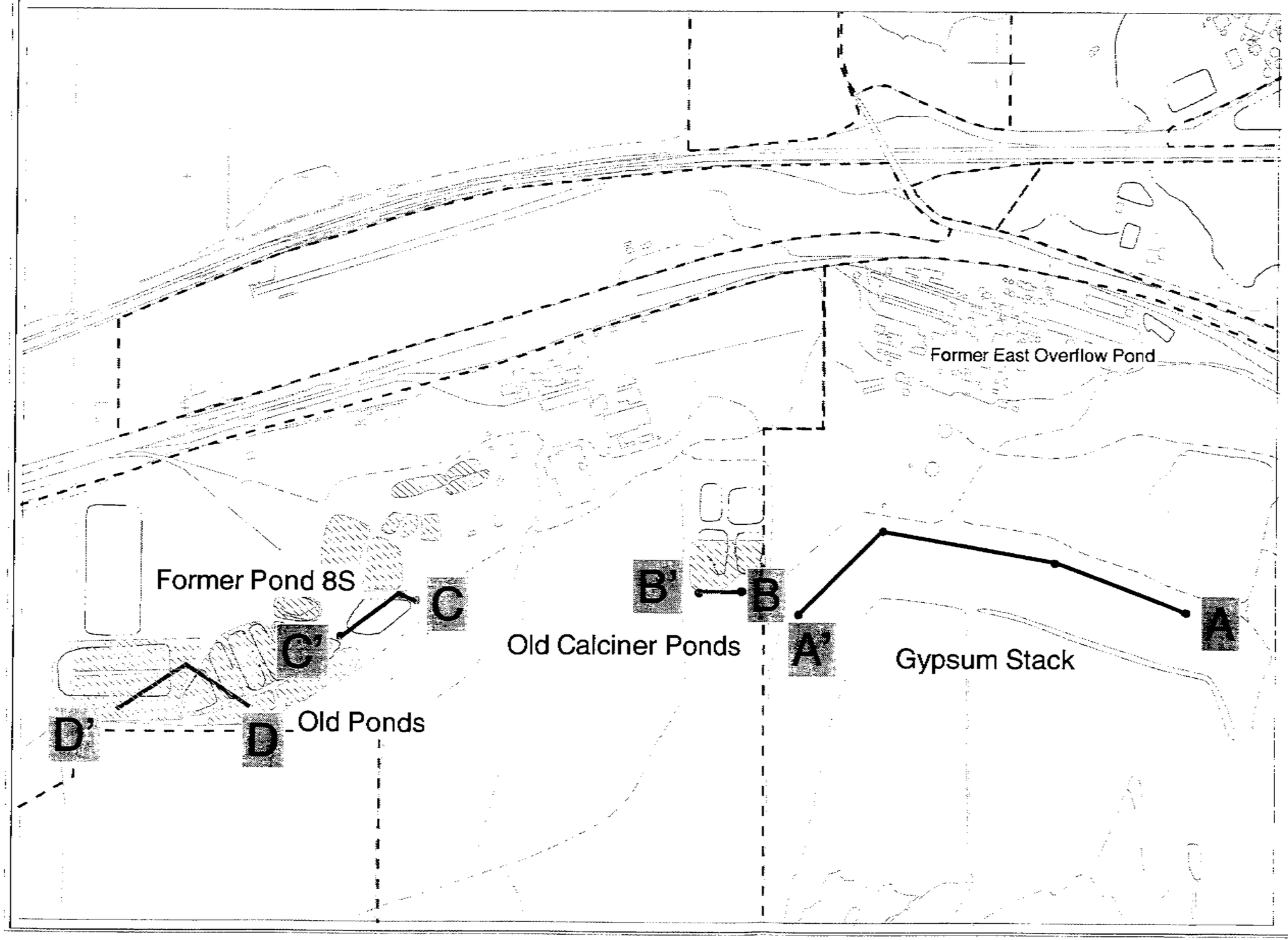


U-238 in Surface Soils



Gross Alpha in Shallow Aquifer

BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO		
EASTERN MICHAUD FLATS POCATELLO, IDAHO		
U-238 in Soil vs. Gross Alpha in Shallow Aquifer		
Job Number	Drawing No.	Rev.
21372	FIGURE 4.4-27	



EXPLANATION:

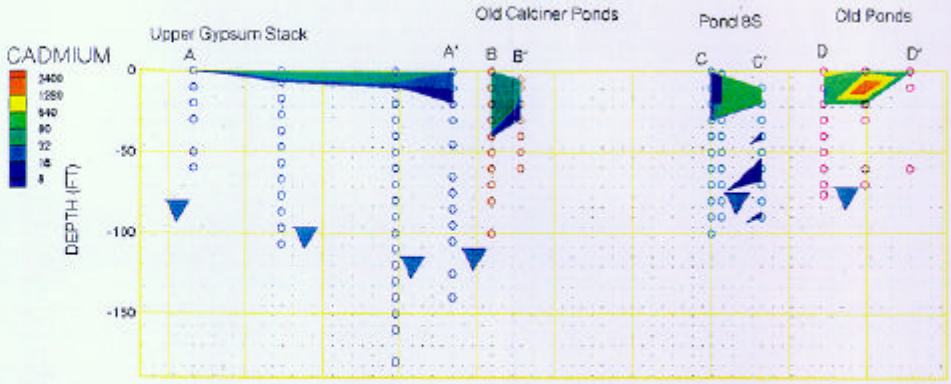
Profile line

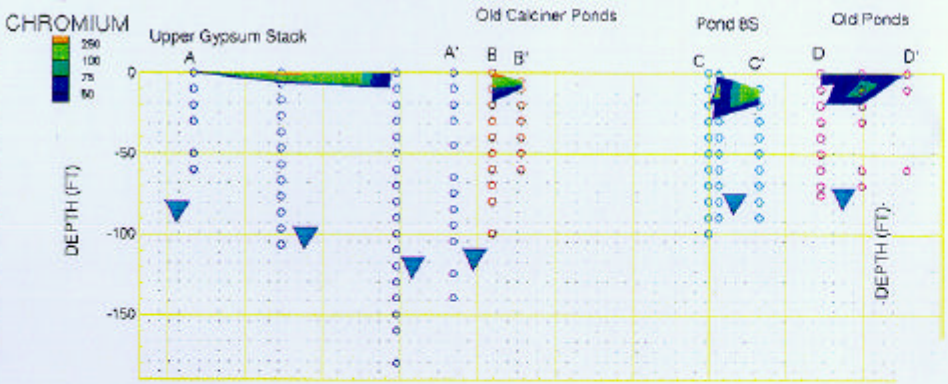
A' A

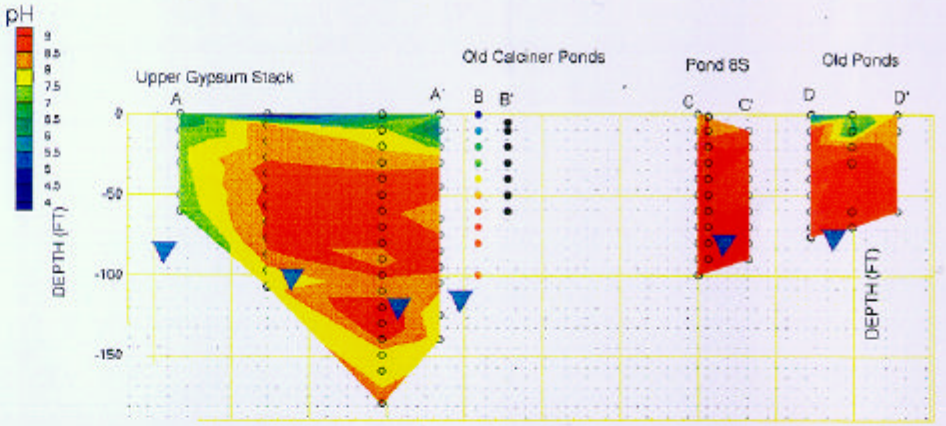
N

0 1000 2000 f

BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO			
EASTERN MICHAUD FLATS POCATELLO, IDAHO			
Soil Chemistry Profiles			
	Job Number	Drawing No.	Rev
	21372	FIGURE 5.3-1a	







Note: pH measurements not collected for all soil samples at Old Calciner Ponds

▼ Approximate Depth of Groundwater

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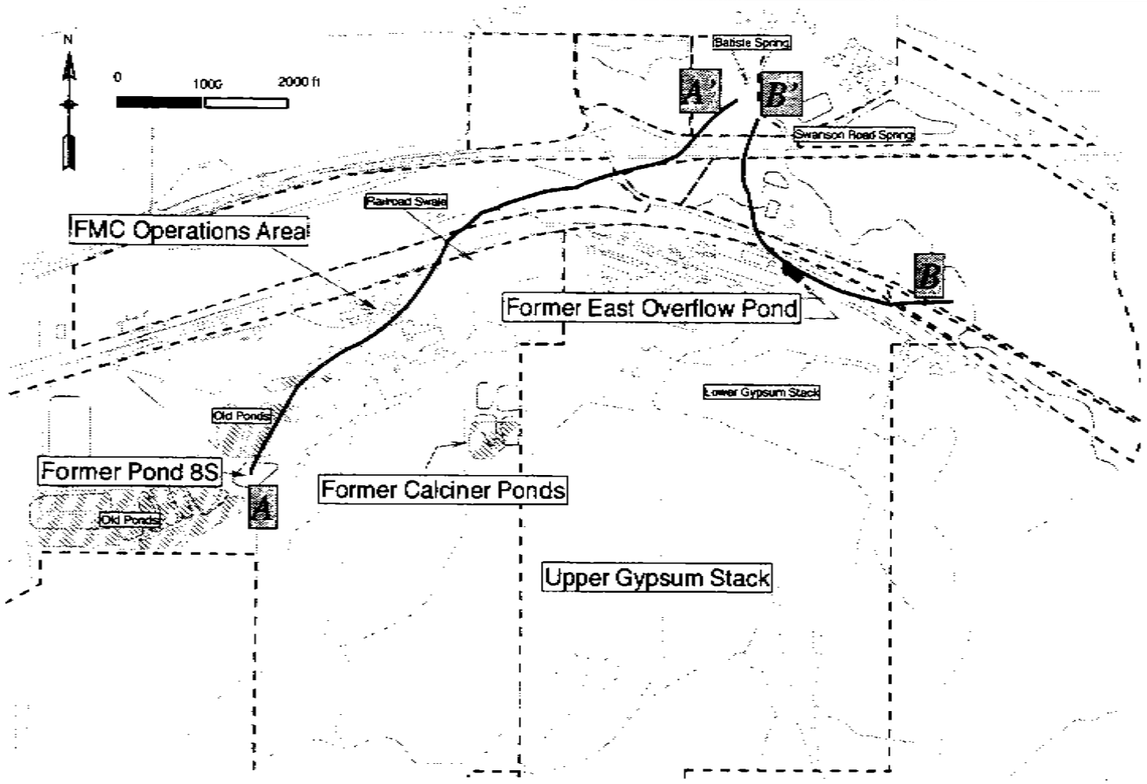
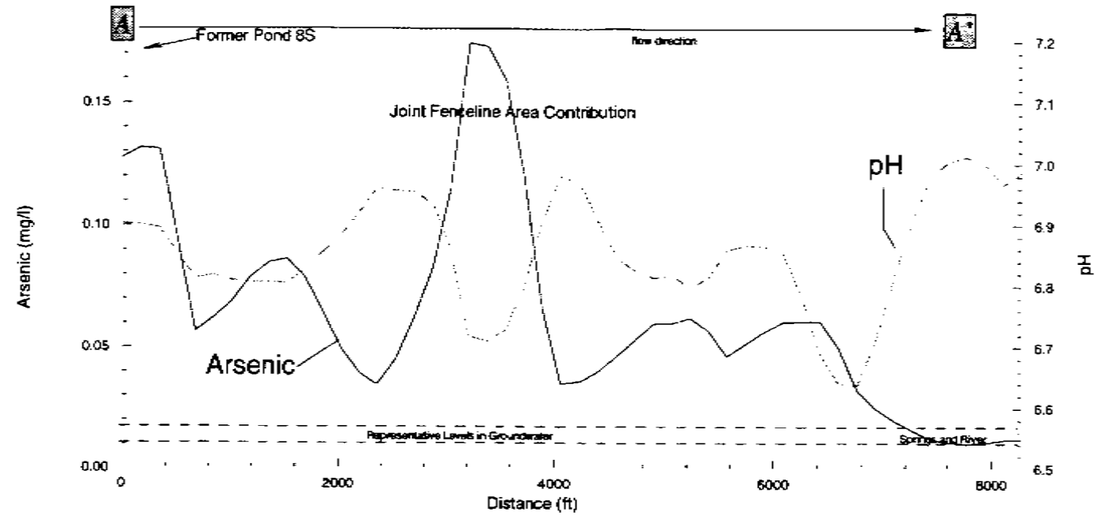
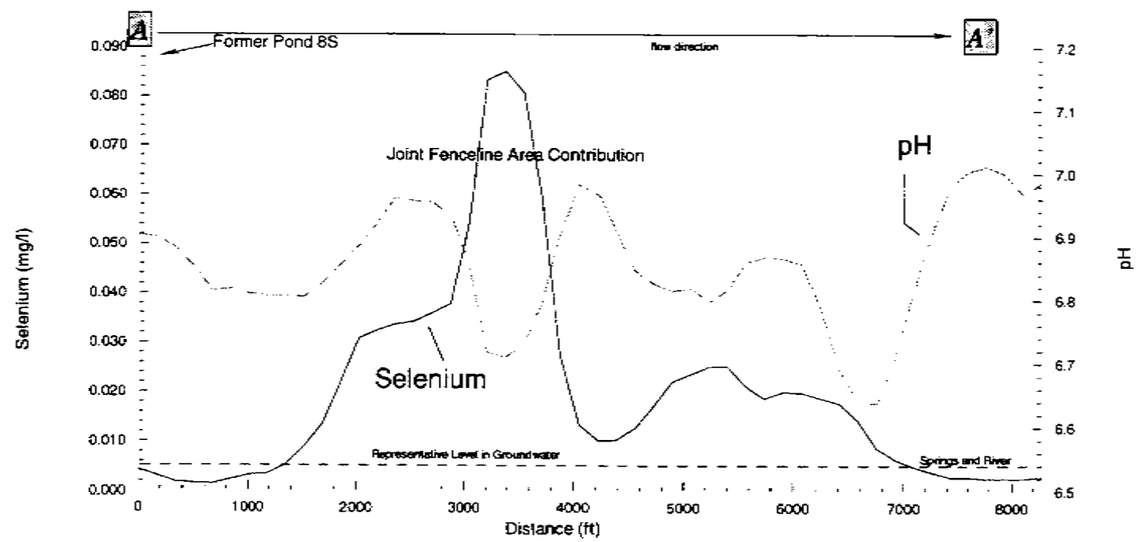
EASTERN MICHAUD FLATS
POCATELLO, IDAHO

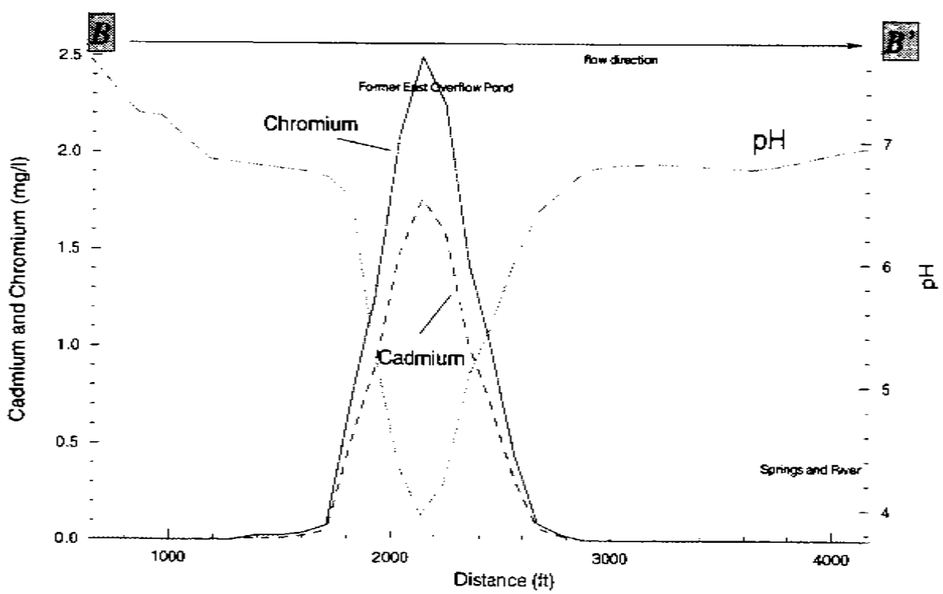
Soil Chemistry Profiles

Job Number	Drawing No.	Rev.
21372	FIGURE 5.3-1b	



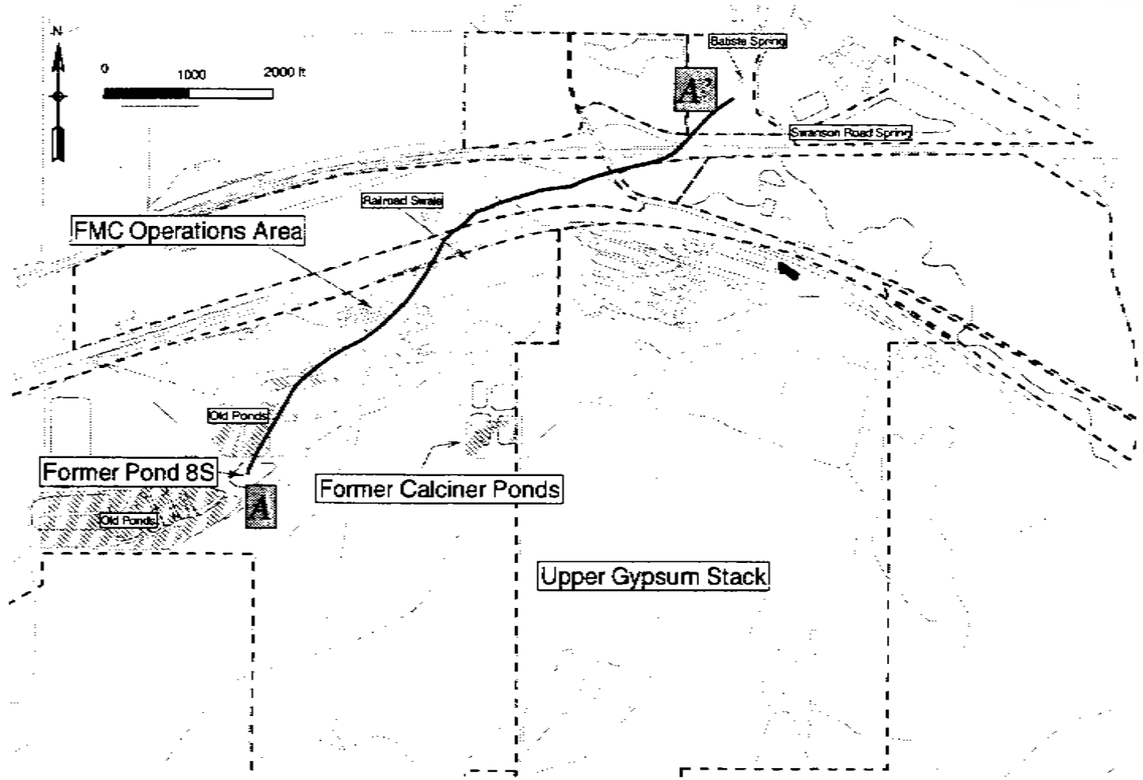




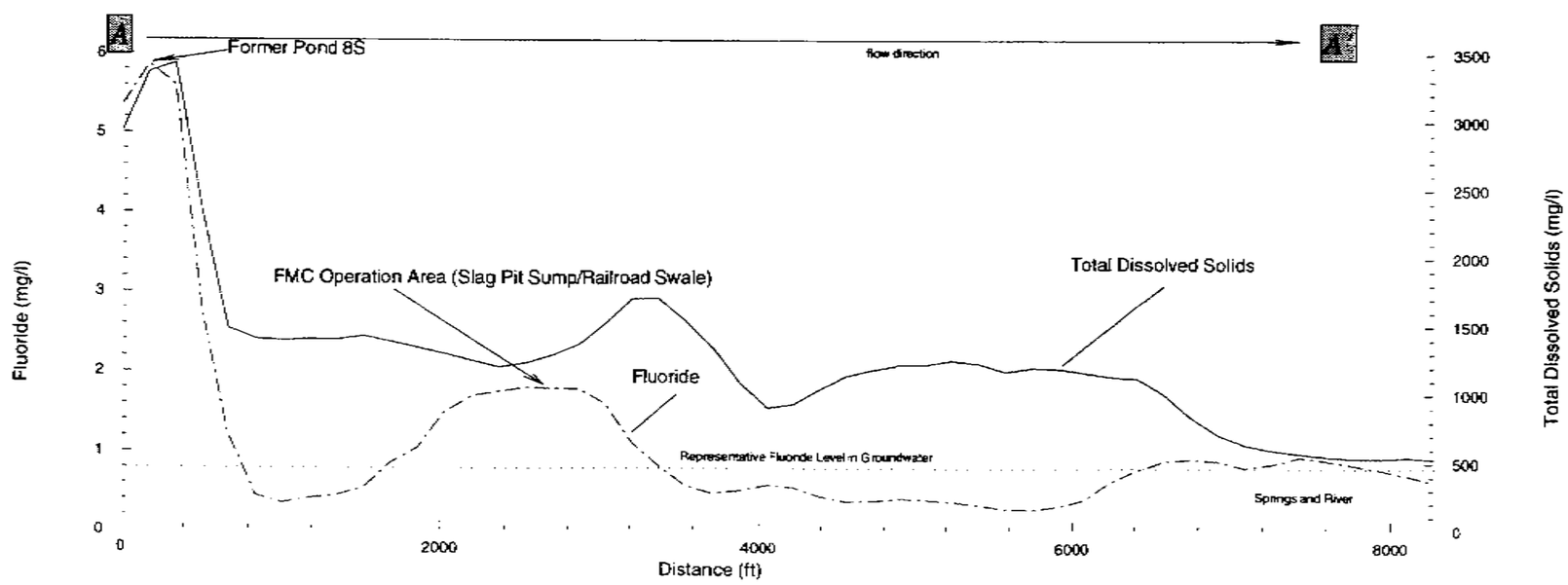


Note: Concentration profiles from shallow groundwater concentration contour plots presented in Section 4.4.
Concentration profiles were generated along particle tracks from the groundwater flow model (Appendix K).

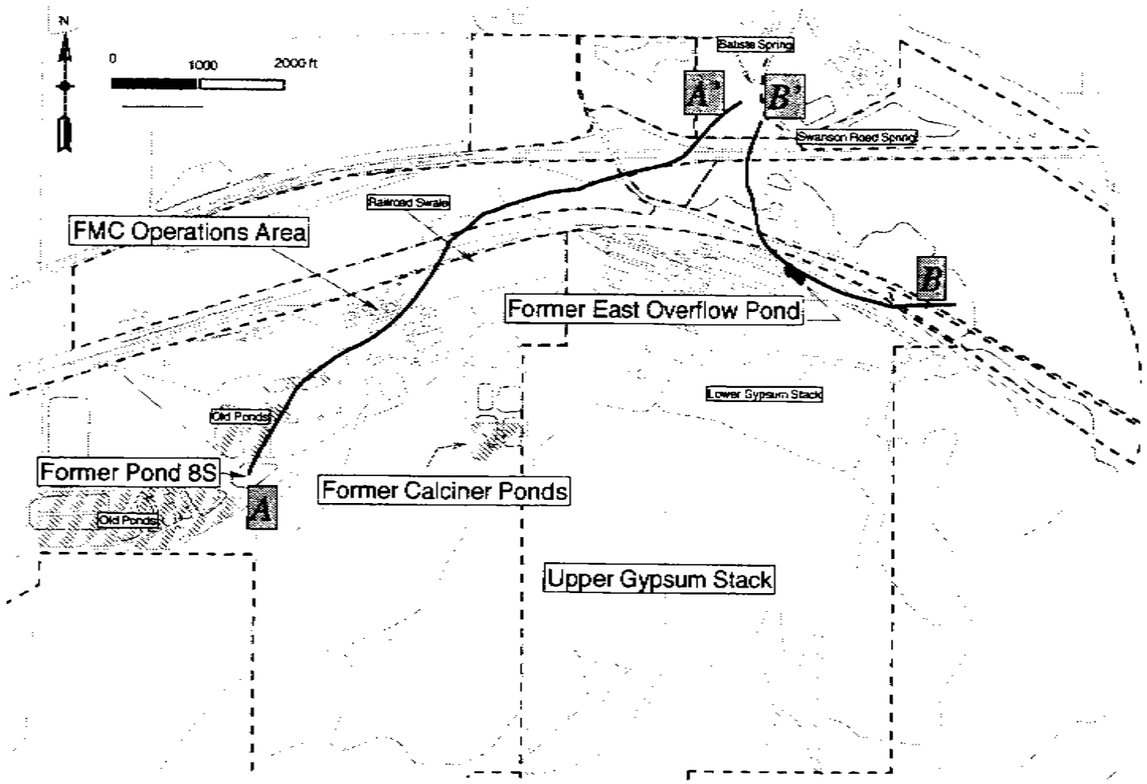
BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO		
EASTERN MICHAUD FLATS POCATELLO, IDAHO		
pH/Solute Relationships Along Shallow Aquifer Particle Tracks		
Job Number	Drawing No.	Rev.
21372	FIGURE 5.3-2	

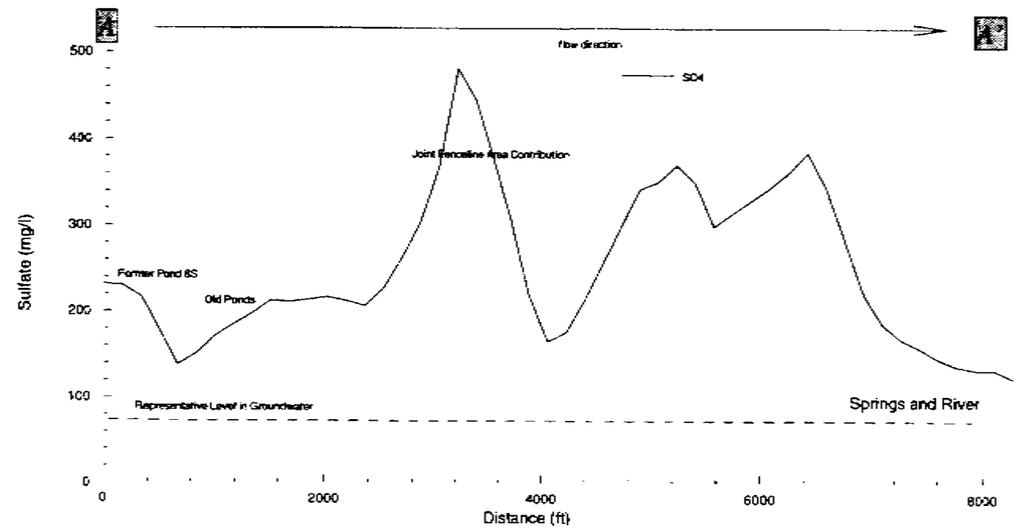


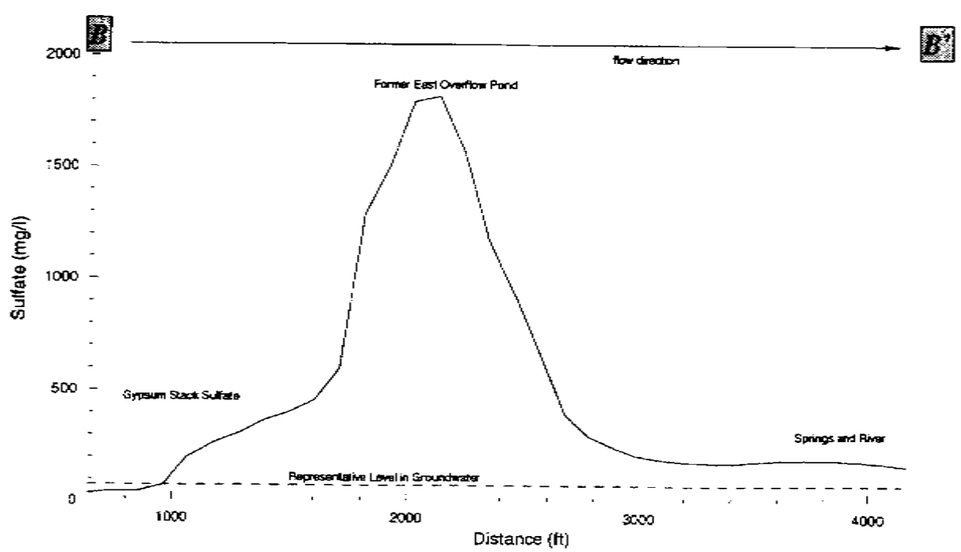
Note: Concentration profiles from shallow groundwater concentration contour plots presented in Section 4.4.
Concentration profiles were generated along particle tracks from the groundwater flow model (Appendix K).



BECHTEL ENVIRONMENTAL, INC. SAN FRANCISCO		
EASTERN MICHAUD FLATS POCATELLO, IDAHO		
Attenuation of Fluoride Along Shallow Aquifer Particle Tracks		
Job Number	Drawing No.	Rev.
21372	FIGURE 5.3-3	







Note: Concentration profiles from shallow groundwater concentration contour plots presented in Section 4.4.
Concentration profiles were generated along particle tracks from the groundwater flow model (Appendix K).

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POCATELLO, IDAHO

Advective Mixing of Sulfate Along Shallow Aquifer Particle Tracks

Job Number	Drawing No.	Rev.
21372	FIGURE 5.3-4	