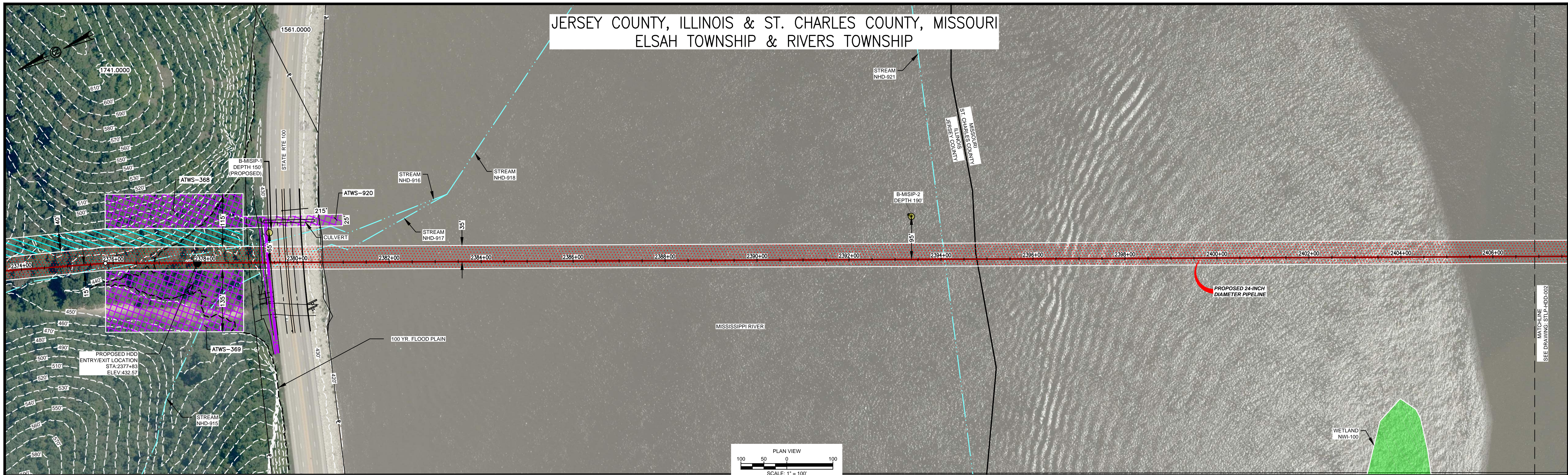


JERSEY COUNTY, ILLINOIS & ST. CHARLES COUNTY, MISSOURI  
 ELSAH TOWNSHIP & RIVERS TOWNSHIP



- HDD NOTES:**
- ALL DIMENSIONS AND ELEVATIONS ARE IN FEET, UNLESS OTHERWISE SPECIFIED.
  - ALL CHAINAGES ARE HORIZONTAL.
  - CONTRACTOR SHALL DETERMINE FINAL LOCATIONS AND DIMENSIONS OF ALL PITS NECESSARY TO ACCOMMODATE THEIR MEANS AND METHODS.
  - CONTRACTOR SHALL DETERMINE DIAMETER, GRADE, WALL THICKNESS AND ADDITIONAL LENGTH OF TEMPORARY CONDUCTOR CASINGS THAN THOSE SHOWN ON THE DRAWINGS. ANY INSTALLED TEMPORARY CONDUCTOR CASING SHALL BE FULLY REMOVED UPON COMPLETION OF PULLBACK OPERATIONS.
  - THE MINIMUM ALLOWABLE DRILLING RADIUS SHALL BE 1,750 FEET BASED ON A 3-JOINT AVERAGE.
  - EXISTING UTILITY LOCATIONS AND DEPTHS, INCLUDING PRIVATE SERVICES, ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION OPERATIONS.

- HDD OPERATIONS SHALL BE CONDUCTED IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS.
- DOWNHOLE ANNUAL DRILLING FLUID PRESSURES SHALL BE MONITORED AT ALL TIMES DURING THE PILOT BORE DRILLING PROCESS. LOCATION OF MONITORING SHALL BE AS CLOSE TO THE DRILL BIT AS POSSIBLE.
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- UPON HDD COMPLETION AND EXTRACTION OF TEMPORARY CASING PIPE (IF APPLICABLE), CONTRACTOR SHALL PLACE A UNIFORM CEMENT BASED GROUT WITHIN THE NEAREST 200 FEET OF THE ANNULAR SPACE OF THE HDD BORE BETWEEN THE PRODUCT PIPE AND THE UNDISTURBED EARTH AT EACH HDD ENTRY AND EXIT LOCATIONS. GROUT DELIVERY METHOD SHALL BE FROM MULTIPLE POINTS WITHIN THE ANNULAR SPACE. CONTRACTOR SHALL MONITOR AND CONTROL GROUT PRESSURES TO WITHIN LIMITS FOR THE ENCOUNTERED GEOTECHNICAL MATERIALS.

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**MISSISSIPPI HDD PLAN VIEW**

PILOT BORE DRILLING TOLERANCES SHALL BE AS FOLLOWS:

ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	)-#k' o " V8Q yhu' ' 70u-k ' yuV\ W#k' o oW' Qm' V8Q ALLOWED.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
PILOT ALIGNMENT	UP TO TEN (10) FEET LEFT OR RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN FIVE (5) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY OR ANY BELOW GRADE UTILITY OR STRUCTURE.

**Soil Stratigraphic Legend:**

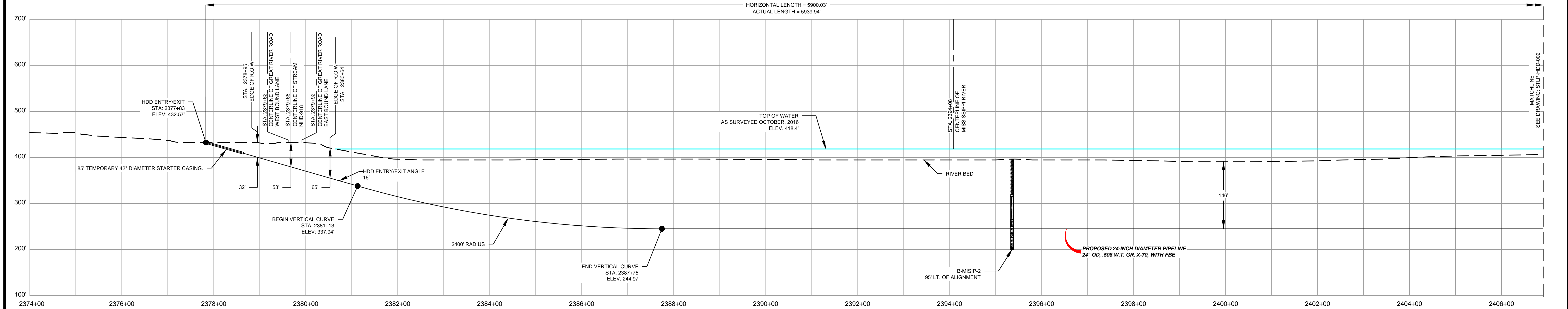
- ML, CL, SP, SW, GP, L, SM

**Rock Stratigraphic Legend:**

- LIMESTONE, MUDDSTONE, SHALE, CONCRETE, GP

**LEGEND**

- PROPOSED PERMANENT EASEMENT
- EXISTING PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED STAGING AREA
- ACCESS ROAD
- USACE EASEMENT
- PROPOSED 24-INCH DIAMETER PIPELINE
- PROPERTY LINE
- MMID
- EXISTING GAS PIPELINE
- EXISTING FOREIGN PIPELINE
- EXISTING OVERHEAD LINE
- ROAD CENTERLINE
- STREAM (DELINEATED)
- STREAM (DESKTOP)
- WETLAND (DESKTOP)
- WETLAND (DELINEATED)



- NOTES:**
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REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				APPROVALS										
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	
STLP-A-052	ALIGNMENT SHEET			1	ISSUE FOR FERC	01/2017	RJR	EB	RJP								D.R.G.	03/2017	D.G.G.	04/2017		
STLP-HDD-002	HDD PROFILE OVERVIEW			2	AMENDMENT TO FERC	04/2017	RJR	EB	RJP								R.J.P.	03/2017	P.M. APPROVAL	DATE		

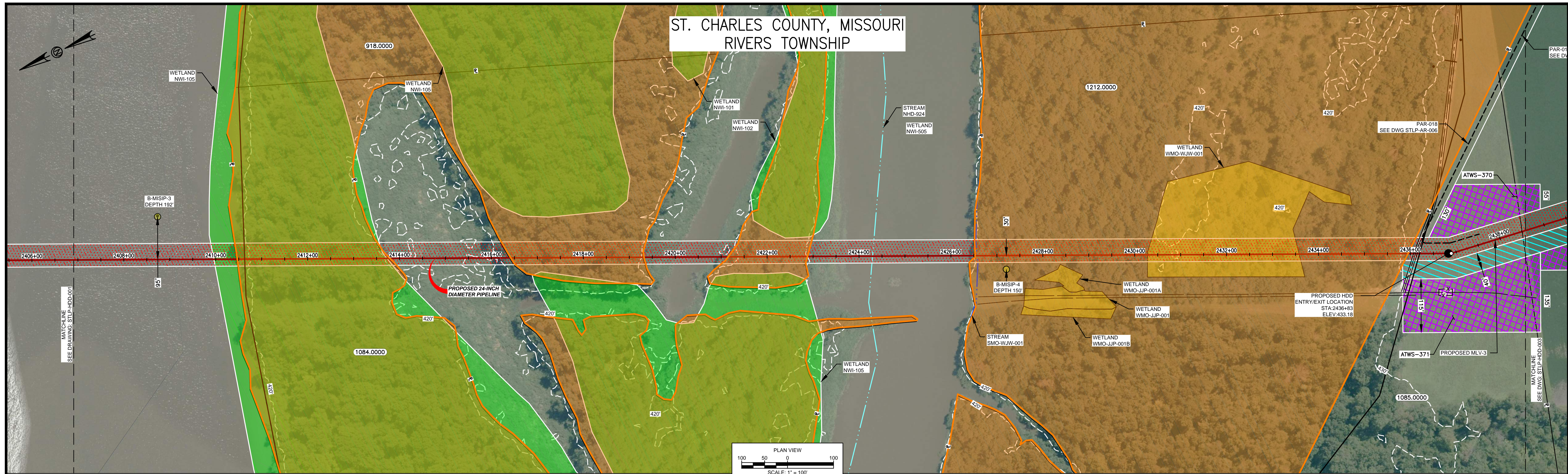
PREPARED FOR  
**Spire STL Pipeline**

PREPARED BY  
**MOTT MACDONALD**

SPIRE STL PIPELINE PROJECT  
 HDD PROFILE OVERVIEW  
 MISSISSIPPI RIVER MAINLINE  
 JERSEY COUNTY, ILLINOIS & ST. CHARLES COUNTY, MISSOURI

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ST. CHARLES COUNTY, MISSOURI  
RIVERS TOWNSHIP



MISSISSIPPI HDD PLAN VIEW  
SCALE: 1" = 100'

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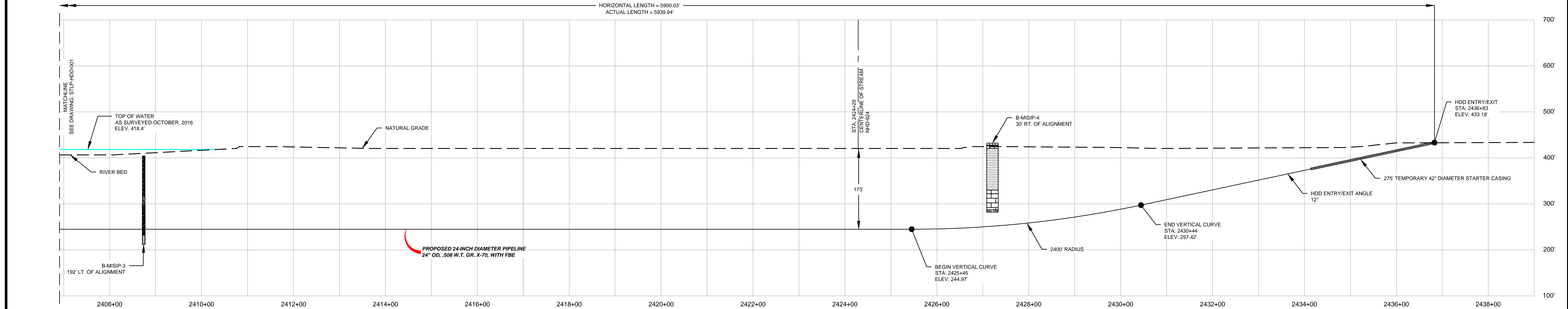
ML	CH	CL	SP
SW	GP	LIMESTONE	SM

**Rock Stratigraphic Legend:**

LIMESTONE	MUDSTONE	SHALE
CONCRETE	GP	

**LEGEND**

PROPOSED PERMANENT EASEMENT	PROPOSED 24-INCH DIAMETER PIPELINE	STREAM (DELINEATED)
EXISTING PERMANENT EASEMENT	PROPERTY LINE	STREAM (DESKTOP)
TEMPORARY WORKSPACE	MMID	WETLAND (DESKTOP)
ADDITIONAL TEMPORARY WORKSPACE	EXISTING GAS PIPELINE	WETLAND (DELINEATED)
PROPOSED STAGING AREA	EXISTING FOREIGN PIPELINE	
ACCESS ROAD	EXISTING OVERHEAD LINE	
USACE EASEMENT	ROAD CENTERLINE	



PROFILE  
SCALES HORIZ. 1" = 100' VERT. 1" = 100'

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STLP-A-052	ALIGNMENT SHEET	STLP-HDD-001	HDD PROFILE OVERVIEW	1	ISSUE FOR PERC	01/2017	RJR	EB	RJP							D.R.G.	01/2017	D.G.G.	04/2017			
STLP-A-053	ALIGNMENT SHEET	STLP-HDD-003	HDD PROFILE OVERVIEW	2	AMENDMENT TO PERC	04/2017	RJR	EB	RJP								CHECKED BY	P.M. APPROVAL	DATE			
STLP-AR-006	ACCESS ROAD SITE PLAN - PAR-018															E.B.	01/2017	J.E.W.	04/2017			

PREPARED FOR  
**Spire STL Pipeline**

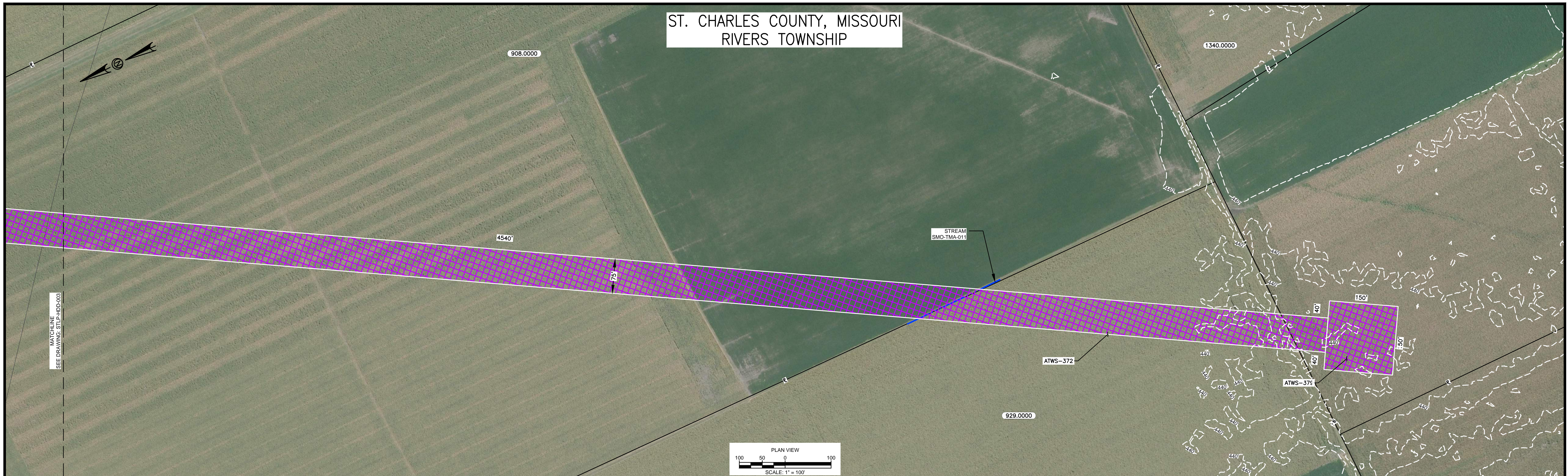
PREPARED BY  
**MOTT MACDONALD**

SPIRE STL PIPELINE PROJECT  
HDD PROFILE OVERVIEW  
MISSISSIPPI RIVER MAINLINE  
JERSEY COUNTY, ILLINOIS & ST. CHARLES COUNTY, MISSOURI

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ST. CHARLES COUNTY, MISSOURI  
RIVERS TOWNSHIP



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Soil Stratigraphic Legend:

- ML (silt loam)
- CH (clayey heavy silty clay)
- CL (clayey silty clay)
- SP (silt)
- SW (silt with sand)
- GP (gravelly sand)
- SM (silt with sand)
- LIMESTONE
- MUDSTONE
- SHALE
- CONCRETE
- GP (gravelly sand)

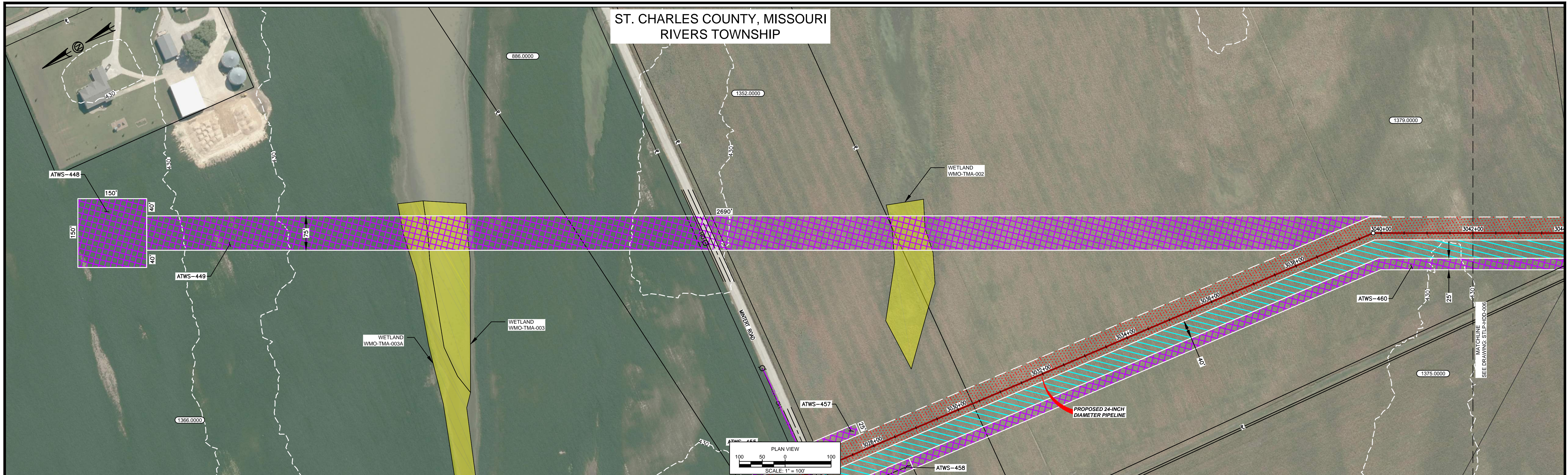
LEGEND

- PROPOSED PERMANENT EASEMENT
- EXISTING PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED STAGING AREA
- ACCESS ROAD
- USACE EASEMENT
- PROPOSED 24-INCH DIAMETER PIPELINE
- PROPERTY LINE
- MMID (MISSOURI MISSILE DEFENSE)
- EXISTING GAS PIPELINE
- EXISTING FOREIGN PIPELINE
- EXISTING OVERHEAD LINE
- ROAD CENTERLINE
- STREAM (DELINEATED)
- STREAM (DESKTOP)
- WETLAND (DESKTOP)
- WETLAND (DELINEATED)

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REFERENCE DRAWINGS				REVISIONS				REVISIONS				APPROVALS				PREPARED FOR		PREPARED BY		SPIRE STL PIPELINE PROJECT								
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	Spire STL Pipeline		MOTT MACDONALD		HDD PROFILE OVERVIEW		
STLP-A-053	ALIGNMENT SHEET			1	ISSUE FOR PERC	01/2017	RJR	EB	RJP							D.R.G.	01/2017	D.G.G.	01/2017									
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MISSOURI RIVER HDD PLAN VIEW

ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	)-#k' o " V8Q yhu' ' 70u-k ' yuVA @#k' o o" Q# " V8Q ALLOWED.
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ML	CH	CL	SP
SW	GP	LIMESTONE	SM
LIMESTONE	MUDSTONE	SHALE	
CONCRETE	GP		

LEGEND

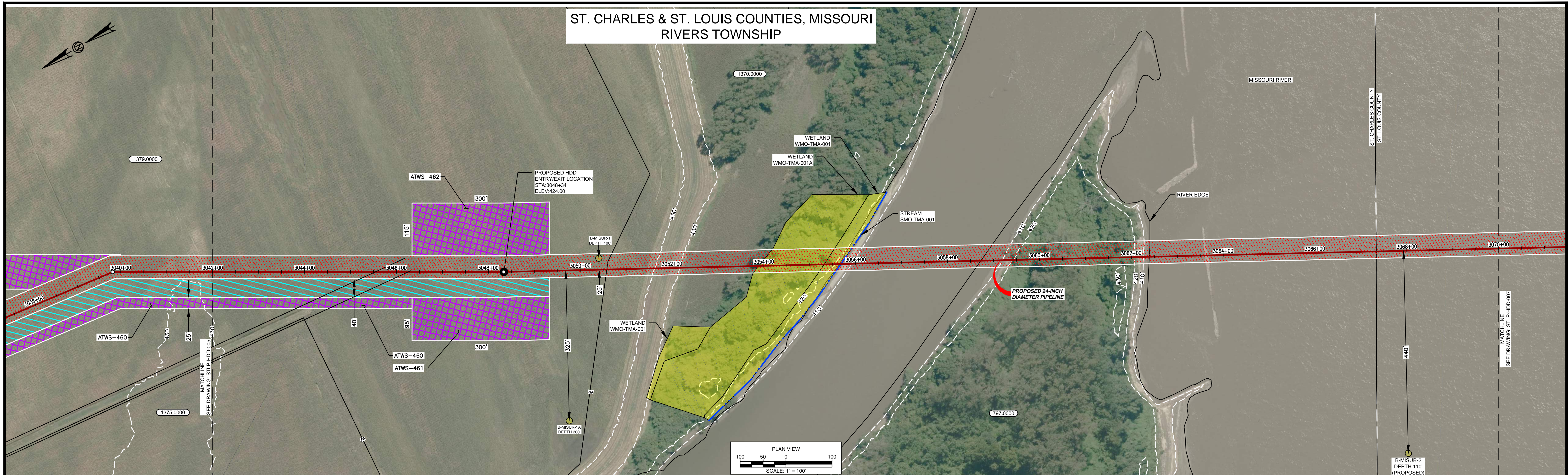
	PROPOSED PERMANENT EASEMENT		PROPOSED 24-INCH DIAMETER PIPELINE		STREAM (DELINEATED)
	EXISTING PERMANENT EASEMENT		PROPERTY LINE		STREAM (DESKTOP)
	TEMPORARY WORKSPACE		MMID		WETLAND (DESKTOP)
	ADDITIONAL TEMPORARY WORKSPACE		EXISTING GAS PIPELINE		WETLAND (DELINEATED)
	PROPOSED STAGING AREA		EXISTING FOREIGN PIPELINE		
	ACCESS ROAD		EXISTING OVERHEAD LINE		
	USACE EASEMENT		ROAD CENTERLINE		

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REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				APPROVALS				PREPARED FOR		PREPARED BY		SPIRE STL PIPELINE PROJECT									
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	Spire STL Pipeline		MOTT MACDONALD		HDD PROFILE OVERVIEW			
STLP-A-066	ALIGNMENT SHEET			1	ISSUE FOR PERC	01/2017	RJR	EB	RJP							D.R.G.	01/2017	D.G.G.	01/2017										
STLP-A-067	ALIGNMENT SHEET			2	HDD PROFILE OVERVIEW	04/2017	RJR	EB	RJP								E.B.	01/2017	J.E.W.	01/2017									

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ST. CHARLES & ST. LOUIS COUNTIES, MISSOURI  
RIVERS TOWNSHIP



HDD NOTES:

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- ALL CHAINAGES ARE HORIZONTAL.
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- CONTRACTOR SHALL DETERMINE DIAMETER, GRADE, WALL THICKNESS AND ADDITIONAL LENGTH OF TEMPORARY CONDUCTOR CASINGS THAN THOSE SHOWN ON THE DRAWINGS. ANY INSTALLED TEMPORARY CONDUCTOR CASING SHALL BE FULLY REMOVED UPON COMPLETION OF PULLBACK OPERATIONS.
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- EXISTING UTILITY LOCATIONS AND DEPTHS, INCLUDING PRIVATE SERVICES, ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION OPERATIONS.
- HDD OPERATIONS SHALL BE CONDUCTED IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS.
- DOWNHOLE ANNULAR DRILLING FLUID PRESSURES SHALL BE MONITORED AT ALL TIMES DURING THE PILOT BORE DRILLING PROCESS. LOCATION OF MONITORING SHALL BE AS CLOSE TO THE DRILL BIT AS POSSIBLE.
- PILOT BORE SHALL BE CONTINUOUSLY TRACKED AT ALL TIMES. NO BLIND SECTIONS SHALL BE PERMITTED, EVEN WHEN THE DRILL BIT IS UNDER WATER.
- UPON HDD COMPLETION AND EXTRACTION OF TEMPORARY CASING PIPE (IF APPLICABLE), CONTRACTOR SHALL PLACE A UNIFORM CEMENT BASED GROUT WITHIN THE NEAREST 200 FEET OF THE ANNULAR SPACE OF THE HDD BORE BETWEEN THE PRODUCT PIPE AND THE UNDISTURBED EARTH AT EACH HDD ENTRY AND EXIT LOCATIONS. GROUT DELIVERY METHOD SHALL BE FROM MULTIPLE POINTS WITHIN THE ANNULAR SPACE. CONTRACTOR SHALL MONITOR AND CONTROL GROUT PRESSURES TO WITHIN LIMITS FOR THE ENCOUNTERED GEOTECHNICAL MATERIALS.
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- CONTRACTOR SHALL MONITOR PRECIPITATION AND RIVER LEVEL ELEVATIONS AND BE PREPARED TO REMOVE EQUIPMENT PRIOR TO A FORECASTED FLOOD EVENT

MISSOURI RIVER HDD PLAN VIEW

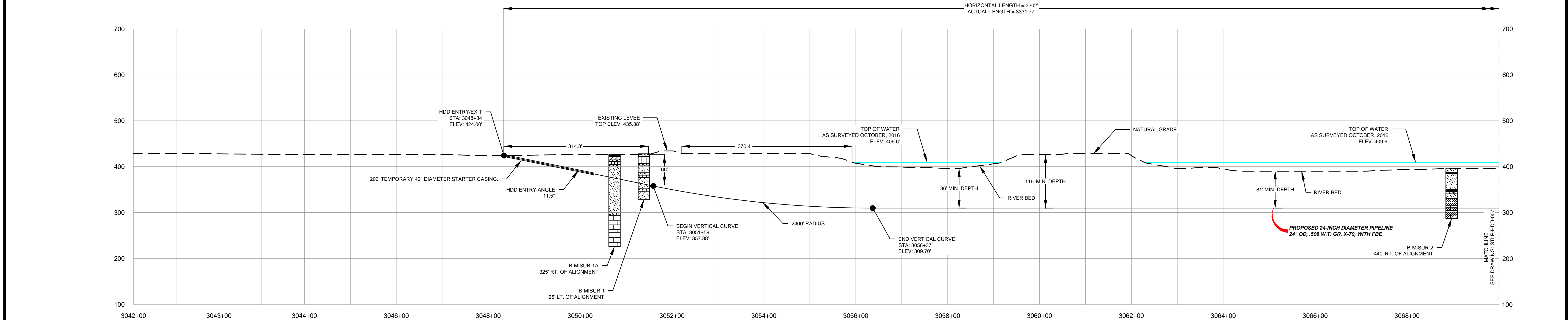
PILOT BORE DRILLING TOLERANCES SHALL BE AS FOLLOWS:	
ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	± 0.5° VERTICAL ANGLE ± 0.5° HORIZONTAL ANGLE ± 0.5° VERTICAL ANGLE ± 0.5° HORIZONTAL ANGLE ALLOWED.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET DEEPER IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
PILOT ALIGNMENT	UP TO TEN (10) FEET LEFT OR RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN FIVE (5) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY OR ANY BELOW GRADE UTILITY OR STRUCTURE.

Soil Stratigraphic Legend:

- ML: MUDSTONE
- CH: CLAY
- CL: CLAY
- SP: SAND
- SW: SAND WITH SILT
- GP: GRAVELLY SAND
- SM: SILTSTONE
- LIMESTONE: LIMESTONE
- MUDSTONE: MUDSTONE
- SHALE: SHALE
- CONCRETE: CONCRETE
- GP: GRAVELLY SAND

LEGEND

- PROPOSED PERMANENT EASEMENT
- EXISTING PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED STAGING AREA
- ACCESS ROAD
- USACE EASEMENT
- PROPOSED 24-INCH DIAMETER PIPELINE
- PIPELINE PROPERTY LINE
- MMID
- EXISTING GAS PIPELINE
- EXISTING FOREIGN PIPELINE
- EXISTING OVERHEAD LINE
- ROAD CENTERLINE
- STREAM (DELINEATED)
- STREAM (DESKTOP)
- WETLAND (DESKTOP)
- WETLAND (DELINEATED)

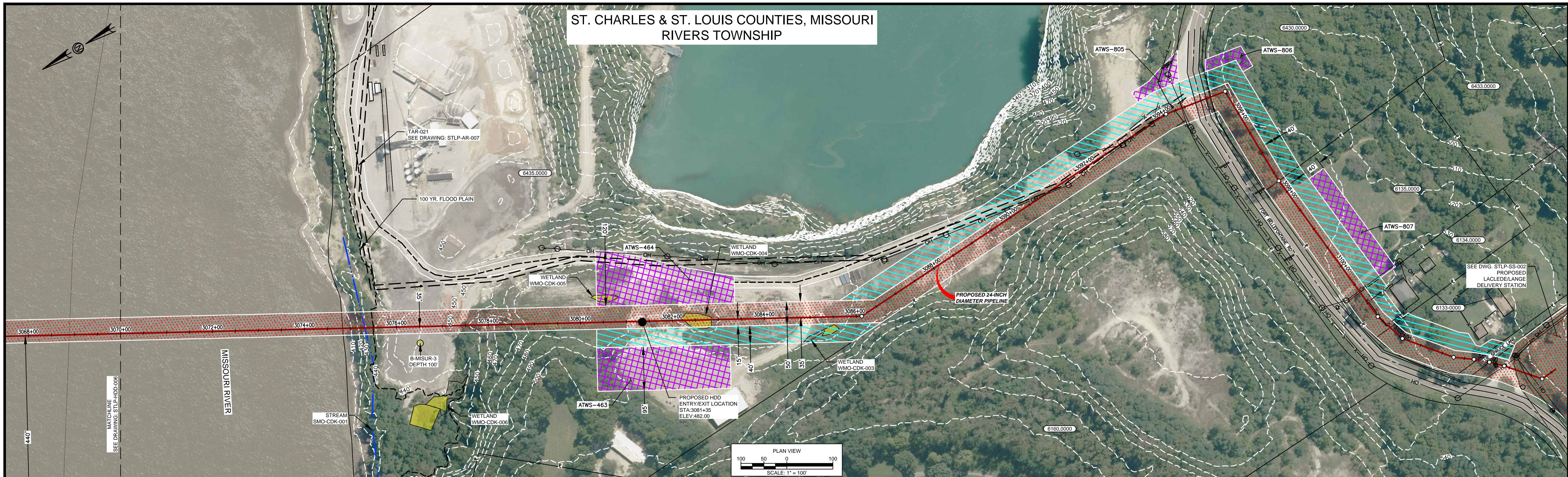


NOTES:

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- EXISTING FEATURES SHOWN WERE SURVEYED BY MOTT MACDONALD AND DIGITIZED FROM IMAGERY. ALL LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY CONTRACTOR.
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- BASE FLOOD ELEVATION LINE SHOWN FOR 100 YEAR FLOOD PLAIN LIMIT WAS PULLED FROM FEMA FLOOD INSURANCE RATE MAPS (FIRM). THE ELEVATION OF 438 FEET WAS DETERMINED USING MAP NUMBERS 29189C0090K AND 17083C0278D.

REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				REVISIONS				APPROVALS				PREPARED FOR		PREPARED BY		SPIRE STL PIPELINE PROJECT				
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	Spire STL Pipeline		MOTT MACDONALD		HDD PROFILE OVERVIEW		
STLP-A-067	ALIGNMENT SHEET			1	ISSUE FOR PERC	01/2017	RJR	EB	RJP							D.R.G.	01/2017	D.G.G.										
STLP-HDD-007	HDD PROFILE OVERVIEW			2	AMENDMENT TO PERC	04/2017	RJR	EB	RJP							CHECKED BY	DATE	P.M. APPROVAL	DATE									
																E.B.	01/2017	J.E.W.	01/2017				STLP-HDD-006					

ST. CHARLES & ST. LOUIS COUNTIES, MISSOURI  
RIVERS TOWNSHIP



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MISSOURI RIVER HDD PLAN VIEW

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PILOT EXIT ANGLE	± 0.5° VERTICAL ANGLE ± 0.5° HORIZONTAL ANGLE ± 0.5°
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
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Soil Stratigraphic Legend:

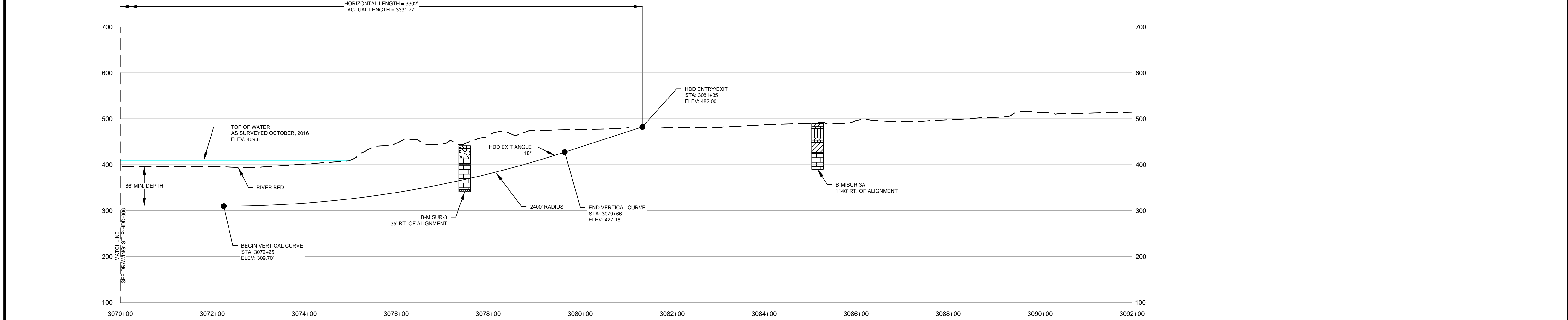
ML	CH	CL	SP
SW	GP	L	SM

Rock Stratigraphic Legend:

L	M	S
L	M	S
C	GP	

LEGEND

[Red Hatched]	PROPOSED PERMANENT EASEMENT	[Red Line]	PROPOSED 24-INCH DIAMETER PIPELINE	[Blue Dashed]	STREAM (DELINEATED)
[Grey Hatched]	EXISTING PERMANENT EASEMENT	[Black Line]	PROPERTY LINE	[Blue Solid]	STREAM (DESKTOP)
[Green Hatched]	TEMPORARY WORKSPACE	[Circle]	MMID	[Green Solid]	WETLAND (DESKTOP)
[Purple Hatched]	ADDITIONAL TEMPORARY WORKSPACE	[Red Line]	EXISTING GAS PIPELINE	[Green Dashed]	WETLAND (DELINEATED)
[Orange Hatched]	PROPOSED STAGING AREA	[Red Line]	EXISTING FOREIGN PIPELINE	[Green Dashed]	
[Green Dashed]	ACCESS ROAD	[Green Line]	EXISTING OVERHEAD LINE	[Black Line]	
[Orange Solid]	USACE EASEMENT	[Black Line]	ROAD CENTERLINE		



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REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				APPROVALS										
DWG NO.	TITLE	DWG NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	
STLP-A-068	ALIGNMENT SHEET	STLP-HDD-006	HDD PROFILE OVERVIEW	1	ISSUE FOR PERC	01/2017	RJR	EB	RJP							D.R.G.	01/2017	D.G.G.	04/2017			
STLP-AR-007	ACCESS ROAD SITE PLAN - TAR-021			2	AMENDMENT TO PERC	04/2017	RJR	EB	RJP									P.M. APPROVAL	DATE			
STLP-SS-002	LACLEDE/LANGE DELIVERY STATION SITE LAYOUT - STLP-SS-002															E.B.	01/2017	J.E.W.	04/2017			STLP-HDD-007

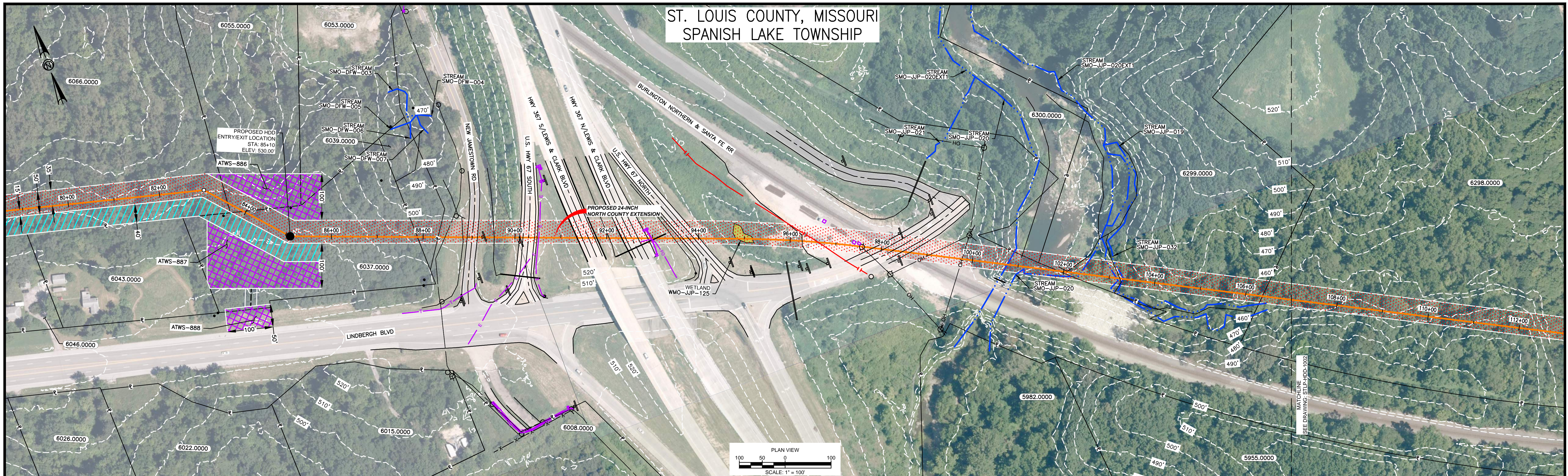
PREPARED FOR  
**Spire STL Pipeline**

PREPARED BY  
**MOTT MACDONALD**

SPIRE STL PIPELINE PROJECT  
HDD PROFILE OVERVIEW  
MISSOURI RIVER MAINLINE  
ST. CHARLES & ST. LOUIS COUNTIES, MISSOURI

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ST. LOUIS COUNTY, MISSOURI  
SPANISH LAKE TOWNSHIP



HDD NOTES:

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HIGHWAY 367 HDD PLAN VIEW

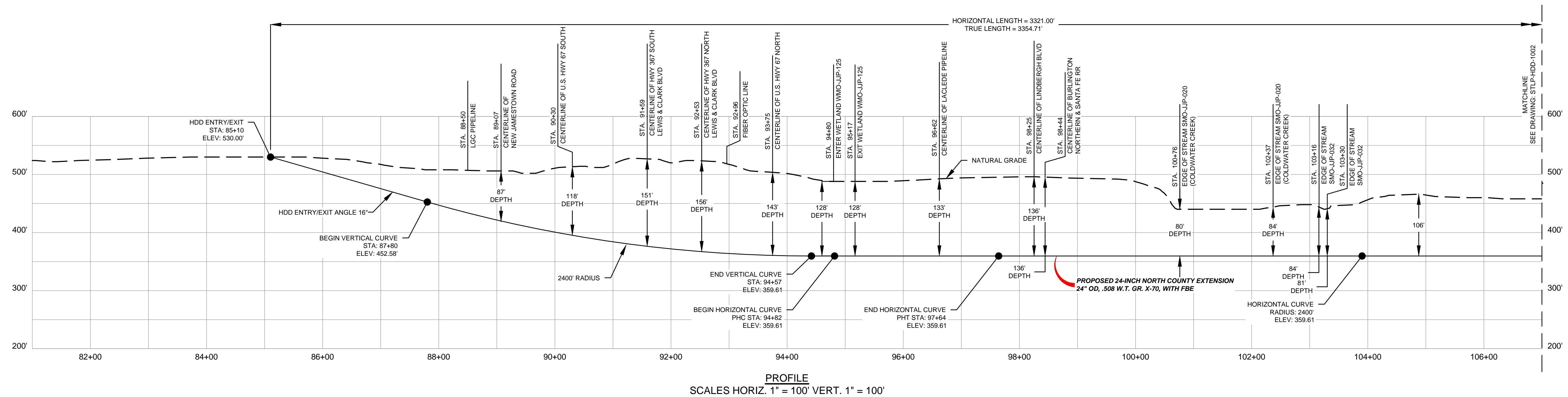
ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	± 0.5° VSO yhu' ' ' 0u-k ' yuV' Wk' ' o o' ' 0' VSO ALLOWED.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
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Soil Stratigraphic Legend:

- ML: MUDSTONE
- CH: CLAY
- CL: CLAY
- SP: SAND
- SW: SAND WITH SILT
- GP: GRAVELLY SAND
- SM: SILTSTONE
- LIMESTONE: LIMESTONE
- MU: MUDSTONE
- SH: SHALE
- CONCRETE: CONCRETE
- GP: GRAVELLY SAND

LEGEND

- PROPOSED PERMANENT EASEMENT
- EXISTING PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED STAGING AREA
- ACCESS ROAD
- USACE EASEMENT
- PROPOSED 24-INCH NORTH COUNTY EXTENSION
- PROPERTY LINE
- MMID
- EXISTING GAS PIPELINE
- EXISTING FOREIGN PIPELINE
- EXISTING OVERHEAD LINE
- ROAD CENTERLINE
- STREAM (DELINEATED)
- STREAM (DESKTOP)
- WETLAND (DESKTOP)
- WETLAND (DELINEATED)



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DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE
STLP-A-1002	ALIGNMENT SHEET			1	AMENDMENT TO FERC	04/2017	SG	KAM	RJP							S.G.	04/2017	D.G.G.	04/2017		
STLP-A-1003	ALIGNMENT SHEET															R.J.P.	04/2017	J.E.W.	04/2017		
STLP-HDD-1002	HDD PROFILE OVERVIEW																				

PREPARED FOR  
**Spire STL Pipeline**

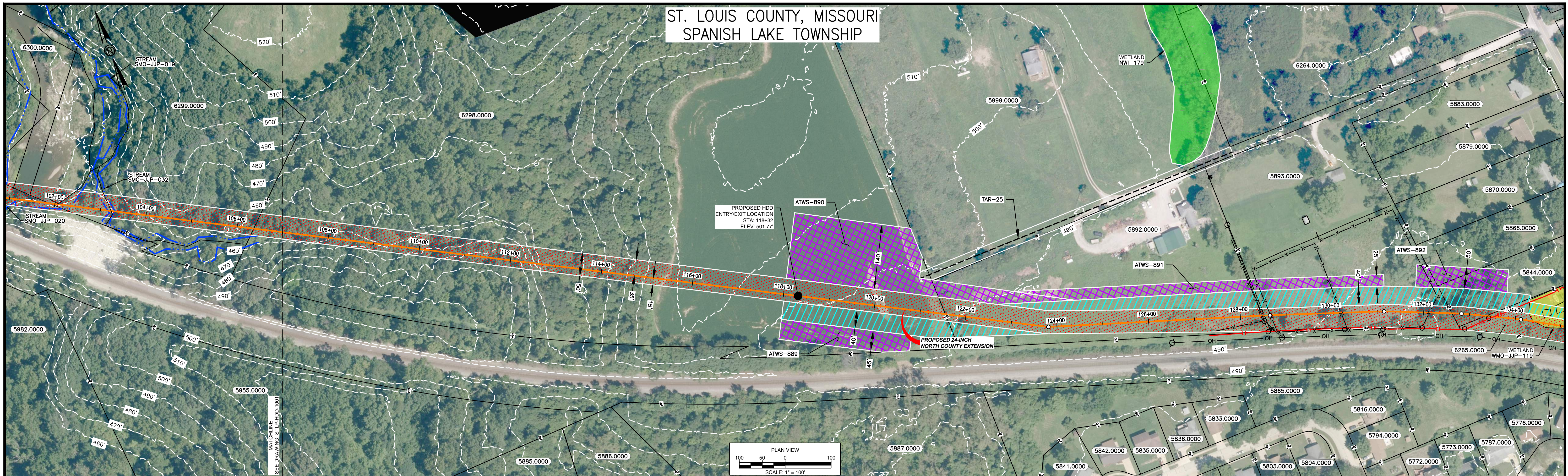
PREPARED BY  
**MOTT MACDONALD**

SPIRE STL PIPELINE PROJECT  
HDD PROFILE OVERVIEW  
HIGHWAY 367 & COLD WATER CREEK NORTH COUNTY EXTENSION  
SPANISH LAKE TOWNSHIP, ST. LOUIS, MISSOURI

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ST. LOUIS COUNTY, MISSOURI  
SPANISH LAKE TOWNSHIP



- HDD NOTES:**
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**PILOT BORE DRILLING TOLERANCES SHALL BE AS FOLLOWS:**

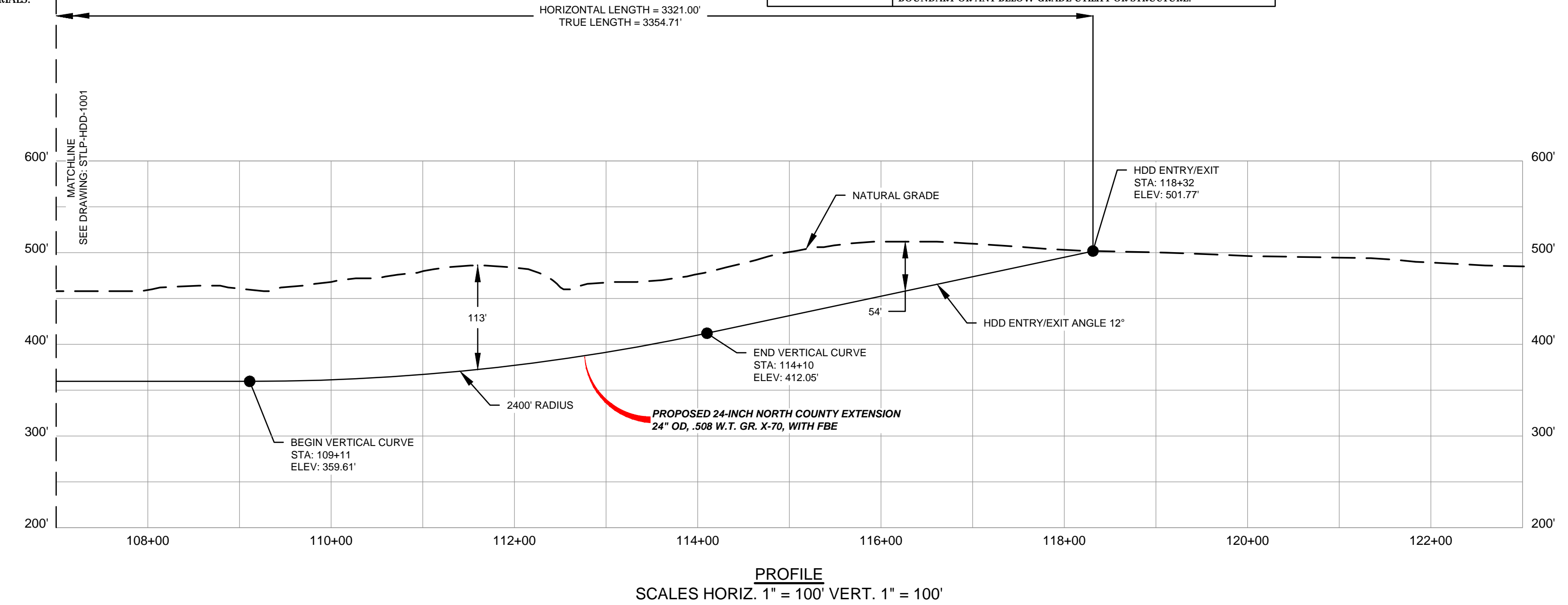
ITEM	TOLERANCE
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PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	± 0.5° VERTICAL ANGLE. ± 0.5° HORIZONTAL ANGLE. ± 0.5° TOTAL ANGLE.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
PILOT ALIGNMENT	UP TO TEN (10) FEET LEFT OR RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN FIVE (5) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY OR ANY BELOW GRADE UTILITY OR STRUCTURE.

**Soil Stratigraphic Legend:**

- ML: MUDSTONE
- CH: CLAY
- CL: CLAY
- SP: SAND
- SW: SAND WITH SILT
- GP: GRAVELLY SAND
- SM: SILTSTONE
- LIMESTONE: LIMESTONE
- MUDSTONE: MUDSTONE
- SHALE: SHALE
- CONCRETE: CONCRETE
- GP: GRAVELLY SAND

**LEGEND**

- PROPOSED PERMANENT EASEMENT
- EXISTING PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED STAGING AREA
- ACCESS ROAD
- USACE EASEMENT
- PROPOSED 24-INCH BARRIER PIPELINE EXTENSION
- PROPERTY LINE
- MMID
- EXISTING GAS PIPELINE
- EXISTING FOREIGN PIPELINE
- EXISTING OVERHEAD LINE
- ROAD CENTERLINE
- STREAM (DELINEATED)
- STREAM (DESKTOP)
- WETLAND (DESKTOP)
- WETLAND (DELINEATED)



- NOTES:**
1. THE IMAGERY SHOWN WAS PROVIDED BY AERIAL DATA SERVICES, 2018. ADDITIONAL IMAGERY SUPPLEMENTED FROM USFWS NWI AND USGS.
  2. EXISTING FEATURES SHOWN WERE SURVEYED BY MOTT MACDONALD AND DIGITIZED FROM IMAGERY. ALL LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY CONTRACTOR.
  3. PROPERTY LINES DEPICTED ON THIS PLAN ARE BASED ON GIS TAX MAP DATA.
  4. BASE FLOOD ELEVATION LINE SHOWN FOR 100 YEAR FLOOD PLAIN LIMIT WAS PULLED FROM FEMA FLOOD INSURANCE RATE MAPS (FIRM). THE ELEVATION OF 438 FEET WAS DETERMINED USING MAP NUMBERS 29189C0090K AND 17083C0278D.

REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				REVISIONS				APPROVALS					
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE
STLP-A-1003	ALIGNMENT SHEET			1	AMENDMENT TO FERC	04/2017	SG	KAM	RJP							S.G.	04/2017	D.G.G.	04/2017		
STLP-HDD-1001	HDD PLAN AND PROFILE															R.J.P.	04/2017	J.E.W.	04/2017		

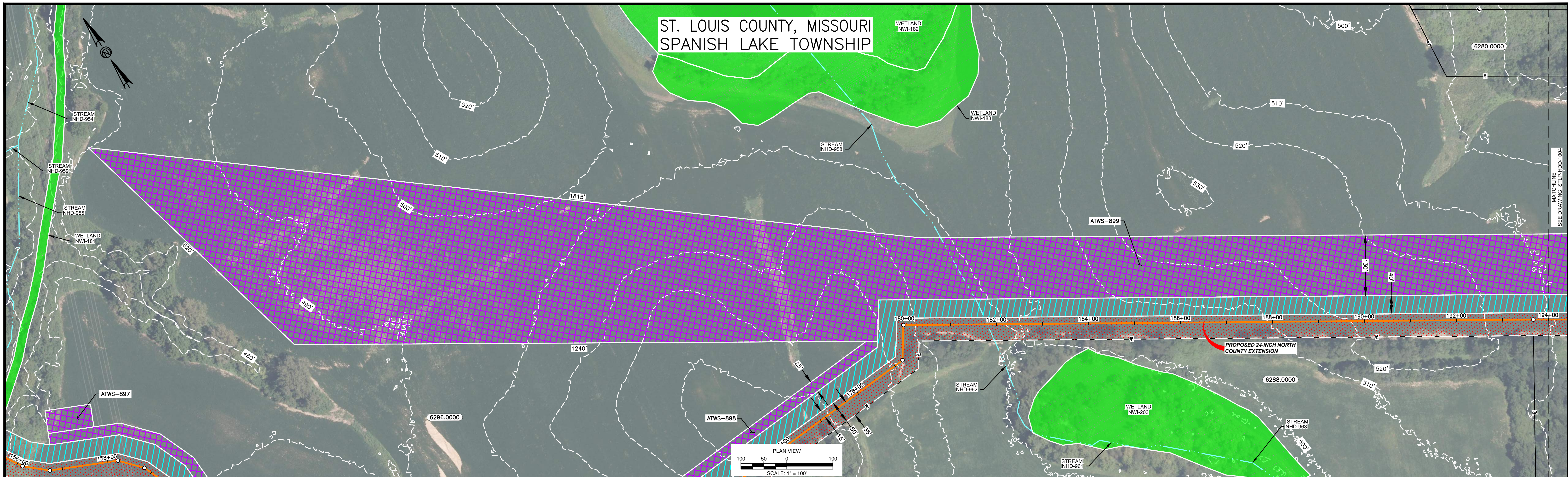
PREPARED FOR  
**Spire STL Pipeline**

PREPARED BY  
**MOTT MACDONALD**

SPIRE STL PIPELINE PROJECT  
HDD PROFILE OVERVIEW  
HIGHWAY 367 & COLDWATER CREEK NORTH COUNTY EXTENSION  
SPANISH LAKE TOWNSHIP, ST. LOUIS MISSOURI

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ST. LOUIS COUNTY, MISSOURI  
SPANISH LAKE TOWNSHIP



- HDD NOTES:**
1. ALL DIMENSIONS AND ELEVATIONS ARE IN FEET, UNLESS OTHERWISE SPECIFIED.
  2. ALL CHAINAGES ARE HORIZONTAL.
  3. CONTRACTOR SHALL DETERMINE FINAL LOCATIONS AND DIMENSIONS OF ALL PITS NECESSARY TO ACCOMMODATE THEIR MEANS AND METHODS.
  4. CONTRACTOR SHALL DETERMINE DIAMETER, GRADE, WALL THICKNESS AND ADDITIONAL LENGTH OF TEMPORARY CONDUCTOR CASINGS THAN THOSE SHOWN ON THE DRAWINGS. ANY INSTALLED TEMPORARY CONDUCTOR CASING SHALL BE FULLY REMOVED UPON COMPLETION OF PULLBACK OPERATIONS.
  5. THE MINIMUM ALLOWABLE DRILLING RADIUS SHALL BE 1,750 FEET BASED ON A 3-JOINT AVERAGE.
  6. EXISTING UTILITY LOCATIONS AND DEPTHS, INCLUDING PRIVATE SERVICES, ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION OPERATIONS.

7. HDD OPERATIONS SHALL BE CONDUCTED IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS.
8. DOWNHOLE ANNULAR DRILLING FLUID PRESSURES SHALL BE MONITORED AT ALL TIMES DURING THE PILOT BORE DRILLING PROCESS. LOCATION OF MONITORING SHALL BE AS CLOSE TO THE DRILL BIT AS POSSIBLE.
9. PILOT BORE SHALL BE CONTINUOUSLY TRACKED AT ALL TIMES. NO BLIND SECTIONS SHALL BE PERMITTED, EVEN WHEN THE DRILL BIT IS UNDER WATER.
10. UPON HDD COMPLETION AND EXTRACTION OF TEMPORARY CASING PIPE (IF APPLICABLE), CONTRACTOR SHALL PLACE A UNIFORM CEMENT BASED GROUT WITHIN THE NEAREST 200 FEET OF THE ANNULAR SPACE OF THE HDD BORE BETWEEN THE PRODUCT PIPE AND THE UNDISTURBED EARTH AT EACH HDD ENTRY AND EXIT LOCATIONS. GROUT DELIVERY METHOD SHALL BE FROM MULTIPLE POINTS WITHIN THE ANNULAR SPACE. CONTRACTOR SHALL MONITOR AND CONTROL GROUT PRESSURES TO WITHIN LIMITS FOR THE ENCOUNTERED GEOTECHNICAL MATERIALS.

11. IF THE CONTRACTOR ENCOUNTERS AN OBSTRUCTION THAT PREVENTS THE INSTALLATION ACCORDING TO THE PROJECT SPECIFICATIONS, THE CONTRACTOR SHALL PLACE A CEMENT BASED GROUT WITHIN THE BORE. WORK SHALL NOT RESUME UNTIL REVISED PLANS AND PROCEDURES HAVE BEEN SUBMITTED TO AND ACCEPTED BY THE OWNER.
12. CONTRACTOR SHALL USE A GYROSCOPIC GUIDANCE SYSTEM TO COMPLETE THE PILOT BORE INSTALLATION.
13. THE PILOT BORE WILL BE EITHER 10.625" OR 12.25" IN DIAMETER. THE FINAL REAMED HOLE DIAMETER IS ANTICIPATED TO BE 36". THE NUMBER OF REAMING PASSES WILL BE DETERMINED BY THE CONTRACTOR SELECTED FOR THE WORK.
14. CONTRACTOR SHALL MONITOR PRECIPITATION AND RIVER LEVEL ELEVATIONS AND BE PREPARED TO REMOVE EQUIPMENT PRIOR TO A FORECASTED FLOOD EVENT.

**SPANISH LAKE PARK HDD PLAN VIEW**

PILOT BORE DRILLING TOLERANCES SHALL BE AS FOLLOWS:	
ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	)-#k' o " V8Q yhu' ' ' 70u-k ' yuVA W#k' o oW' Qh' V8Q ALLOWED.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
PILOT ALIGNMENT	UP TO TEN (10) FEET LEFT OR RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN FIVE (5) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY OR ANY BELOW GRADE UTILITY OR STRUCTURE.

**Soil Stratigraphic Legend:**

- ML (Mudstone)
- CH (Claystone)
- CL (Clay)
- SP (Siltstone)
- SW (Sandstone)
- GP (Gypsiferous)
- SM (Sandstone)
- LIMESTONE
- SHALE
- MUDSTONE
- CONCRETE
- GP (Gravelly)

**LEGEND**

- PROPOSED PERMANENT EASEMENT
- EXISTING PERMANENT EASEMENT
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED STAGING AREA
- ACCESS ROAD
- USACE EASEMENT
- PROPOSED 24-INCH NORTH COUNTY EXTENSION PROPERTY LINE
- MMID
- EXISTING GAS PIPELINE
- EXISTING FOREIGN PIPELINE
- EXISTING OVERHEAD LINE
- ROAD CENTERLINE
- STREAM (DELINEATED)
- STREAM (DESKTOP)
- WETLAND (DESKTOP)
- WETLAND (DELINEATED)

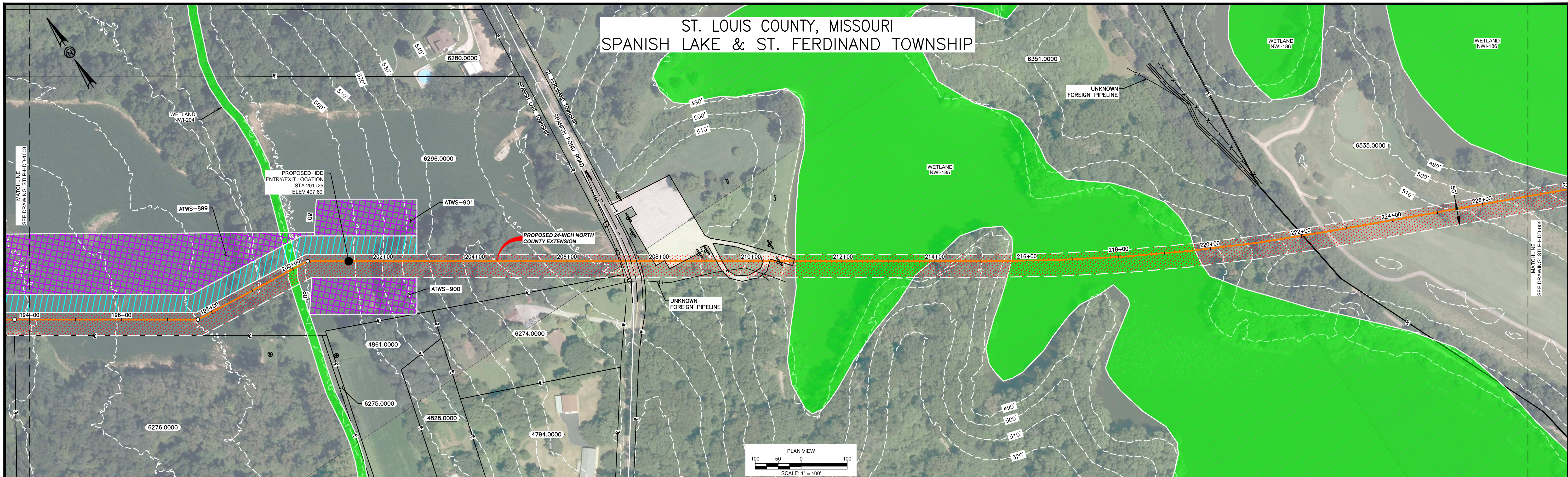
- NOTES:**
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  2. EXISTING FEATURES SHOWN WERE SURVEYED BY MOTT MACDONALD AND DIGITIZED FROM IMAGERY. ALL LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY CONTRACTOR.
  3. PROPERTY LINES DEPICTED ON THIS PLAN ARE BASED ON GIS TAX MAP DATA.
  4. BASE FLOOD ELEVATION LINE SHOWN FOR 100 YEAR FLOOD PLAIN LIMIT WAS PULLED FROM FEMA FLOOD INSURANCE RATE MAPS (FIRM). THE ELEVATION OF 438 FEET WAS DETERMINED USING MAP NUMBERS 29189C0080K AND 17083C0278D.

REFERENCE DRAWINGS		REVISIONS		REVISIONS		REVISIONS		APPROVALS		PREPARED FOR		PREPARED BY		SPIRE STL PIPELINE PROJECT					
DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE
STLP-A-1004	ALIGNMENT SHEET	1	AMENDMENT TO FERC	04/2017	AK	KAM	RJP							A.K.Y.	04/2017	D.G.G.	04/2017		
STLP-HDD-1004	HDD PROFILE OVERVIEW													R.J.P.	04/2017	J.E.W.	04/2017	STLP-HDD-1003	

**STLP-HDD-1003**  
**SPANISH LAKE PARK NORTH COUNTY EXTENSION**  
**SPANISH LAKE TOWNSHIPS, ST. LOUIS, MISSOURI**

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# ST. LOUIS COUNTY, MISSOURI SPANISH LAKE & ST. FERDINAND TOWNSHIP



- HDD NOTES:**
- ALL DIMENSIONS AND ELEVATIONS ARE IN FEET, UNLESS OTHERWISE SPECIFIED.
  - ALL CHAINAGES ARE HORIZONTAL.
  - CONTRACTOR SHALL DETERMINE FINAL LOCATIONS AND DIMENSIONS OF ALL PITS NECESSARY TO ACCOMMODATE THEIR MEANS AND METHODS.
  - CONTRACTOR SHALL DETERMINE DIAMETER, GRADE, WALL THICKNESS AND ADDITIONAL LENGTH OF TEMPORARY CONDUCTOR CASINGS THAN THOSE SHOWN ON THE DRAWINGS. ANY INSTALLED TEMPORARY CONDUCTOR CASING SHALL BE FULLY REMOVED UPON COMPLETION OF PULLBACK OPERATIONS.
  - THE MINIMUM ALLOWABLE DRILLING RADIUS SHALL BE 1,750 FEET BASED ON A 3-JOINT AVERAGE.
  - EXISTING UTILITY LOCATIONS AND DEPTHS, INCLUDING PRIVATE SERVICES, ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION OPERATIONS.

- HDD OPERATIONS SHALL BE CONDUCTED IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS.
- DOWNHOLE ANNUAL DRILLING FLUID PRESSURES SHALL BE MONITORED AT ALL TIMES DURING THE PILOT BORE DRILLING PROCESS. LOCATION OF MONITORING SHALL BE AS CLOSE TO THE DRILL BIT AS POSSIBLE.
- PILOT BORE SHALL BE CONTINUOUSLY TRACKED AT ALL TIMES. NO BLIND SECTIONS SHALL BE PERMITTED, EVEN WHEN THE DRILL BIT IS UNDER WATER.
- UPON HDD COMPLETION AND EXTRACTION OF TEMPORARY CASING PIPE (IF APPLICABLE), CONTRACTOR SHALL PLACE A UNIFORM CEMENT BASED GROUT WITHIN THE NEAREST 200 FEET OF THE ANNULAR SPACE OF THE HDD BORE BETWEEN THE PRODUCT PIPE AND THE UNDISTURBED EARTH AT EACH HDD ENTRY AND EXIT LOCATIONS. GROUT DELIVERY METHOD SHALL BE FROM MULTIPLE POINTS WITHIN THE ANNULAR SPACE. CONTRACTOR SHALL MONITOR AND CONTROL GROUT PRESSURES TO WITHIN LIMITS FOR THE ENCOUNTERED GEOTECHNICAL MATERIALS.

- IF THE CONTRACTOR ENCOUNTERS AN OBSTRUCTION THAT PREVENTS THE INSTALLATION ACCORDING TO THE PROJECT SPECIFICATIONS, THE CONTRACTOR SHALL PLACE A CEMENT BASED GROUT WITHIN THE BORE. WORK SHALL NOT RESUME UNTIL REVISED PLANS AND PROCEDURES HAVE BEEN SUBMITTED TO AND ACCEPTED BY THE OWNER.
- CONTRACTOR SHALL USE A GYROSCOPIC GUIDANCE SYSTEM TO COMPLETE THE PILOT BORE INSTALLATION.
- THE PILOT BORE WILL BE EITHER 10.625" OR 12.25" IN DIAMETER. THE FINAL REAMED HOLE DIAMETER IS ANTICIPATED TO BE 36". THE NUMBER OF REAMING PASSES WILL BE DETERMINED BY THE CONTRACTOR SELECTED FOR THE WORK.
- CONTRACTOR SHALL MONITOR PRECIPITATION AND RIVER LEVEL ELEVATIONS AND BE PREPARED TO REMOVE EQUIPMENT PRIOR TO A FORECASTED FLOOD EVENT.

**SPANISH LAKE PARK HDD PLAN VIEW**

PILOT BORE DRILLING TOLERANCES SHALL BE AS FOLLOWS:

ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	± 0.5° VSO yhu' ' ' 0 u k ' yuV' W#k' o o W' 0 0 VSO ALLOWED.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
PILOT ALIGNMENT	UP TO TEN (10) FEET LEFT OR RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN FIVE (5) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY OR ANY BELOW GRADE UTILITY OR STRUCTURE.

**Soil Stratigraphic Legend:**

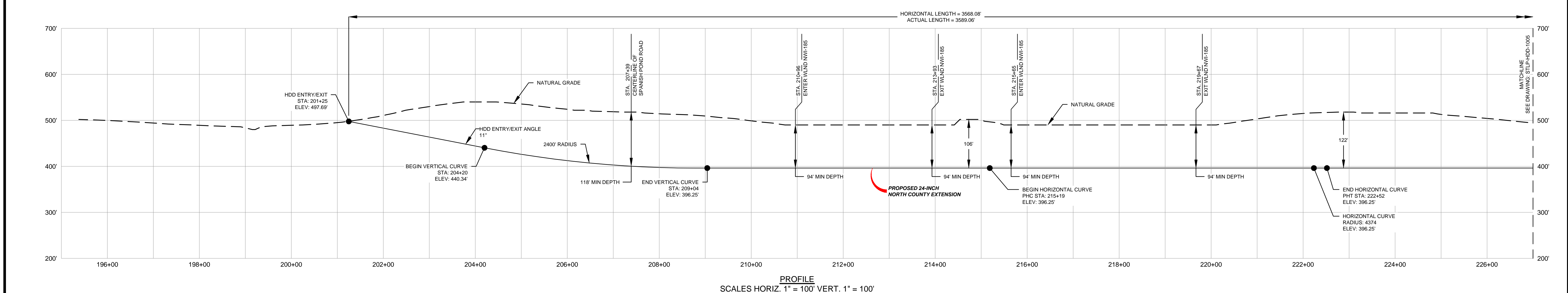
- ML: MUDSTONE
- CH: CLAY
- CL: CLAY
- SP: SAND
- SW: SAND
- GP: GRAVEL
- SM: SAND
- LIMESTONE: LIMESTONE

**Rock Stratigraphic Legend:**

- LIMESTONE: LIMESTONE
- MUDSTONE: MUDSTONE
- SHALE: SHALE
- CONCRETE: CONCRETE
- GP: GRAVEL

**LEGEND**

	PROPOSED PERMANENT EASEMENT		PROPOSED 24-INCH NORTH COUNTY EXTENSION PROPERTY LINE		STREAM (DELINEATED)
	EXISTING PERMANENT EASEMENT		MMID		STREAM (DESKTOP)
	TEMPORARY WORKSPACE		EXISTING GAS PIPELINE		WETLAND (DESKTOP)
	ADDITIONAL TEMPORARY WORKSPACE		EXISTING FOREIGN PIPELINE		WETLAND (DELINEATED)
	PROPOSED STAGING AREA		EXISTING OVERHEAD LINE		ROAD CENTERLINE
	ACCESS ROAD		ROAD CENTERLINE		
	USACE EASEMENT				



- NOTES:**
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  - EXISTING FEATURES SHOWN WERE SURVEYED BY MOTT MACDONALD AND DIGITIZED FROM IMAGERY. ALL LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY CONTRACTOR.
  - PROPERTY LINES DEPICTED ON THIS PLAN ARE BASED ON GIS TAX MAP DATA.
  - BASE FLOOD ELEVATION LINE SHOWN FOR 100 YEAR FLOOD PLAIN LIMIT WAS PULLED FROM FEMA FLOOD INSURANCE RATE MAPS (FIRM). THE ELEVATION OF 438 FEET WAS DETERMINED USING MAP NUMBERS 29189C0090K AND 17083C0278D.

REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				REVISIONS				APPROVALS						
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	
STLP-HDD-1003	HDD PLAN AND PROFILE			1	AMENDMENT TO FERC	04/2017	AK	KAM	RJP								A.K.Y.	04/2017				
STLP-A-1005	ALIGNMENT SHEET																					
STLP-HDD-1005	HDD PLAN AND PROFILE																R.J.P.	04/2017				

PREPARED FOR

PREPARED BY

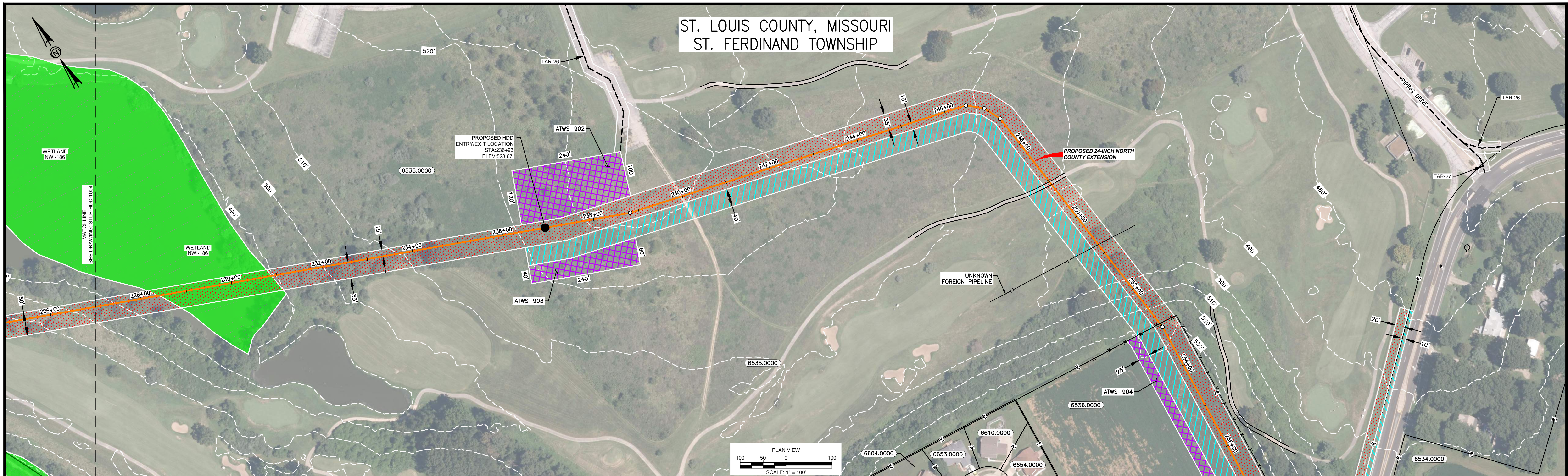
PROJECT

**SPANISH LAKE PARK NORTH COUNTY EXTENSION**

SPANISH LAKE & ST. FERDINAND TOWNSHIPS, ST. LOUIS, MISSOURI

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ST. LOUIS COUNTY, MISSOURI  
ST. FERDINAND TOWNSHIP



HDD NOTES:

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- HDD OPERATIONS SHALL BE CONDUCTED IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS.
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SPANISH LAKE PARK HDD PLAN VIEW

PILOT BORE DRILLING TOLERANCES SHALL BE AS FOLLOWS:	
ITEM	TOLERANCE
PILOT ENTRY ANGLE	INCREASE ANGLE UP TO 1 (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT ENTRY LOCATION	AS STAKED BY OWNER. NO CHANGES WITHOUT OWNER APPROVAL.
PILOT EXIT ANGLE	$\pm 0.5^\circ$ TO $\pm 1.0^\circ$ (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT EXIT LOCATION	UP TO TEN (10) FEET SHORTER OR LONGER.
PILOT DEPTH	UP TO THREE (3) FEET SHALLOWER DEPTH ALLOWED. UP TO TEN (10) FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
PILOT ALIGNMENT	UP TO TEN (10) FEET LEFT OR RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN FIVE (5) FEET OF THE RIGHT-OF-WAY EASEMENT BOUNDARY OR ANY BELOW GRADE UTILITY OR STRUCTURE.

Soil Stratigraphic Legend:

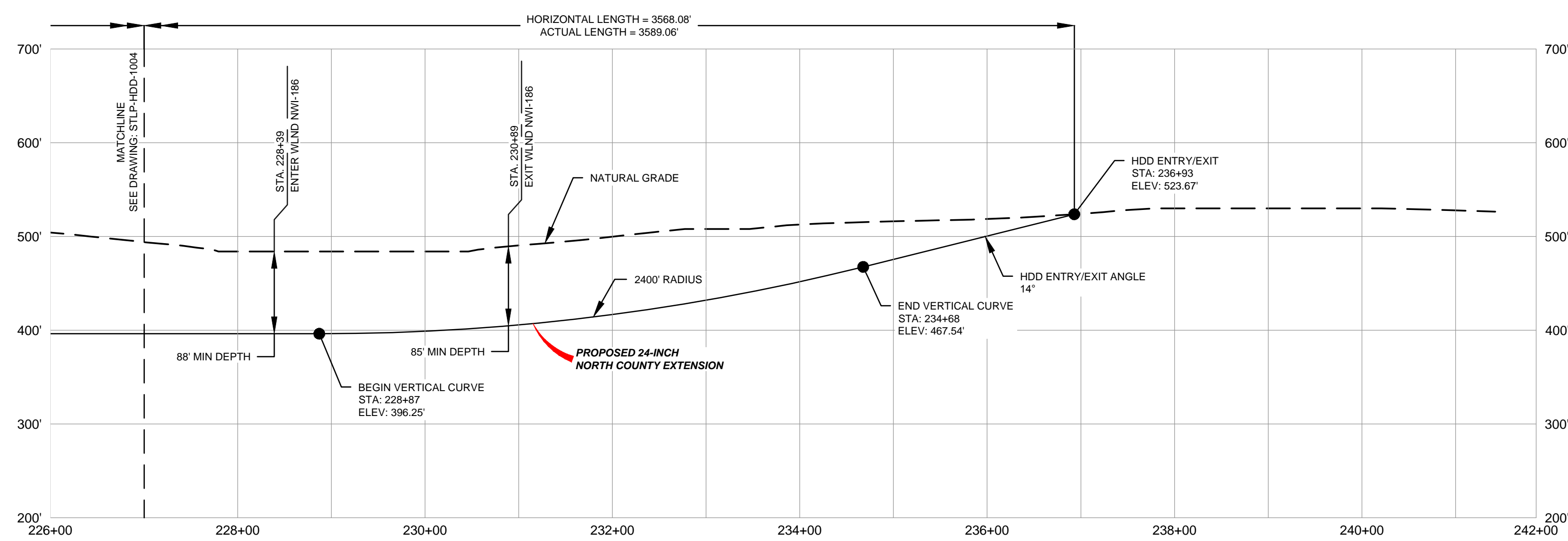
ML	CH	CL	SP
SW	GP	LIMESTONE	SM

Rock Stratigraphic Legend:

LIMESTONE	MUDSTONE	SHALE
CONCRETE	GP	

LEGEND

PROPOSED PERMANENT EASEMENT	PROPOSED 24-INCH NORTH COUNTY EXTENSION	STREAM (DELINEATED)
EXISTING PERMANENT EASEMENT	PROPERTY LINE	STREAM (DESKTOP)
TEMPORARY WORKSPACE	MMID	WETLAND (DESKTOP)
ADDITIONAL TEMPORARY WORKSPACE	EXISTING GAS PIPELINE	WETLAND (DELINEATED)
PROPOSED STAGING AREA	EXISTING FOREIGN PIPELINE	
ACCESS ROAD	EXISTING OVERHEAD LINE	
USACE EASEMENT	ROAD CENTERLINE	



PROFILE  
SCALES HORIZ. 1" = 100' VERT. 1" = 100'

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REFERENCE DRAWINGS		REFERENCE DRAWINGS		REVISIONS				REVISIONS				REVISIONS				APPROVALS						
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE	
STLP-A-1005	ALIGNMENT SHEET			1	AMENDMENT TO FERC	04/2017	AK	KAM	RJP													
STLP-A-1006	ALIGNMENT SHEET																					
STLP-HDD-1004	HDD PLAN AND PROFILE																					

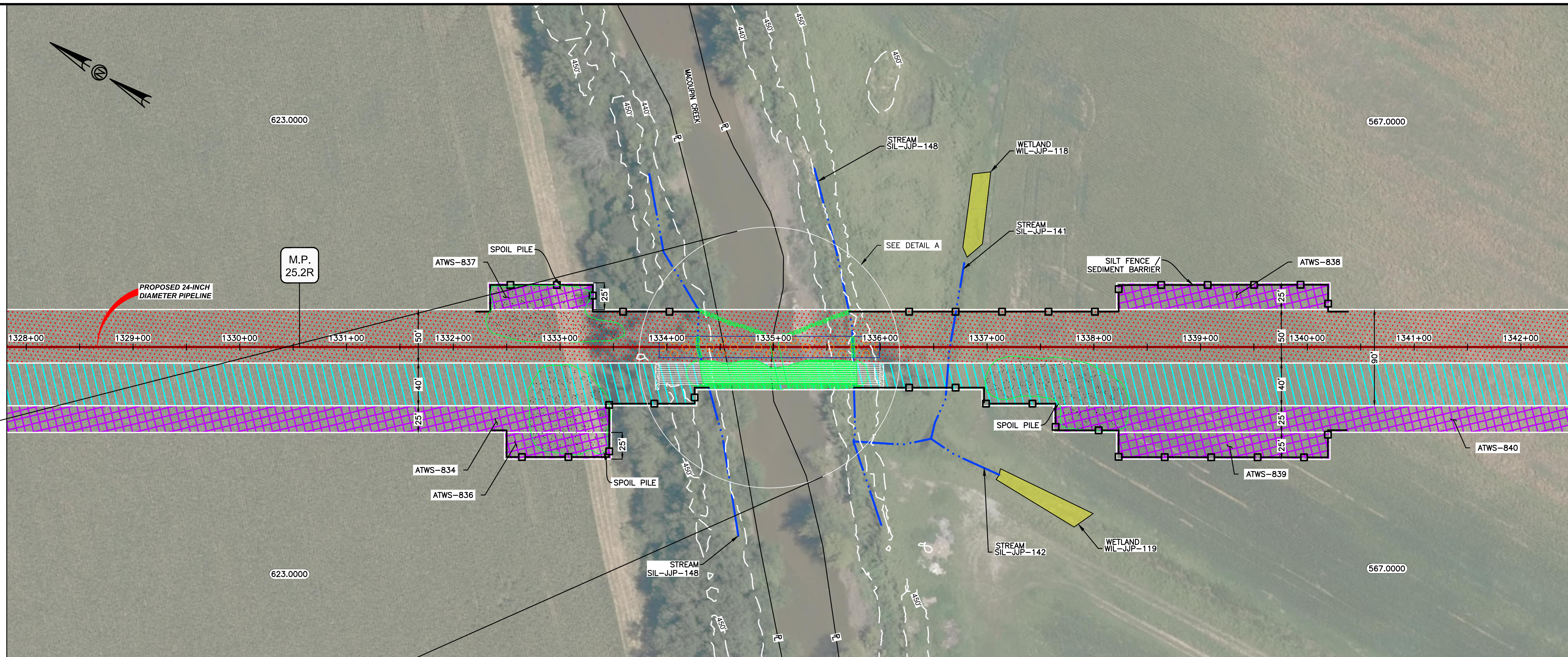
PREPARED FOR  
**Spire STL Pipeline**

PREPARED BY  
**MOTT MACDONALD**

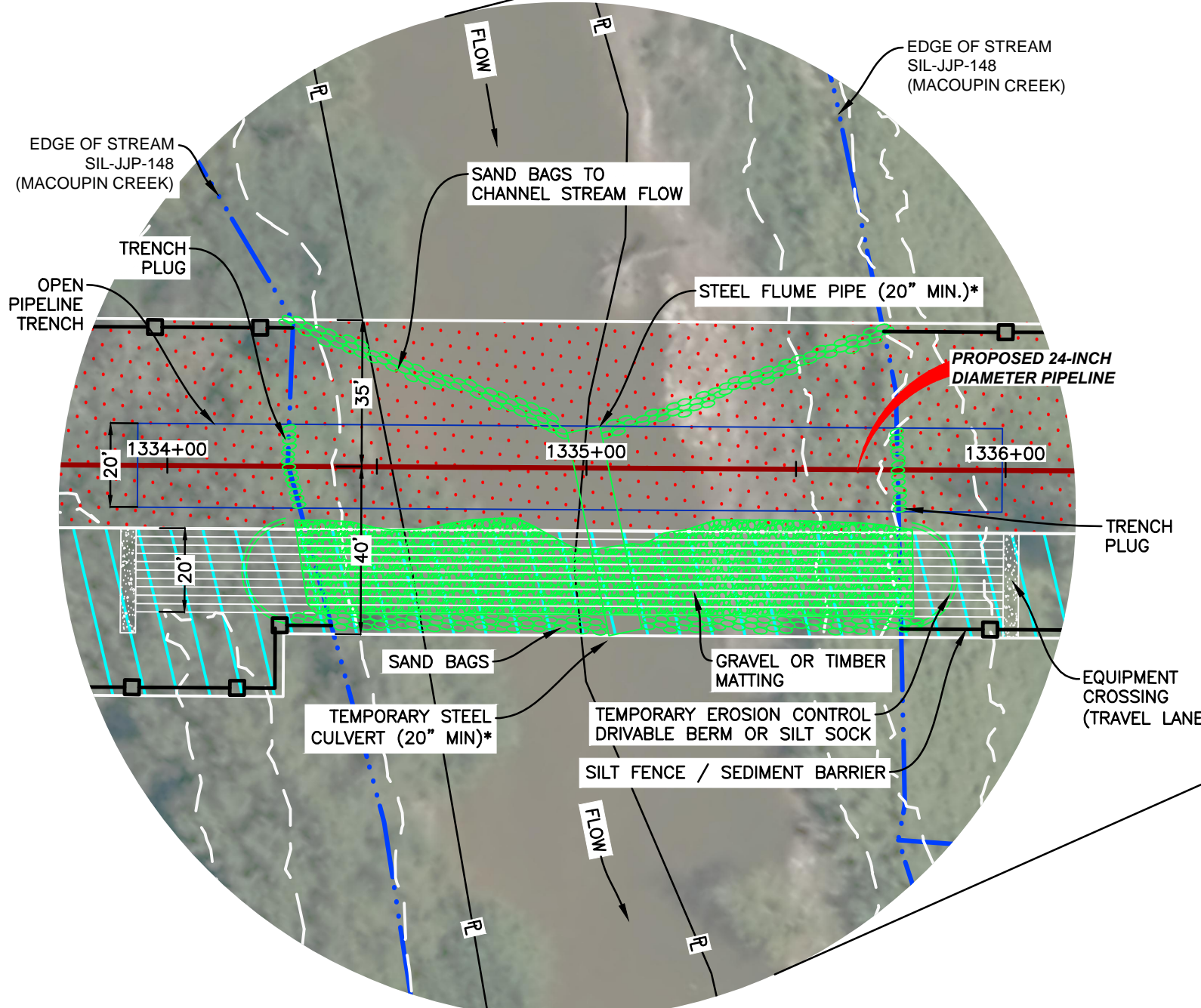
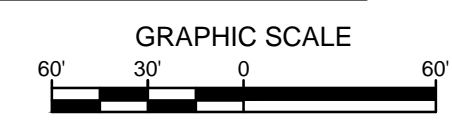
SPIRE STL PIPELINE PROJECT  
HDD PROFILE OVERVIEW  
SPANISH LAKE PARK NORTH COUNTY EXTENSION  
ST. FERDINAND TOWNSHIPS, ST. LOUIS MISSOURI



LOCATION MAP  
N.T.S.

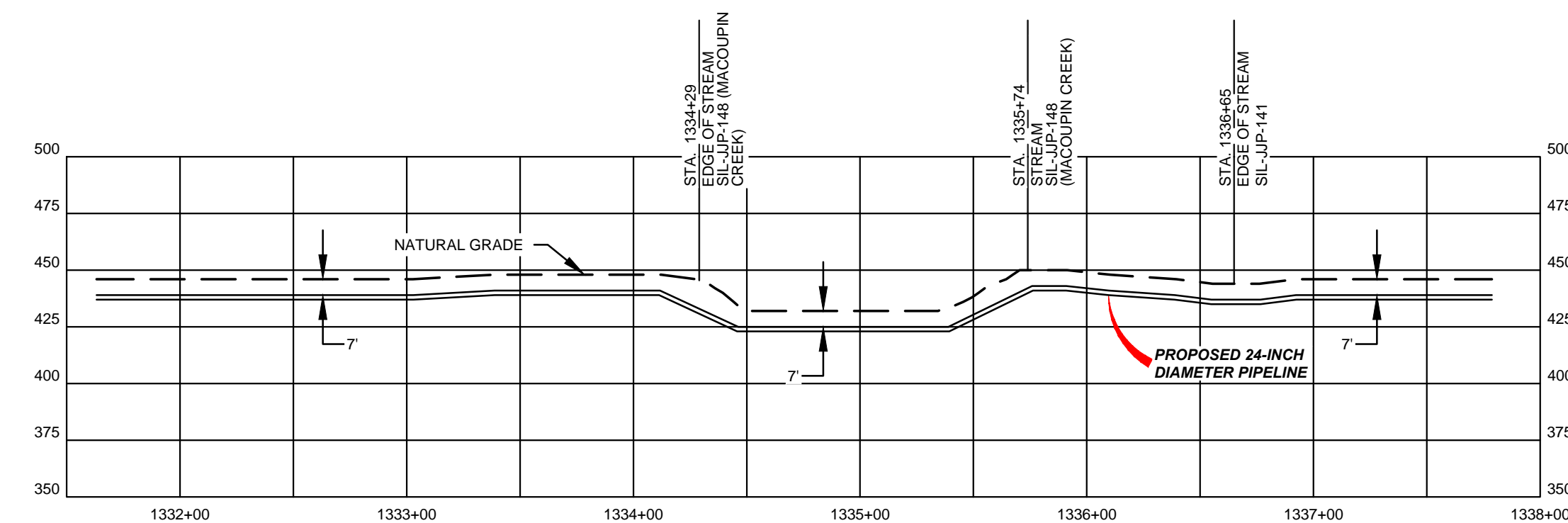


PLAN



DETAIL "A"

\*ACTUAL NUMBER OF FLUMES/PIPES/CULVERTS REQUIRED TO BE DETERMINED IN THE FIELD BASED ON STREAM FLOWS AT THE TIME OF CONSTRUCTION



PROFILE  
SCALES HORIZ. 1" = 60' VERT. 1" = 60'

LEGEND	
	PROPOSED PERMANENT EASEMENT
	TEMPORARY WORKSPACE
	ADDITIONAL TEMPORARY WORKSPACE (ATWS)
	PROPOSED STAGING AREA
	ACCESS ROAD
	PROPOSED 24-INCH DIAMETER PIPELINE
	EXISTING GAS PIPELINE
	EXISTING FOREIGN PIPELINE
	OVERHEAD POWER LINE
	EXISTING FIBER OPTIC LINE
	MMID
	PROPERTY LINE
	MUNICIPAL LINE
	WETLAND (DESKTOP)
	WETLAND (DELINATED)
	EDGE OF STREAM (DESKTOP)
	EDGE OF STREAM (DELINATED)
	SILT FENCE / SEDIMENT BARRIER
	FENCE LINE

- NOTES:
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  2. EXISTING FEATURES SHOWN WERE SURVEYED BY MOTT MACDONALD AND DIGITIZED FROM IMAGERY. ALL LOCATIONS ARE APPROXIMATE, AND SHALL BE VERIFIED BY CONTRACTOR.
  3. PROPERTY LINES DEPICTED ON THIS PLAN ARE BASED ON GIS TAX MAP DATA. THE MAXIMUM FLOW RECORDED DURING 2016 CALENDAR YEAR AT USGS 0558700 MACOUPIN CREEK NEAR KANE, IL WAS 7400 CUBIC FEET PER SECOND ON JULY 3, 2016.

REFERENCE DRAWINGS		REVISIONS				REVISIONS				APPROVALS				PREPARED FOR		PREPARED BY		SPIRE STL PIPELINE PROJECT	
DWG. NO.	TITLE	NO.	REVISIONS	DATE	DRAWN	CK	APPR	NO.	REVISIONS	DATE	DRAWN	CK	APPR	DRAWN BY	DATE	ENG. APPROVAL	DATE	CLIENT APPROVAL	DATE
STLP-A-030	ALIGNMENT SHEET	1	ISSUE FOR FERC	01/2017	RMR	EB	DCG							GS	03/2017	DGG	04/2017		
		2	AMENDMENT TO FERC	04/2017	DWS	RJP	DGG							RJP	04/2017	JEV	04/2017		

PREPARED FOR  
**Spire STL Pipeline**  
 PREPARED BY  
**MOTT MACDONALD**  
 SPIRE STL PIPELINE PROJECT  
 PROPOSED 24-INCH DIAMETER PIPELINE  
 MACOUPIN CREEK CROSSING  
 GREENE COUNTY, ILLINOIS