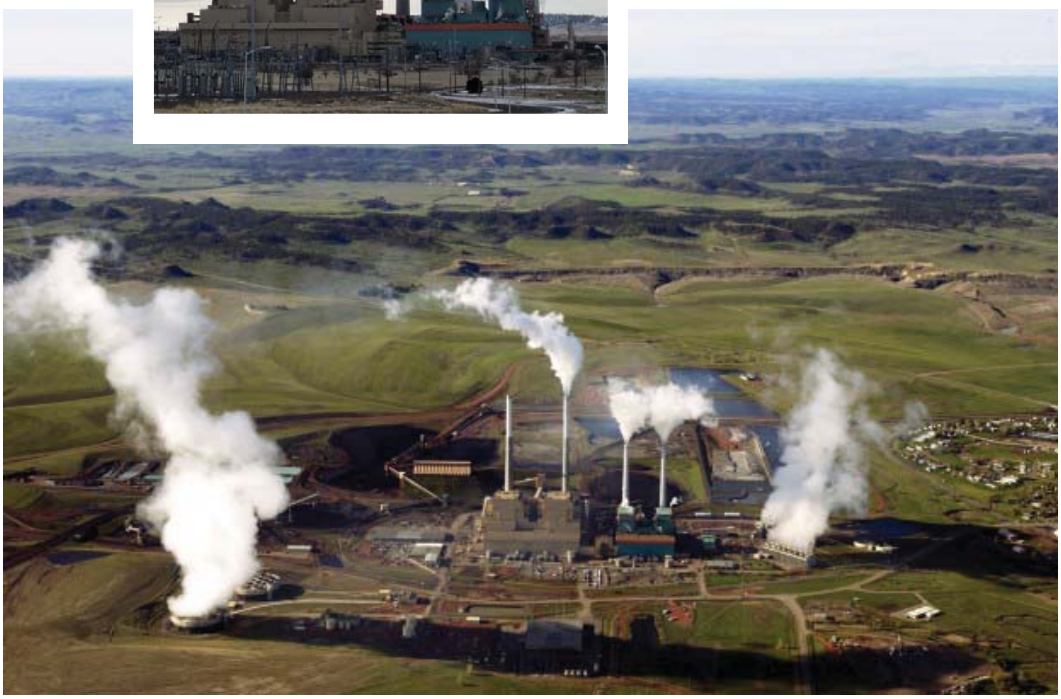
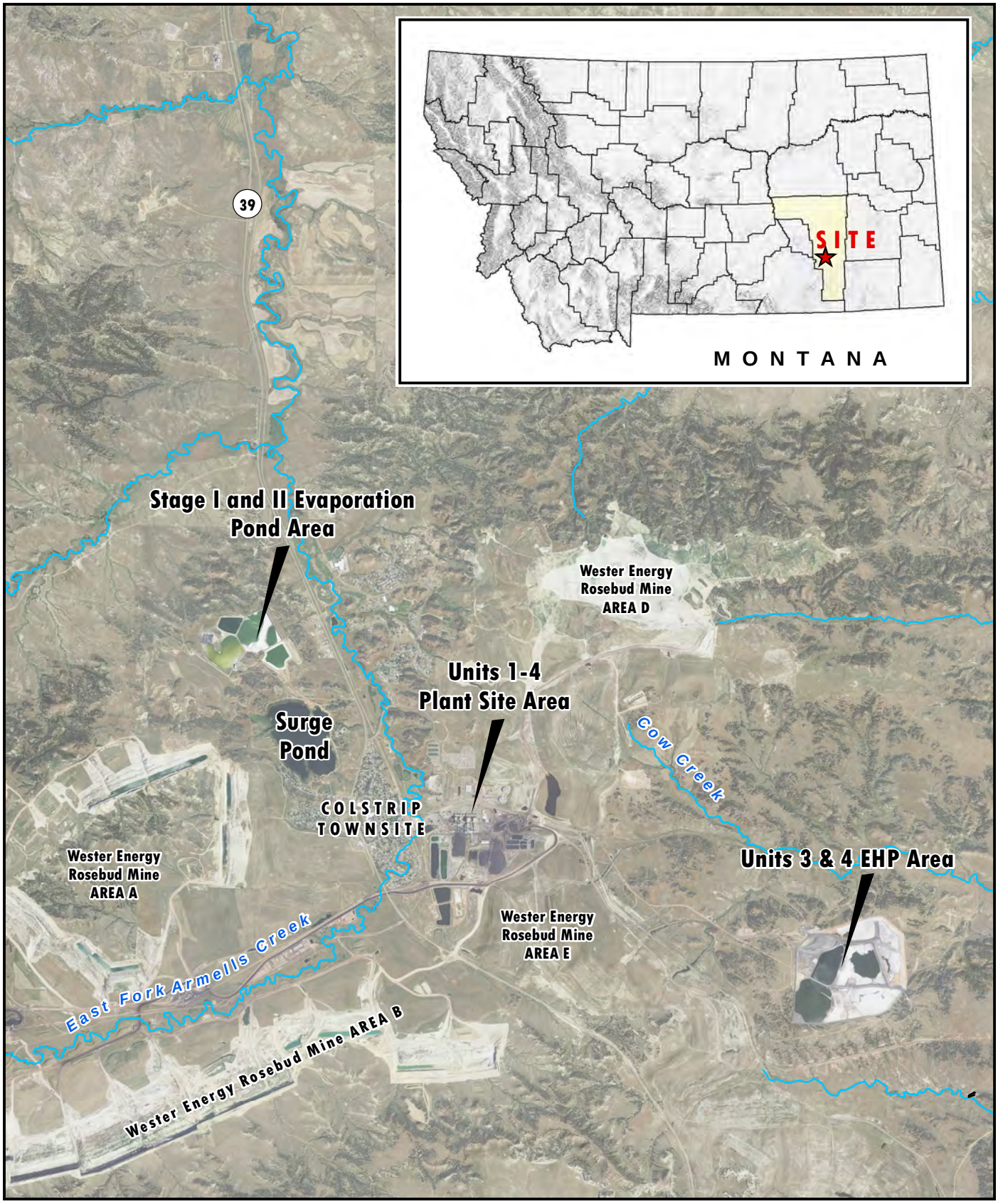


FIGURES

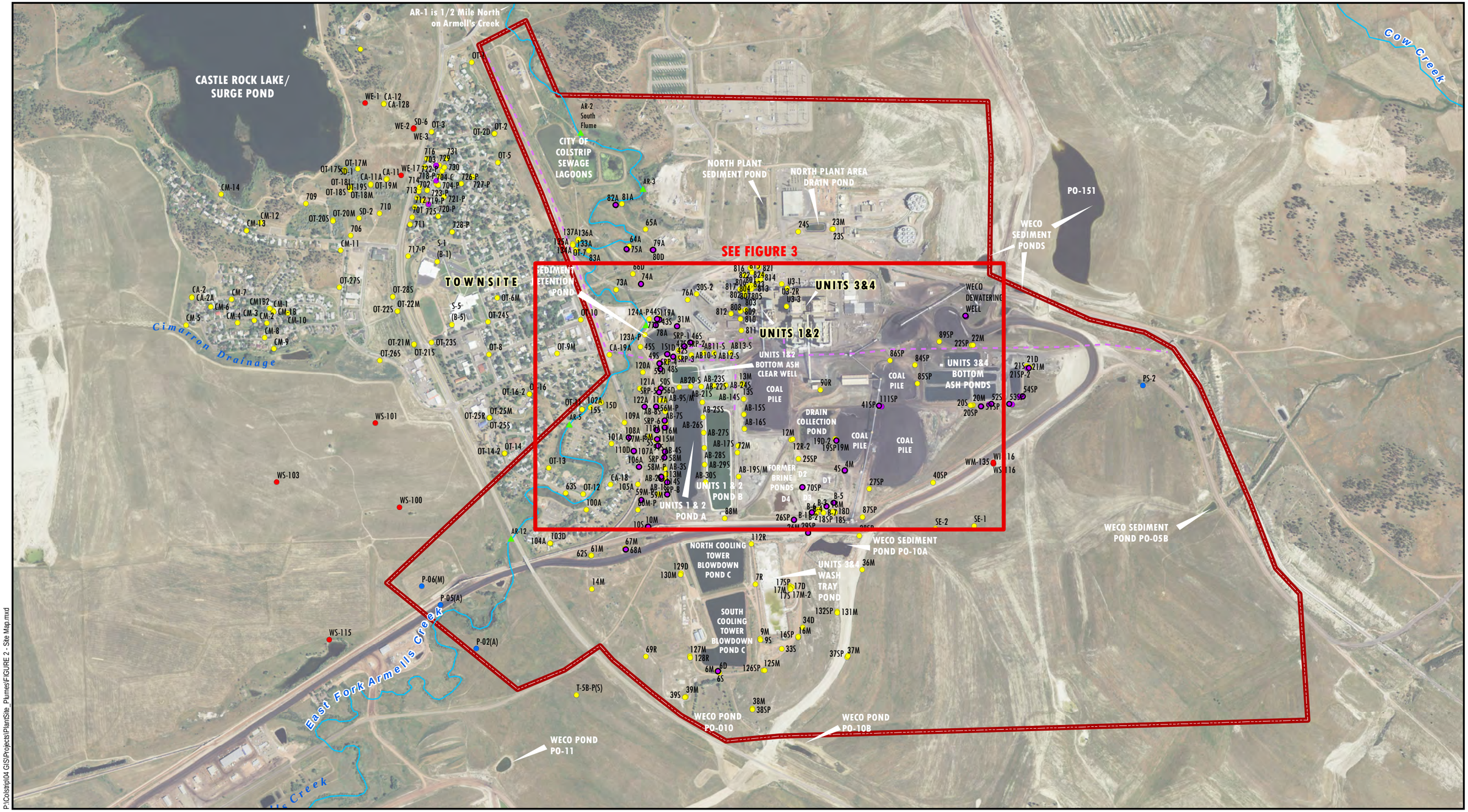


Note: 2013 NAIP Imagery

0 6,000
Feet

NewFields

Location Map
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 1



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 2 - Site Map.mxd

Note: 2013 NAIP Imagery

- Gauging Station
- Monitoring Well
- Montana Bureau of Mines and Gelogy (MBMG) Well
- Western Energy Well
- Capture Well
- Fly Ash Slurry Pipelines
- Plant Site Area

0 Feet 1,200

NewFields

Plant Site Area Map
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 2

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 3 - Site Map Details.mxd

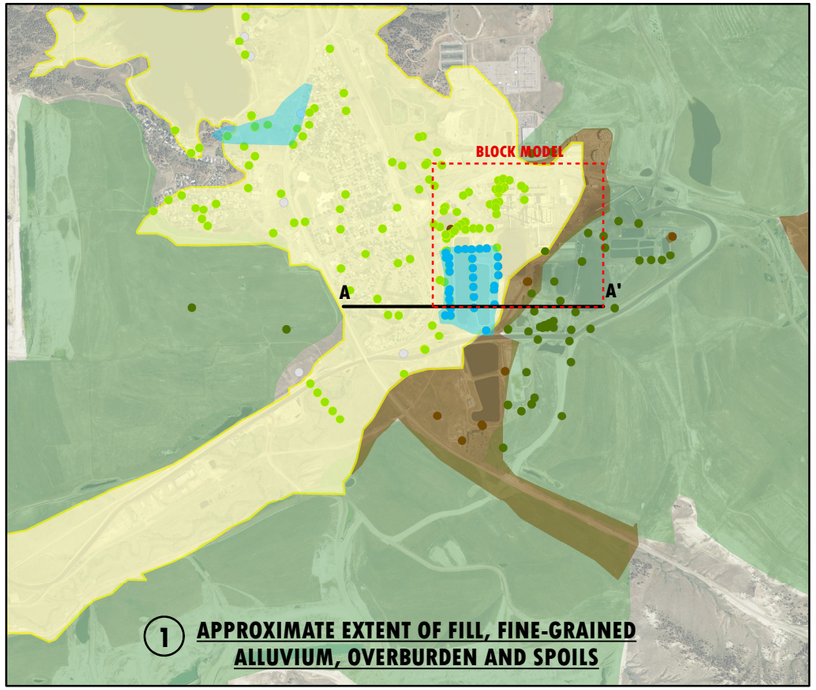
Note: 2013 NAIP Imagery

- Gauging Station
- Monitoring Well
- Montana Bureau of Mines and Geology (MBMG) Well
- Western Energy Well
- Capture Well
- Fly Ash Slurry Pipelines

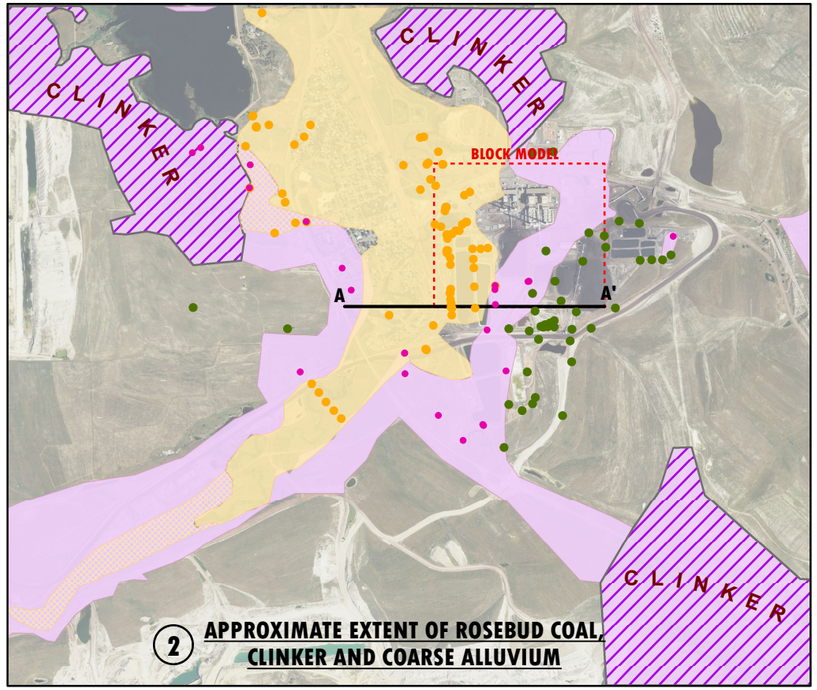
0 Feet 400

NewFields

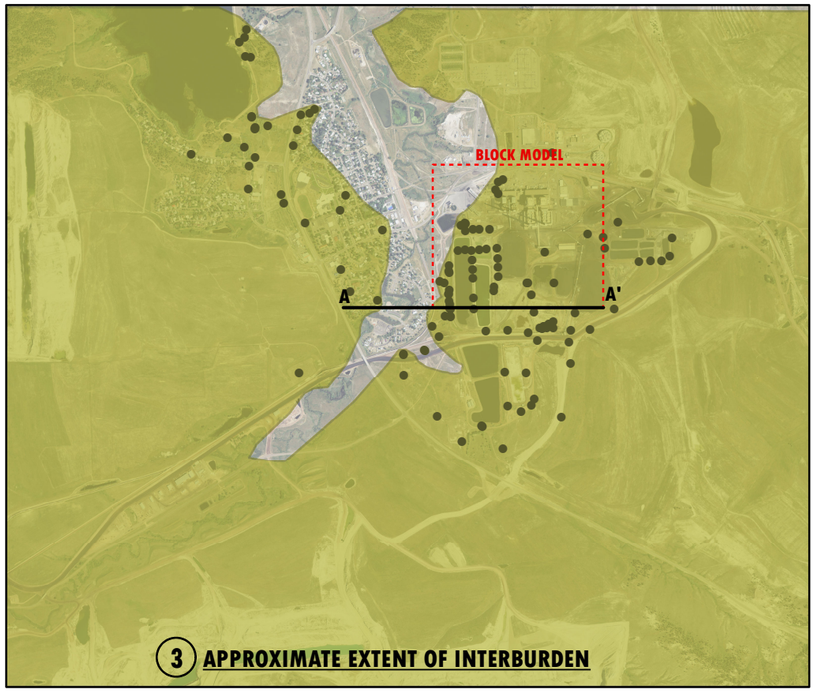
Plant Site Area Map Details
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 3



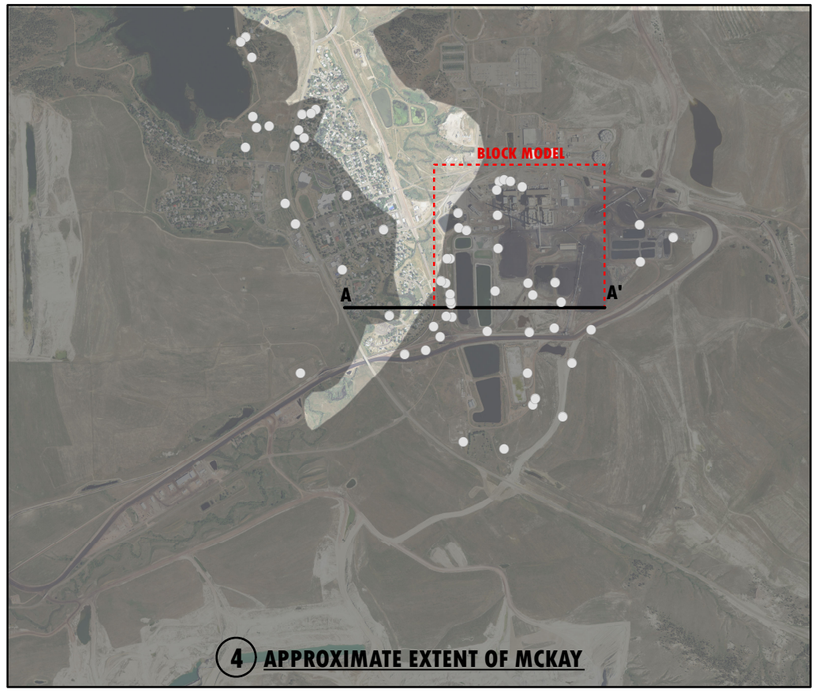
1 APPROXIMATE EXTENT OF FILL, FINE-GRAINED ALLUVIUM, OVERBURDEN AND SPOILS



2 APPROXIMATE EXTENT OF ROSEBUD COAL, CLINKER AND COARSE ALLUVIUM



3 APPROXIMATE EXTENT OF INTERBURDEN



4 APPROXIMATE EXTENT OF MCKAY

LEGEND

- Block Model (See Figure 34)
- Cross Section A - A' (See Figure 6)
- Fill Material Extent
- Fine Grained Alluvium/Colluvium Extent
- Overburden Extent
- Spoils Extent
- Coarse Alluvium Extent
- Coarse Alluvium Overlying Rosebud Extent
- Rosebud Coal Extent
- Clinker Extent
- Interburden Extent
- McKay Extent
- Well Penetrating Fill
- Well Penetrating Spoils
- Well Penetrating Fine Alluvium/Colluvium
- Well Penetrating Overburden
- Well Penetrating Coarse Alluvium
- Well Penetrating Rosebud Coal
- Well Penetrating Interburden
- Well Penetrating McKay Coal

Note: Lithologic extents interpolated from review of approximately 300 well logs, historic USGS topographic maps, aeriel photography and mine reports.
(USGS 1971, Western Energy 2013A,B,C,D,E &F)

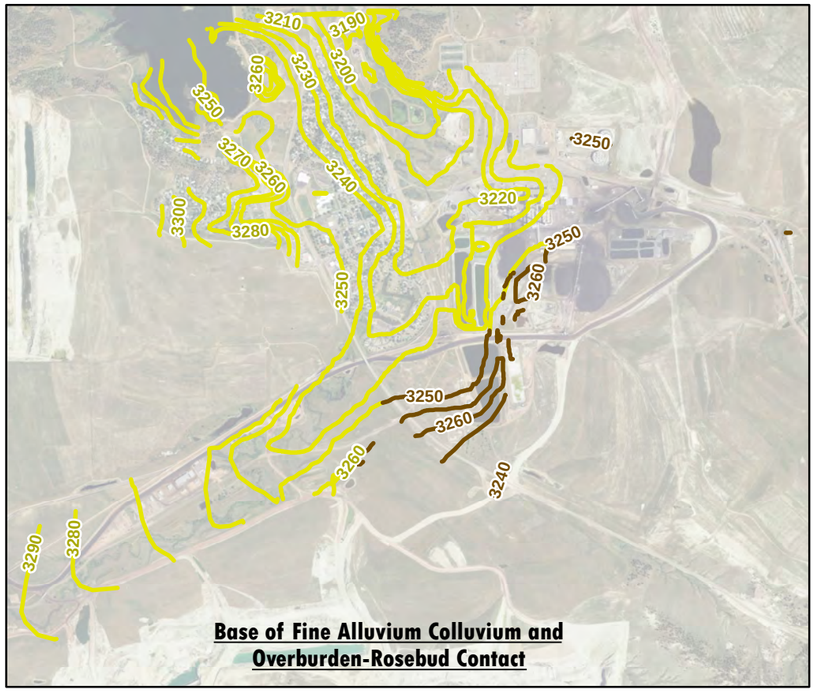
Note: 2013 NAIP Imagery

N

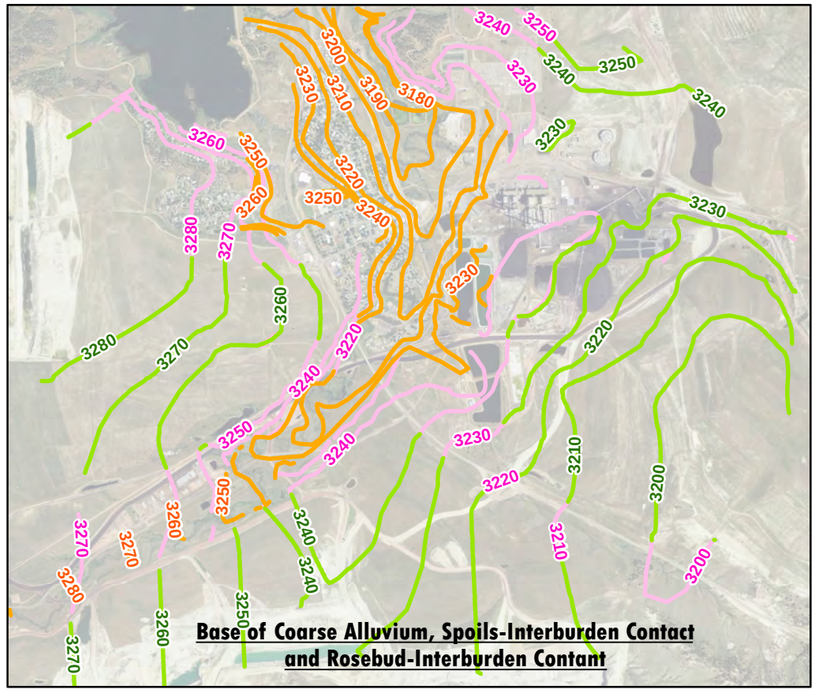
0 Feet 3,200

NewFields

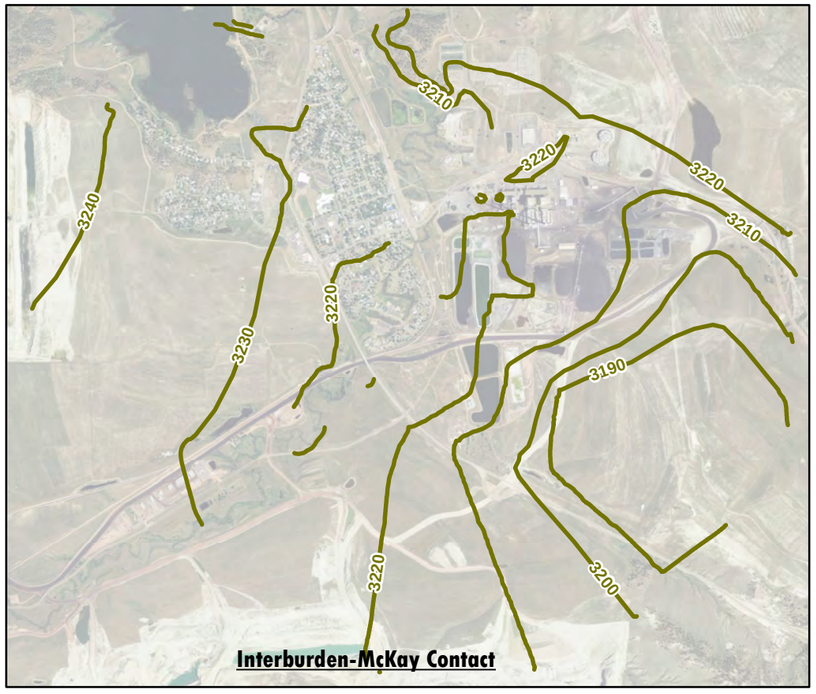
Approximate Areal Extent of Lithologic Units
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 4



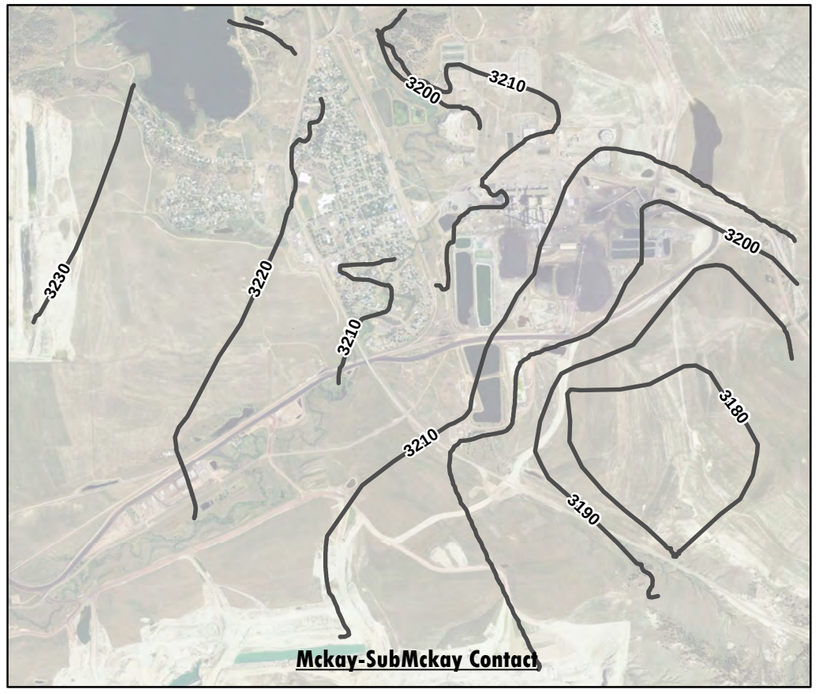
Base of Fine Alluvium Colluvium and Overburden-Rosebud Contact



Base of Coarse Alluvium, Spoils-Interburden Contact and Rosebud-Interburden Contant



Interburden-McKay Contact



Mckay-SubMckay Contact

LEGEND

- Base of Fine Alluvium Colluvium
- Overburden-Rosebud Contact
- Base of Coarse Alluvium
- Spoils-Interburden Contact
- Rosebud-Interburden Contact
- Interburden-Mckay Contact
- McKay-Sub-Mckay Contact

Note: Contact eleavations interpolated from review of approximately 300 well logs, historic USGS topographic maps, aeriel photography and mine reports.
(USGS 1971, Western Energy 2013A,B,C,D,E &F)

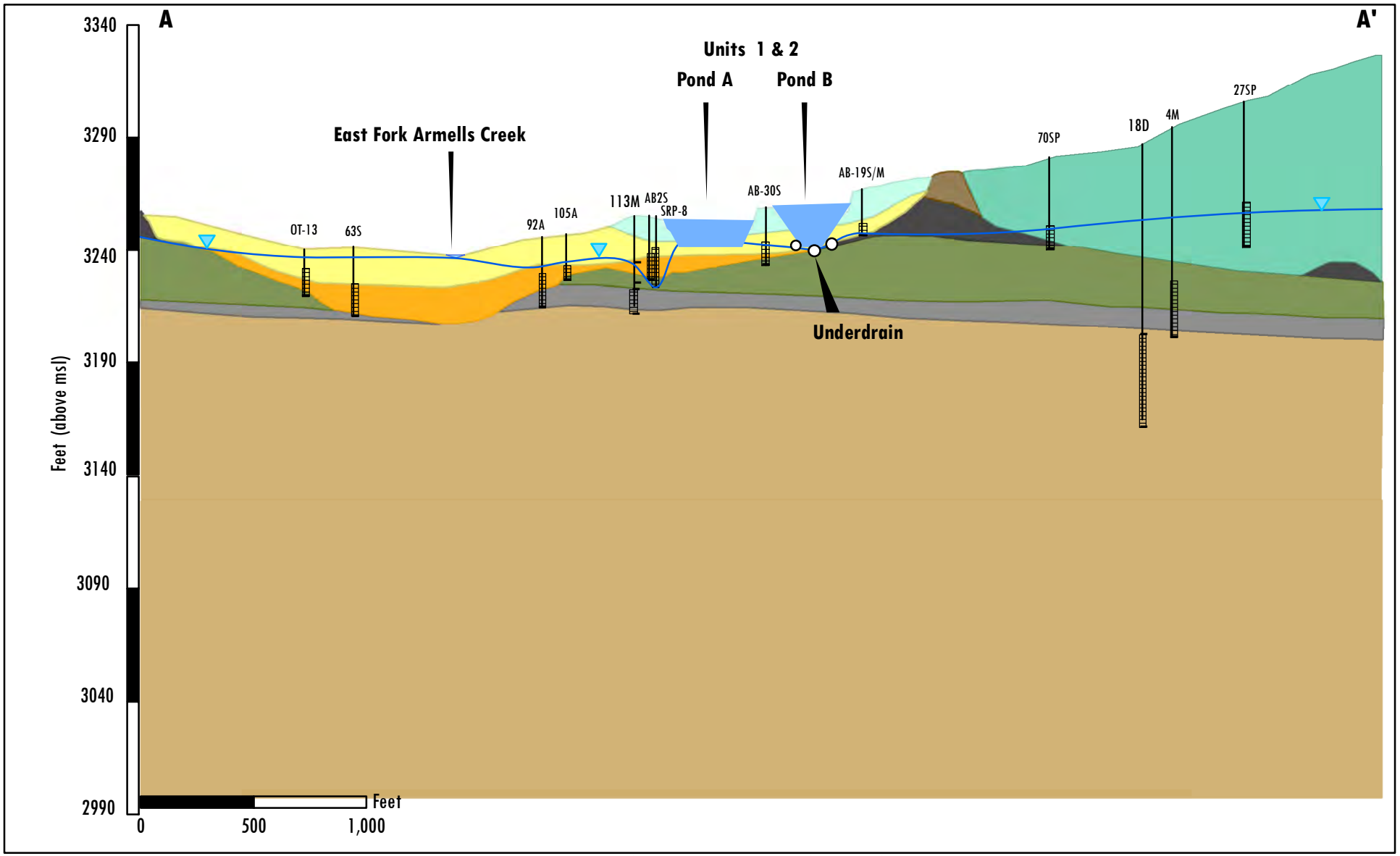
Note: 2003 NAIP Imagery

N

0 Feet 3,200

NewFields

Contoured Surface of Lithologic Contacts
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 5



Note: Location of cross-section shown on Figure 2 and Figure 3

Potentiometric Surface

Well

Well Screen Interval

Spoils

Fill

Alluvium Clay/Silt

Overburden

Rosebud Coal

Alluvium Sand/Gravel

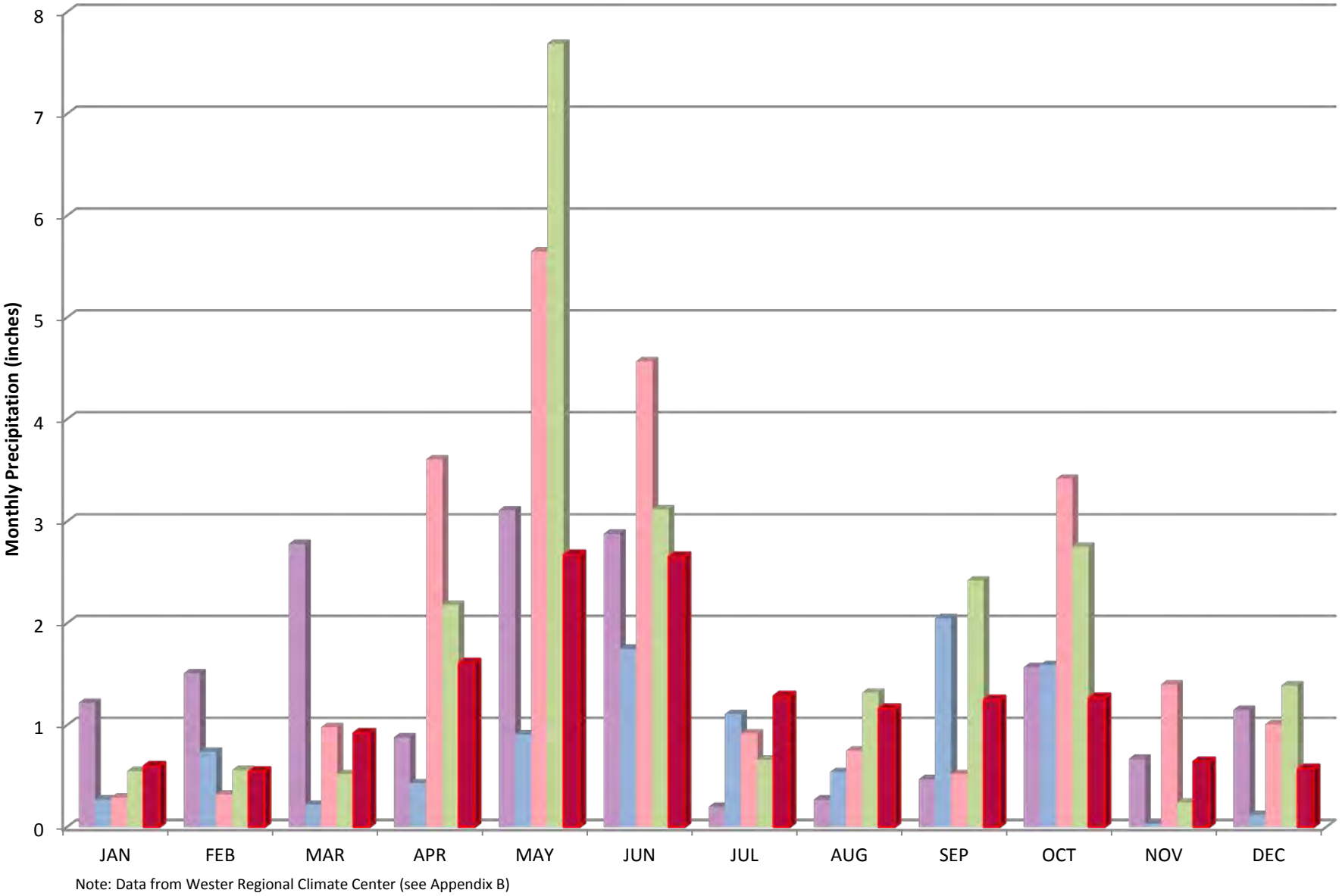
Interburden (interbedded siltstone/sandstone)

McKay Coal

SubMcKay (interbedded siltstone/sandstone)

NewFields

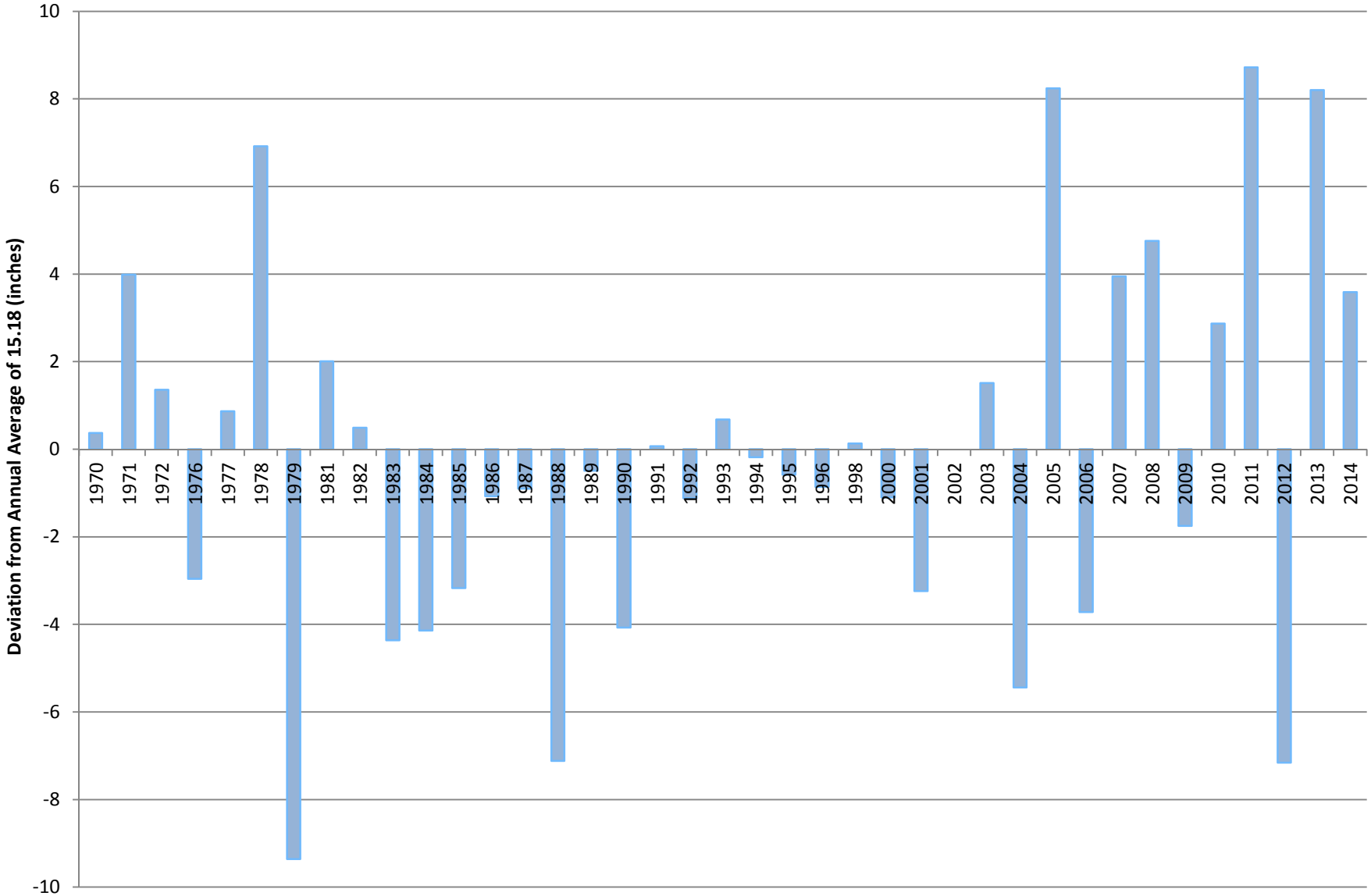
Hydrostratigraphic Cross Section A-A'
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 6



Note: Data from Wester Regional Climate Center (see Appendix B)

Average Monthly Precipitation
Plant Site Area Groundwater Model
Colstrip, Montana
FIGURE 7

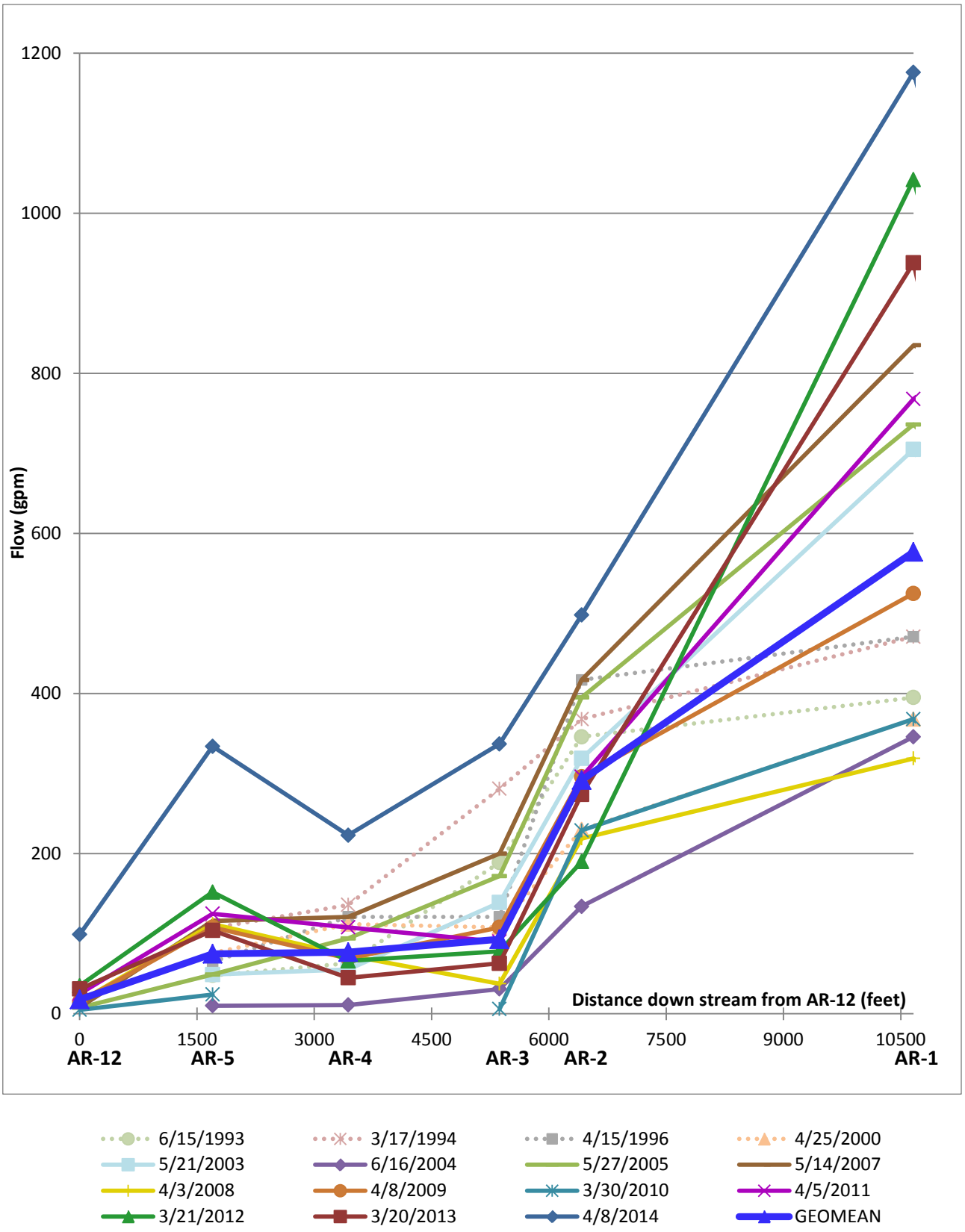
NewFields



Notes:
Data from Wester Regional Climate Center (see Appendix B).
Year excluded if more than 5 days are missing from any one month.

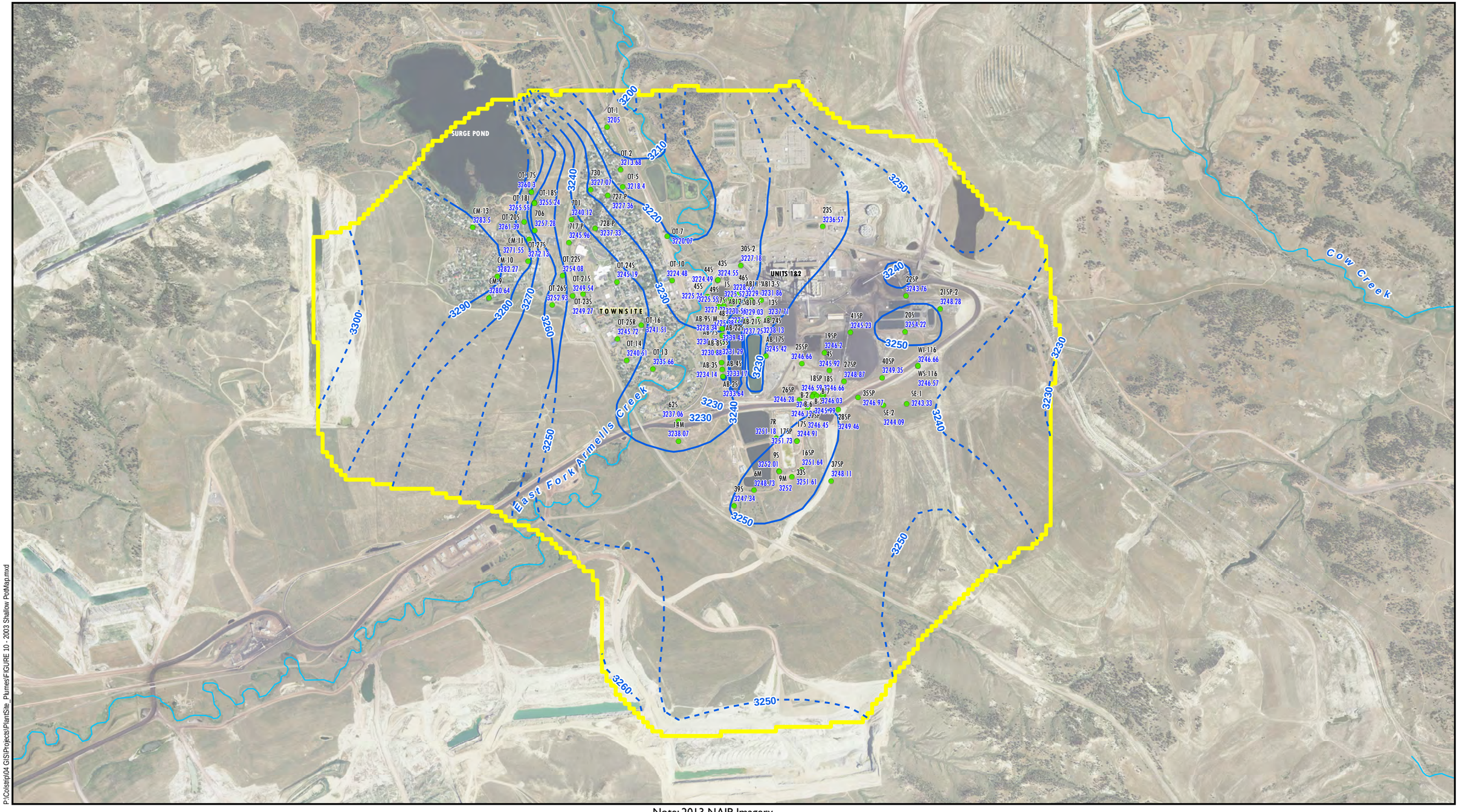
Deviation from Annual Average Precipitation
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 8

NewFields



East Fork Armells Creek Synoptic Gaging
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 9

NewFields



Note: 2013 NAIP Imagery

0 Feet 2,000

NewFields

Shallow Monitoring Well and Water Level Date

- 11/19/2003-12/31/2003

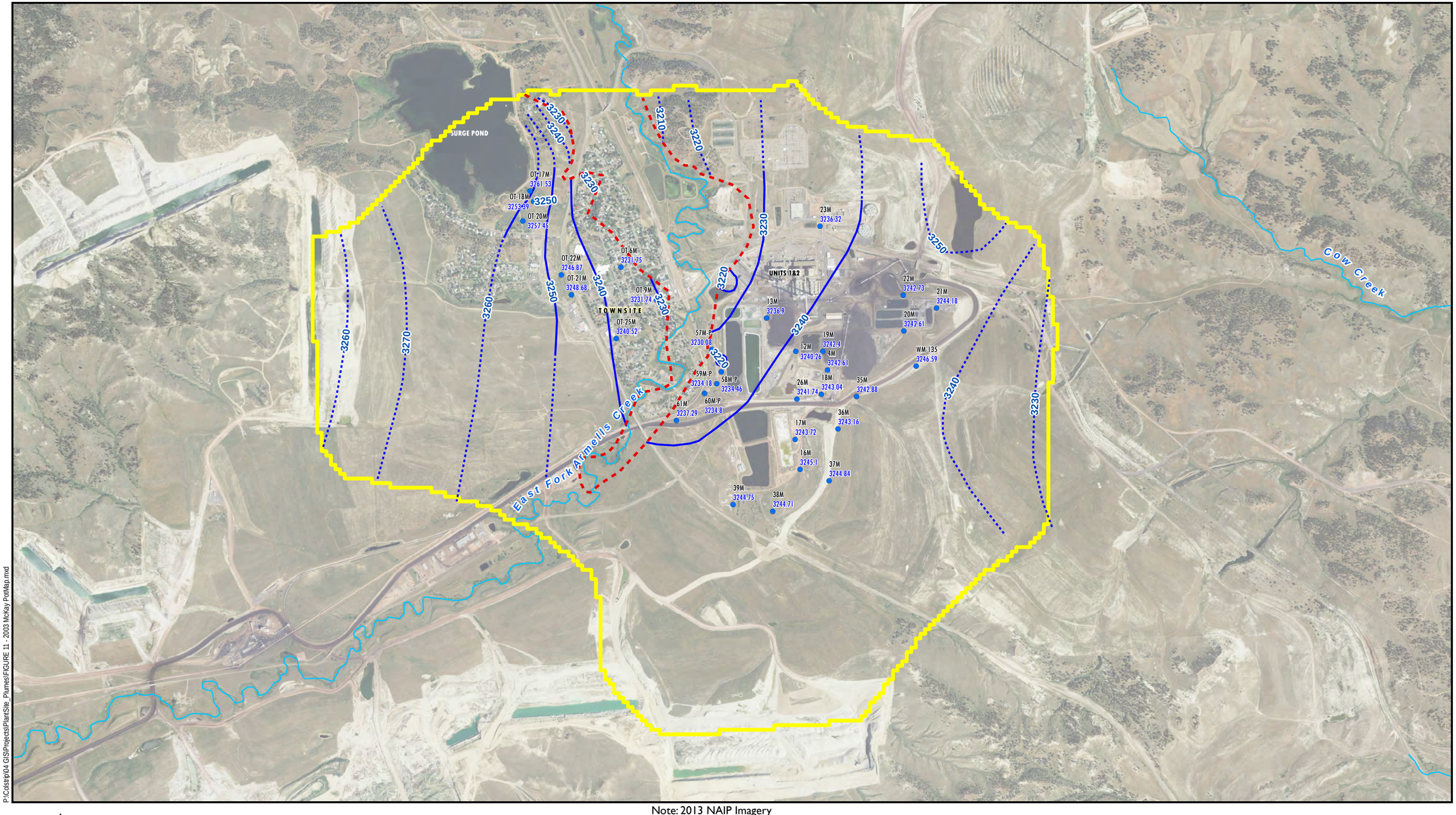
Shallow Potentiometric Contour (feet amsl)

Inferred Shallow Potentiometric Contour (feet amsl)

Model Domain

2003 Shallow Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 10

P:\Colstrip\04 GIS\Projects\PlantSite_PlumesFIGURE 10 - 2003 Shallow PotMap.mxd



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 11 - 2003 McKay PotMap.mxd

Note: 2013 NAIP Imagery

0 Feet 2,000

Note:
McKay is eroded below East Fork Armells Creek.

McKay Monitoring Well and Water Level Date
- 11/19/2003-12/9/2003

Inferred McKay Potentiometric Contour (feet amsl)

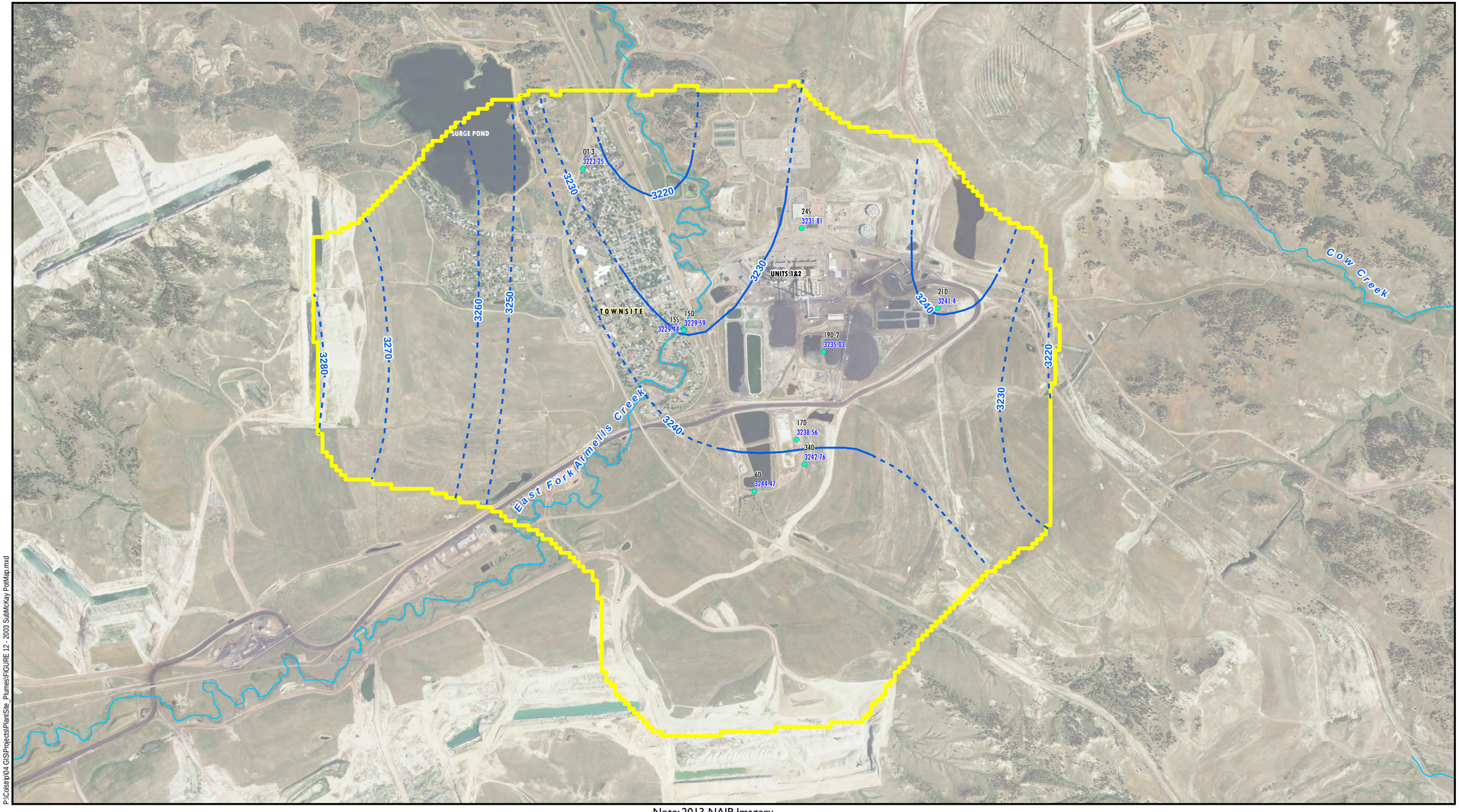
McKay Potentiometric Contour (feet amsl)

Model Domain

Extend Of McKay

NewFields

2003 McKay Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 11



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 12 - 2003 SubMcKay PotMap.mxd

Note: 2013 NAIP Imagery

SubMcKay Monitoring Well and Water Level Date

11/19/2003-12/31/2003

SubMcKay Potentiometric Contour (feet amsl)

Inferred SubMcKay Potentiometric Contour (feet amsl)

Model Domain

0 2,000 Feet

NewFields

2003 Shallow SubMcKay Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 12

951D
3133.22

212796 Western
Energy Co.
3305

595D
2971.81

PSW-1
EGAN
3052.1

583DD
2997.1

PSW-5
2992.09

599D
2982.27

276545 Estern
Energy Co WM 202
3263.5

BS-01
3082.95

3140
3120
3160
3180
3200
3220
3100
3080
3060
3040

Cow Creek

East Fork Armells Creek

Note: 2013 NAIP Imagery

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 13 - 2003 Deep SubMcKay PotMap.mxd

N

0 Feet 4,500

NewFields

Note: Sparse water level data is available for Deep Sub-McKay wells. A large time period was allowed (2003 through 2013) to provide adequate spatial coverage. Hydrographs from site wells indicate a slight increase in water levels (between 2 and 5 feet) during this period. At the scale of this potentiometric map, this temporal difference would not greatly impact the gradient or direction of groundwater flow.

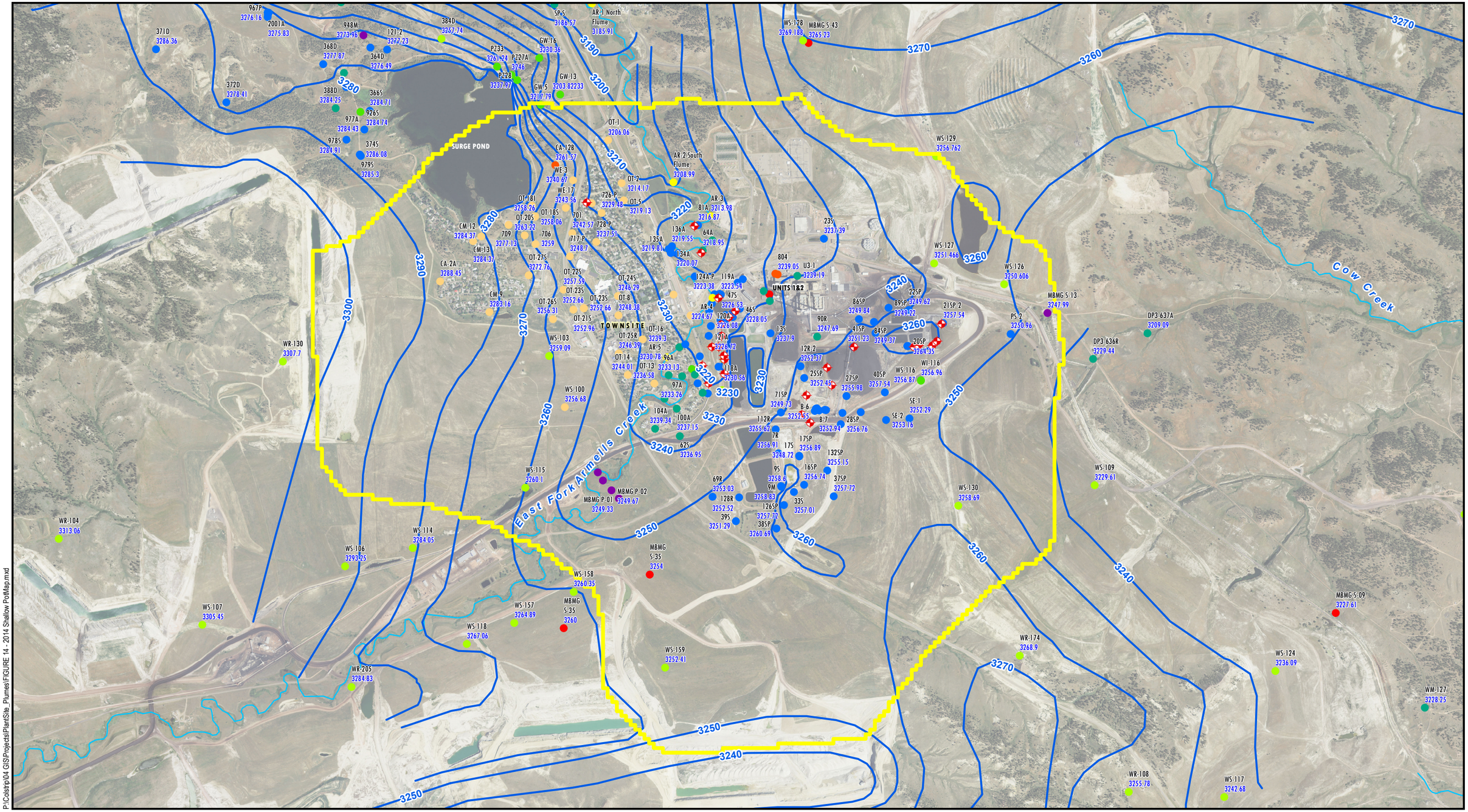
Monitoring Well and Water Level Date

- 12/1/2003-12/3/2003
- 2004
- 2006
- 2009
- 2013
- Unknown

Deep SubMcKay Potentiometric Contour (feet amsl)

Model Domain

2003 Deep SubMcKay Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 13



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 14 - 2014 Shallow PotMap.mxd

Note: 2013 NAIP Imagery

0 Feet 2,000

NewFields

Pumping Well

Big Sky Mine Well

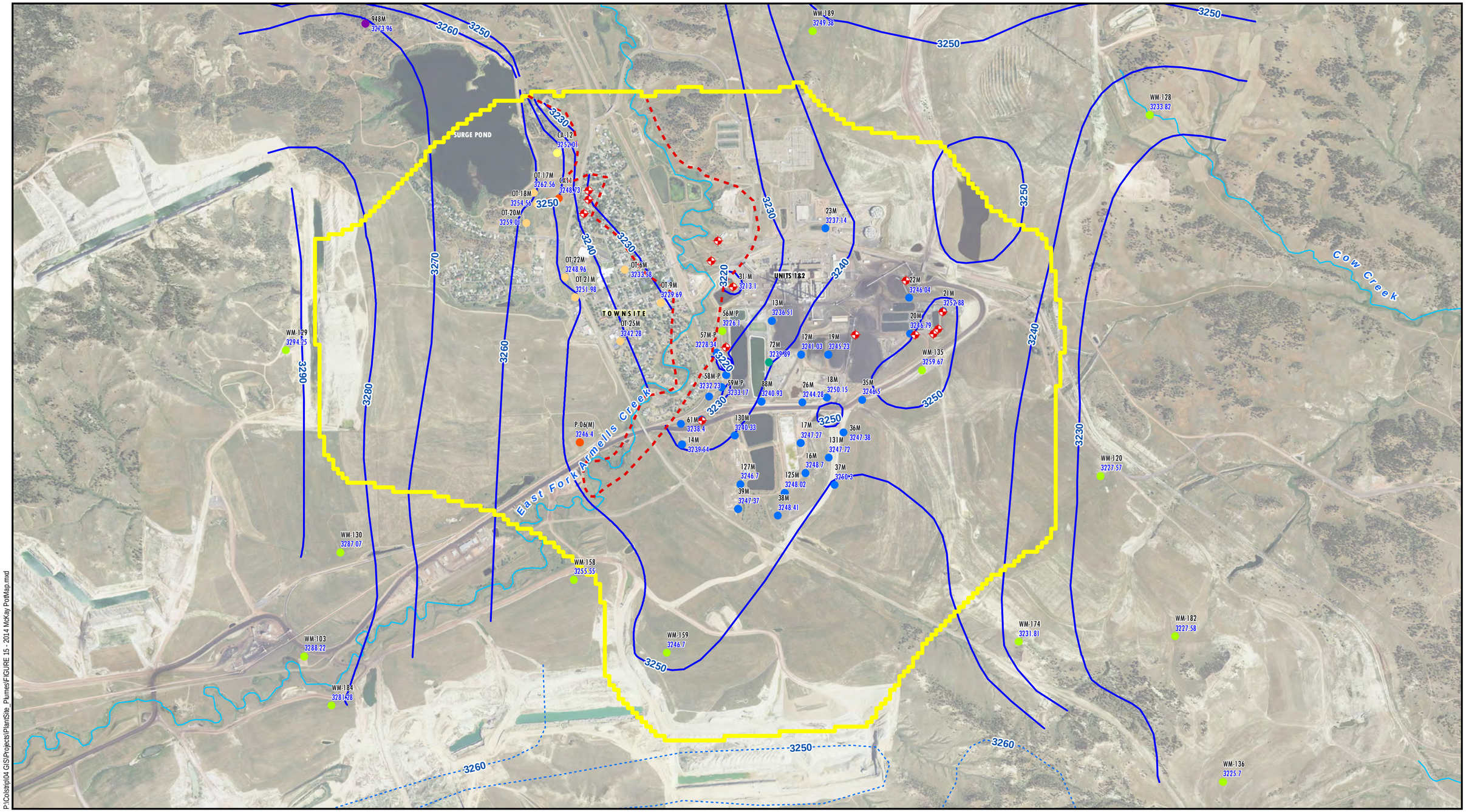
Monitoring Well and Water Level Date

- 5/5/2014-7/1/2014
- 1/6/2014-3/4/2014
- 10/1/2013-11/5/2013
- 1/7/2013- 3/1/2013
- 10/3/2012-12/31/2012
- 3/21/2012
- 12/15/2011
- 10/8/2010; 11/2/2010
- 2009 or earlier

Shallow Potentiometric Contour (feet amsl)

Model Domain

2014 Shallow Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 14



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 15 - 2014 McKay PotMap.mxd

Note: 2013 NAIP Imagery

0 Feet 2,000

NewFields

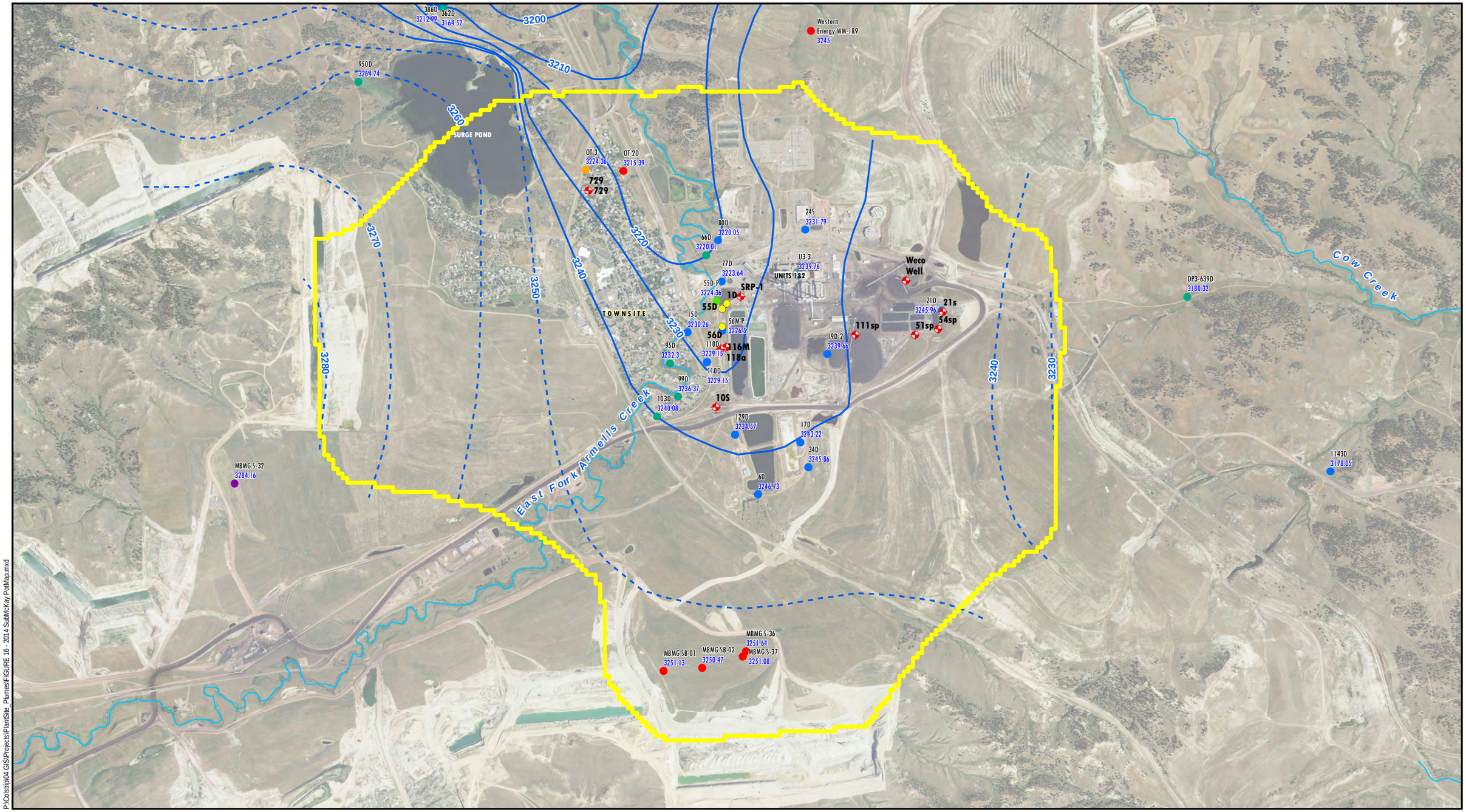
Note:
McKay is eroded below
East Fork Armells Creek.

Pumping Well

Monitoring Well and Water Level Date
- 5/5/2014- 5/6/2014
- 1/3/2014-3/3/2014
- 10/2/2013- 10/7/2013
- 10/31/2012- 12/31/2012
- 6/10/2012
- 12/15/2011
- 10/8/2010

- Inferred McKay Potentiometric Contour (feet amsl)
- McKay Potentiometric Contour (feet amsl)
- Model Domain
- Extend Of McKay

2014 McKay Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 15



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 16 - 2014 SubMcKay PotMap.mxd

Note: 2013 NAIP Imagery

0 Feet 2,000

NewFields

Pumping Well

Monitoring Well and Water Level Date

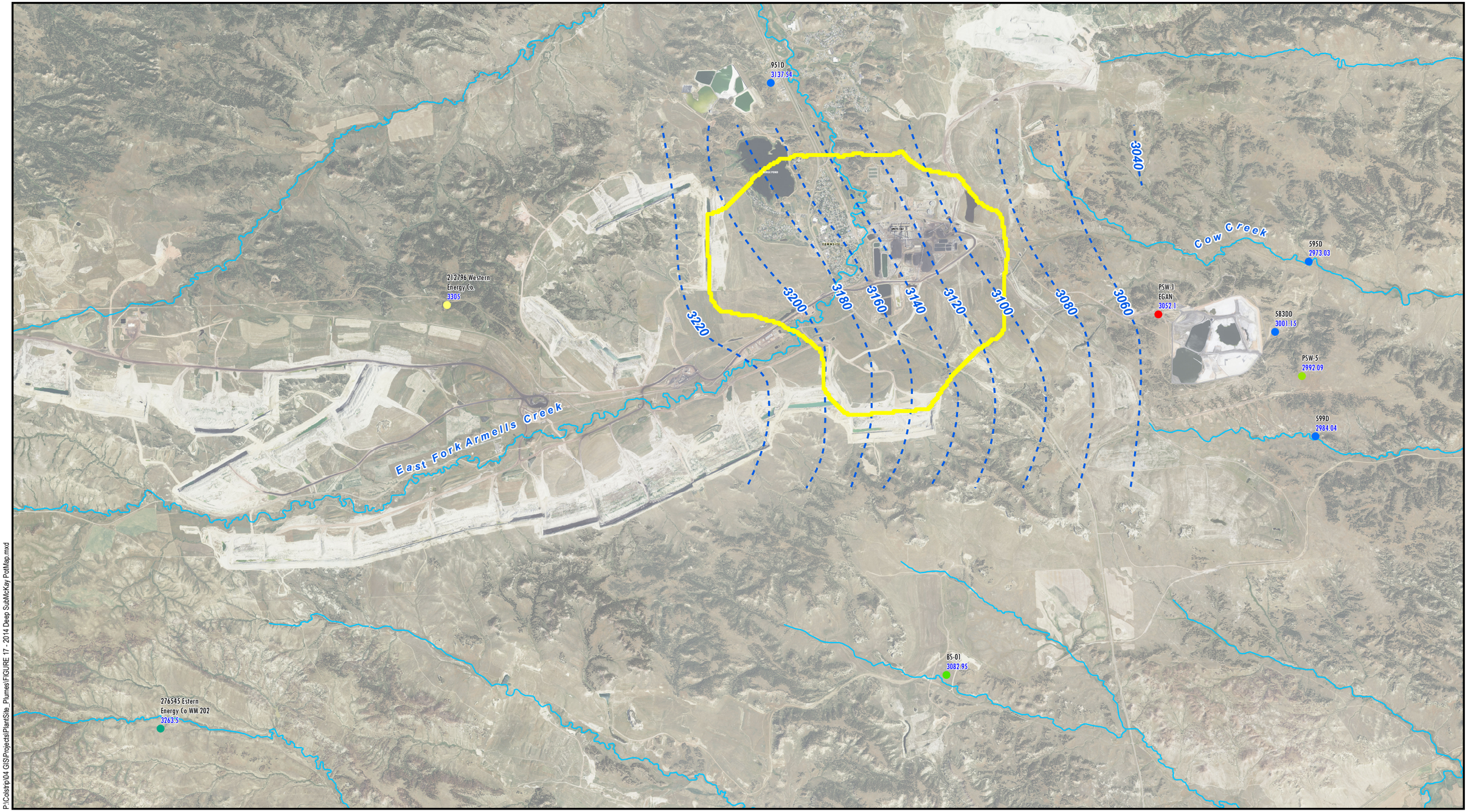
- 7/1/2014
- 1/6/2014- 2/6/2014
- 10/1/2013-10/8/2013
- 1/7/2013- 2/5/2013
- 10/3/2012
- 12/15/2011
- 2008 or earlier

Inferred SubMcKay Potentiometric Contour (feet)

SubMcKay Potentiometric Contour (feet)

Model Domain

2014 Shallow SubMcKay Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 16



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 17 - 2014 Deep SubMcKay PotMap.mxd

Note: 2013 NAIP Imagery

0 Feet 4,500

NewFields

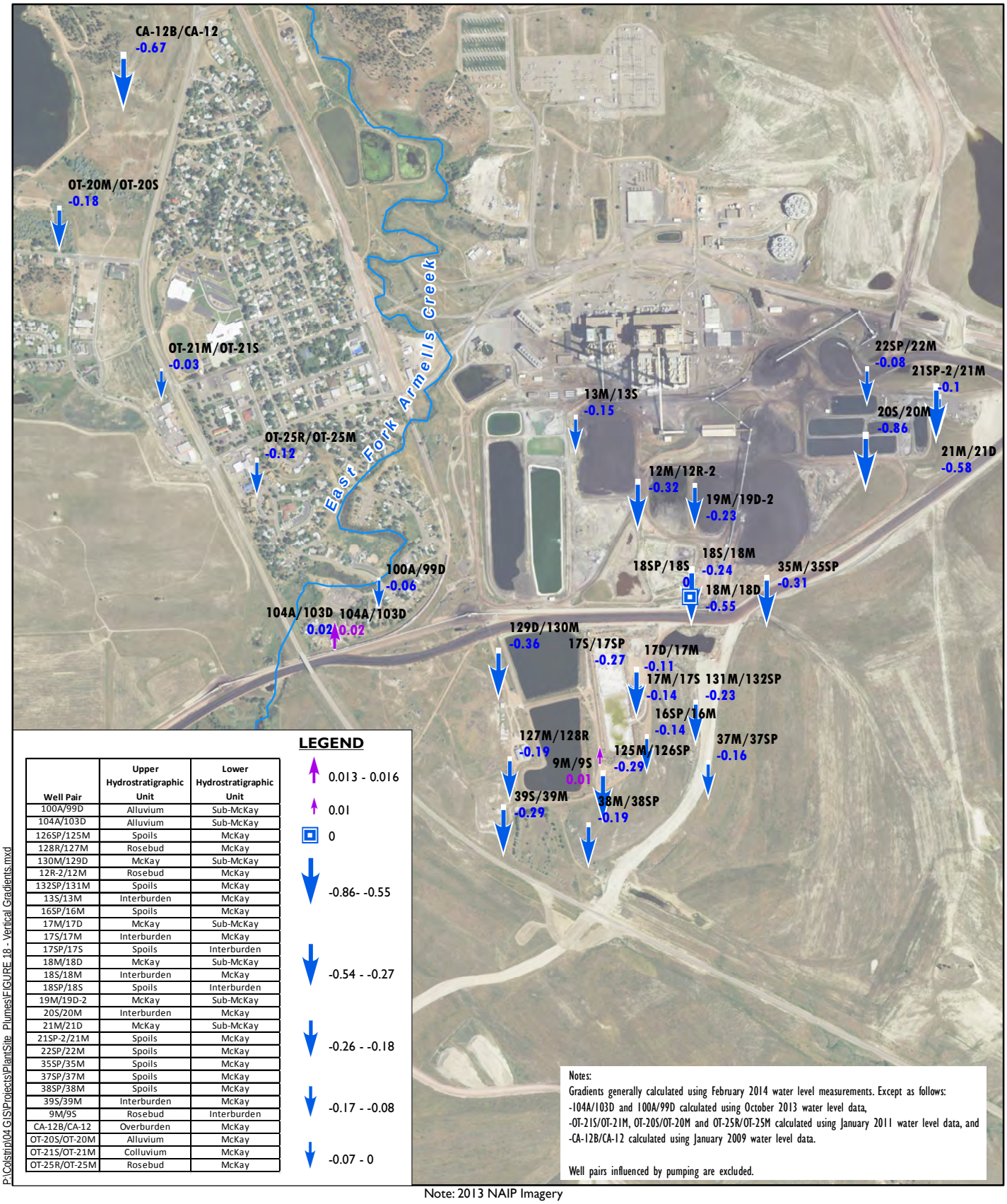
Note: Sparse water level data is available for Deep Sub-McKay wells. A large time period was allowed (2004 through 2014) to provide adequate spatial coverage. Hydrographs from site wells indicate a slight increase in water levels (between 2 and 5 feet) during this period. At the scale of this potentiometric map, this temporal difference would not greatly impact the gradient or direction of groundwater flow.

Monitoring Well and Water Level Date

- 1/9/2014; 2/4/1/9/2014-2/7/2014
- 10/22/2013
- 2009
- 2006
- 2004
- UnKnown

- Deep Potentiometric Contour (feet amsl)
- Model Domain

2014 Deep SubMcKay Potentiometric Surface
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 17



Well Pair	Upper Hydrostratigraphic Unit	Lower Hydrostratigraphic Unit
100A/99D	Alluvium	Sub-McKay
104A/103D	Alluvium	Sub-McKay
126SP/125M	Spoils	McKay
128R/127M	Rosebud	McKay
130M/129D	McKay	Sub-McKay
12R-2/12M	Rosebud	McKay
132SP/131M	Spoils	McKay
13S/13M	Interburden	McKay
16SP/16M	Spoils	McKay
17M/17D	McKay	Sub-McKay
17S/17M	Interburden	McKay
17SP/17S	Spoils	Interburden
18M/18D	McKay	Sub-McKay
18S/18M	Interburden	McKay
18SP/18S	Spoils	Interburden
19M/19D-2	McKay	Sub-McKay
20S/20M	Interburden	McKay
21M/21D	McKay	Sub-McKay
21SP-2/21M	Spoils	McKay
22SP/22M	Spoils	McKay
35SP/35M	Spoils	McKay
37SP/37M	Spoils	McKay
38SP/38M	Spoils	McKay
39S/39M	Interburden	McKay
9M/9S	Rosebud	Interburden
CA-12B/CA-12	Overburden	McKay
OT-20S/OT-20M	Alluvium	McKay
OT-21S/OT-21M	Colluvium	McKay
OT-25R/OT-25M	Rosebud	McKay

LEGEND

- 0.013 - 0.016
- 0.01
- 0
- -0.86- -0.55
- -0.54 - -0.27
- -0.26 - -0.18
- -0.17 - -0.08
- -0.07 - 0

Notes:
Gradients generally calculated using February 2014 water level measurements. Except as follows:
-104A/103D and 100A/99D calculated using October 2013 water level data,
-OT-21S/OT-21M, OT-20S/OT-20M and OT-25R/OT-25M calculated using January 2011 water level data, and
-CA-12B/CA-12 calculated using January 2009 water level data.

Well pairs influenced by pumping are excluded.

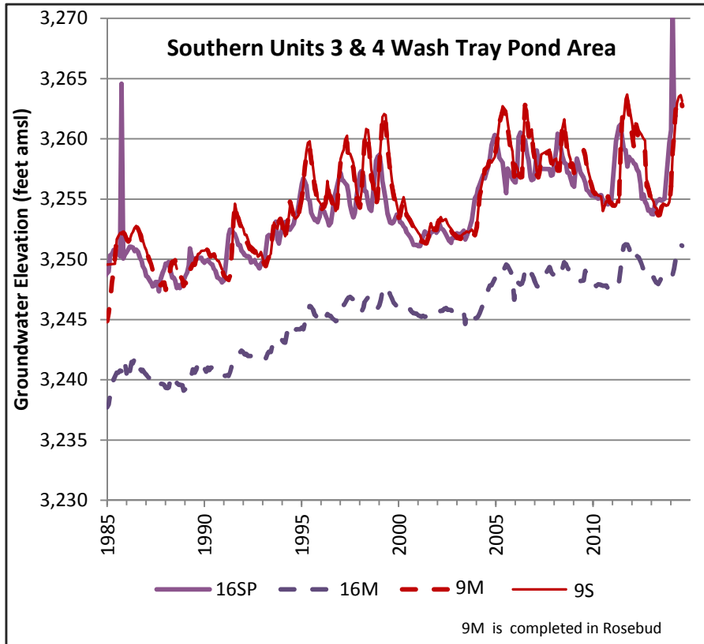
P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 18 - Vertical Gradients.mxd

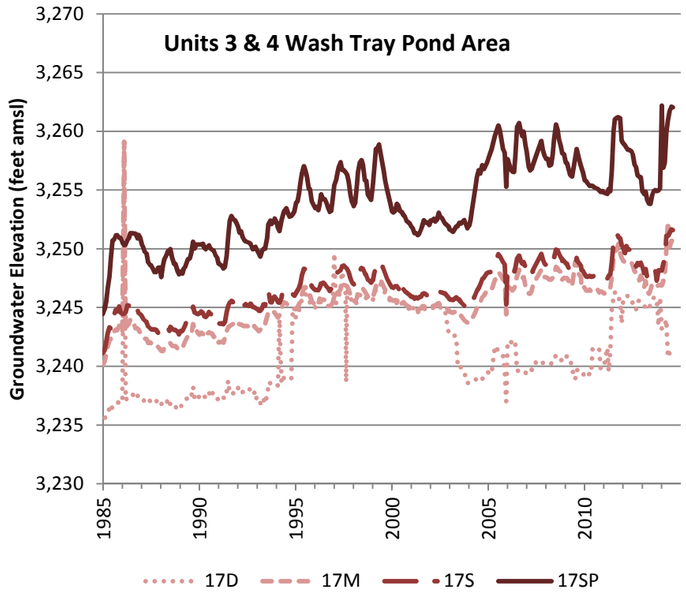
Note: 2013 NAIP Imagery

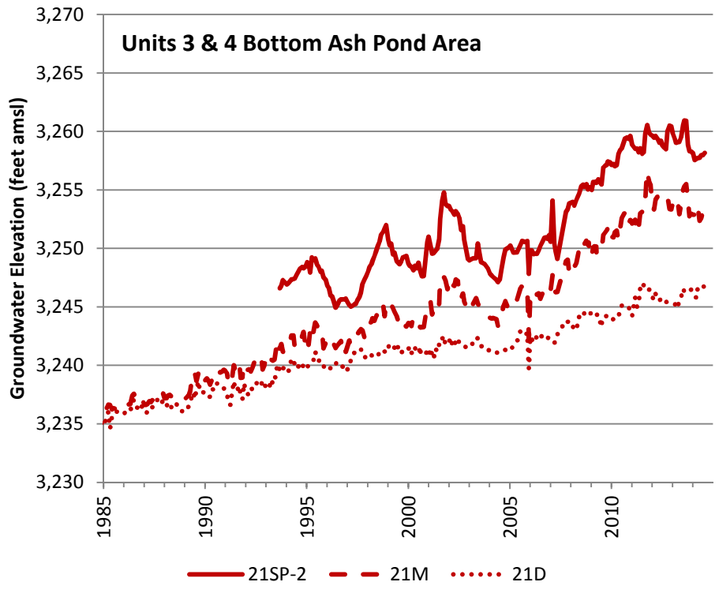
0 1,400
Feet

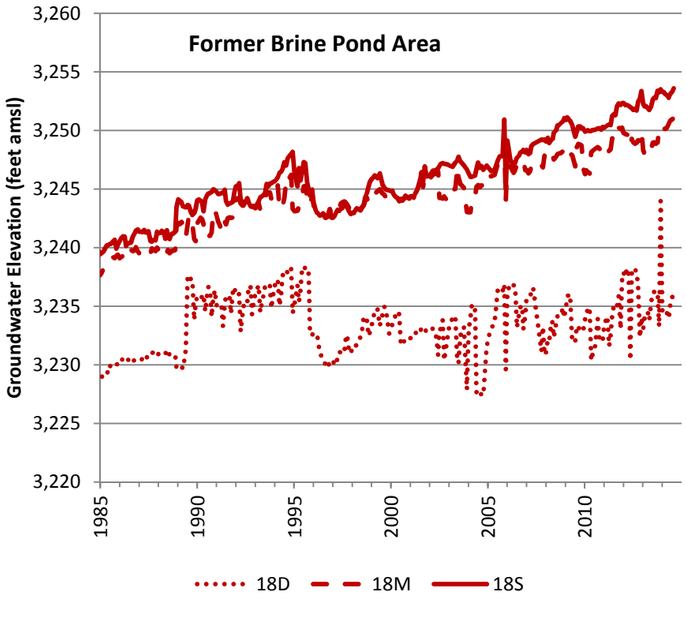
NewFields

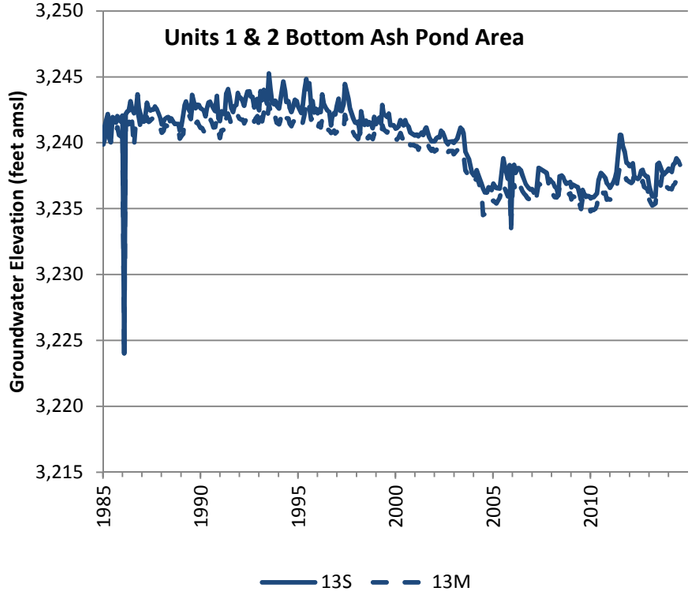
Vertical Hydraulic Gradients
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 18

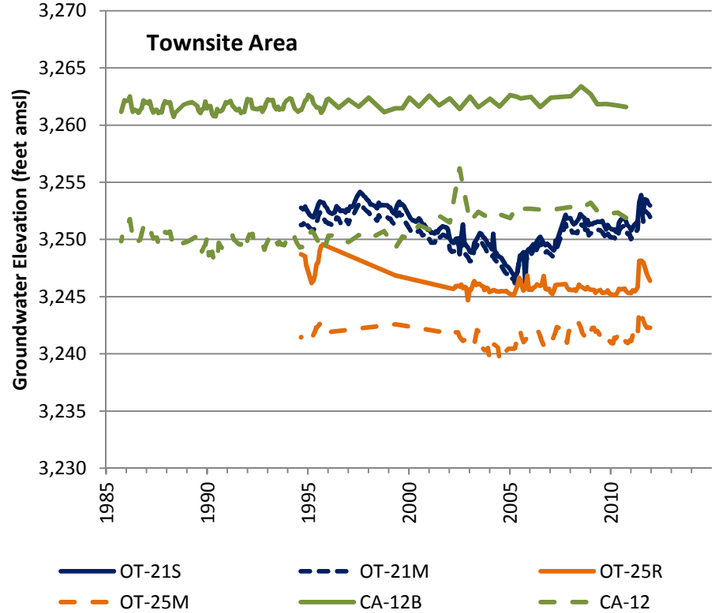










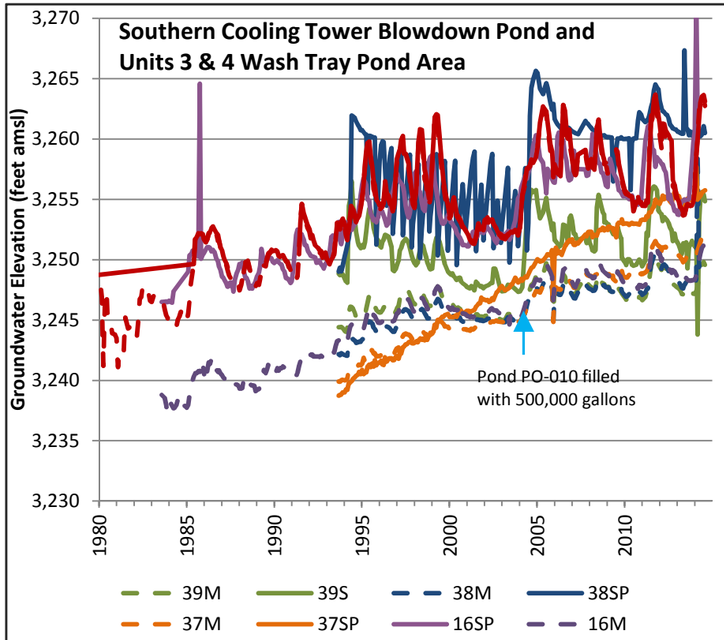


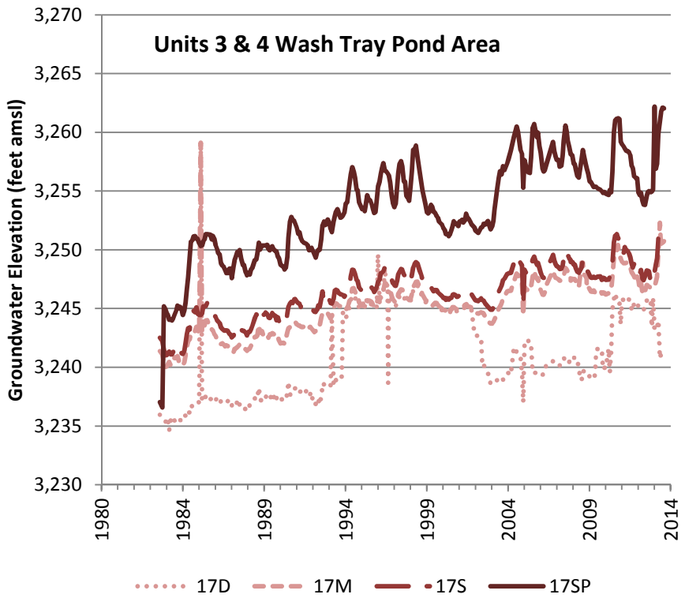
Note: Deeper wells are symbolized with dashed and dotted hydrographs

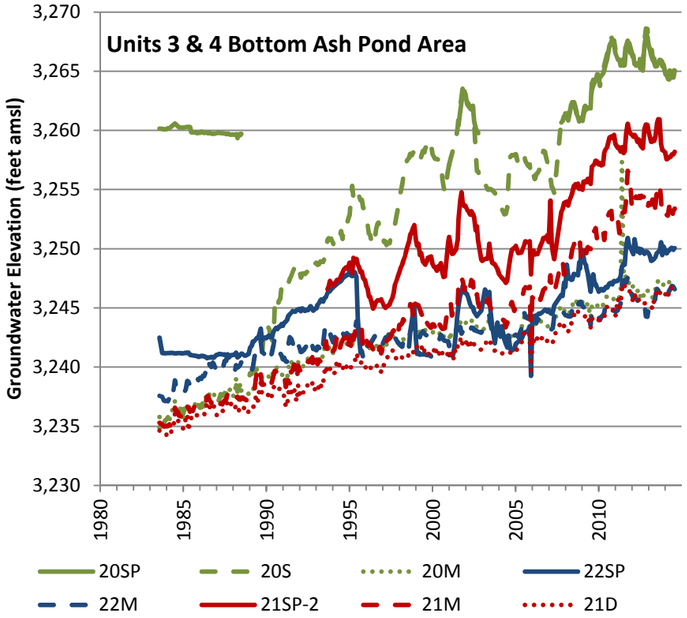
SP = well finished in Spoils
M = well finished in McKay (excluding 9M)
R = well Finished in Rosebud
D = well Finished in Sub McKay
S = well finished in Interburden or Overburden

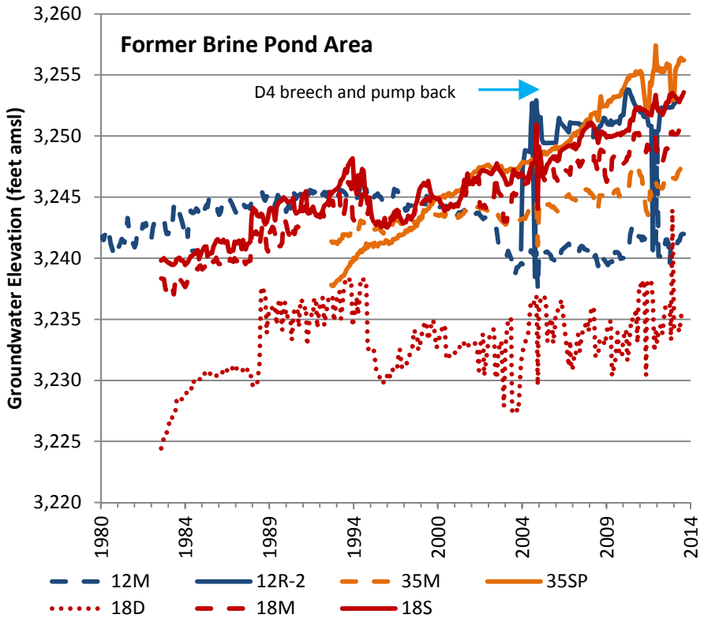
NewFields

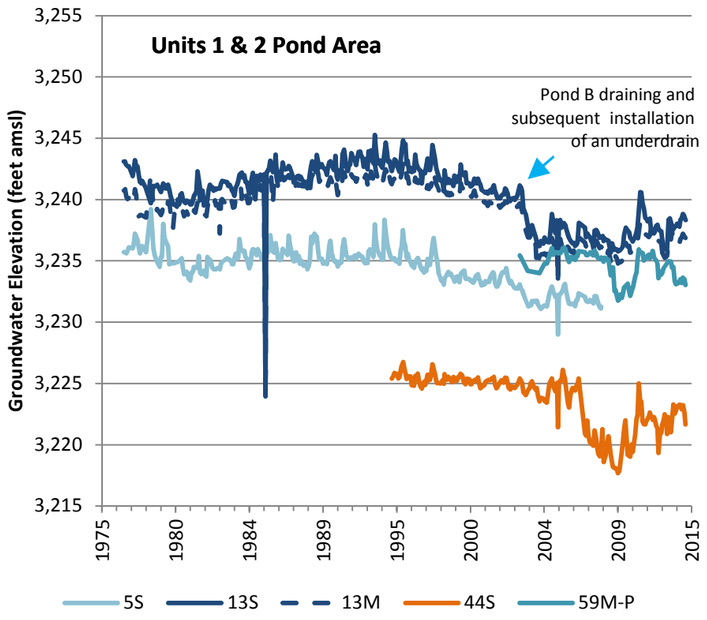
Select Hydrographs of Paired Wells
Plant Site Area Groundwater Model
CSES Colstrip Montana
FIGURE 19

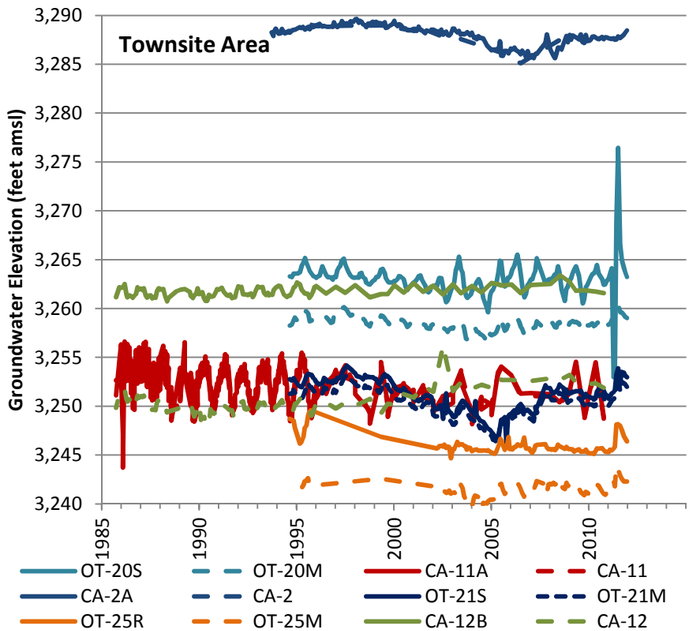








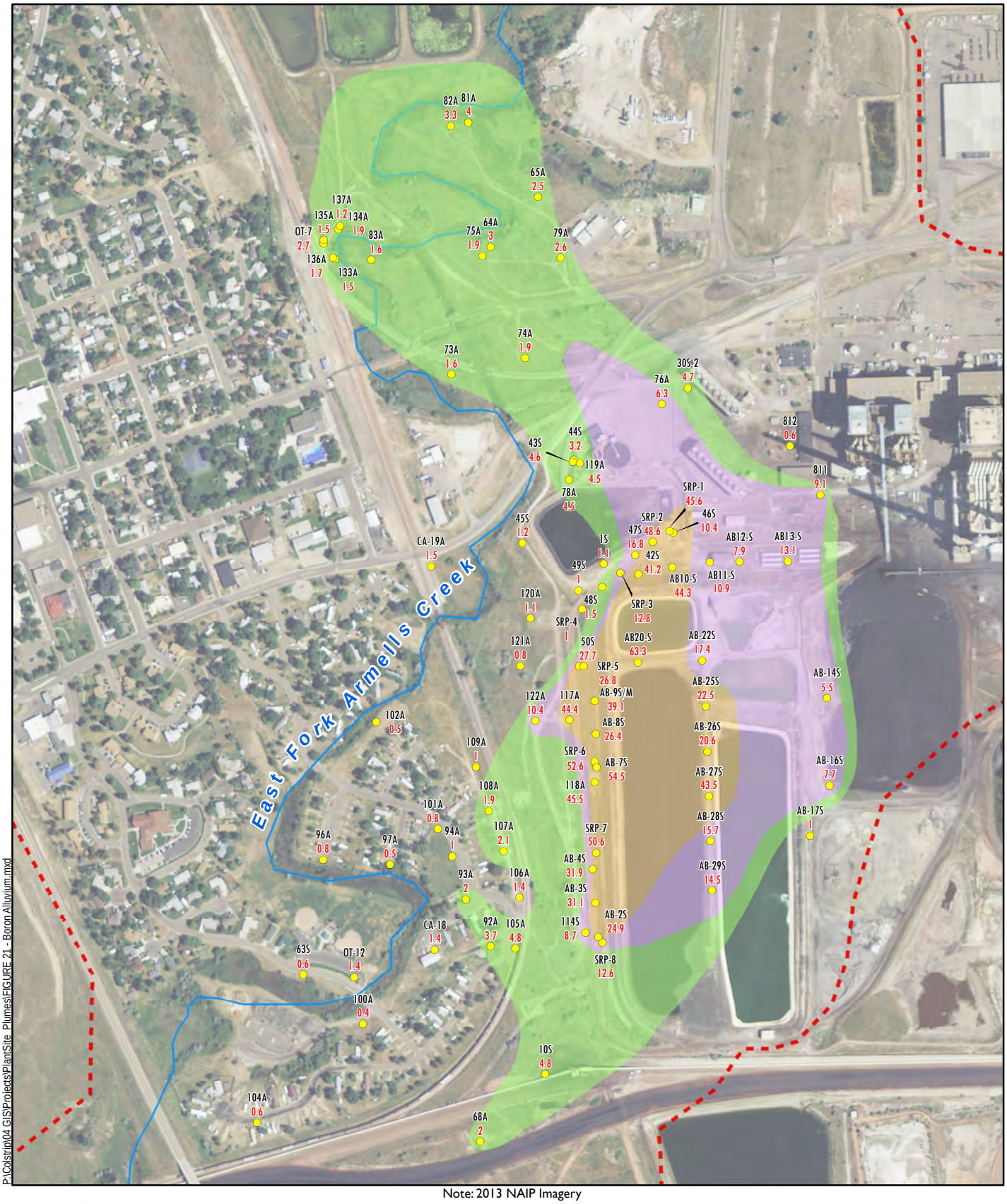




Note: Deeper wells are symbolized with dashed and dotted hydrographs

NewFields

Select Hydrographs
Plant Site Area Groundwater Model
CSES Colstrip Montana
FIGURE 20



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 21 - Boron Alluvium.mxd

Note: 2013 NAIP Imagery

Boron Alluvium

Approximate Extent of Fine Grained Alluvium/Colluvium

Boron Concentration (mg/L)

> 1.5 to 5.0

> 5.0 to 20

> 20

0 600 Feet

NewFields

Note:
Baseline screening level (BSL) for Boron in Alluvium = 1.5 mg/L (ARCADIS 2007) as of January 2015

Dissolved Boron in Alluvial Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 21

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 22 - Chloride Alluvium.mxd

Note: 2013 NAIP Imagery

Chloride Alluvium

Approximate Extent of Fine Grained Alluvium/Colluvium

Chloride Concentration (mg/L)

> 213 to 500

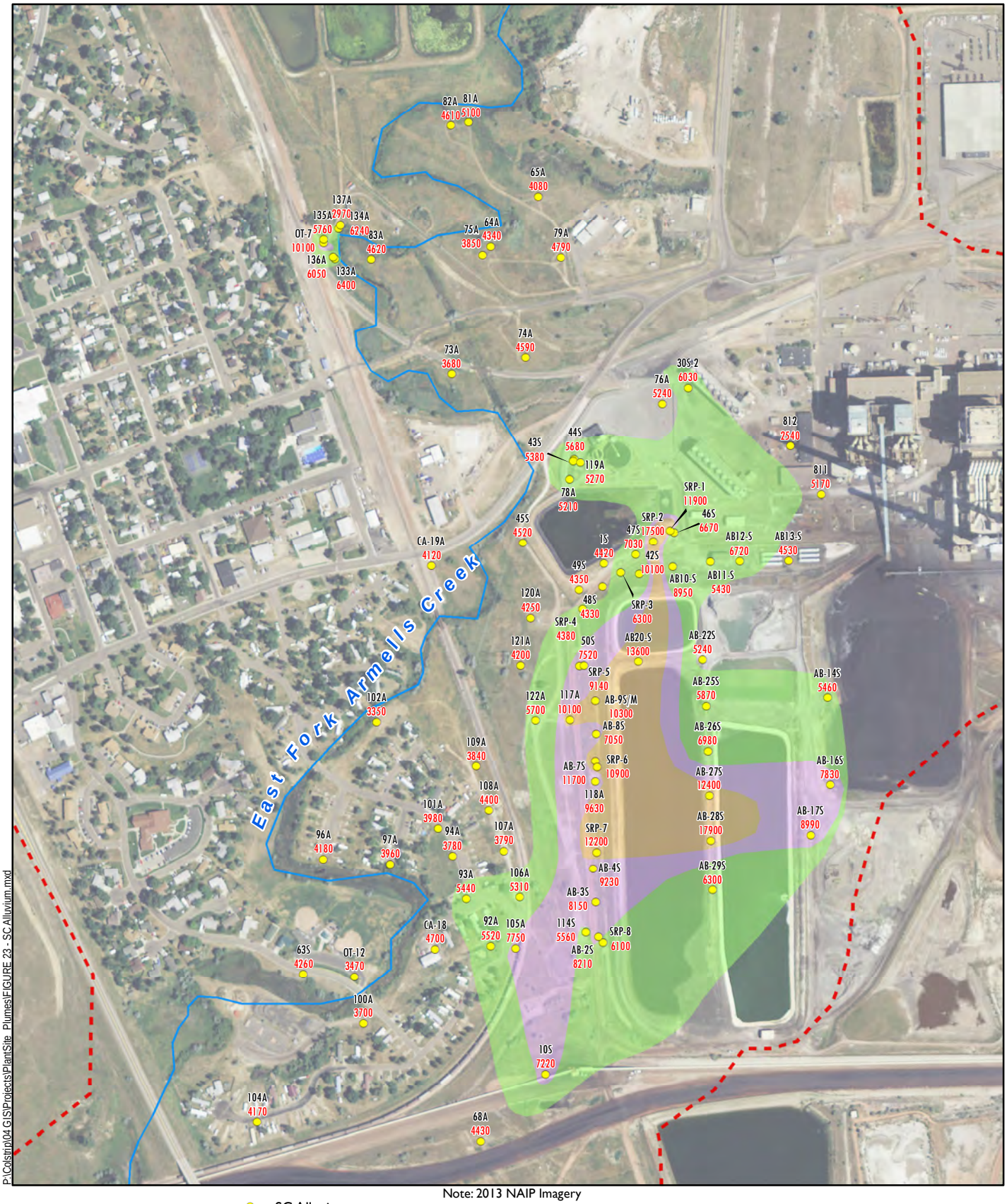
> 500

Note:
Baseline screening level (BSL) for Chloride in Alluvium = 213 mg/L (ARCADIS 2007) as of January 2015

0 600
Feet

NewFields

Chloride in Alluvial Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 22



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 23 - SC Alluvium.mxd

Note: 2013 NAIP Imagery

SC Alluvium

Approximate Extent of Fine Grained Alluvium/Colluvium

Specific Conductance (µmhos/cm)

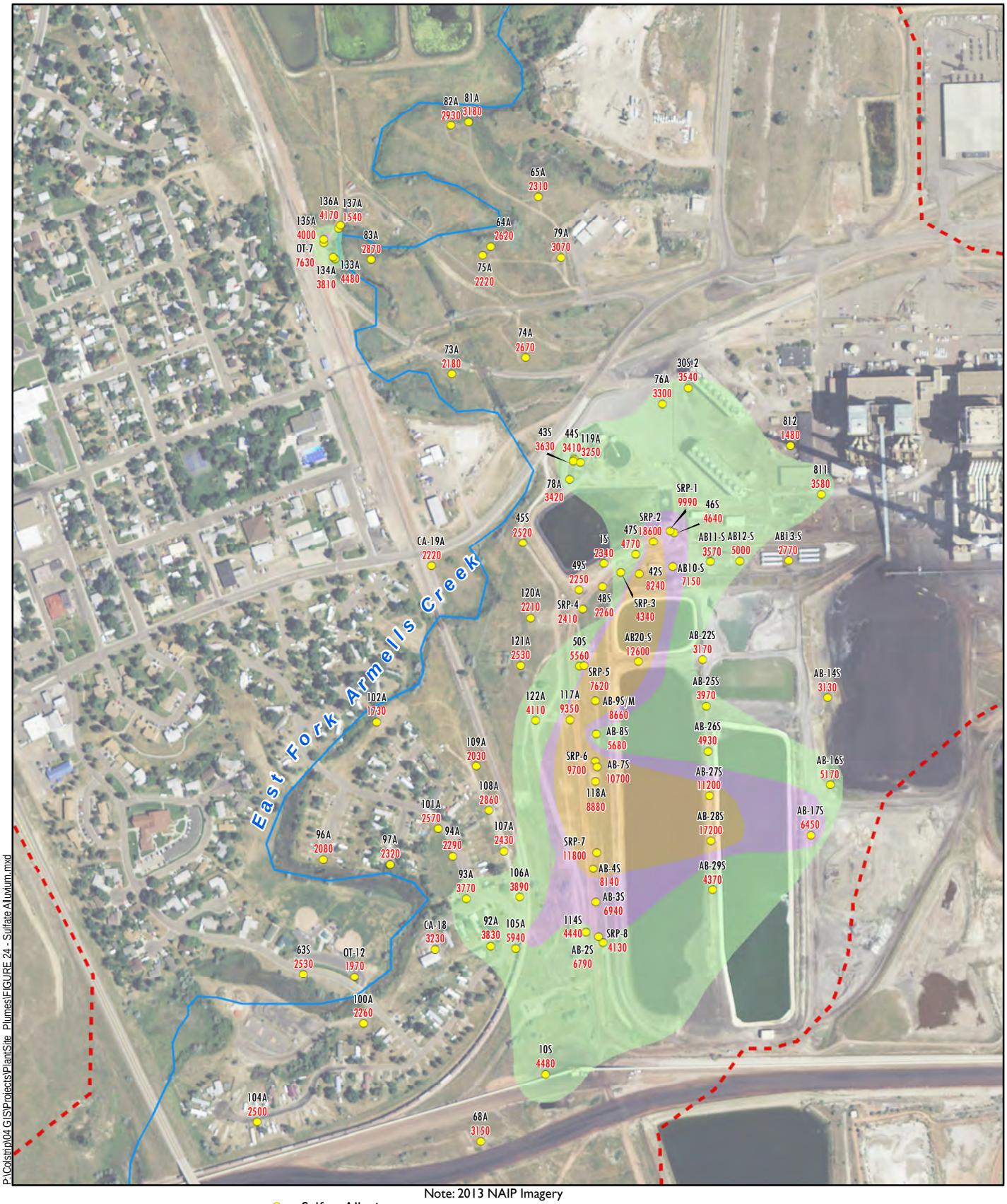
- > 5,300 to 7,000
- > 7,000 to 10,000
- > 10,000

0 600 Feet

NewFields

Note:
Baseline screening level (BSL) for SC in Alluvium = 5,300 µmhos/cm (ARCADIS 2007) as of January 2015

Specific Conductance in Alluvial Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 23



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 24 - Sulfate Alluvium.mxd

Note: 2013 NAIP Imagery

Sulfate Alluvium

Approximate Extent of Fine Grained Alluvium/Colluvium

Sulfate Concentration (mg/L)

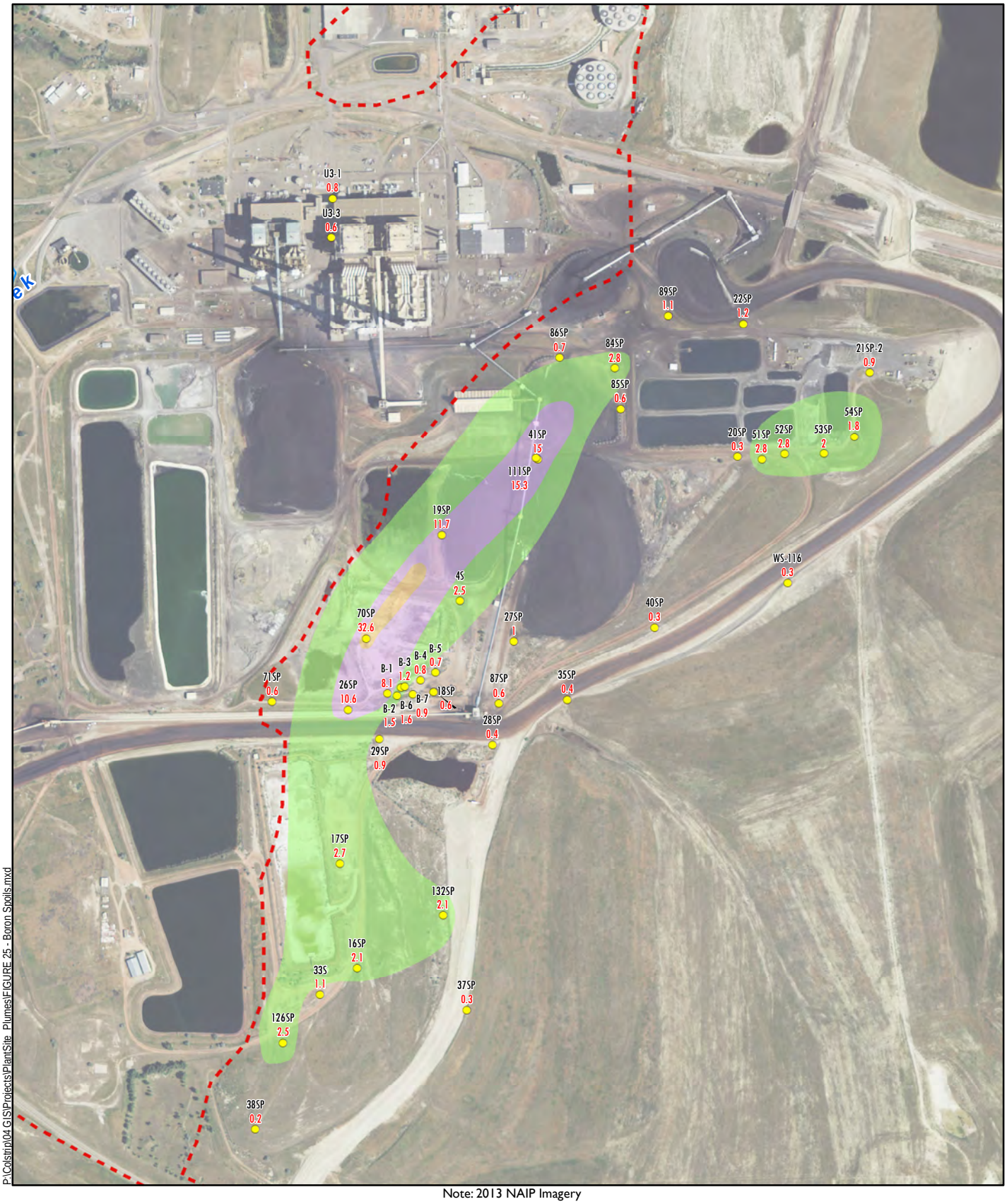
- > 3,400 to 6,000
- > 6,000 to 8,000
- > 8,000

0 600 Feet

NewFields

Note:
Baseline screening level (BSL) for Sulfate in Alluvium = 3,400 mg/L (ARCADIS 2007) as of January 2015

Sulfate in Alluvial Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 24



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 25 - Boron Spoils.mxd

Note: 2013 NAIP Imagery

Monitoring Well

Approximate Extent of Spoils

Boron Concentration (mg/L)

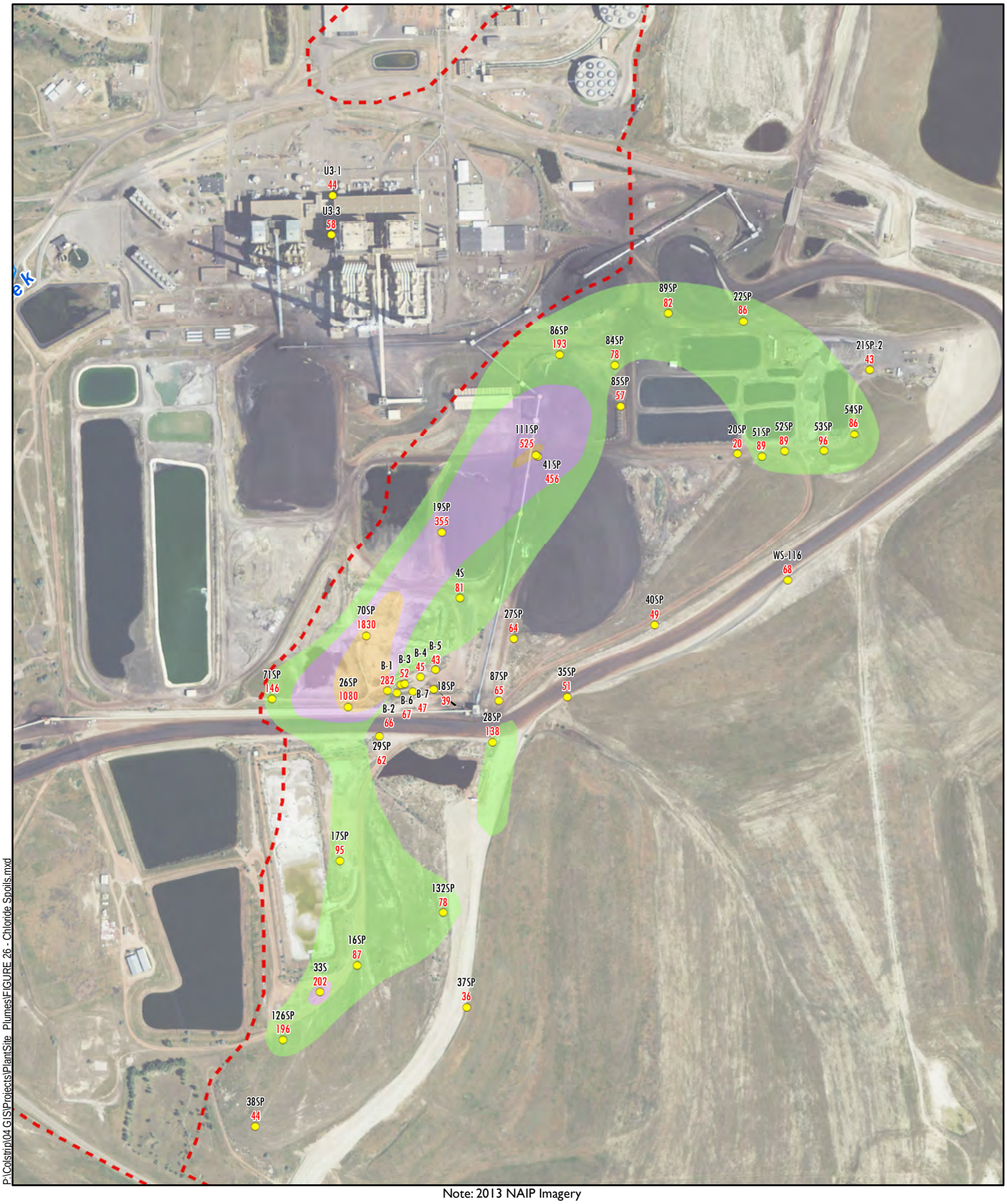
- > 1.3 to 5.0
- > 5.0 to 20
- > 20

Note:
Baseline screening level (BSL) for Boron in Spoils = 1.3 mg/L (ARCADIS 2007) as of January 2015

0 800
Feet

NewFields

Dissolved Boron in Spoils Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 25



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 26 - Chloride Spoils.mxd

Note: 2013 NAIP Imagery

Monitoring Well

Approximate Extent of Spoils

Chloride Concentration (mg/L)

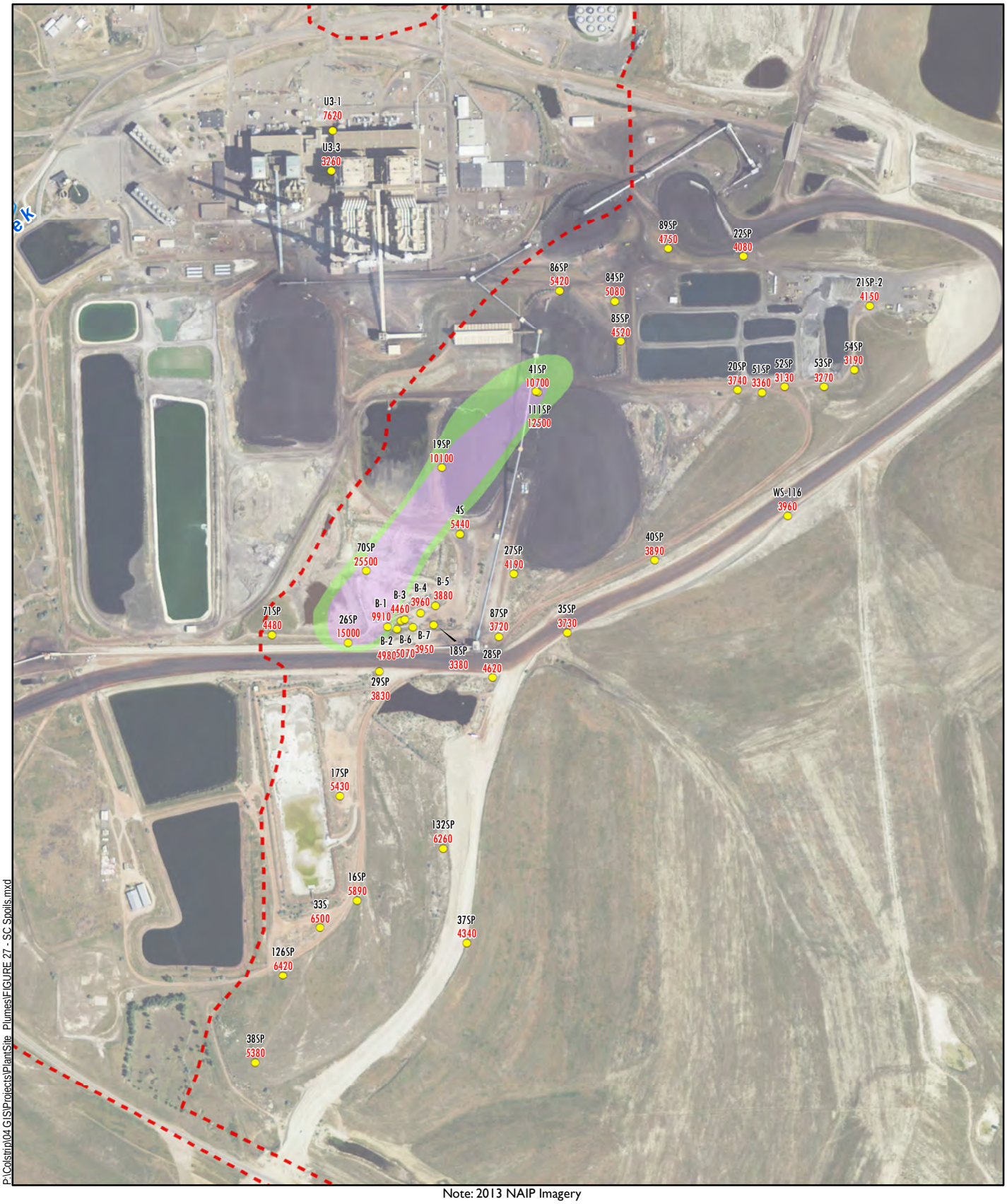
- > 73 to 200
- > 200 to 500
- > 500

0 800 Feet

NewFields

Note:
Baseline screening level (BSL) for Chloride in Spoils = 73 mg/L (ARCADIS 2007) as of January 2015

Chloride in Spoils Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 26



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 27 - SC Spoils.mxd

Note: 2013 NAIP Imagery

0 800
Feet

Monitoring Well

Approximate Extent of Spoils

Specific Conductance (µmhos/cm)

> 7,390 to 10,000

> 10,000

Note:
Baseline screening level (BSL) for SC in Spoils = 7,390 µmhos/cm (ARCADIS 2007) as of January 2015

NewFields

Specific Conductance in Spoils Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 27

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 28 - Sulfate Spoils.mxd

Note: 2013 NAIP Imagery

0 Feet 800

NewFields

Note:
Baseline screening level (BSL) for Sulfate in Spoils = 5,000 mg/L (ARCADIS 2007) as of January 2015

Figure does not include Deep Sub-McKay Water Quality because there are no "Deep Sub-McKay" monitoring wells in the Plant Site Area

Monitoring Well

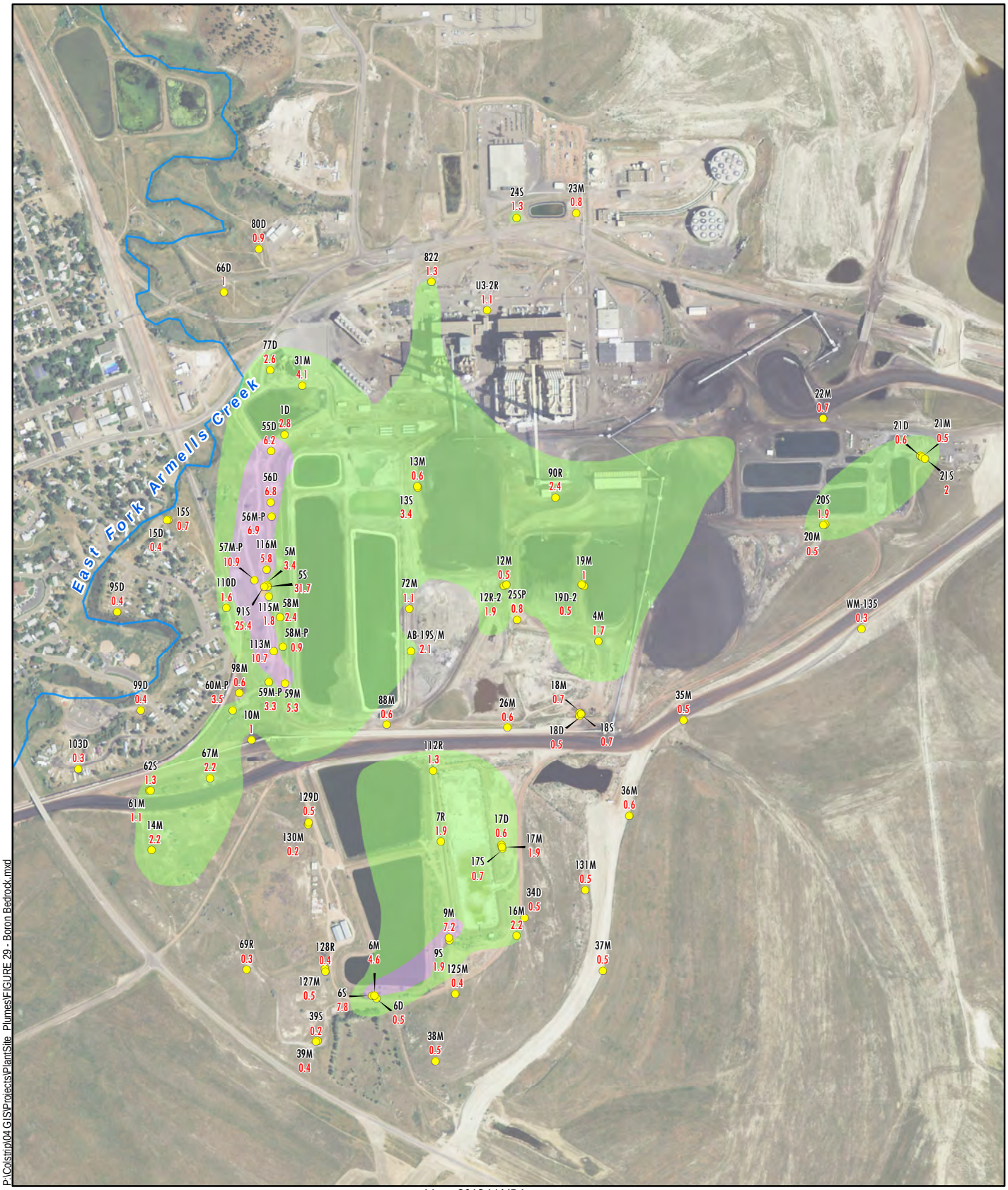
Approximate Extent of Spoils

Sulfate Concentration (mg/L)

> 5,000 to 10,000

> 10,000

Sulfate in Spoils Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 28



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 29 - Boron Bedrock.mxd

Note: 2013 NAIP Imagery

Note:
Baseline screening level (BSL) for Boron in Bedrock = 1.2 mg/L (ARCADIS 2007) as of January 2015

Figure does not include Deep Sub-McKay Water Quality because there are no "Deep Sub-McKay" monitoring wells in the Plant Site Area
Includes Water Quality from Wells Screened in McKay Coal

Monitoring Well

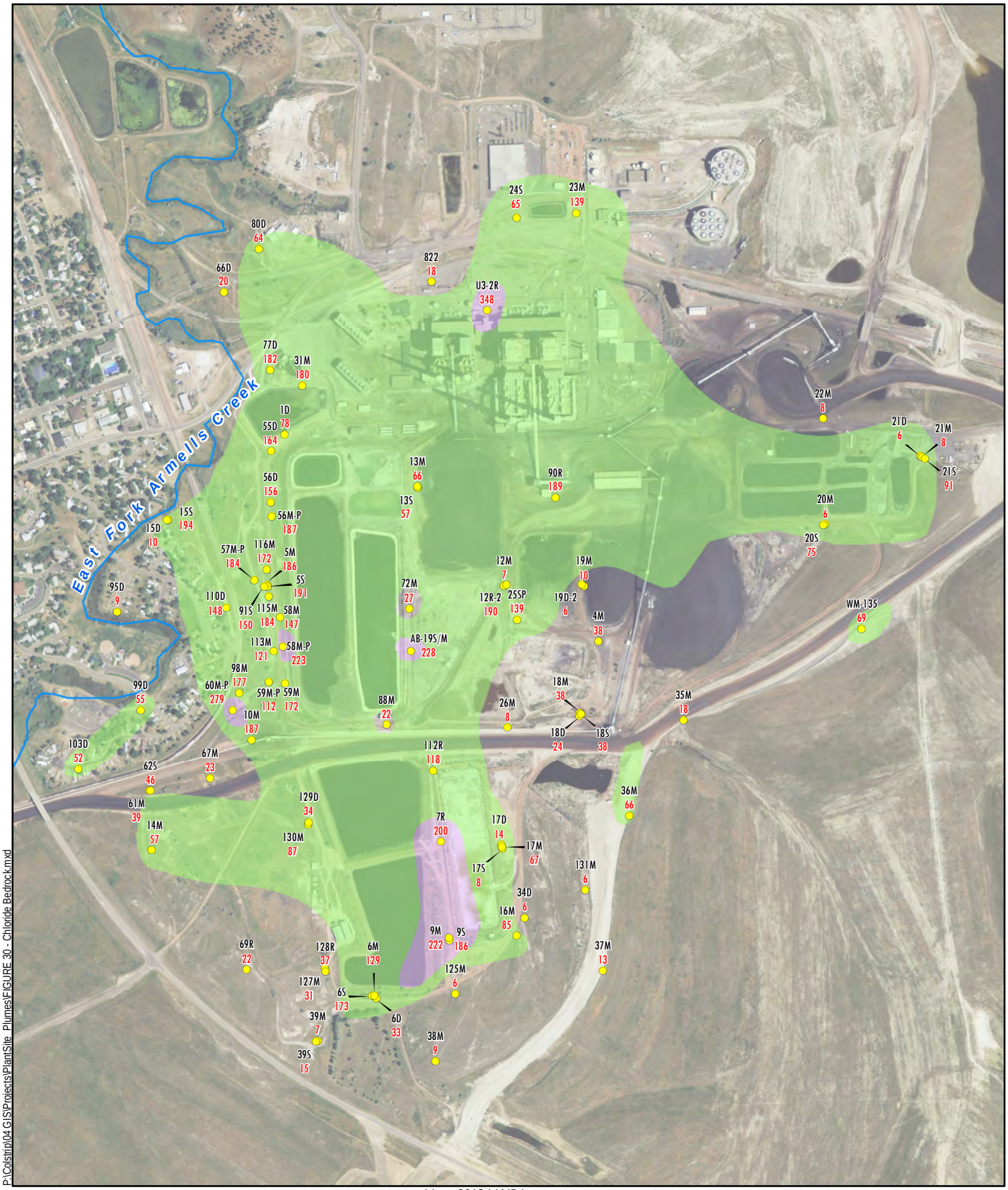
Boron Concentration (mg/L)

- > 1.2 to 5.0
- > 5.0 to 20
- > 20

0 1,000 Feet

NewFields

Dissolved Boron in Bedrock Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 29



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 30 - Chloride Bedrock.mxd

Note: 2013 NAIP Imagery

Note:
Baseline screening level (BSL) for Chloride in Bedrock = 48 mg/L (ARCADIS 2007) as of January 2015

Figure does not include Deep Sub-McKay Water Quality because there are no "Deep Sub-McKay" monitoring wells in the Plant Site Area
Includes Water Quality from Wells Screened in McKay Coal

N

0 Feet 1,000

NewFields

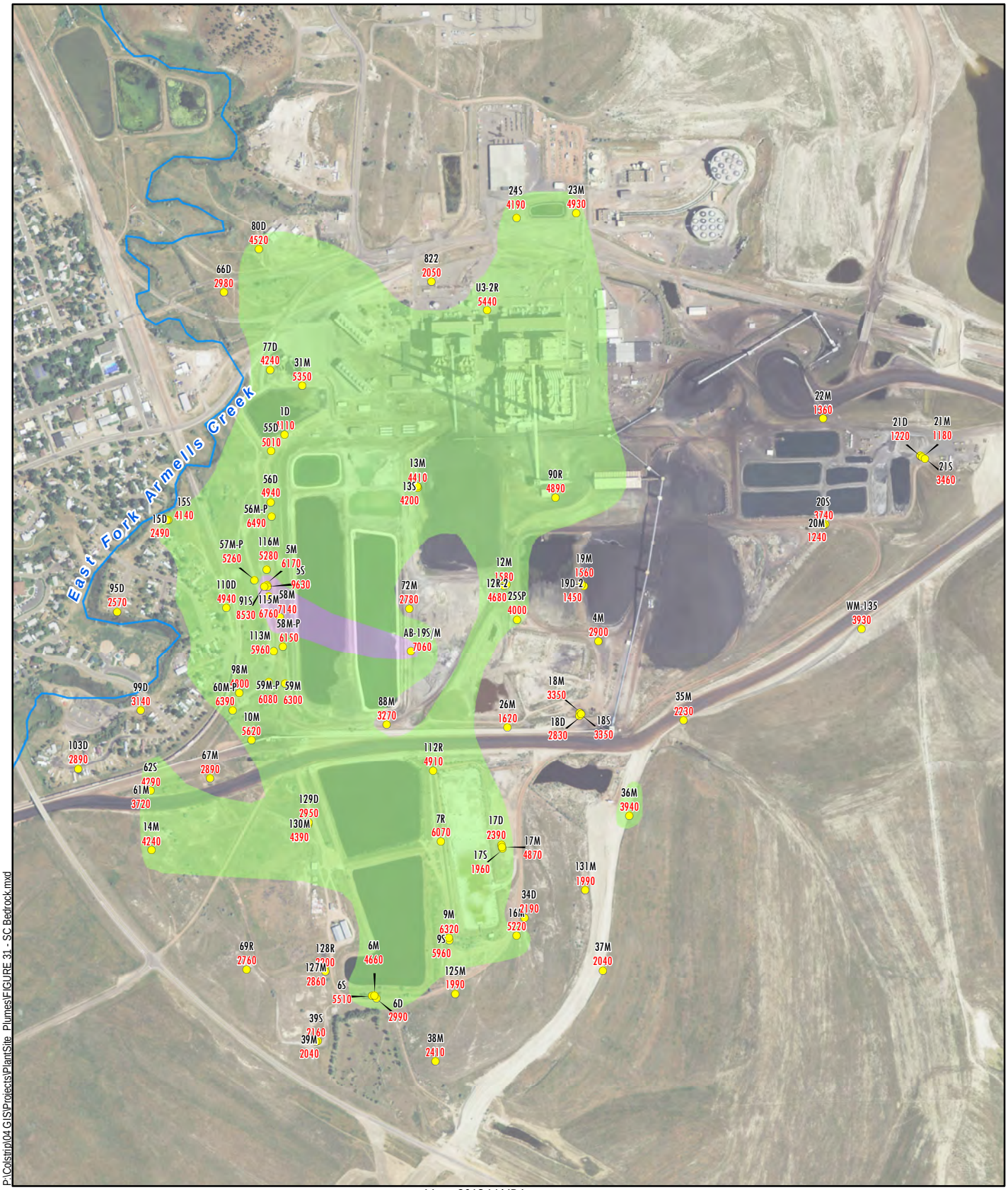
Monitoring Well

Chloride Concentration (mg/L)

> 48 to 200

> 200

Chloride in Bedrock Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 30



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 31 - SC Bedrock.mxd

Note: 2013 NAIP Imagery

Note:
Baseline screening level (BSL) for SC in Bedrock = 3,940 µmhos/cm (ARCADIS 2007) as of January 2015

Figure does not include Deep Sub-McKay Water Quality because there are no "Deep Sub-McKay" monitoring wells in the Plant Site Area
Includes Water Quality from Wells Screened in McKay Coal

0 1,000 Feet

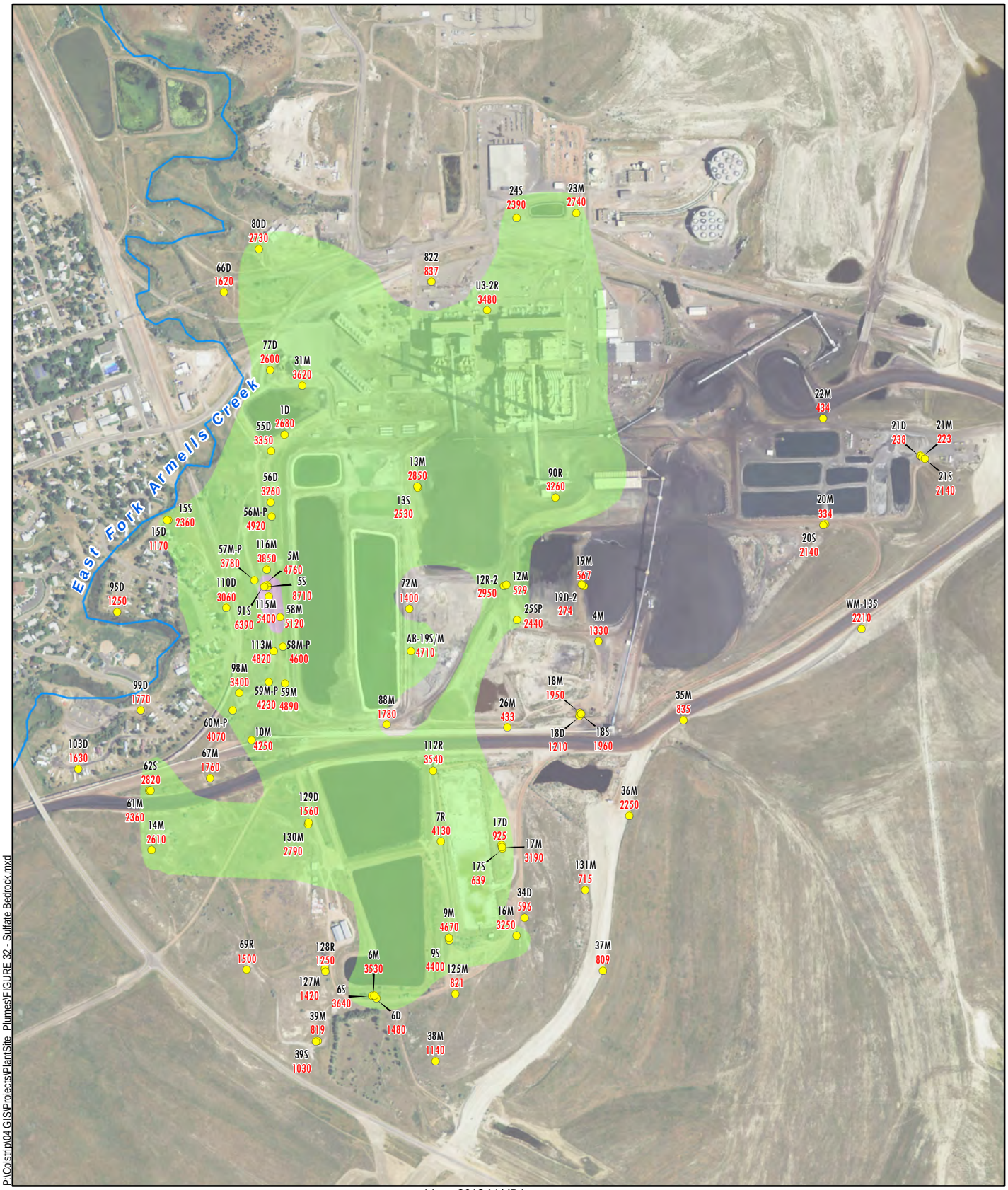
Monitoring Well

Specific Conductance (µmhos/cm)

- > 3,940 to 7,000
- > 7000

NewFields

Specific Conductance in Bedrock Groundwater April 2014 Plant Site Area Groundwater Model CSES-Colstrip, Montana FIGURE 31



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 32 - Sulfate Bedrock.mxd

Note: 2013 NAIP Imagery

Note:
Baseline screening level (BSL) for Sulfate in Bedrock = 2,310 mg/L (ARCADIS 2007) as of January 2015

Figure does not include Deep Sub-McKay Water Quality because there are no "Deep Sub-McKay" monitoring wells in the Plant Site Area
Includes Water Quality from Wells Screened in McKay Coal

0 1,000 Feet

NewFields

Monitoring Well

Sulfate Concentration (mg/L)

> 2,310 to 6,000

> 6,000

Sulfate in Bedrock Groundwater
April 2014
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 32

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 33 - GW Extraction.mxd

Note: 2013 NAIP Imagery

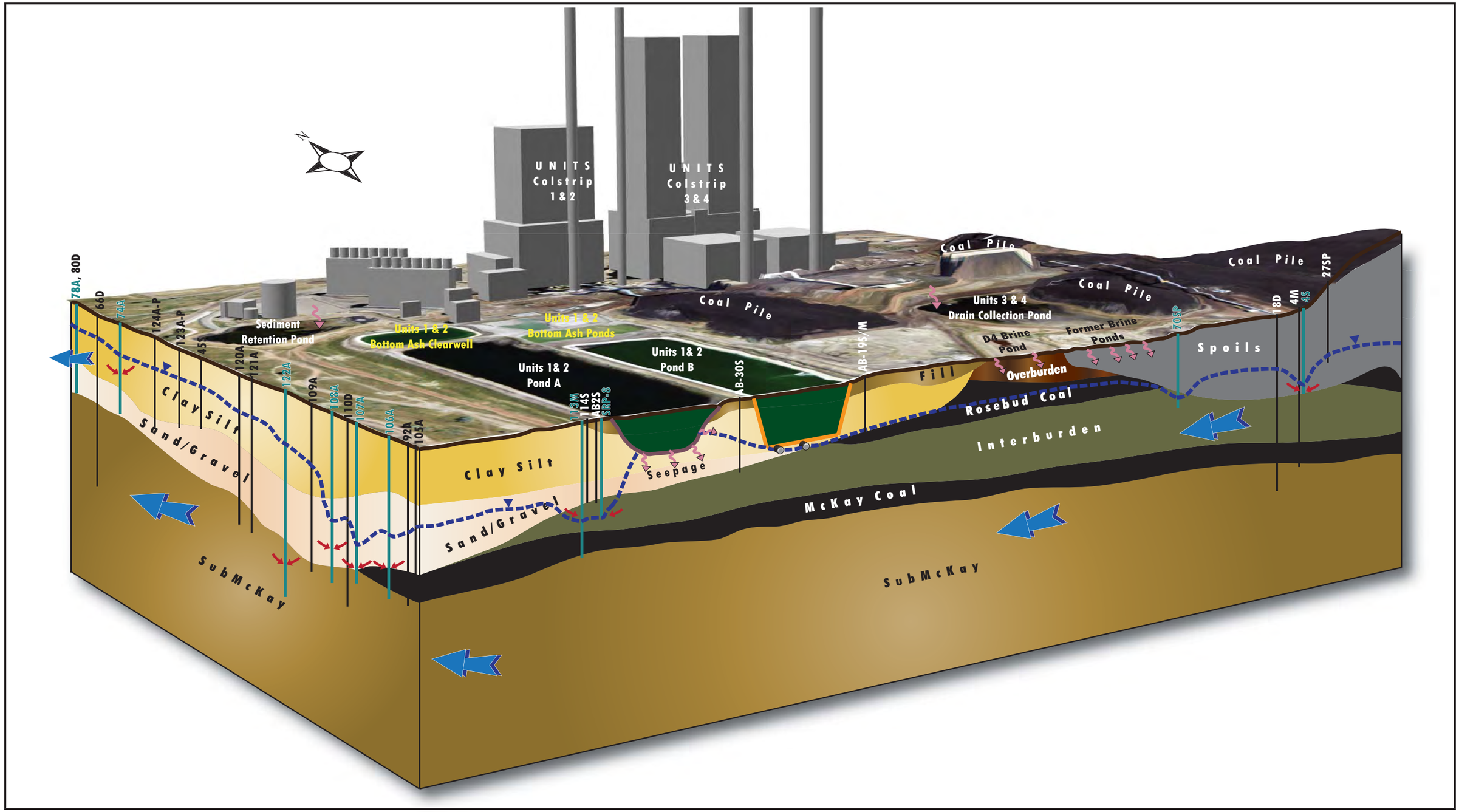
0 Feet 800

NewFields

Extraction Well Screened Unit

- Spoils
- Alluvium
- McKay Coal
- Overburden
- Rosebud/Clinker
- Sub-McKay
- Townsite Dewatering Wells (not part of PPLM's groundwater extraction system)
- Drain

Location of Groundwater Extraction System
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 33



Seepage/Infiltration From Process Pond/Source Area

106A — Capture Well

Direction of Groundwater Flow

Potentiometric Surface

Capture of Impacted Water

Underdrain Pond B

Clay Liner Pond A

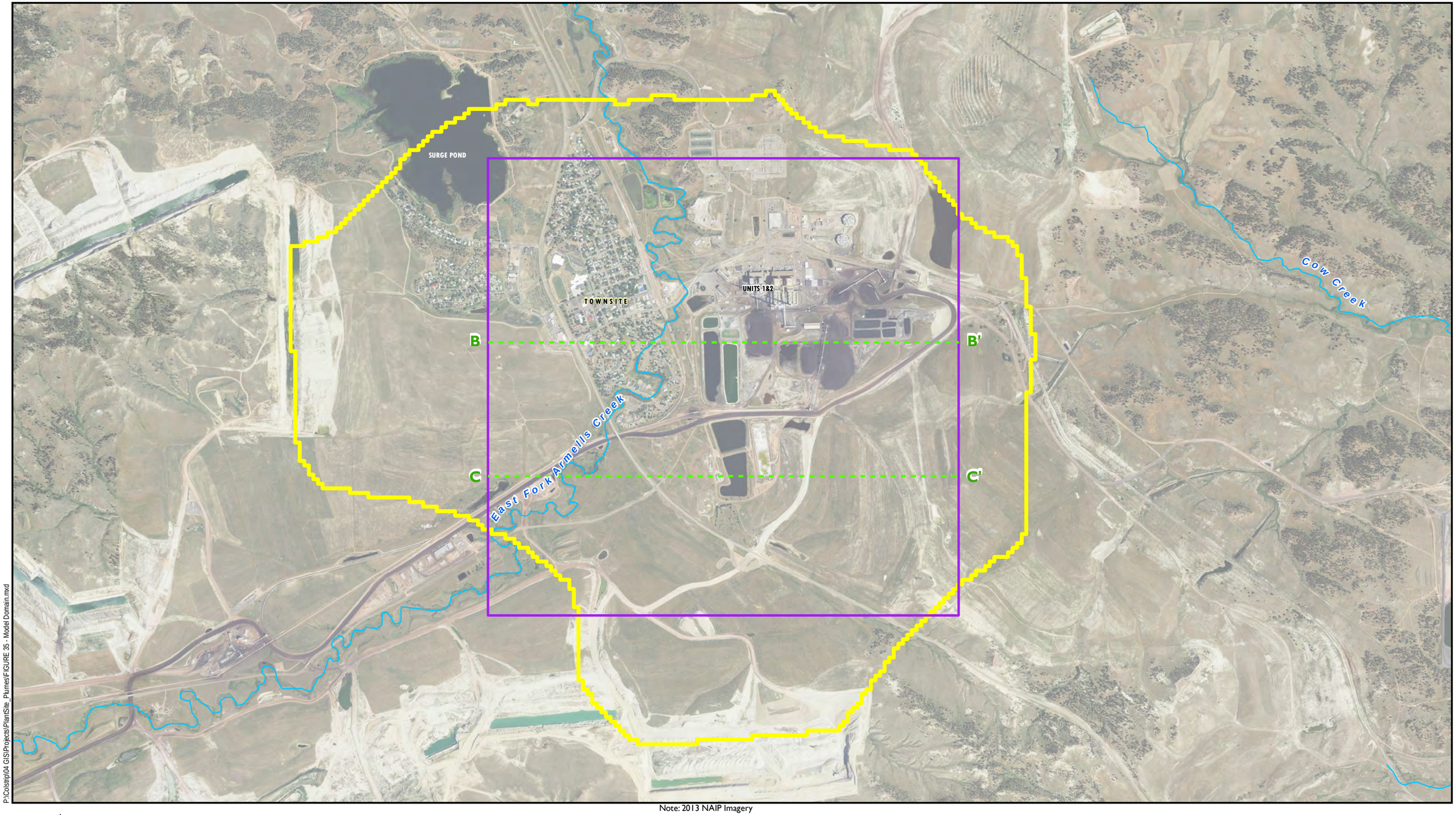
Geotextile Liner Pond B

92A — Monitoring Well

Not To Scale

NewFields

Block Model
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 34



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 35 - Model Domain.mxd

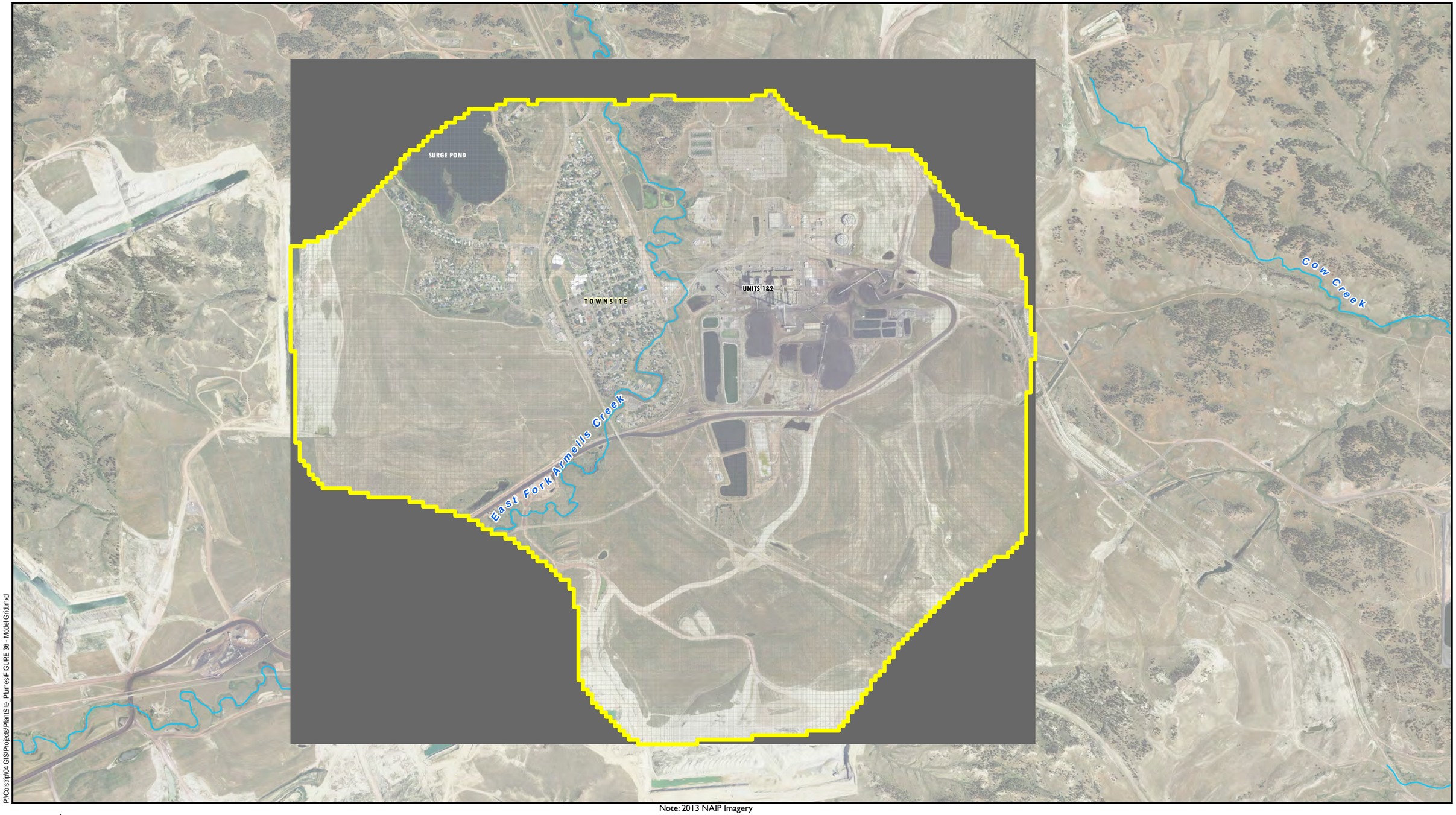
Note: 2013 NAIP Imagery

0 Feet 2,000

NewFields

- Cross Section Locations (See Figures 37 and 38)
- Previous Model Domain
- Model Domain

Model Domain
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 35



P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 36 - Model Grid.mxd

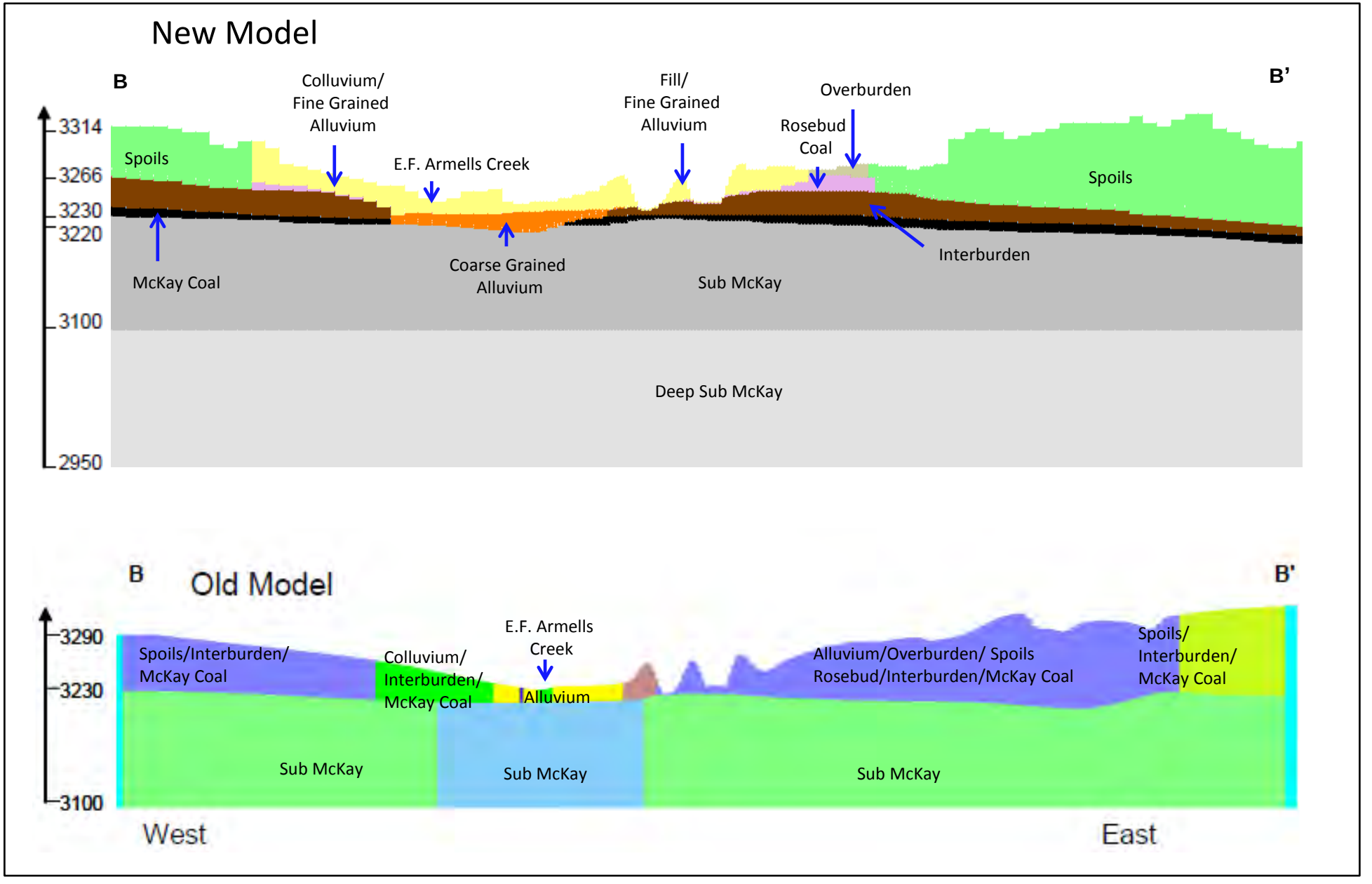
Note: 2013 NAIP Imagery

0 Feet 2,000

NewFields

Model Domain
No Flow
Model Grid

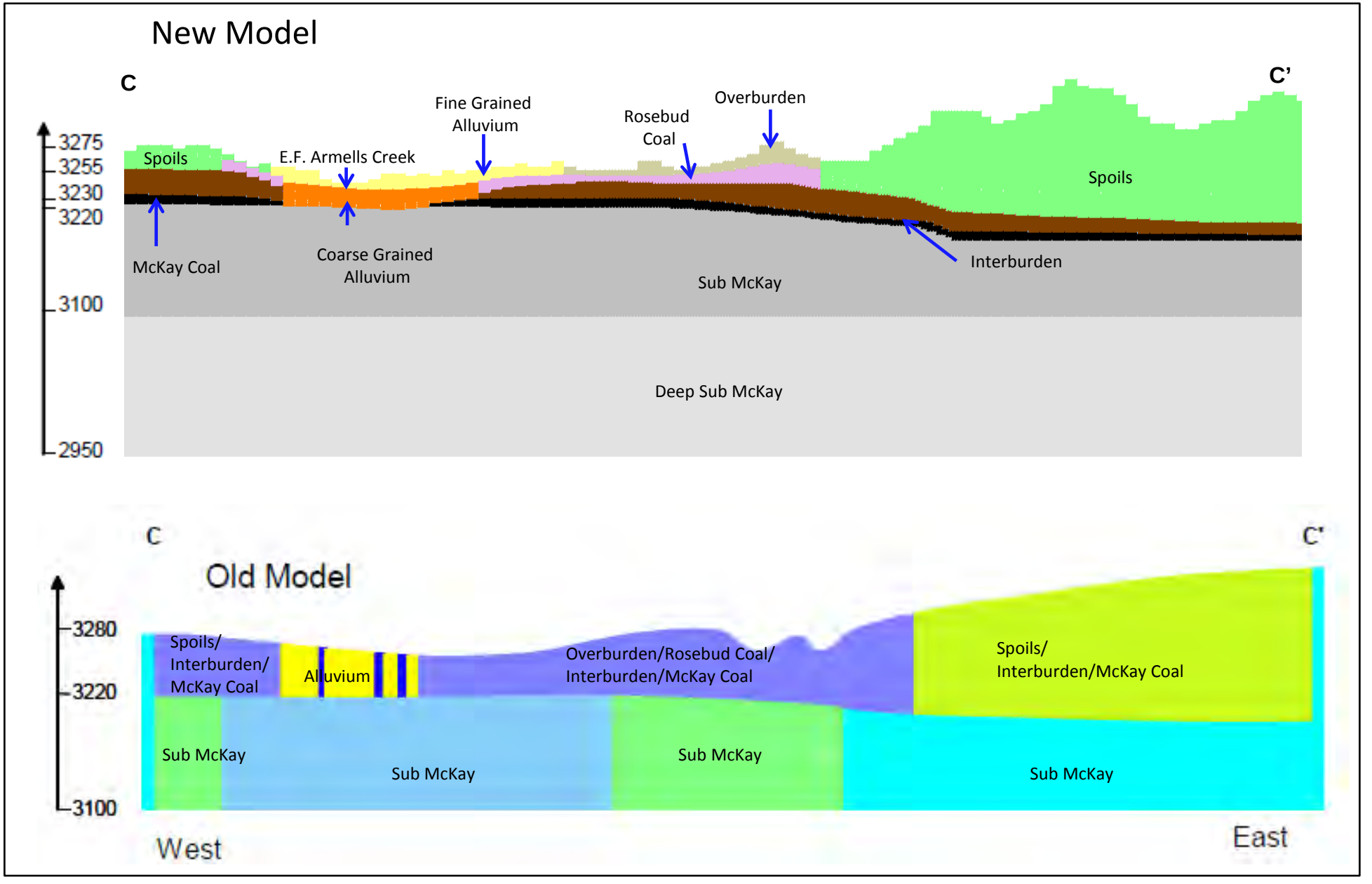
Model Grid
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 36



Cross Section Location shown on Figure 35

Model Cross Section B-B'
Plant Site Area Groundwater Model
CSES Colstrip, Montana
FIGURE 37

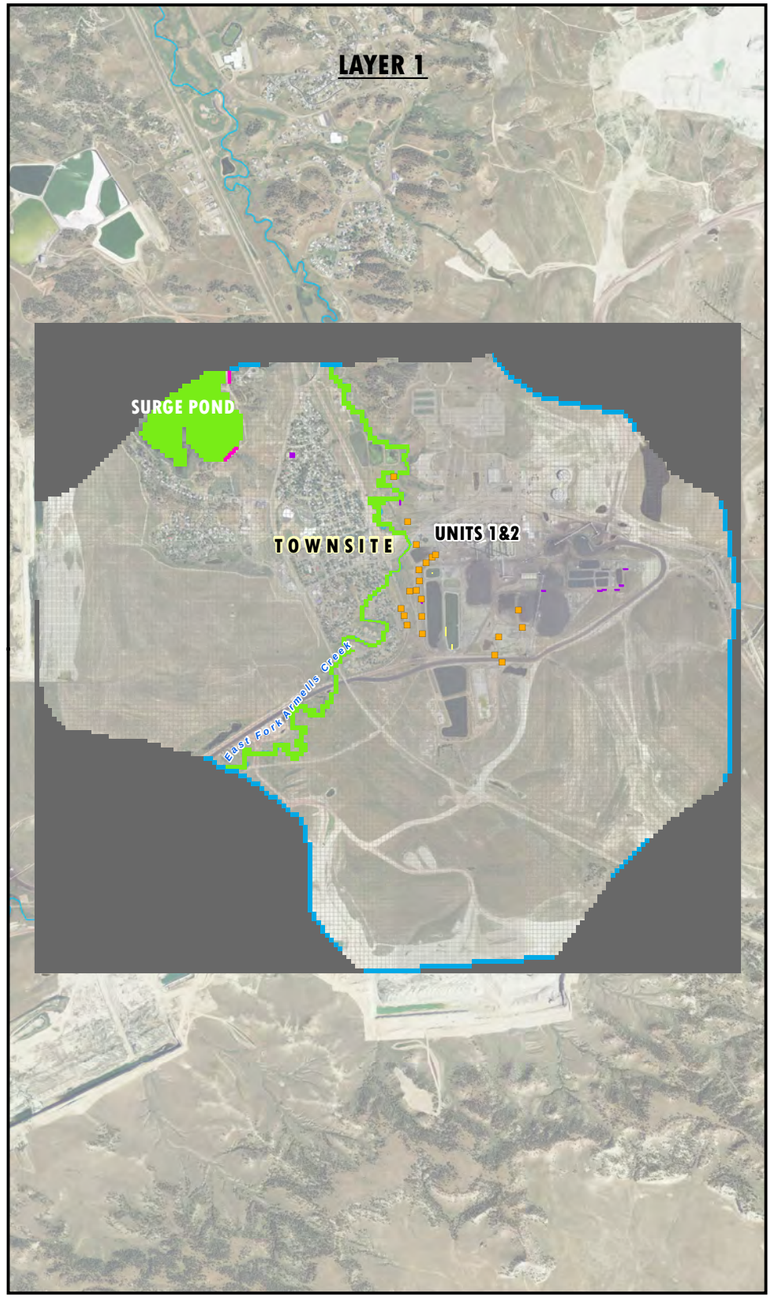
NewFields

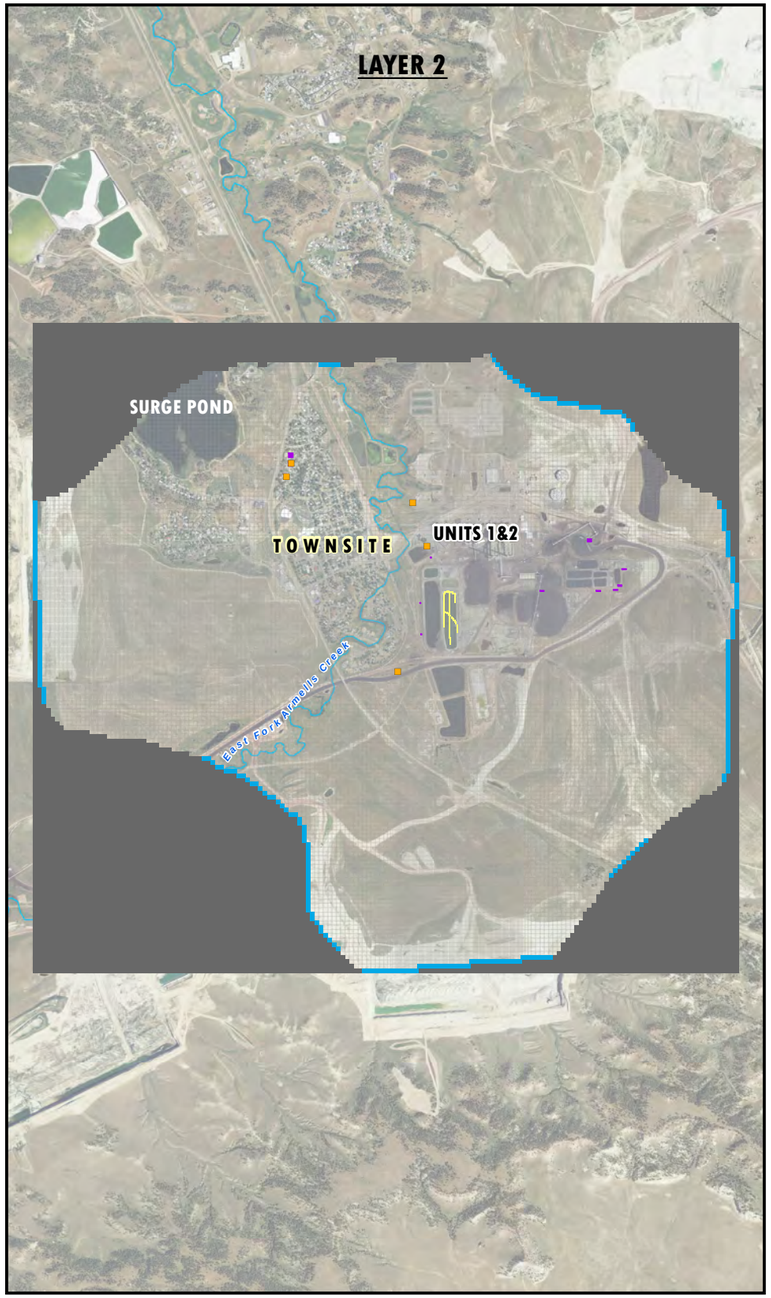


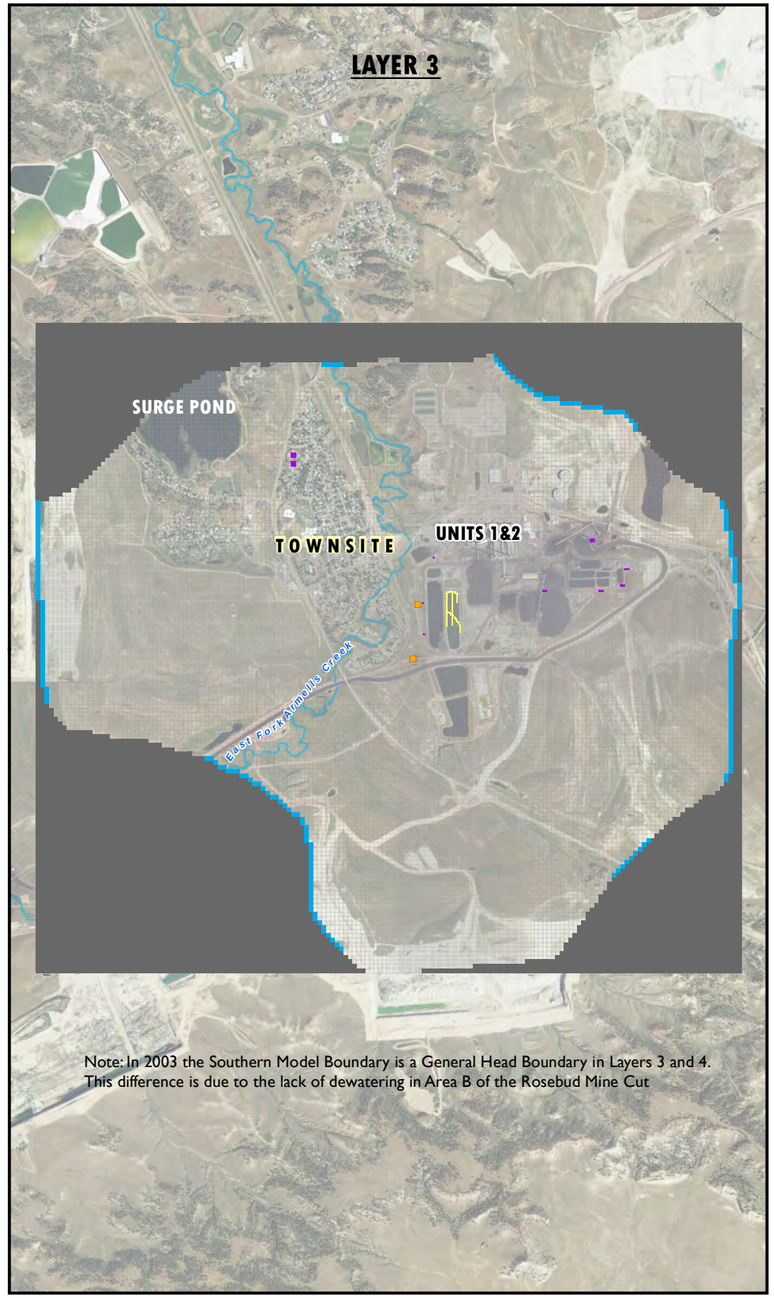
Cross Section Location shown on Figure 35

Model Cross Section C-C'
Plant Site Area Groundwater Model
CSES Colstrip, Montana
FIGURE 38

NewFields







Note: In 2003 the Southern Model Boundary is a General Head Boundary in Layers 3 and 4. This difference is due to the lack of dewatering in Area B of the Rosebud Mine Cut

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 39 - Boundary123.mxd

Note: 2013 NAIP Imagery

N

0 Feet 3,500

NewFields

Well Package
FWL5 Well Package
Wall
Drain
General Head
No Flow
River
Model Grid

Boundary Conditions Layer 1, 2 and 3
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 39

Note: In 2003 the Southern Model Boundary is a General Head Boundary in Layers 3 and 4. This difference is due to the lack of dewatering in Area B of the Rosebud Mine Cut

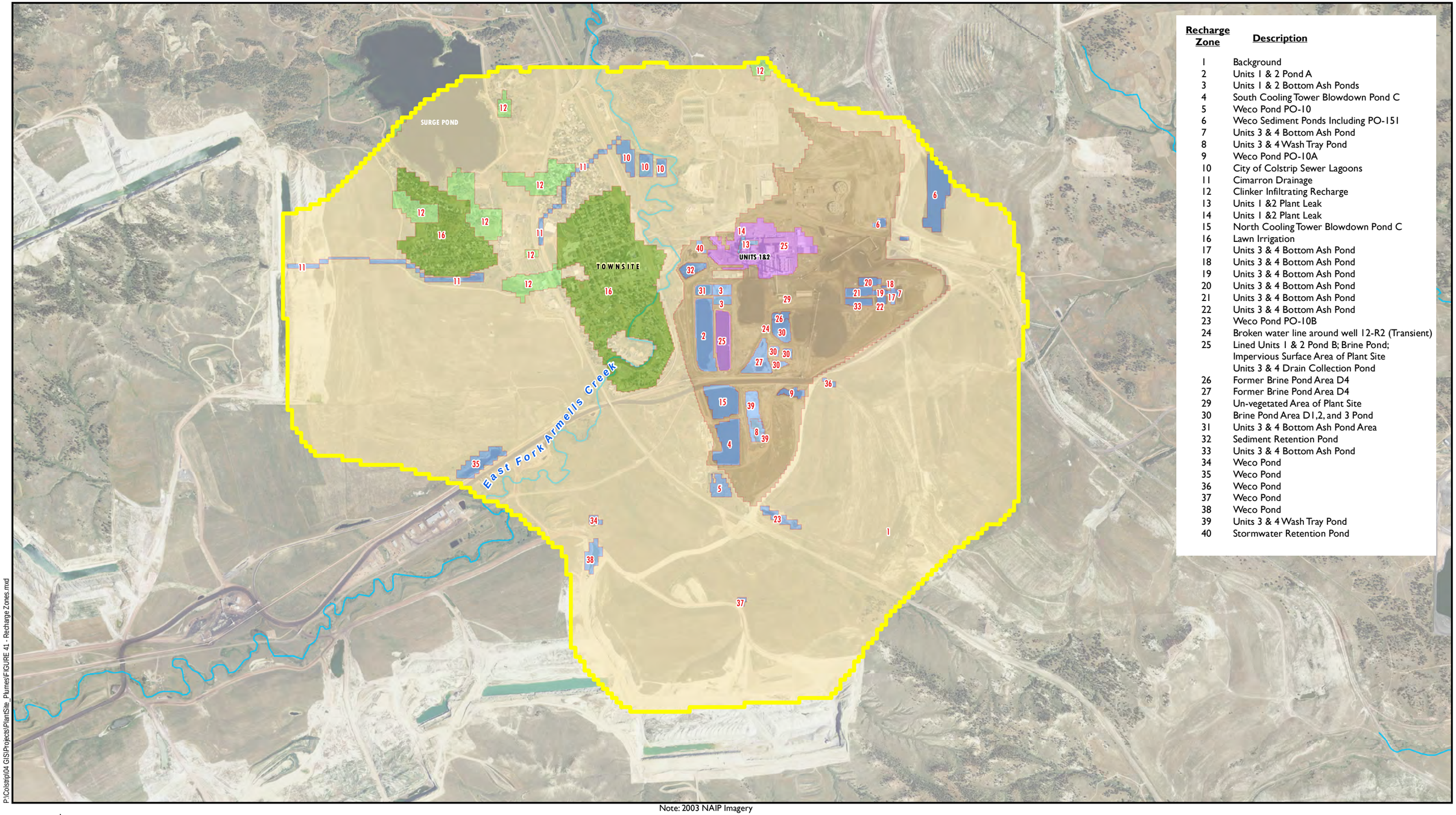
Note: 2013 NAIP Imagery

NewFields

Well Package
FWL5 Well Package
General Head
No Flow
Model Grid

Boundary Conditions Layer 4, 5 and 6
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 40

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 40 - Boundary456.mxd



Recharge Zone	Description
1	Background
2	Units 1 & 2 Pond A
3	Units 1 & 2 Bottom Ash Ponds
4	South Cooling Tower Blowdown Pond C
5	Weco Pond PO-10
6	Weco Sediment Ponds Including PO-151
7	Units 3 & 4 Bottom Ash Pond
8	Units 3 & 4 Wash Tray Pond
9	Weco Pond PO-10A
10	City of Colstrip Sewer Lagoons
11	Cimarron Drainage
12	Clinker Infiltrating Recharge
13	Units 1 &2 Plant Leak
14	Units 1 &2 Plant Leak
15	North Cooling Tower Blowdown Pond C
16	Lawn Irrigation
17	Units 3 & 4 Bottom Ash Pond
18	Units 3 & 4 Bottom Ash Pond
19	Units 3 & 4 Bottom Ash Pond
20	Units 3 & 4 Bottom Ash Pond
21	Units 3 & 4 Bottom Ash Pond
22	Units 3 & 4 Bottom Ash Pond
23	Weco Pond PO-10B
24	Broken water line around well 12-R2 (Transient)
25	Lined Units 1 & 2 Pond B; Brine Pond; Impervious Surface Area of Plant Site Units 3 & 4 Drain Collection Pond
26	Former Brine Pond Area D4
27	Former Brine Pond Area D4
29	Un-vegetated Area of Plant Site
30	Brine Pond Area D1,2, and 3 Pond
31	Units 3 & 4 Bottom Ash Pond Area
32	Sediment Retention Pond
33	Units 3 & 4 Bottom Ash Pond
34	Weco Pond
35	Weco Pond
36	Weco Pond
37	Weco Pond
38	Weco Pond
39	Units 3 & 4 Wash Tray Pond
40	Stormwater Retention Pond

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 41 - Recharge Zones.mxd

Note: 2003 NAIP Imagery

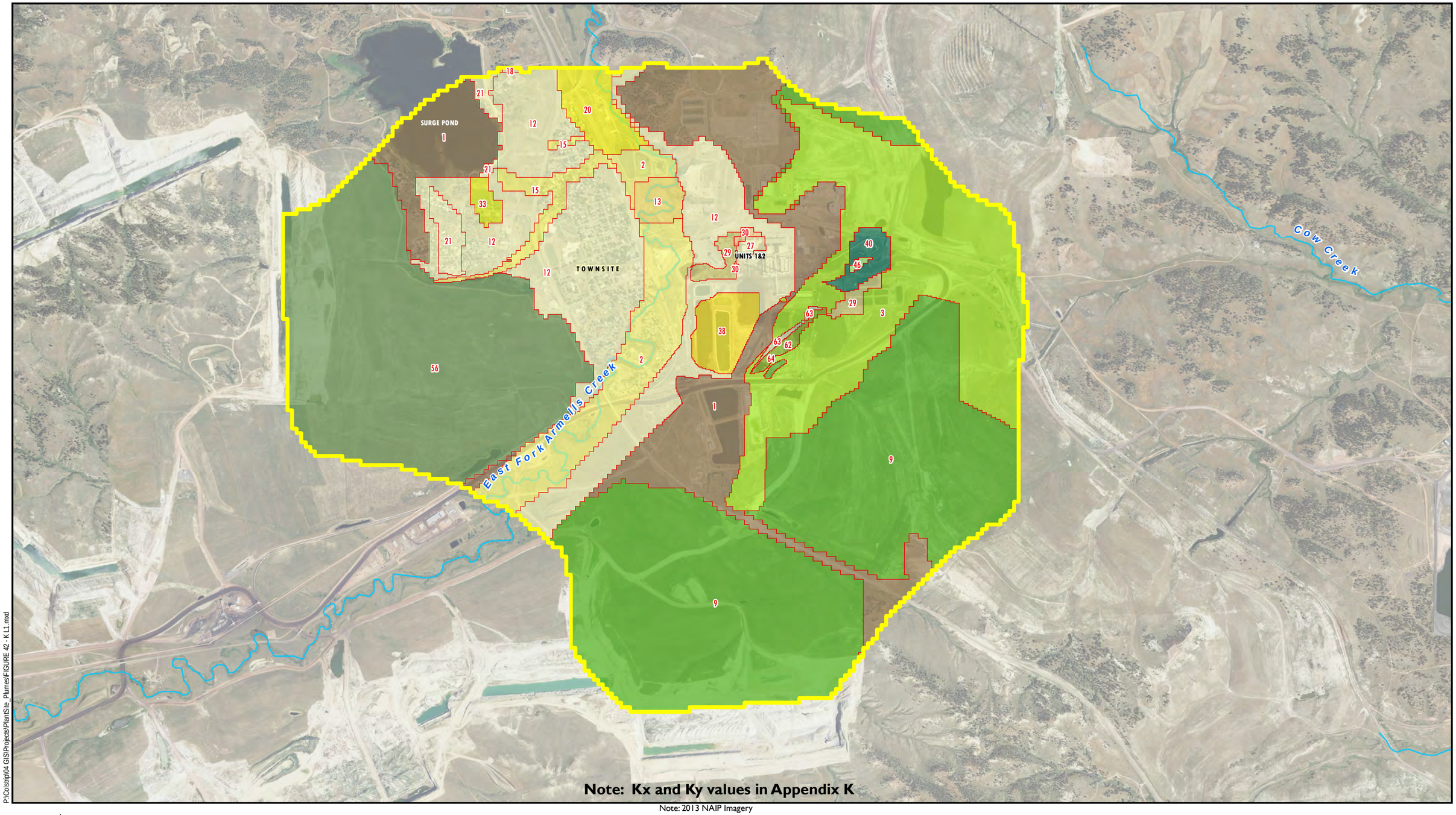
Recharge Zones

- Background
- Clinker Infiltrating Recharge
- Impervious
- Lawn Irrigation Infiltration
- Ponds Seepage
- Unvegetated Infiltration Recharge
- Model Domain

0 Feet 2,000

NewFields

Recharge Zones
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 41



Note: Kx and Ky values in Appendix K

Note: 2013 NAIP Imagery

Hydraulic Conductivity Zone

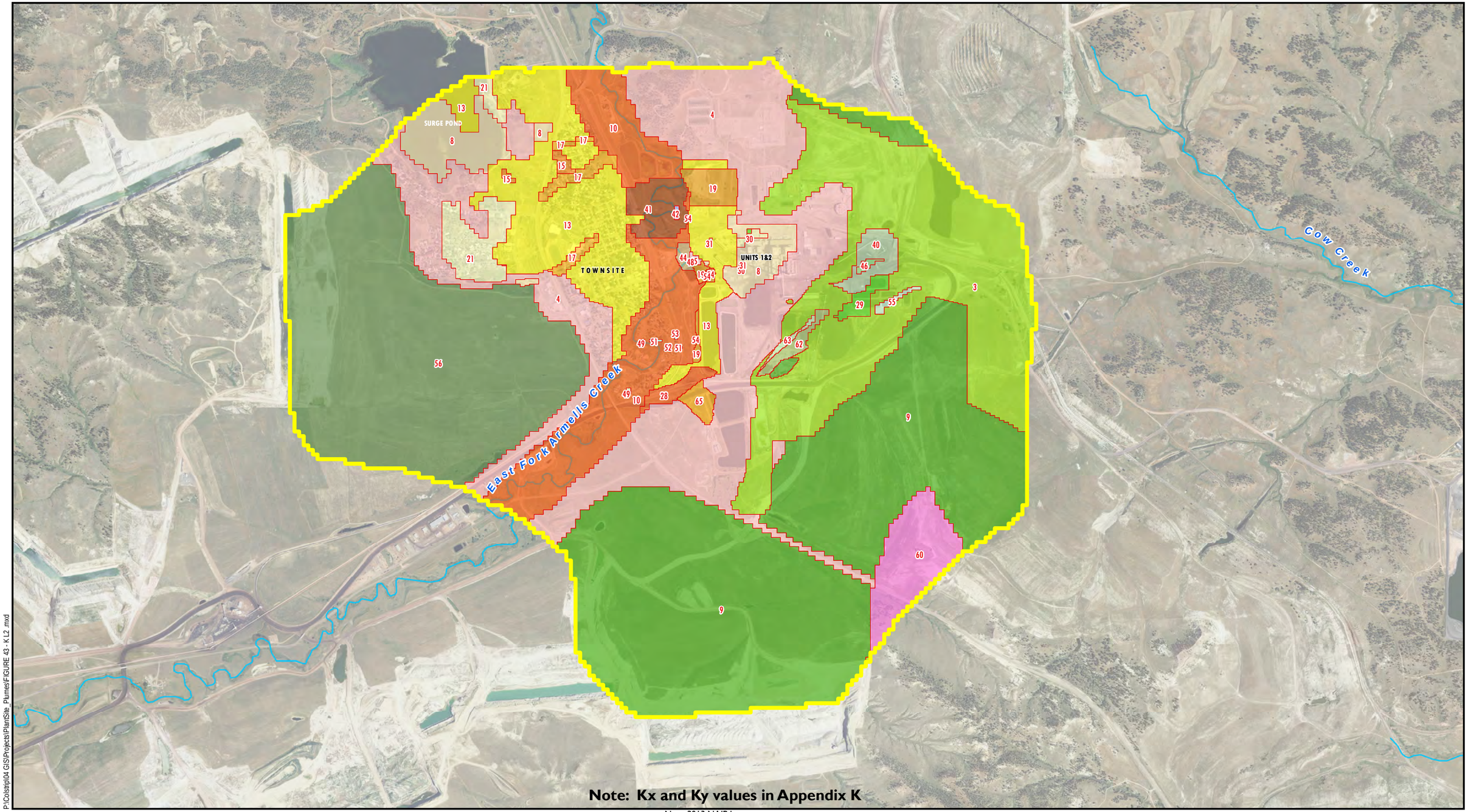
1	12	20	30	46	64		Model Domain
2	13	21	33	56			
3	15	27	38	62			
9	18	29	40	63			

0 Feet 2,000

NewFields

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 42 - K L1.mxd

Calibrated Hydraulic Conductivity Distribution - Layer 1
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 42



Note: Kx and Ky values in Appendix K

Note: 2013 NAIP Imagery

Hydraulic Conductivity Zone

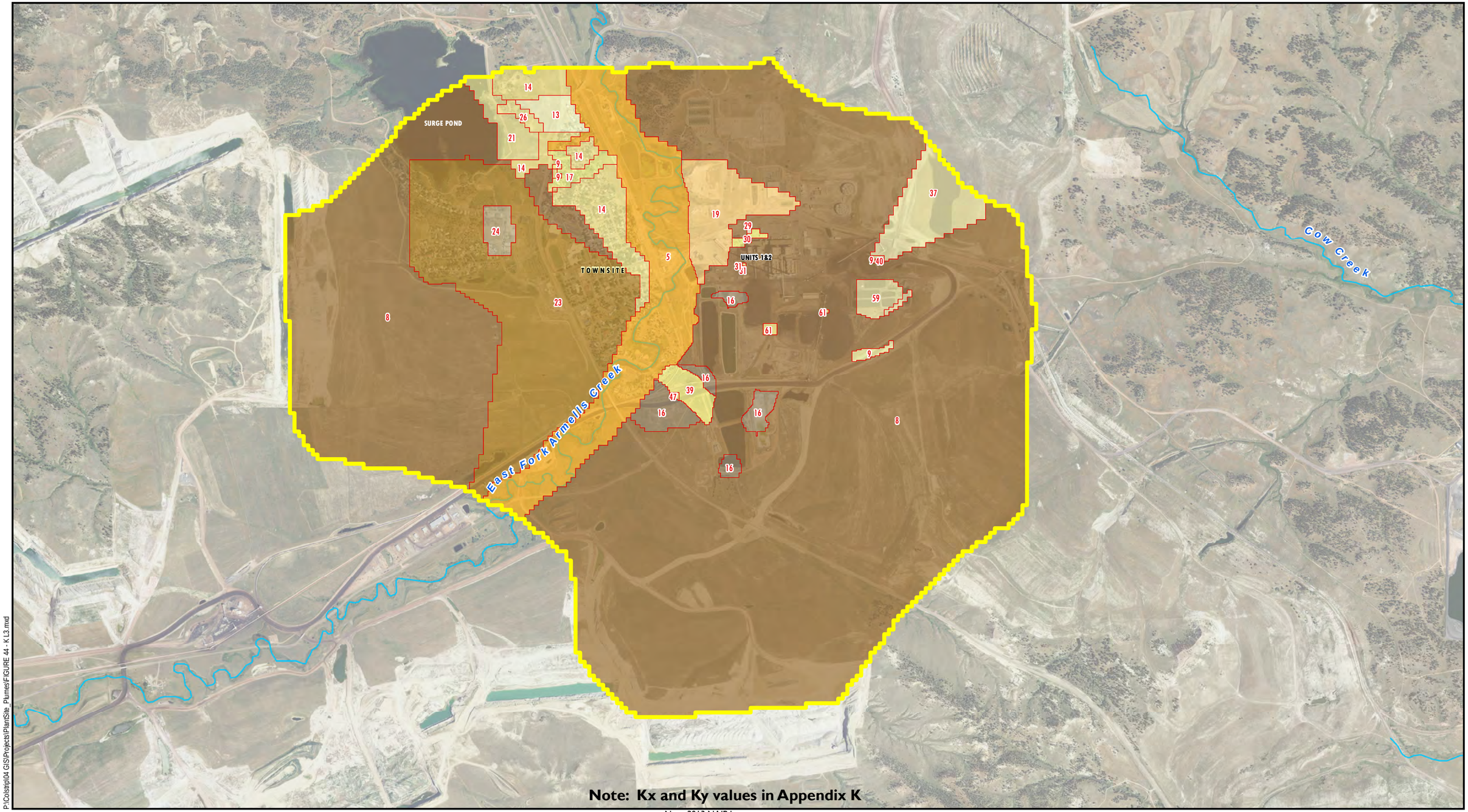
3	10	19	30	42	48	53	60	Model Domain		
4	13	21	31	44	49	54	62			
8	15	28	40	45	51	55	63			
9	17	29	41	46	52	56	65			

0 Feet 2,000

NewFields

Calibrated Hydraulic Conductivity Distribution - Layer 2
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 43

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 43 - K L2 .mxd



Note: Kx and Ky values in Appendix K

Note: 2013 NAIP Imagery

Hydraulic Conductivity Zone

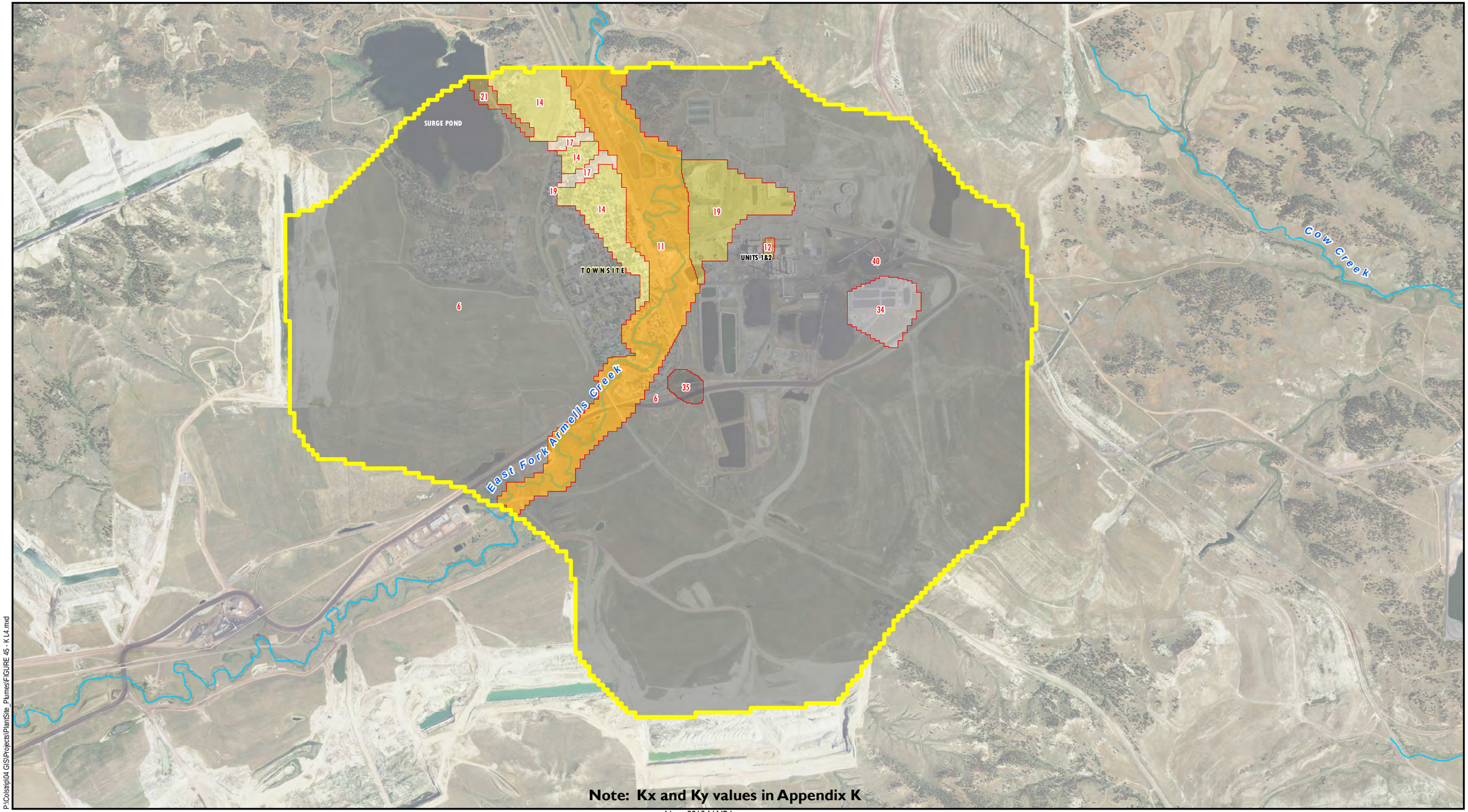
5	14	21	29	39	Model Domain	
8	16	23	30	40		
9	17	24	31	47		
13	19	26	37	59		
				61		

0 Feet 2,000

NewFields

Calibrated Hydraulic Conductivity Distribution - Layer 3
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 44

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 44 - K L3.mxd



Note: Kx and Ky values in Appendix K

Note: 2013 NAIP Imagery

Hydraulic Conductivity Zone

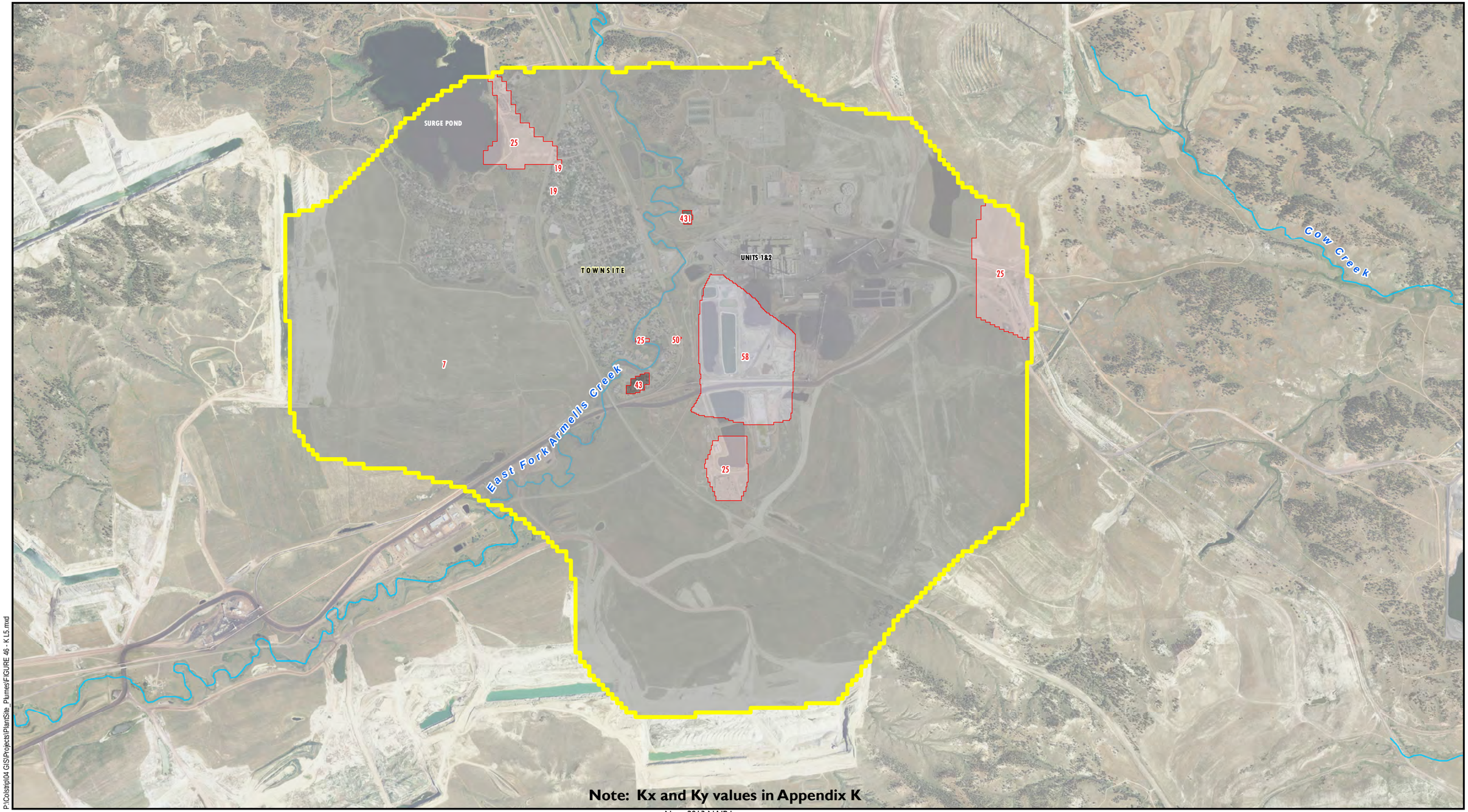
6	19	Model Domain	
11	21		
12	34		
14	35		
17	40		

0 Feet 2,000

NewFields

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 45 - K L4.mxd

Calibrated Hydraulic Conductivity Distribution - Layer 4
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 45



Note: Kx and Ky values in Appendix K

Note: 2013 NAIP Imagery

Hydraulic Conductivity Zone

1	31	Model Domain	
7	43		
19	50		
25	58		

0 Feet 2,000

NewFields

Calibrated Hydraulic Conductivity Distribution - Layer 5
Plant Site Area Groundwater Model
CSES-Colstrip, Montana
FIGURE 46

P:\Colstrip\04 GIS\Projects\PlantSite_Plumes\FIGURE 46 - K L5.mxd