N

SCALE 1" = 300'
0 150 300 600

MISSOURI RIVER ELEVATION
June 8, 2010
465.9 ft Ameren Missouri - Labadie Power Plant Gauging Station

LEGEND

- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- SURVEY MONUMENT
- 459.23 GROUNDWATER ELEVATION (FT.) (★SEE NOTE 9)
- GROUNDWATER FLOW DIRECTION
- 465 EXISTING GROUND CONTOURS (C.I. = 1 FT.)
- 460.00 GROUNDWATER CONTOUR NOTE: CONTOUR INTERVAL (C.I.) = 0.5 FT. (DASHED WHERE INFERRED)
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES

1. MAP DEVELOPED BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.
2. GROUNDWATER DATA NOT AVAILABLE FOR TEMPORARY AND CPT BORINGS.
3. MEASUREMENTS RECORDED BY GREDELL ENGINEERING RESOURCES FIELD PERSONNEL.
4. MAP REPRESENTATIVE OF GROUNDWATER CONDITIONS OCCURRING ON DATE OF MEASUREMENT.
5. USE OF SMALL CONTOUR INTERVAL (0.5 FT.) EXAGGERATES APPARENT "SLOPE" OF WATER TABLE SURFACE.
6. RANGE OF GROUNDWATER FLOW GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.00003298 FT./FT. TO 0.0009193 FT./FT.
7. MISSOURI RIVER GAUGE ELEVATION = 465.9 FT. ON DATE OF WATER LEVEL MONITORING AS MEASURED AT LABADIE POWER PLANT. THIS REPRESENTS AN APPROXIMATE 1.0 FT. DECREASE IN RIVER ELEVATION BEGINNING ON JUNE 6, 2010.
8. NO MEASUREMENT. PIEZOMETER COULD NOT BE ACCESSED.
9. GROUNDWATER ELEVATIONS ABOVE APPARENT GROUND SURFACE ELEVATIONS IN P-102, P-150, P-156, P-166, P-167, AND P-177 (SEE ALSO TABLE 3).

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727586.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996728.98	731621.69	467.67

Missouri State Plane Coordinate System Datum
Horizontal Datum NAD 1983;
Vertical Datum NAVD 1988

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DRAWN 020411 W.J.A. (GER)	FIGURE 24
CHKD. M.C.C. (GER)	DETAILED SITE INVESTIGATION
SUPV. M.C.C. (GER)	PROPOSED UTILITY WASTE DISPOSAL AREA
APPD. M.C.C. (GER)	WATER TABLE SURFACE MAP - JUNE 8, 2010
LOCATION 001004	LABADIE PLANT
CLASS 02010	
Ameren MISSOURI ST. LOUIS, MISSOURI	FIGS (18) THRU (29)(33).DWG
REV.	

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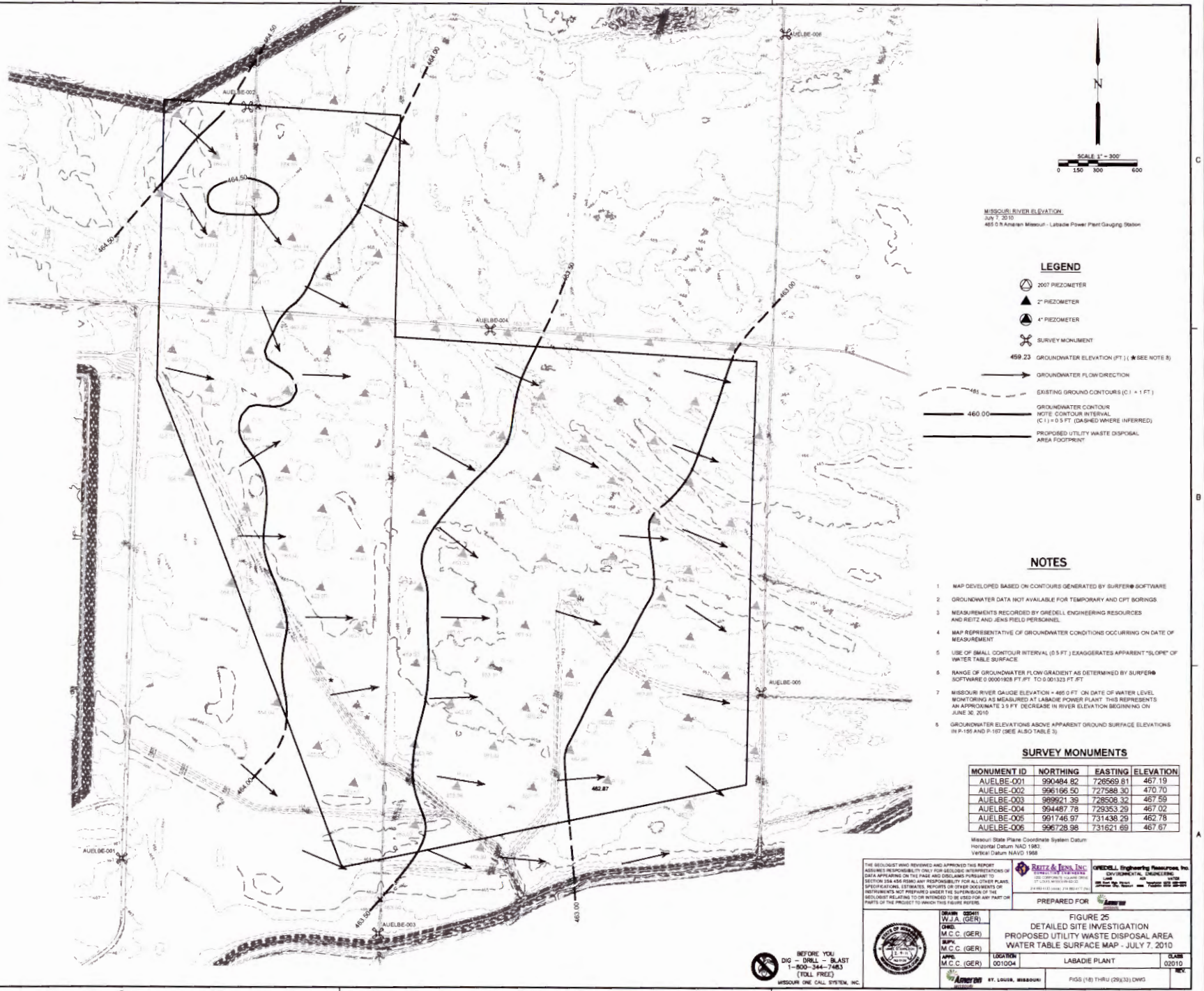

MISSOURI RIVER ELEVATION:
July 7, 2010
465.0 ft Amaren Missouri - Labadie Power Plant Gauging Station

LEGEND

- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- SURVEY MONUMENT
- 459.23 GROUNDWATER ELEVATION (FT.) (★SEE NOTE 8)
- GROUNDWATER FLOW DIRECTION
- 485 EXISTING GROUND CONTOURS (C.I. = 1 FT.)
- 460.00 GROUNDWATER CONTOUR NOTE: CONTOUR INTERVAL (C.I.) = 0.5 FT. (DASHED WHERE INFERRED)
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES

1. MAP DEVELOPED BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE
2. GROUNDWATER DATA NOT AVAILABLE FOR TEMPORARY AND CPT BORINGS
3. MEASUREMENTS RECORDED BY GREDELL ENGINEERING RESOURCES AND REITZ AND JENS FIELD PERSONNEL
4. MAP REPRESENTATIVE OF GROUNDWATER CONDITIONS OCCURRING ON DATE OF MEASUREMENT
5. USE OF SMALL CONTOUR INTERVAL (0.5 FT.) EXAGGERATES APPARENT "SLOPE" OF WATER TABLE SURFACE
6. RANGE OF GROUNDWATER FLOW GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.00001808 FT./FT. TO 0.001323 FT./FT.
7. MISSOURI RIVER GAUGE ELEVATION = 465.0 FT. ON DATE OF WATER LEVEL MONITORING AS MEASURED AT LABADIE POWER PLANT. THIS REPRESENTS AN APPROXIMATE 3.9 FT. DECREASE IN RIVER ELEVATION BEGINNING ON JUNE 30, 2010.
8. GROUNDWATER ELEVATIONS ABOVE APPARENT GROUND SURFACE ELEVATIONS IN P-155 AND P-167 (SEE ALSO TABLE 3)

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727588.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996728.98	731621.69	467.67

Missouri State Plane Coordinate System Datum
Horizontal Datum NAD 1983.
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GREDELL Engineering Resources, Inc. ENVIRONMENTAL ENGINEERING LAND AIR WATER

PREPARED FOR Ameren

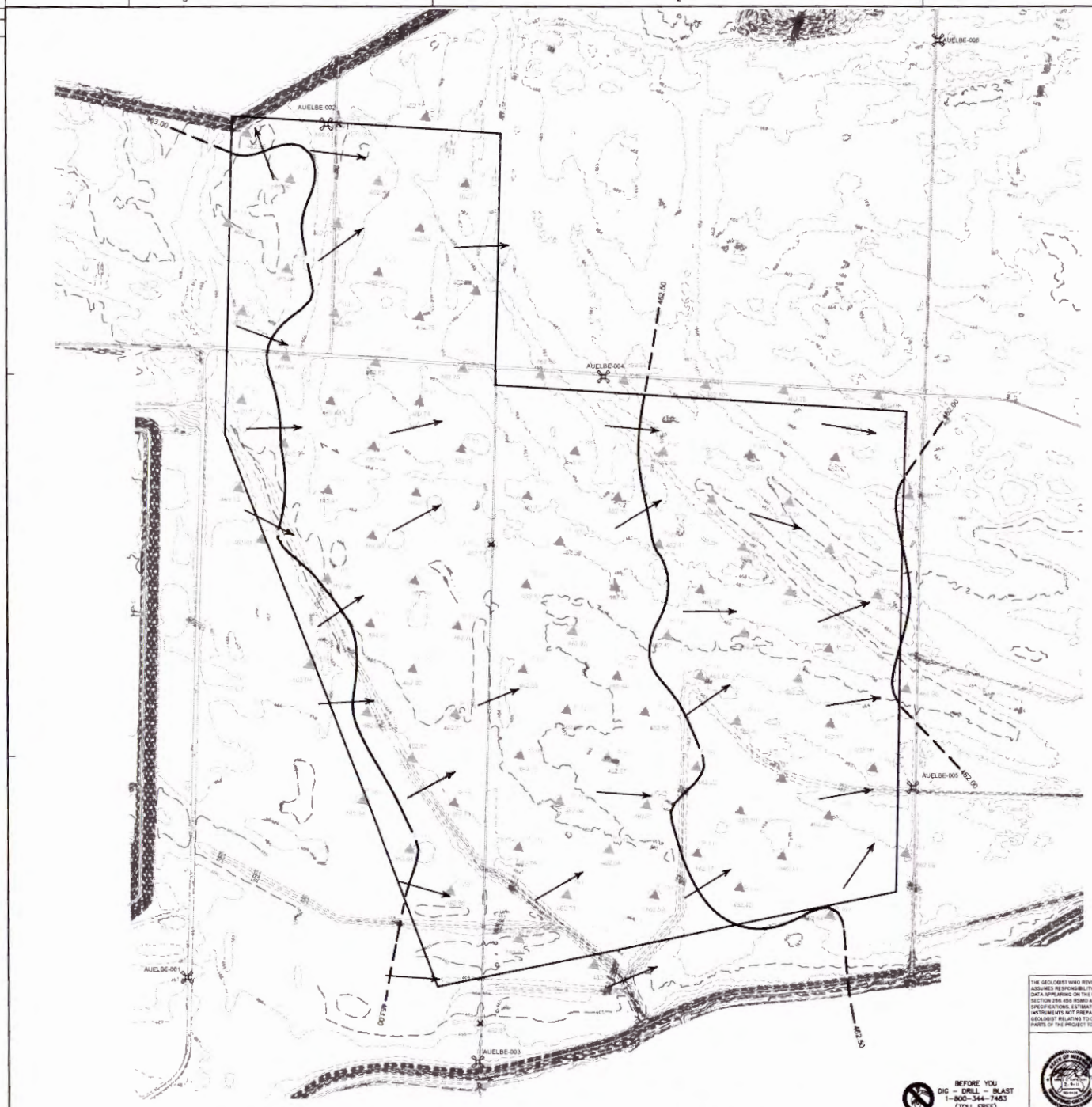
DRAWN	CDD/JT/ W.J.A. (GER)
CHKD.	M.C.C. (GER)
SUPV.	M.C.C. (GER)
APPD.	M.C.C. (GER)
LOCATION	001004
CLASS	02010
REV.	

FIGURE 25
DETAILED SITE INVESTIGATION
PROPOSED UTILITY WASTE DISPOSAL AREA
WATER TABLE SURFACE MAP - JULY 7, 2010

LABADIE PLANT

Ameren MISSOURI ST. LOUIS, MISSOURI

FIGS (18) THRU (29)(33).DWG



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REVISIONS

REV.	W.O.

MISSOURI RIVER ELEVATION
August 5, 2010
462.9 ft Ameren Missouri - Labadie Power Plant Gauging Station

LEGEND

- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- SURVEY MONUMENT
- 459.23 GROUNDWATER ELEVATION (FT.)
- GROUNDWATER FLOW DIRECTION
- EXISTING GROUND CONTOURS (C.I. = 1 FT.)
- 460.00 GROUNDWATER CONTOUR NOTE: CONTOUR INTERVAL (C.I.) = 0.5 FT. (DASHED WHERE INFERRED)
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES

1. MAP DEVELOPED BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.
2. GROUNDWATER DATA NOT AVAILABLE FOR TEMPORARY AND CPT BORINGS.
3. MEASUREMENTS RECORDED BY GREDELL ENGINEERING RESOURCES AND REITZ AND JENS FIELD PERSONNEL.
4. MAP REPRESENTATIVE OF GROUNDWATER CONDITIONS OCCURRING ON DATE OF MEASUREMENT.
5. USE OF SMALL CONTOUR INTERVAL (0.5 FT.) EXAGGERATES APPARENT "SLOPE" OF WATER TABLE SURFACE.
6. RANGE OF GROUNDWATER FLOW GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.000006144 FT./FT. TO 0.001152 FT./FT.
7. MISSOURI RIVER GAUGE ELEVATION = 462.9 FT. ON DATE OF WATER LEVEL MONITORING AS MEASURED AT LABADIE POWER PLANT. THIS REPRESENTS AN APPROXIMATE 2.5 FT. DECREASE IN RIVER ELEVATION BEGINNING ON AUGUST 1, 2010.

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727588.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996728.98	731621.69	467.67

Missouri State Plane Coordinate System Datum
Horizontal Datum NAD 1983,
Vertical Datum NAVD 1988

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GREDELL Engineering Resources, Inc. ENVIRONMENTAL ENGINEERING

PREPARED FOR Ameren

DRAWN 030411 W.J.A. (GER)	FIGURE 26
CHKD. M.C.C. (GER)	DETAILED SITE INVESTIGATION
SUPV. M.C.C. (GER)	PROPOSED UTILITY WASTE DISPOSAL AREA
APPD. M.C.C. (GER)	WATER TABLE SURFACE MAP - AUGUST 5, 2010
LOCATION 001004	LABADIE PLANT
CLASS 02010	
Ameren ST. LOUIS, MISSOURI	FIGS (18) THRU (29)(33).DWG
REV.	

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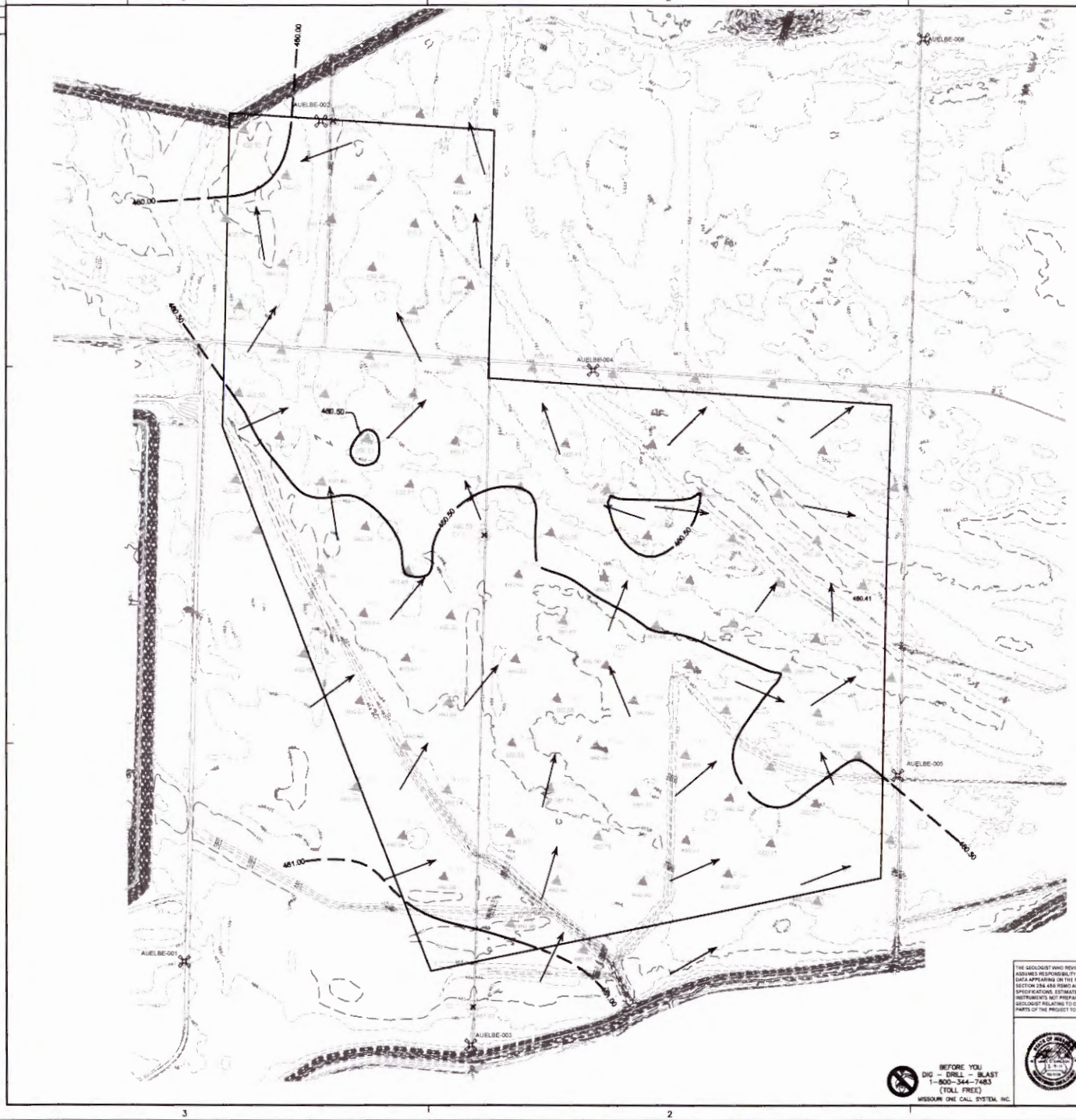

MISSOURI RIVER ELEVATION
September 8, 2010
458.5 ft Ameren Missouri - Labadie Power Plant Gauging Station

LEGEND

- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- SURVEY MONUMENT
- 459.23 GROUNDWATER ELEVATION (FT.)
- GROUNDWATER FLOW DIRECTION
- EXISTING GROUND CONTOURS (C.I. = 1 FT.)
- 460.00 GROUNDWATER CONTOUR NOTE: CONTOUR INTERVAL (C.I.) = 0.5 FT. (DASHED WHERE INFERRED)
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES:

1. MAP DEVELOPED BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE.
2. GROUNDWATER DATA NOT AVAILABLE FOR TEMPORARY AND CPT BORINGS.
3. MEASUREMENTS RECORDED BY GREDELL ENGINEERING RESOURCES AND RIETZ AND JENS FIELD PERSONNEL.
4. MAP REPRESENTATIVE OF GROUNDWATER CONDITIONS OCCURRING ON DATE OF MEASUREMENT.
5. USE OF SMALL CONTOUR INTERVAL (0.5 FT.) EXAGGERATES APPARENT "SLOPE" OF WATER TABLE SURFACE.
6. RANGE OF GROUNDWATER FLOW GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.00000395 FT./FT. TO 0.001044 FT./FT.
7. MISSOURI RIVER GAUGE ELEVATION = 458.5 FT. ON DATE OF WATER LEVEL MONITORING AS MEASURED AT LABADIE POWER PLANT. THIS REPRESENTS AN APPROXIMATE 3.1 FT. DECREASE IN RIVER ELEVATION BEGINNING ON SEPTEMBER 4, 2010.

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727588.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996726.98	731621.69	467.67

Missouri State Plane Coordinate System Datum
Horizontal Datum NAD 1983.
Vertical Datum NAVD 1988

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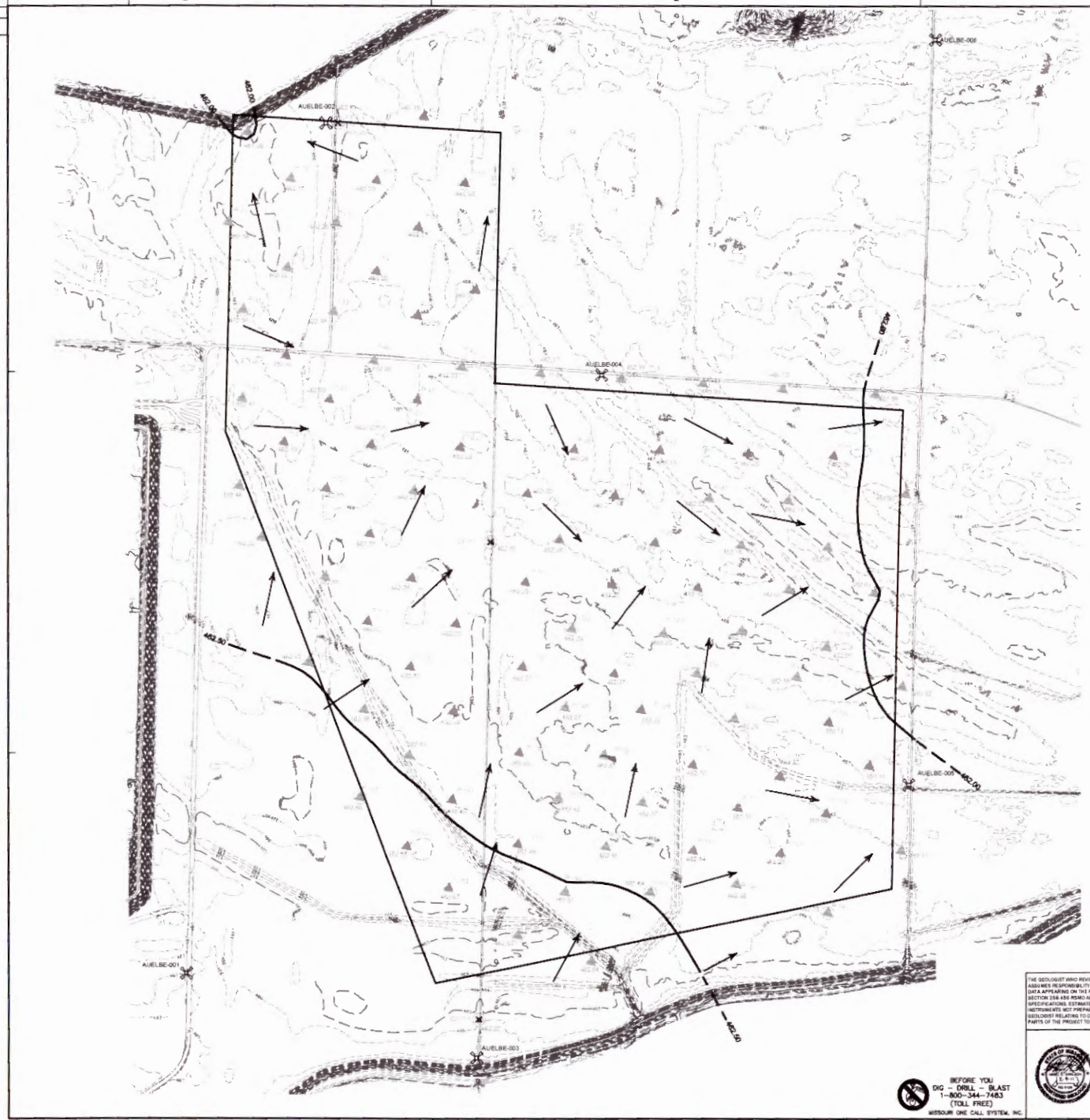
GREDELL Engineering Resources, Inc. ENVIRONMENTAL ENGINEERING

PREPARED FOR Ameren

DRAWN: W.J.A. (GER)	DOC#: 020401		
CHKD: M.C.C. (GER)			
SUPV: M.C.C. (GER)			
APPD: M.C.C. (GER)	LOCATION: 001004	LABADIE PLANT	JOB#: 02010
Ameren MISSOURI ST. LOUIS, MISSOURI		FIGS (18) THRU (29)(33).DWG	REV.

FIGURE 27
DETAILED SITE INVESTIGATION
PROPOSED UTILITY WASTE DISPOSAL AREA
WATER TABLE SURFACE MAP - SEPTEMBER 8, 2010



MISSOURI RIVER ELEVATION:
October 7, 2010
460.3 ft Ameren Missouri - Labadie Power Plant Gauging Station

LEGEND

- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- SURVEY MONUMENT
- 459.23 GROUNDWATER ELEVATION (FT.)
- GROUNDWATER FLOW DIRECTION
- EXISTING GROUND CONTOURS (C.I. = 1 FT.)
- 460.00 GROUNDWATER CONTOUR NOTE: CONTOUR INTERVAL (C.I.) = 0.5 FT. (DASHED WHERE INFERRED)
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES:

1. MAP DEVELOPED BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE
2. GROUNDWATER DATA NOT AVAILABLE FOR TEMPORARY AND CPT BORINGS
3. MEASUREMENTS RECORDED BY GREDELL ENGINEERING RESOURCES FIELD PERSONNEL
4. MAP REPRESENTATIVE OF GROUNDWATER CONDITIONS OCCURRING ON DATE OF MEASUREMENT.
5. USE OF SMALL CONTOUR INTERVAL (0.5 FT.) EXAGGERATES APPARENT "SLOPE" OF WATER TABLE SURFACE.
6. RANGE OF GROUNDWATER FLOW GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.000002677 FT./FT. TO 0.0005534 FT./FT.
7. MISSOURI RIVER GAUGE ELEVATION = 460.3 FT. ON DATE OF WATER LEVEL MONITORING AS MEASURED AT LABADIE POWER PLANT. THIS REPRESENTS AN APPROXIMATE 8.5 FT. DECREASE IN RIVER ELEVATION BEGINNING ON SEPTEMBER 25, 2010.
8. GROUNDWATER ELEVATION READING FOR P-61 IS SUSPECTED MEASUREMENT ERROR. VALUE NOT CONSIDERED REPRESENTATIVE OF TRUE GROUNDWATER CONDITIONS (SEE TABLE 3).

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727588.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996728.98	731621.69	467.67

Missouri State Plane Coordinate System Datum:
Horizontal Datum NAD 1983;
Vertical Datum NAVD 1988

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GREDELL Engineering Resources, Inc. — Environmental Engineering — Air — Water — Land

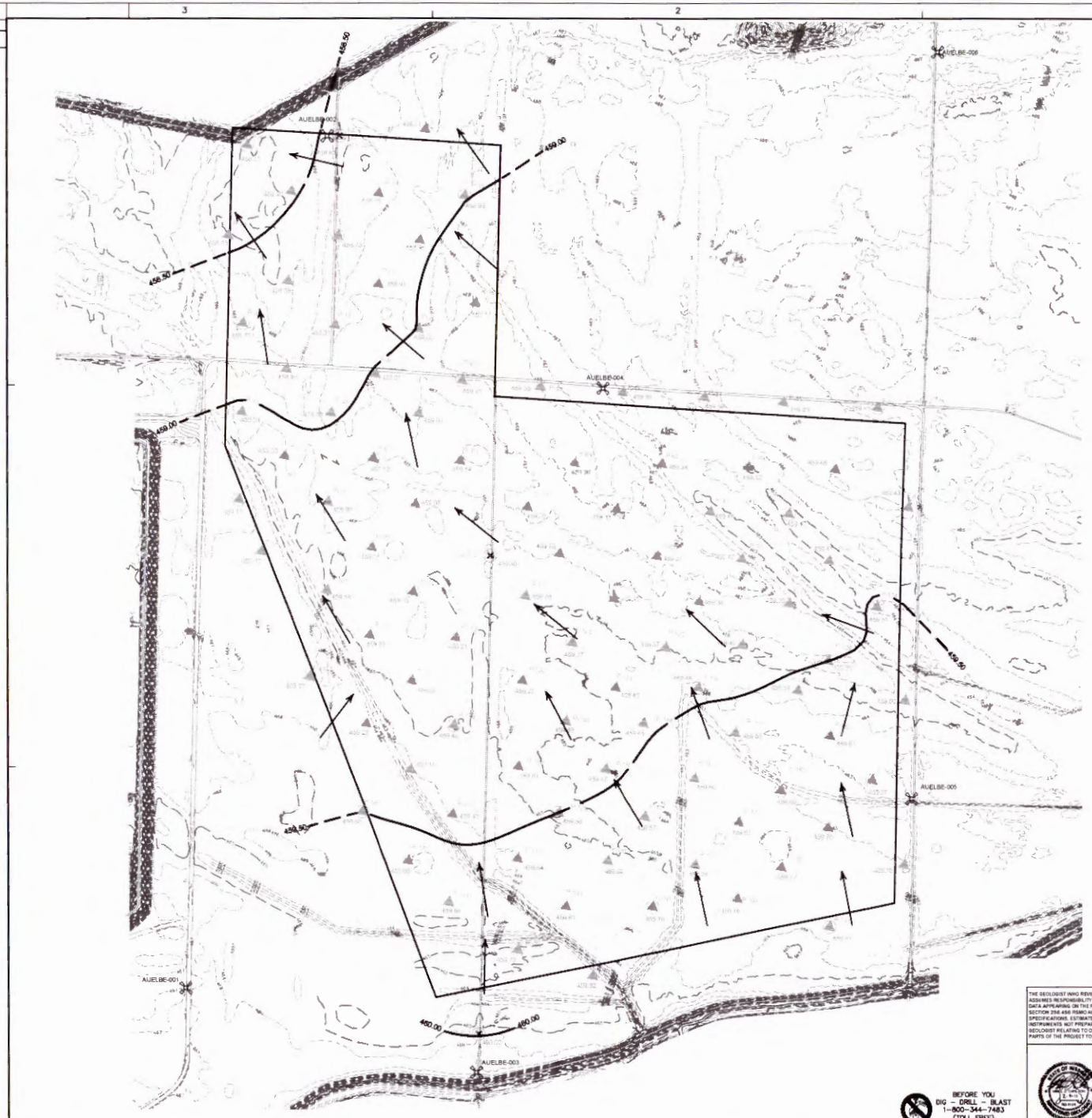
PREPARED FOR Ameren

DRAWN: 020411 W.J.A. (GER)
CHKD. M.C.C. (GER)
SUPV. M.C.C. (GER)
APPD. M.C.C. (GER)

FIGURE 28
DETAILED SITE INVESTIGATION
PROPOSED UTILITY WASTE DISPOSAL AREA
WATER TABLE SURFACE MAP - OCTOBER 7, 2010

LOCATION 001004 | LABADIE PLANT | CLASS 02010

Ameren ST. LOUIS, MISSOURI | FIGS (18) THRU (29)(33).DWG | REV.



N

SCALE 1" = 300'

0 150 300 600

MISSOURI RIVER ELEVATION
November 4, 2010
456.8 ft Ameren Missouri - Labadie Power Plant Gauging Station

LEGEND

- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- SURVEY MONUMENT
- 459.23 GROUNDWATER ELEVATION (FT.)
- GROUNDWATER FLOW DIRECTION
- EXISTING GROUND CONTOURS (C.I. = 1 FT.)
- 460.00 GROUNDWATER CONTOUR NOTE: CONTOUR INTERVAL (C.I.) = 0.5 FT. (DASHED WHERE INFERRED)
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES:

1. MAP DEVELOPED BASED ON CONTOURS GENERATED BY SURFER® SOFTWARE
2. GROUNDWATER DATA NOT AVAILABLE FOR TEMPORARY AND CPT BORINGS
3. MEASUREMENTS RECORDED BY GREDELL ENGINEERING RESOURCES FIELD PERSONNEL
4. MAP REPRESENTATIVE OF GROUNDWATER CONDITIONS OCCURRING ON DATE OF MEASUREMENT
5. USE OF SMALL CONTOUR INTERVAL (0.5 FT.) EXAGGERATES APPARENT "SLOPE" OF WATER TABLE SURFACE
6. RANGE OF GROUNDWATER FLOW GRADIENT AS DETERMINED BY SURFER® SOFTWARE 0.00000199 FT./FT. TO 0.0008934 FT./FT.
7. MISSOURI RIVER GAUGE ELEVATION = 456.8 FT. ON DATE OF WATER LEVEL MONITORING AS MEASURED AT LABADIE POWER PLANT. THIS REPRESENTS AN APPROXIMATE 3.5 FT. DECREASE IN RIVER ELEVATION BEGINNING ON OCTOBER 7, 2010.

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727588.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996726.98	731621.69	467.67

Missouri State Plane Coordinate System Datum:
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PREPARED FOR Ameren Missouri

DRAWN 020411 W.J.A. (GER)
CHKD. M.C.C. (GER)
SUPV. M.C.C. (GER)
APPD. M.C.C. (GER)

FIGURE 29
DETAILED SITE INVESTIGATION
PROPOSED UTILITY WASTE DISPOSAL AREA
WATER TABLE SURFACE MAP - NOVEMBER 4, 2010

LOCATION 001004 — LABADIE PLANT — CLASS 02010

Ameren MISSOURI ST. LOUIS, MISSOURI — FIG5 (18) THRU (29)(33).DWG — REV.

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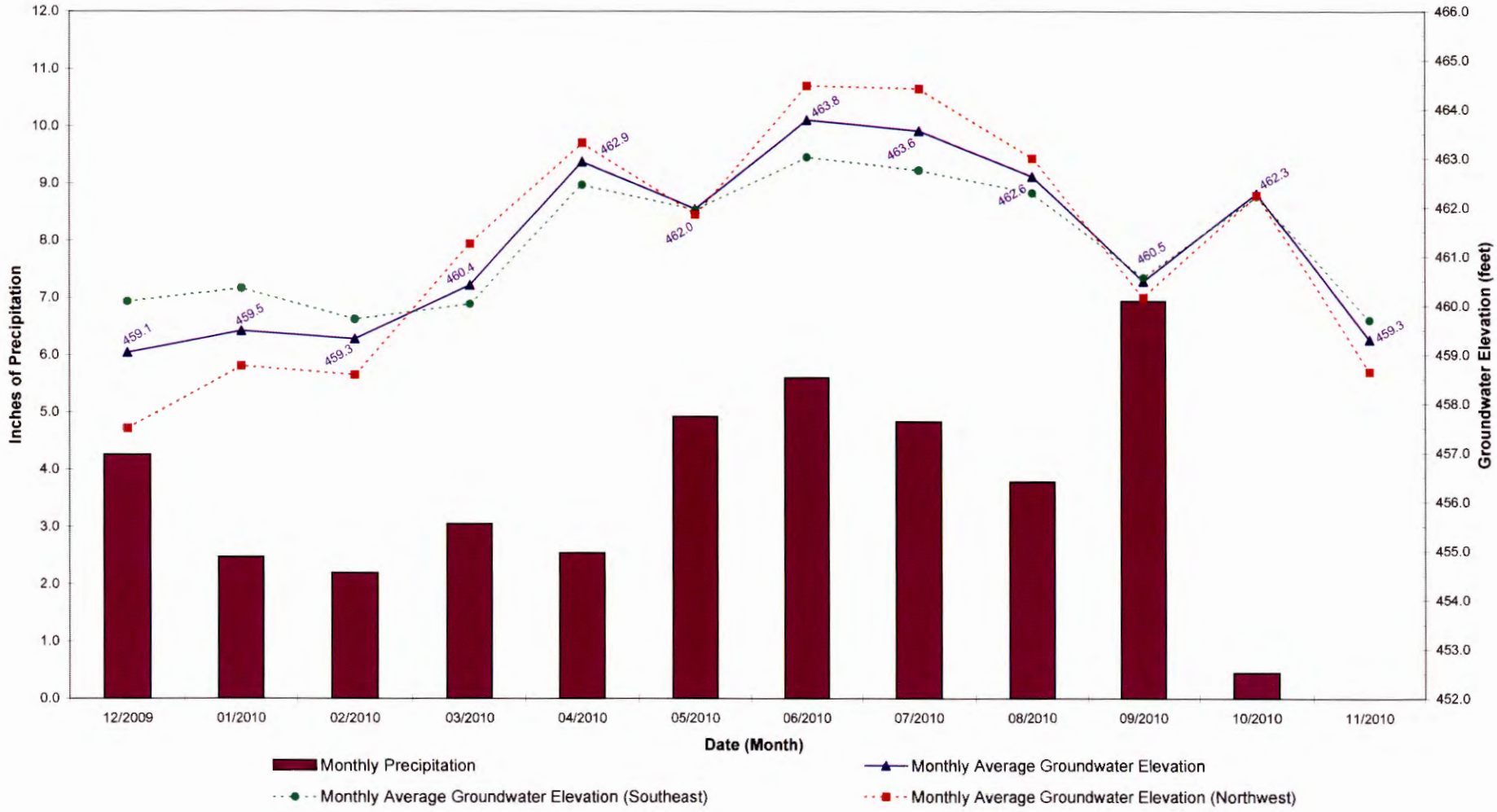
Detailed Site Investigation
Proposed Utility Waste Disposal Area
Ameren Missouri Labadie Power Plant

Monthly Average Water Table Elevation vs Precipitation

FIGURE 30

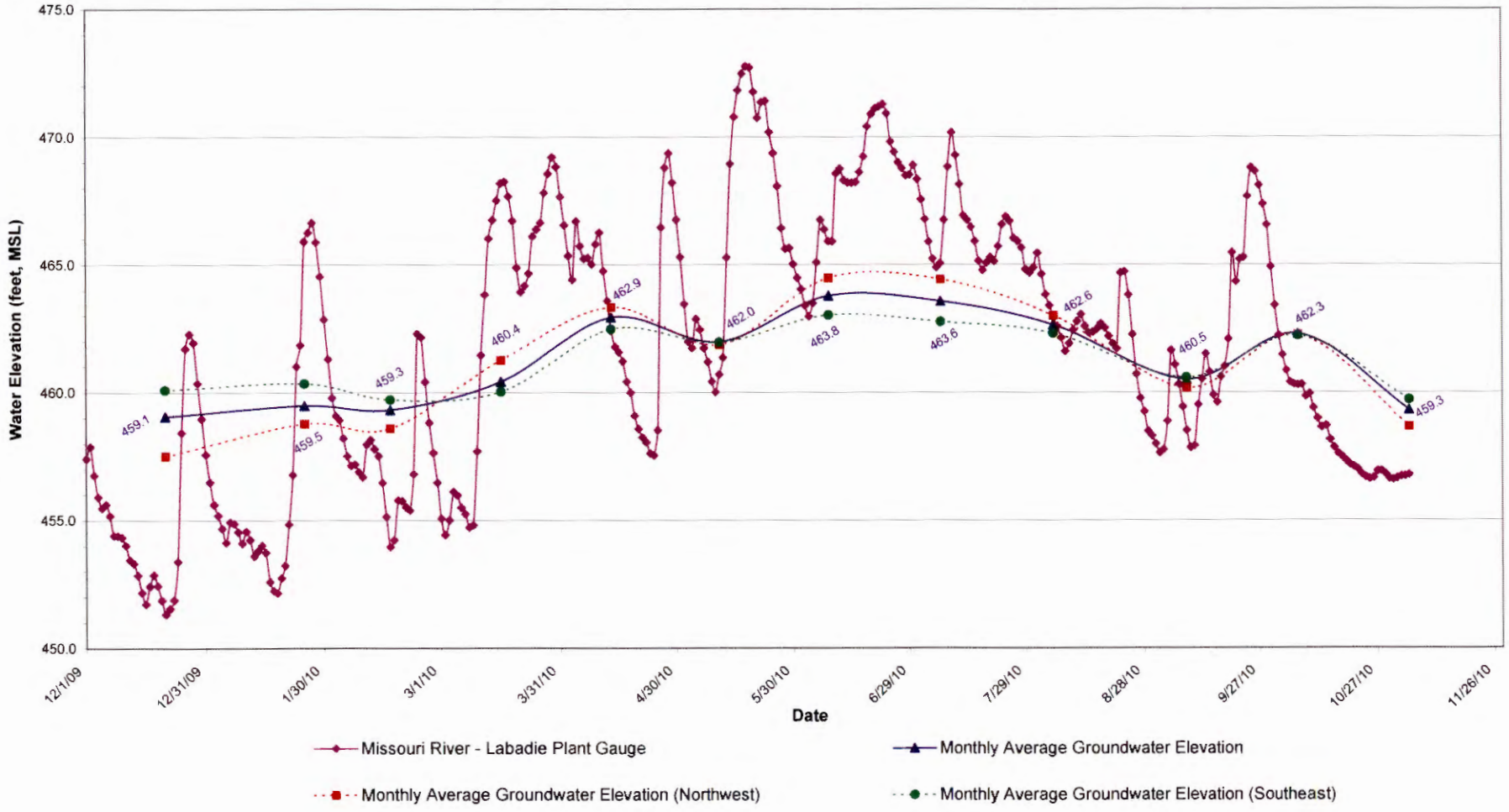


*November 2010 Precipitation Only Extends Through the Date of Monitoring (11/4/2010)

Detailed Site Investigation
Proposed Utility Waste Disposal
Ameren Missouri Labadie Power Plant

Monthly Average Water Table Elevation vs Missouri River Elevation

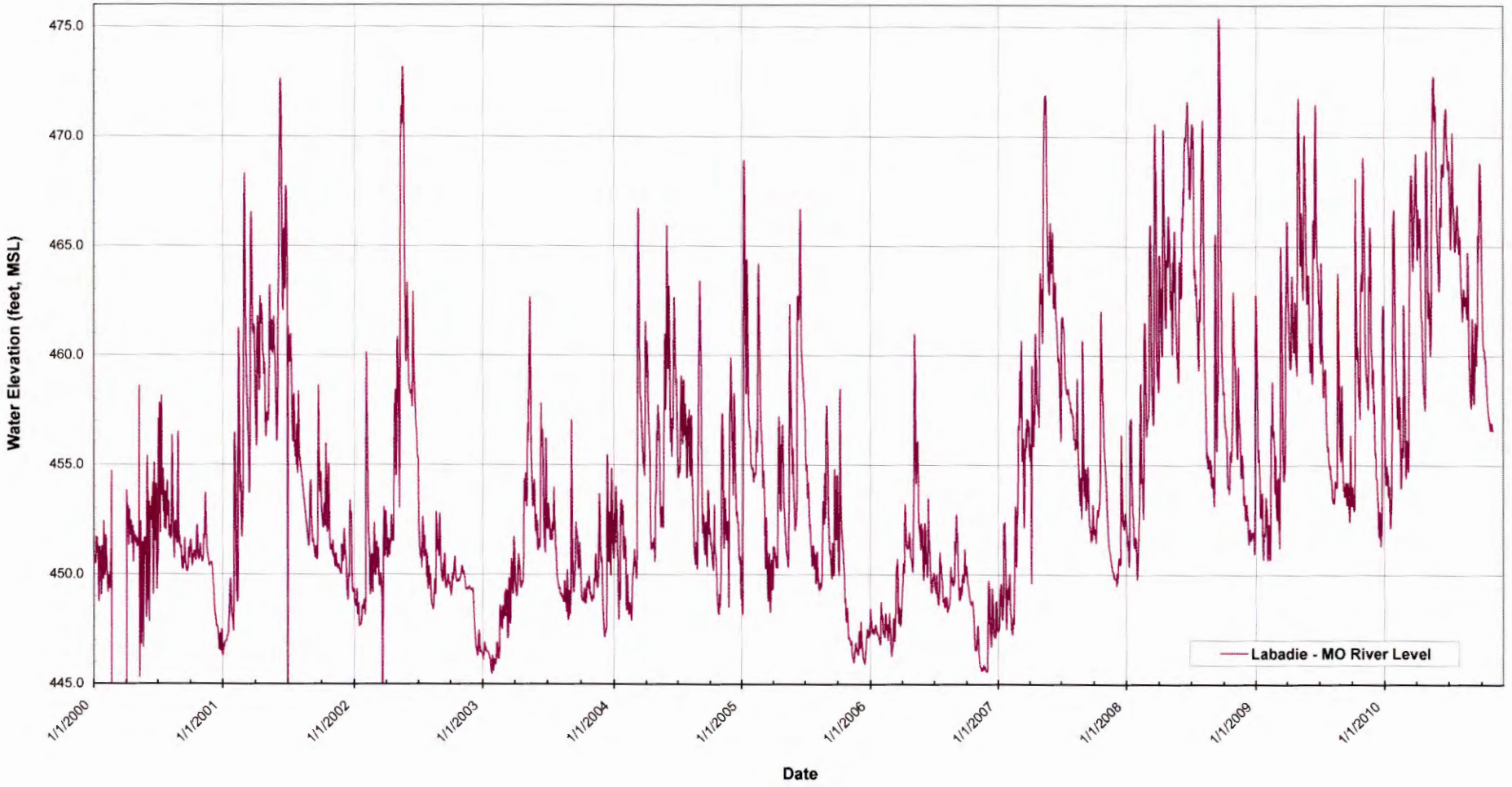
FIGURE 31



Detailed Site Investigation
Proposed Utility Waste Disposal
Ameren Missouri Labadie Power Plant

Missouri River 10-Year Historical Data (2000-2010)

FIGURE 32



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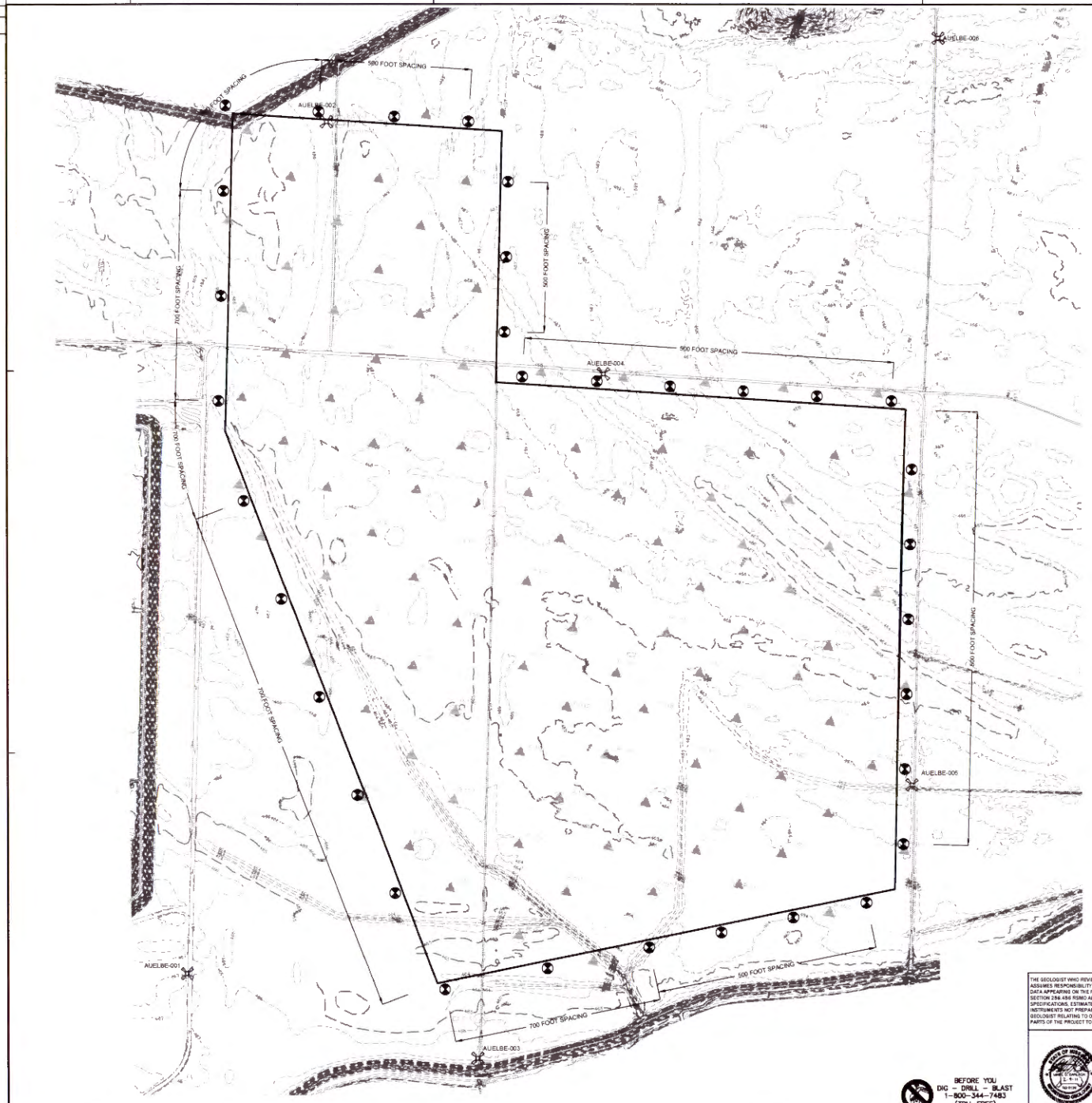

LEGEND

- CONCEPTUAL MONITORING WELL
- 2007 PIEZOMETER
- 2" PIEZOMETER
- 4" PIEZOMETER
- IRRIGATION WELL
- SURVEY MONUMENT
- PROPOSED UTILITY WASTE DISPOSAL AREA FOOTPRINT

NOTES

1. THE NUMBER AND LOCATION OF MONITORING WELLS WILL VARY FROM WHAT IS DEPICTED DUE TO POSSIBLE PHASED DEVELOPMENT AND INTERIM WELL INSTALLATION. A MORE PRECISE REPRESENTATION OF WELL LOCATION TO BE DEVELOPED COINCIDENT WITH PREPARATION OF CONSTRUCTION PERMIT APPLICATION.
2. UPGRADIENT AND DOWNGRADIENT LOCATIONS VARY TEMPORALLY AT THIS SITE.
3. GENERAL AREAS OF DOWNGRADIENT MOVEMENT MARKED BY SUGGESTED 500-FT CONCEPTUAL WELL SPACINGS. REMAINING AREAS MARKED BY SUGGESTED 700-FT CONCEPTUAL WELL SPACINGS.

SURVEY MONUMENTS

MONUMENT ID	NORTHING	EASTING	ELEVATION
AUELBE-001	990484.82	726569.81	467.19
AUELBE-002	996166.50	727588.30	470.70
AUELBE-003	989921.39	728508.32	467.59
AUELBE-004	994487.78	729353.29	467.02
AUELBE-005	991746.97	731438.29	462.78
AUELBE-006	996728.98	731621.69	467.67

Missouri State Plane Coordinate System Datum
Horizontal Datum NAD 1983.
Vertical Datum NAVD 1988

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PREPARED FOR Ameren

DRAWN W.J.A. (GER)	CSD451	FIGURE 33
CHKD. M.C.C. (GER)		DETAILED SITE INVESTIGATION
SUPV. M.C.C. (GER)		PROPOSED UTILITY WASTE DISPOSAL AREA
APPD. M.C.C. (GER)		CONCEPTUAL GROUNDWATER MONITORING NETWORK
LOCATION 001004	LABADIE PLANT	CLASS 02010
Ameren ST. LOUIS, MISSOURI	FIGS (18) THRU (29)(33).DWG	REV.