

Exhibit 3.2.4

**WorleyParsons
Taylorville Energy Center to REX/PEPL
Pipeline Interconnects 12" Natural Gas Pipeline
Estimating Scope**



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Consulting Services for
Taylorville Energy Center to REX/PEPL
Pipeline Interconnects
12" Natural Gas Pipeline Estimating Scope

Prepared for:

Christian County Generation, ("Owner") L.L.C

Prepared by:



WorleyParsons

resources & energy

WorleyParsons Group Inc.

Revision 2

February 19, 2010



Leadership
No Incidents
Safe Behavior

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Attachments

APPENDIX A

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- Drawings
 - Gas-1
 - Gas-2
 - Gas-3
 - Gas-4
- Additional data received from Tenaska on 10-20-09 regarding SNG Export and NG Import to TEC.
- Typical TEC SNG Stream

APPENDIX B

- Sketches
 - SK-001 – Flow Diagram TEC to Pipeline
 - SK-002 – Plot Plan Pig Launcher Area
 - SK-003 – Plot Plan Pig Receiver Area

Revision Record

Revision	Date	Content
0	10/22/09	Initial Report for Comments
1	10/30/09	Draft Report for Client Comments
2	2/19/10	Issued for client use

Section 1

Introduction

WorleyParsons' office in Tulsa, Oklahoma was retained to provide preliminary design definition as required to prepare a total installed cost (TIC) estimate for a 12 inch natural gas transmission pipeline for Tenaska in central Illinois. This pipeline feeds natural gas to the Taylorville Energy Center from interstate pipeline systems and also has the capability to feed substitute natural gas from the Taylorville Energy Center back into the interstate pipelines. The cost estimate accuracy definition from this effort is to be +/- 30%. WorleyParsons developed a sketch (SK-001) which was utilized to clarify the limits of the estimate and to provide preliminary design definition as interpreted from the client provided drawings and documents. Further estimate definition was provided by developing two (2) additional sketches, one (1) at the launcher end at the plant and one (1) at the receiver/metering interconnects at the other end of the line.

Executive Summary

WorleyParsons was requested to provide an estimate for the total installed cost of a bi-directional 12 inch gas pipeline including pig launching and receiving stations based on criteria supplied by Tenaska to an accuracy of +/-30%. Various assumptions were made as defined within this report and a total installed cost of \$15,570,000 was established. This excludes Owner's personnel costs for overseeing the project.

Section 2 Client Provided Documentation

The following is a list of documents that were provided by Tenaska and utilized in preparing the natural gas pipeline definition to develop the cost estimate:

- Drawings
 - Gas-1
 - Gas-2
 - Gas-3
 - Gas-4
- Documents
 - Taylorville (TEC) Natural Gas Fuel Gas Line Description and Assumption Draft Rev. 1 dated 9-3-09
 - Typical TEC SNG stream data

These drawings and documents are included in Appendix A for ease of reference.

Section 3 WorleyParsons Developed Sketches

The following list of drawings was developed to provide definition to the TIC estimate:

<i>Drawing Number</i>	<i>Description</i>
SK-001	Flow Diagram TEC to Pipeline
SK-002	Plot Plan Pig Launcher Area
SK-003	Plot Plan Pig Receiver Area

These drawings are included in Appendix B for ease of reference.

A material takeoff was developed using these drawings plus the GAS 1-4 alignment sheets provided by Tenaska.

Section 4

General Comments

WorleyParsons has assumed that union labor will be required for construction cost estimating purposes. The selected union contract would be independent of any plant construction work and could interface efficiently with the plant contractors while laying the portion of the line within the plant boundaries. The pipeline contractor would be able to employ standard pipeline construction techniques to obtain standard natural gas pipeline industry lay and weld production rates.

Major Assumptions

WorleyParsons assumes the following:

1. Pipeline is to be constructed in 2012, avoiding winter construction.
2. Pipeline material cost will be escalated from fourth quarter 2009 to first quarter 2012, approximately 30 months.
3. Pipeline depth of cover standardized to 4 feet of cover due to the majority of the ROW being in agricultural crop production.
4. Road crossing and stream crossing permits were included in the 221 \$/Rod ROW cost.
5. Pipeline will be dehydrated to a -40° F dew point after hydro test.
6. 3D induction bends with tangents for all direction changes between launcher and receiver, 1-1/2 D fittings will be utilized on branch piping.
7. Power is readily available at both ends of the line.
8. Fencing and lighting will be required around both the launcher and receiver sites.
9. The plant contractor has previously prepared the launcher site area.
10. The receiver site has not been previously prepared.
11. Actuators to be electric motor type.
12. Potable water will be utilized for hydro static testing, and can be disposed of on the ground through standard hay bale and silt fence arrangements.
13. A geometry pig or Kaliper survey will be required.
14. A baseline Magnetic Flux Leakage inspection pig run will not be required.
15. Road bores will not require casing pipe.

16. Cathodic protection rectifiers can be powered from each end or one end of the line, i.e. no intermediary power requirements.
17. The 9 miles of line pipe can be stock piled at the Taylorville Energy Center and will be double random joint length (40 foot) pre coated with 12-14 mills of FBE coating.
18. Two (2) welders will be required for all welds (12" and above).
19. 100' ROW width for top soil segregation and additional temporary work space is available at special crossings.
20. The pipeline control system will require a PLC but be integrated into the main control room using radio communications.
21. One (1) directional bore will be required.
22. Standard natural gas pipeline industry construction specifications will be utilized.
23. Only capital costs are considered. No operating costs are addressed.
24. Conventional bores will be used at all road crossings and road ROW is 120 ft. each.
25. There will be 15 drain tile repairs per mile of pipeline.

Section 5 Hydraulics Verification

WorleyParsons performed basic hydraulic evaluation to validate that the flows and pressure drops as described in the Appendix A documentation were reasonable. Pipephase software was utilized in this analysis and the 3 flow and pressure drop cases listed below were verified as achievable with a 12" x 0.281" WT. x 9 mile long pipeline. The chemical composition of the Substitute Natural Gas used in this modeling was provided by Tenaska.

- Design from the plant for 70 MMSCF/day @ 950 psig with a DP of 5 psi/mile
- Design to the plant will be 83 MMSCF/day @ 600 psig with a DP of 10 psi/mile
- Design to the plant revised to be 111 MMSCF/day @ 600 psig with a DP of 18 psi/mile

Section 6 Basis of Estimate & Cost Estimate



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Class – 1 Estimate Basis

Taylorville Energy Center
Natural Gas Pipeline

Prepared by:

WorleyParsons Inc.
Tulsa Office

October 22, 2009

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1.0 Purpose

The purpose of this estimate basis is to provide an initial conceptual estimate for the installation of approximately 9 miles of 12 inch gas line to provide natural gas service to the proposed Taylorville Energy Center (TEC).

2.0 Quality of the Estimate

The accuracy level of this estimate is expected to fall within the Class 1 estimate quality. The accuracy range of this estimate is premised to be within a cost range of -30% to +30%.

3.0 General Estimate Methodology

This estimate is based on a 4th quarter 2009 cost. Forward escalation to project completion is not included in this estimate. It is premised that escalation will be addressed separately and included with the overall facility estimate by TENASKA.

The direct cost elements for pipeline construction were developed using historical pricing data from previous contractor estimates of similar length and line diameter. The quantities in the estimate for construction lay cost additions are “estimated amounts” and are based on proposed alignment maps provided by others for the expected route.

Material costs for pipe and other materials are based on current vendor quotes or recent historical pricing data.

4.0 Project Scope Overview

The project scope consists of the following:

- Install approximately 9 miles of new 12 inch line from the REX and PEPL Gas pipeline interconnects to the proposed TEC.
- No Compression is premised.
- No Valve stations are premised.

Total cost of the project is estimated at **\$ 15,570,000**.

5.0 Key Documentation

- Preliminary pipeline routing plan
- Alignment maps of the proposed route
- Material and Lay Cost quantities based on the alignment maps
- Vendor pricing on line pipe
- Lay cost unit price data from past recent projects

- Right of way costs provided by TENASKA
- Project schedule

6.0 Construction Estimate

The pipeline and facility estimates cover all work required to complete the installation of the new pipeline, including lay cost, all crossings, and other related construction activities necessary to install the line.

6.1 Direct Costs

6.1.1 Launcher & Receiver Facilities

As part of the project premise a pipeline pig launcher and receiver station are included in the estimate for the pipeline system. The launcher site is premised to be on the TEC plant site with site preparation by the plant contractor and the receiver station located nearby the REX and PEPL meter interconnections. Natural gas metering costs were provided by others and are included as individual line items in this estimate. An allowance for SCADA communications and telemetry is included in the estimate.

6.1.2 Pipelines

A preliminary routing of the pipeline used in the preparation of this estimate was provided by others. The following construction elements, along with their respective distances and quantities, were developed:

- Line lengths
- HDD and bored crossing lengths and quantities
- Drain tile line crossings
- Extra depth and double ditch's
- Work delays
- Quantities for various lay cost construction additions

Line pipe estimates were based on the following diameters and wall thicknesses:

- Pipeline – 12” dia., 0.281wall
- HDD & Crossings – 12” dia., 0.375 wall

Line pipe material costs are based on a budgetary vendor quote. The estimates include an allowance of 3% for overbuy, damage

and minor deviations in route. Pipeline lay cost estimate was based on unit prices obtained from past historical data and adjusted for line diameter and site location. Unit costs include the following items:

- Base lay cost
- HDD costs
- Bored Crossings
- Hydrostatic Testing
- Drain Tile Crossings
- Timber Mat allowance
- Work delays unit costs
- Other unit price additions
- Mainline metering and tie-in costs Provided by REX and PEPL

6.2 Indirect Costs

Indirect costs related to the pipeline construction are included in the contractor lay rate unit prices and are not itemized in the estimate.

6.3 Engineering and Construction Management

Engineering and construction management costs are based on experience and historical averages from similar size and length pipeline projects.

6.4 Right of Way and Damages

Right of way (ROW) and damage costs were provided by TENASKA and assume a cost of \$ 221.00 per rod for all land acquisition and legal costs. Total ROW costs are \$ 644,000 based on the proposed route.

6.5 Freight

Pipe and bulks freight costs are include in the construction contractor base lay price, which includes picking up the pipe at the coating yard and delivering to site.

6.6 Taxes

A composite tax rate of 8.75% was applied to all material costs to arrive at the estimated sales tax value.

7.0 Owners Costs & Contractor Services

7.1 Owner Costs

Owner related costs are not included in this estimate per client request. Owner related costs would include project management, inspection, HSE, admin and other support functions, staffed by the owner personnel necessary to oversee the project execution. It is premised that owner cost will be added by TENASKA to support not only the pipeline but the overall project and facilities.

7.2 Contract Services

- In addition to owner costs, other contract/third party costs should be considered to be included with owner costs including field inspection, commissioning and operations personnel during project execution.

8.0 Escalation

As mentioned previously no forward escalation allowance is included in this estimate. Escalation will be addressed by the client for the overall project

9.0 Risk and Contingency

A risk assessment for the project has not been requested or conducted for this study. A nominal contingency allowance of 20% has been applied to all costs. This allowance is considered to be reasonable for the estimate quality and level of definition at this stage.

10.0 Pipeline Interconnection Costs

Mainline tie-in costs to the REX and PEPL gas transmission lines have been provided by the client. The cost for these tie-ins are listed separately in the estimate and represent an all inclusive cost, including all materials, labor, engineering, contingency, etc. to perform the tie-ins. No validation or evaluation of these costs was requested by the client or preformed for this estimate study.



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PROJECT: Tenaska Energy Gas Transmission Pipeline 12" 9.0 miles
 LOCATION: Taylorville, IL

Date: 10/22/2009
 Prepared By: P McIntire
 Estimate Class: Class - 1
 Accuracy Range: -30% to +30%

		Total Cost
Pipeline Material Costs		
Pipe	\$1,252,400	
Other Materials	\$87,310	
		\$1,339,710
Pipeline Construction Cost		
Base Lay Cost	\$3,569,000	
Lay Cost Adders	\$1,376,434	
Launcher/Receiver Costs	\$453,172	
		\$5,398,606
Right of Way		
By Tenaska Energy	\$636,000	
		\$636,000
TOTAL DIRECT FIELD COSTS		\$7,374,316
Engineering		
Engineering FEL + Detailed	\$485,100	
Construction Survey	\$110,000	
		\$595,100
Material Related Costs		
Freight Sales Taxes	\$208,690	
		\$208,690
Client Costs		
Project Manager		
Constr. Superintendent		
Constr. Field Rep.		
Environmental		
Contract Inspection & Services		
Callper Test	\$25,000	
Pipeline Inspectors	\$400,000	
Third Party Commissioning & Start up	\$92,700	
		\$517,700
SUB-TOTAL PROJECT COSTS		\$8,695,806
Escalation @		\$ -
TOTAL PROJECT COSTS BEFORE ESCALATION		
Contingency @ 20.0%		\$1,740,794
REX Interconnection Cost (Provided by Tenaska)		\$2,827,000
PEPL Interconnection Cost (Provided by Tenaska)		\$2,306,400
TOTAL PROJECT COSTS		\$15,570,000

APPENDIX A – Client Provided Documentation

- Taylorville (TEC) Natural Gas Fuel Gas Line Description and Assumption Draft Rev.1 dated 9-3-09
- Drawings
 - Gas-1
 - Gas-2
 - Gas-3
 - Gas-4
- Additional data received from Tenaska on 10-20-09 regarding SNG Export and NG Import to TEC.
- Typical TEC SNG Stream

Taylorville (TEC) Natural Gas Fuel Gas Line Description and Assumptions

Draft Rev. 1

9-3-09

Description

The natural gas pipeline will be a 12-inch steel routed per drawings "preliminary natural gas layout sheets 1 to 17". The line will be designed for bi-directional flow. The north end of the line will terminate at an interconnect station yard. The station will be designed to tie into both the PEPL and REX gas lines. The measurement, pipeline tapping, and piping from the end of the TEC line will be installed by PEPL or REX. Cost for the pipelines has been received from PEPL and REX and will be used in the cost estimate. TEC's line will require two flow control valves and a Remote Terminal Unit (RTU) to balance flows between the two interconnects. The flow control valves will be 12-inch full opening ball valves.

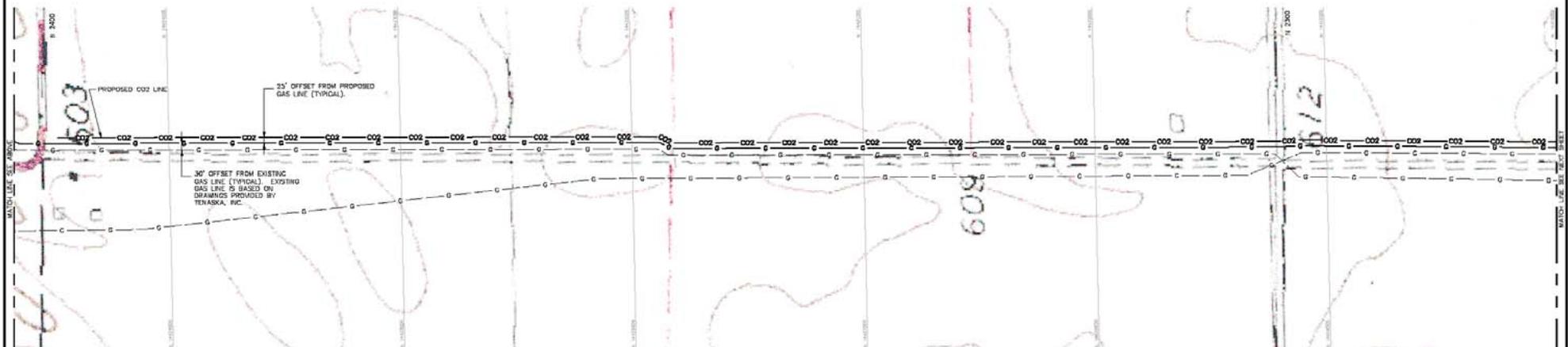
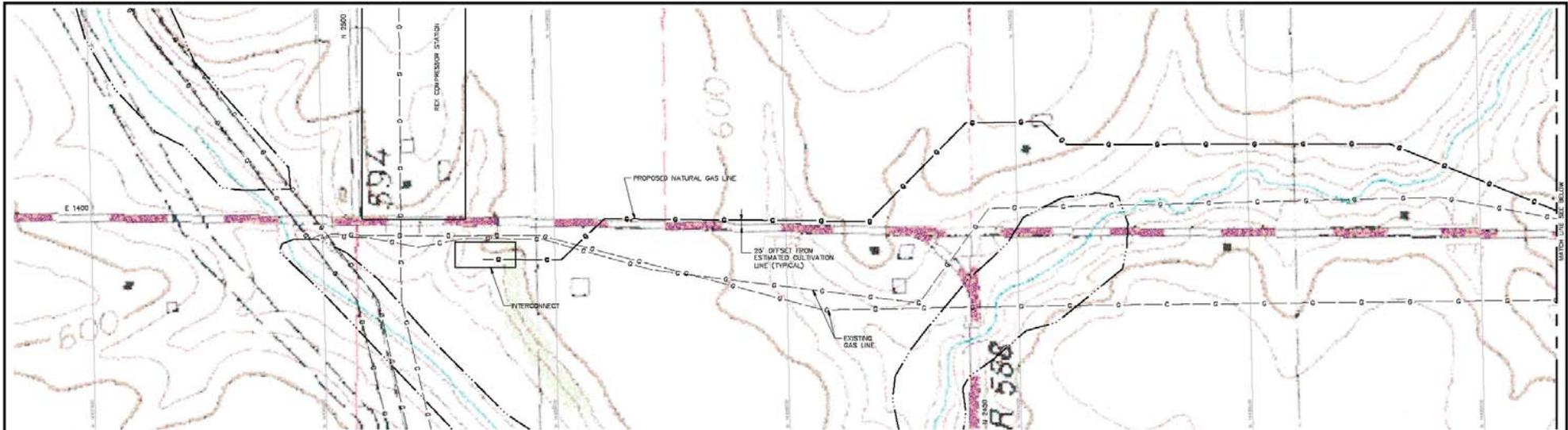
The line will be designed for smart pigging with permanent launchers and receivers. The line will be pigged going south to north using gas flow from the plant to move the pig. Minimum depth of cover to the top of the pipe will be 36 inches, however, assume 50% of the line will require 48 inches of cover due to ROW and drainage tile issues. The south end of the line will have a launcher located within the plant. A 12-inch line will connect the plant to the launcher. This line will be considered plant piping and is not part of the gas line. Source MAOP will be 1480 psig, therefore, no overpressure protection (OPP) will be required. An insulating kit will be installed at the launcher to isolate the plant piping from the pipeline. Insulating kits will also be installed between the pipeline and the PEPL and REX interconnects.

The line will be designed to meet DOT 192 standards for transmission pipelines. The Class location of the line is Class 1, but the line will be designed to Class 2 standards. Line pipe will be 12.75" OD, 0.281" wall, grade X60 Fusion Bonded Epoxy (FBE) using a 0.6 design factor. Pipe needing a 0.5 design factor will be 12.75" OD, 0.375" wall, grade X60 FBE. Any bores will use a powercrete coating to protect the FBE coating. Fittings will be 0.375" wall, grade Y-60. Launcher and receiver barrels will be 16" 0.375" X65. Launcher and receiver kicker lines will be 6.625" OD, 0.280" wall Grade "B". Kicker valves and blow off valves will be weld-in plug type valve. All other valves will be full opening weld-in ball valve.

The line will be hydrotested with a minimum pressure of 2,220 psig for 8 hours. Test pressure will not exceed 2,368 psig.

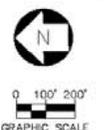
Assumptions

- 1480 MAOP
- 120 F design Temperature
- Design from the plant for 70 MMSCF/day @ 950 psig with a DP of 5 psi/mile
- Design to the plant will be 83 MMSCF/day @ 600 psig with a DP of 10 psi/mile
- ANSI 600# SP-44 flanges
- ANSI 600# rated for 1480 @ 120 F
- Line pipe will be 12.75" OD, 0.281" wall, grade X60 FBE
- Line designed to be pigged with permanent launcher and receivers capable of smart pigs
- No winter construction
- Full topsoil segregation
- 100 % X-ray
- No Rock in ROW
- No Compression
- Drainage tile will be crossed and protected during construction
- 12" ball style flow control valves at interconnects
- No OPP required.
- REX interconnect cost: \$2,827,000 with tax gross-up
- PEPL interconnect cost: \$2,306,400 with tax gross-up
- ROW cost: \$221 /rod (includes cost for agent, easement, damages)



LEGEND:
 - - - - - EXISTING GAS LINE
 - - - - - PROPOSED NATURAL GAS LINE
 - - - - - PROPOSED CO2 LINE
 - - - - - FLOOD PLAIN

- SOURCE:**
1. NORTHEAST QTR AND SOUTHEAST QTR, GROVE CITY AND TAYLORVILLE, E. 3.75 MINUTE DIGITAL ORTHOPHOTO, 2005. SCS GIS DATABASE.
 2. EXISTING GAS LINES APPROXIMATE LOCATION ARE BASED ON PANHANDLE EASTERN PIPE LINE DRAWINGS PROVIDED BY TENASKA, INC.
 3. THE INTERCONNECTION AND COMPRESSOR STATION LOCATIONS PROVIDED BY TENASKA.
 4. FLOOD PLAIN IS BASED ON FEMA'S FLOOD HAZARD BOUNDARY MAP, CHRISTIAN COUNTY, IL, UNINC. AREAS, PAGE 4 OF 11, COMMUNITY - PANEL NUMBER 17026 DDGL, APRIL 7, 1978.



\\SPRINGER\02\PROJECTS\TENASKA\DRAWINGS\WORKING\GAS\GAS

REV.	DATE	DESCRIPTION
ISSUES & REVISIONS		

Owner:	
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PATRICK
ENGINEERING INC.

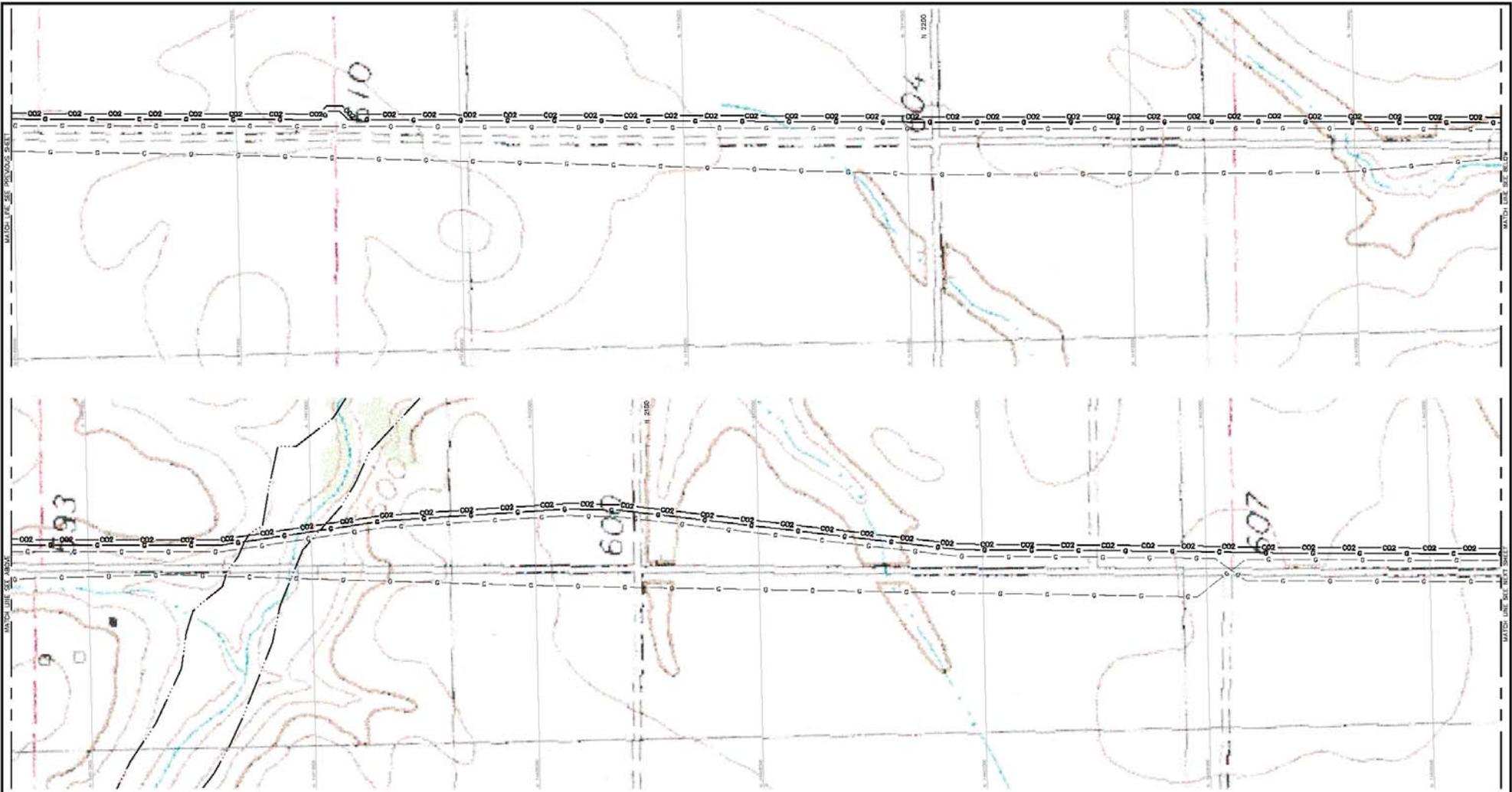
300 W. TENASKA ST. SUITE 200 TEL: (617) 965-1000
 WINTERFIELD, MA 01891 FAX: (617) 965-1000
 www.patrickengineering.com

PROFESSIONAL DESIGN FIRM LICENSE NO. 94-02048

Project: **TENASKA TAYLORVILLE, LLC.
 TAYLORVILLE ENERGY CENTER**

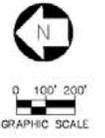
Sheet Title: **CONNECTION CORRIDORS - PHASE I STUDY
 CONCEPTUAL NATURAL GAS PIPELINE
 & CO2 PIPELINE**

PROJECT No.:	20903.027	DATE:	9/4/09
DESIGNED BY:	JWD	DRAWN BY:	JWD
CHECKED BY:	MEM	APPROVED BY:	CJB
SHEET No.		GAS-1	
		Sheet 1 of 4	



- LEGEND:**
- EXISTING GAS LINE
 - PROPOSED NATURAL GAS LINE
 - PROPOSED CO2 LINE
 - FLOOD PLAIN

- SOURCE:**
1. NORTHEAST QTR AND SOUTHEAST QTR, GROVE CITY AND TAYLORVILLE, E. 3.75 MINUTE DIGITAL PHOTO, 3000, SCS 2IS DATABASE.
 2. EXISTING GAS LINES APPROXIMATE LOCATION ARE BASED ON RAINHARDE EASTERN PURE LINE DRAWINGS PROVIDED BY TENASKA, INC.
 3. THE INTERCONNECTION AND COMPRESSOR STATION LOCATIONS PROVIDED BY TENASKA.
 4. FLOOD PLAIN IS BASED ON FEMA'S FLOOD HAZARD BOUNDARY MAP, CHRISTIAN COUNTY, E.; UNINC. AREAS, PAGE 4 OF 11, COMMUNITY - PANEL NUMBER 170926 DD4A, APRIL 7, 1978.



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REV.	DATE	DESCRIPTION
ISSUES & REVISIONS		

Owner:	
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PATRICK ENGINEERING INC.

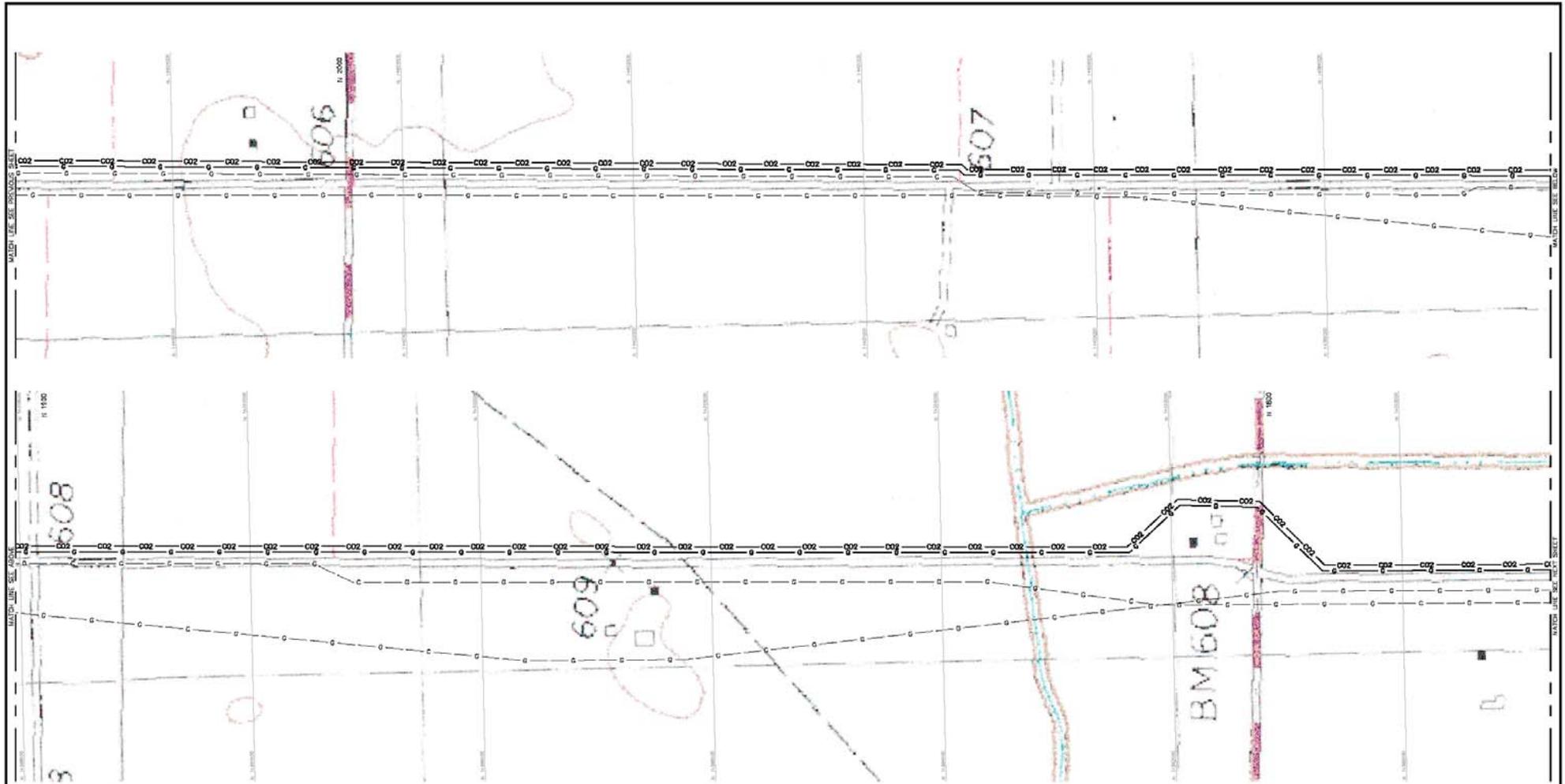
100 W. KENNEDY BLVD. SUITE 1000 | TEL: 817-380-7000
 IRVING, TX 75039-1002 | FAX: 817-380-7009
 www.patrickeng.com

PROFESSIONAL DESIGN FIRM LICENSE NO. 194-00048

Project: **TENASKA TAYLORVILLE, LLC. TAYLORVILLE ENERGY CENTER**

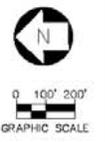
Sheet Title: **CONNECTION CORRIDORS - PHASE I STUDY CONCEPTUAL NATURAL GAS PIPELINE & CO2 PIPELINE**

PROJECT No.:	20903.027	DATE:	8/4/09
DESIGNED BY:	JWD	SHEET No.:	GAS-2
DRAWN BY:	JWD		Sheet 2 of 4
CHECKED BY:	MEM		
APPROVED BY:	CJB		



LEGEND:
 - - - - - EXISTING GAS LINE
 ——— PROPOSED NATURAL GAS LINE
 - - - - - PROPOSED CO2 LINE
 - - - - - FLOOD PLAIN

- SOURCE:**
1. NORTHEAST QTR AND SOUTHEAST QTR, GROVE CITY AND TAYLORVILLE, E. 3.75 MINUTE DIGITAL PHOTO, 3000, SCS 2IS DATABASE.
 2. EXISTING GAS LINES APPROXIMATE LOCATION ARE BASED ON PANHANDLE EASTERN PIPE LINE DRAWINGS PROVIDED BY TENASKA, INC.
 3. THE INTERCONNECTION AND COMPRESSOR STATION LOCATIONS PROVIDED BY TENASKA.
 4. FLOOD PLAIN IS BASED ON FEMA'S FLOOD HAZARD BOUNDARY MAP, CHRISTIAN COUNTY, E., UNINC. AREAS, PAGE 4 OF 11, COMMUNITY - PANEL NUMBER 170926 DD4, APRIL 7, 1978.



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REV.	DATE	DESCRIPTION
ISSUES & REVISIONS		

Owner:	
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PATRICK ENGINEERING INC.
 100 W. KENNEDY BLVD. SUITE 1000 TEL: 817-385-1000
 IRVING, TEXAS 75039-1002 FAX: 817-385-1009
 http://www.patrickeng.com
 PROFESSIONAL DESIGN FIRM LICENSE NO. 164-00048

Project: **TENASKA TAYLORVILLE, LLC. TAYLORVILLE ENERGY CENTER**

Sheet Title: **CONNECTION CORRIDORS - PHASE I STUDY CONCEPTUAL NATURAL GAS PIPELINE & CO2 PIPELINE**

PROJECT No.:	20903.027	DATE:	8/4/09
DESIGNED BY:	JWD	SHEET No.:	GAS-3
DRAWN BY:	JWD		Sheet 3 of 4
CHECKED BY:	MEM		
APPROVED BY:	CJB		



LEGEND:
 - - - - - EXISTING GAS LINE
 - - - - - PROPOSED NATURAL GAS LINE
 - - - - - PROPOSED CO2 LINE
 - - - - - FLOOD PLAN

- SOURCE:
1. NORTHEAST QTR AND SOUTHEAST QTR, GROVE CITY AND TAYLORVILLE, E. 3.75 MINUTE DIGITAL DRTOPHO, 2005. SDG DIS DATABASE.
 2. EXISTING GAS LINES APPROXIMATE LOCATION ARE BASED ON PANHANDLE EASTERN PIPE LINE DRAWINGS PROVIDED BY TENASKA, INC.
 3. THE INTERCONNECTION AND COMPRESSOR STATION LOCATIONS PROVIDED BY TENASKA.
 4. FLOOD PLAN IS BASED ON TENA'S FLOOD HAZARD BOUNDARY MAP, CHRISTIAN COUNTY, E, UNINC. AREAS, PAGE 4 OF 11, COMMUNITY - PANEL NUMBER 170926 004A, APRIL 7, 1978.



0 100' 200'
 GRAPHIC SCALE

\\SPRINGER\PROJECTS\TENASKA\DRAGONS\WORKING\GAS.DWG

REV.	DATE	DESCRIPTION

Owner: _____



MR. W. EDWARDS ET ALTE AND TEL: 817-385-1888
 DFW OFFICE: 817-385-1888
 HOUSTON OFFICE: 281-385-1888
 PROFESSIONAL DESIGN PERM LICENSE NO. 54-02048

Project: **TENASKA TAYLORVILLE, LLC.
 TAYLORVILLE ENERGY CENTER**

Sheet Title: **CONNECTION CORRIDORS - PHASE I STUDY
 CONCEPTUAL NATURAL GAS PIPELINE
 & CO2 PIPELINE**

PROJECT No.: 20003.027
 DESIGNED BY: JWD
 DRAWN BY: JWD
 CHECKED BY: MEM
 APPROVED BY: CJB

DATE: 8/4/09
 SHEET No.: **GAS-4**
 Sheet 4 of 4

Additional Data Received From Tenaska on 10-20-09 – SNG Export & NG Import to TEC

We reviewed the SNG export and NG import flows for the latest project design. The changes in design flows should not change the assumed pipeline size (12.75" OD .281" wall).

The maximum SNG export is 65 MMSCF/day. This occurs with the SNG operation at full production and the power island operating at minimum load in a 1x1 configuration.

The maximum NG import is 111 MMSCF/day (based on Siemens gas turbine technology, 24F ambient temperature, and 950 Btu/scf natural gas).

The design basis for the pipeline should be adjusted accordingly.

* Design from the plant for 70 MMSCF/day @ 950 psig with a DP of approximately 5 psi/mile (SNG)

* Design to the plant will be 111 MMSCF/day @ 600 psig with a DP of approximately 18 psi/mile (NG)

Typical TEC SNG Stream

Stream Number	41002	
Description	SNG Product	
Phase	Vapour	
Total flow	lbmol/h	10771
Total flow	lb/h	177482
	Liquid	Vapour
Vol. flow	gpm	-
Norm. vol. flow	MMSCFD	-
Mass flow	lb/h	177482
Mole flow	lbmol/h	10771
Molweight	lb/lbmol	16.48
Flr density	lb/ft ³	1.45
Norm. density	lb/SCF	0.05
Spec. heat cap.	Btu/(lb °F)	0.57
Viscosity	cP	0.01
Ther. conductivity (Btu/h)(ft °F)		0.02
Mole fraction	%	100.00
Mass fraction	%	100.00
Temperature	°F	108
Pressure	psi(g)	500
Component	MW	mol%
H ₂	2.02	0.67
CO	28.01	0.00
CO ₂	44.01	0.10
CH ₄	16.04	95.23
O ₂	32.00	0.00
N ₂	28.01	3.19
AR	39.95	0.17
MeOH	32.04	0.00
H ₂ O	18.02	0.33

<i>Aligned with Siemens Guarantee</i>	
	<i>"Expected Case"</i>
100%	110%
93.3	102.7
169,030	185,933
10,258	11,284

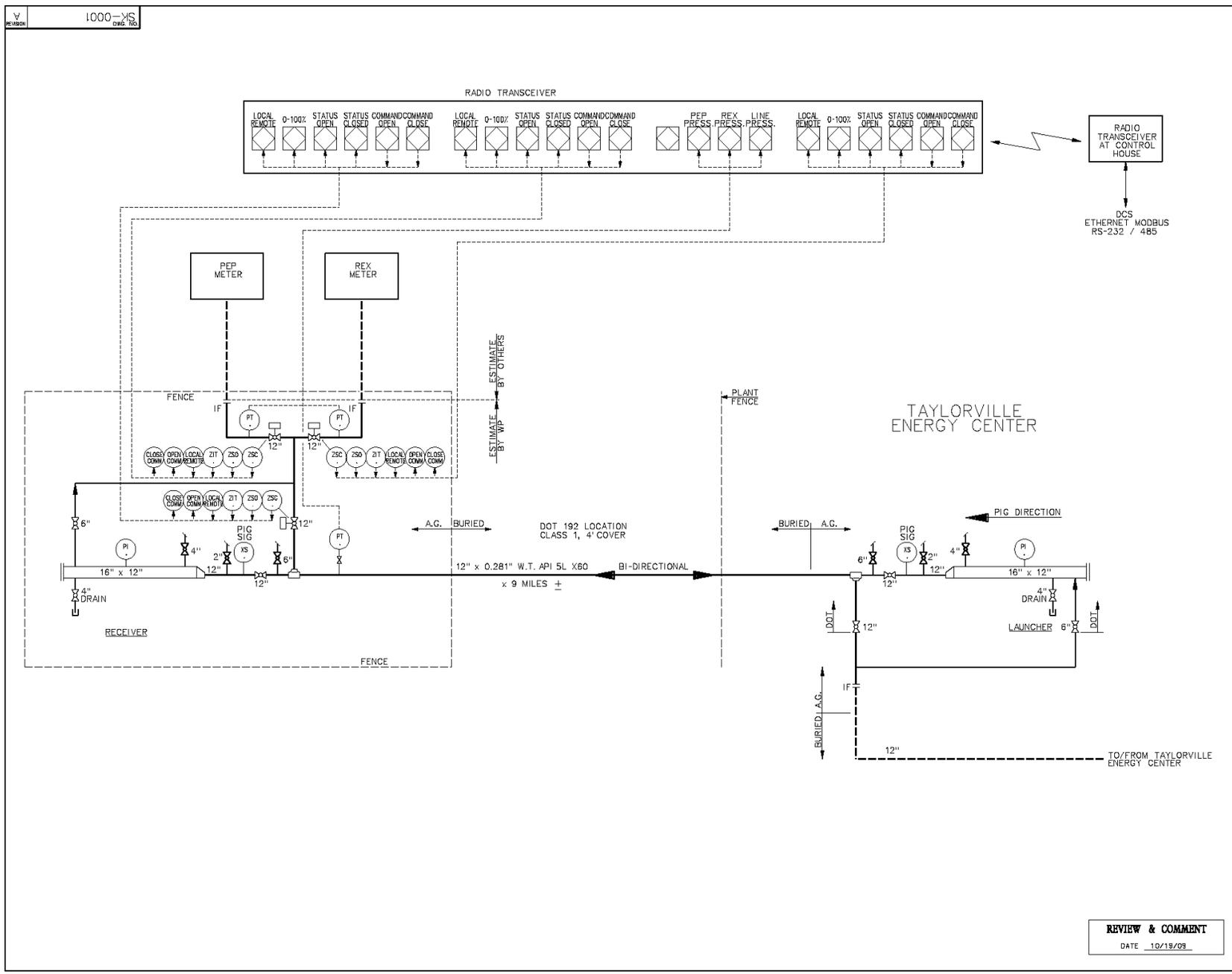
NOTE:

Rates are at the battery limit of the Methanator before drying in the TEG unit and before take-offs for parasitic usages

APPENDIX B – WorleyParsons Sketches

- Sketches
 - SK-001 – Flow Diagram TEC to Pipeline
 - SK-002 – Plot Plan Pig Launcher Area
 - SK-003 – Plot Plan Pig Receiver Area

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NOTES:

- 1480 MAOP
- DESIGN FOR LOCATION CLASS II
- PIG FROM PLANT TOWARDS P/L
- LINE IS BI-DIRECTIONAL
- LOCATE TRANSDUCER WITH I/O AT CONTROL VALVES AND CONTROL BUILDING
- PIPELINE DESIGN FACTOR = .6

REV	DATE	DESCRIPTION	BY	CHK	APP	PH
C	10/19/09	ISSUE FOR REVIEW REVISED REVISED	DR			
B	10/12/09	ISSUE FOR REVIEW REVISED	DR			
A	10/02/09	ISSUE FOR REVIEW	DR			

DESIGNED BY	DATE
DRITCHEY	09/25/09
CHECKED BY	DATE
ENGINEER	DATE
PROJECT ENGINEERING MANAGER/DATE	
PROJECT MANAGER	DATE

WorleyParsons
resources & energy

CLIENT/PROJECT TITLE
TENASKA
TAYLORVILLE ENERGY CENTER

PROJECT NO.
##

SCALE
NONE

DWG. NO.
SK-0001

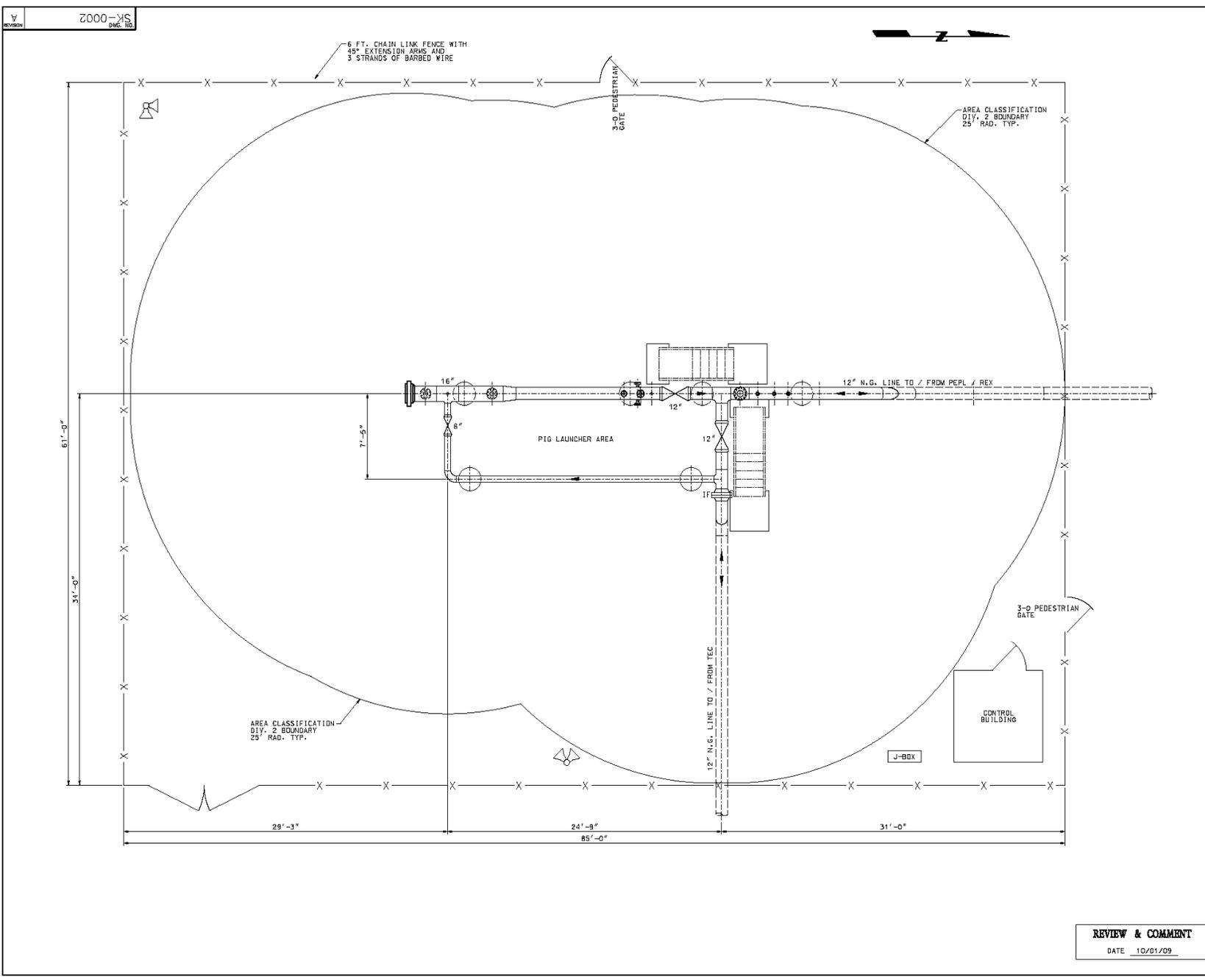
REVISION
C

FILE NAME: \\TENASKA\PI\SR-0001.dgn

ANSI D 22 x 34

REVIEW & COMMENT
DATE 10/19/09

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REV	DATE	ISSUE FOR REVIEW	DR	BY	CHK	REV	RM
A	10/01/09						

DRAWN BY	DATE	DESCRIPTION	BY	CHK	REV	RM
RITCHIEY	09/29/09					
CHECKED BY	DATE					
OWNER	DATE					
PROJECT ENGINEERING MANAGER	DATE					
PROJECT MANAGER	DATE					



CLIENT/PROJECT TITLE
 TENASKA
 TAYLORVILLE ENERGY CENTER

PROJECT NO.
 58007407

PLOT PLAN
 PIG LAUNCHER AREA

REVIEW & COMMENT
 DATE 10/01/09

SCALE
 $\frac{1}{4}'' = 1' - 0''$

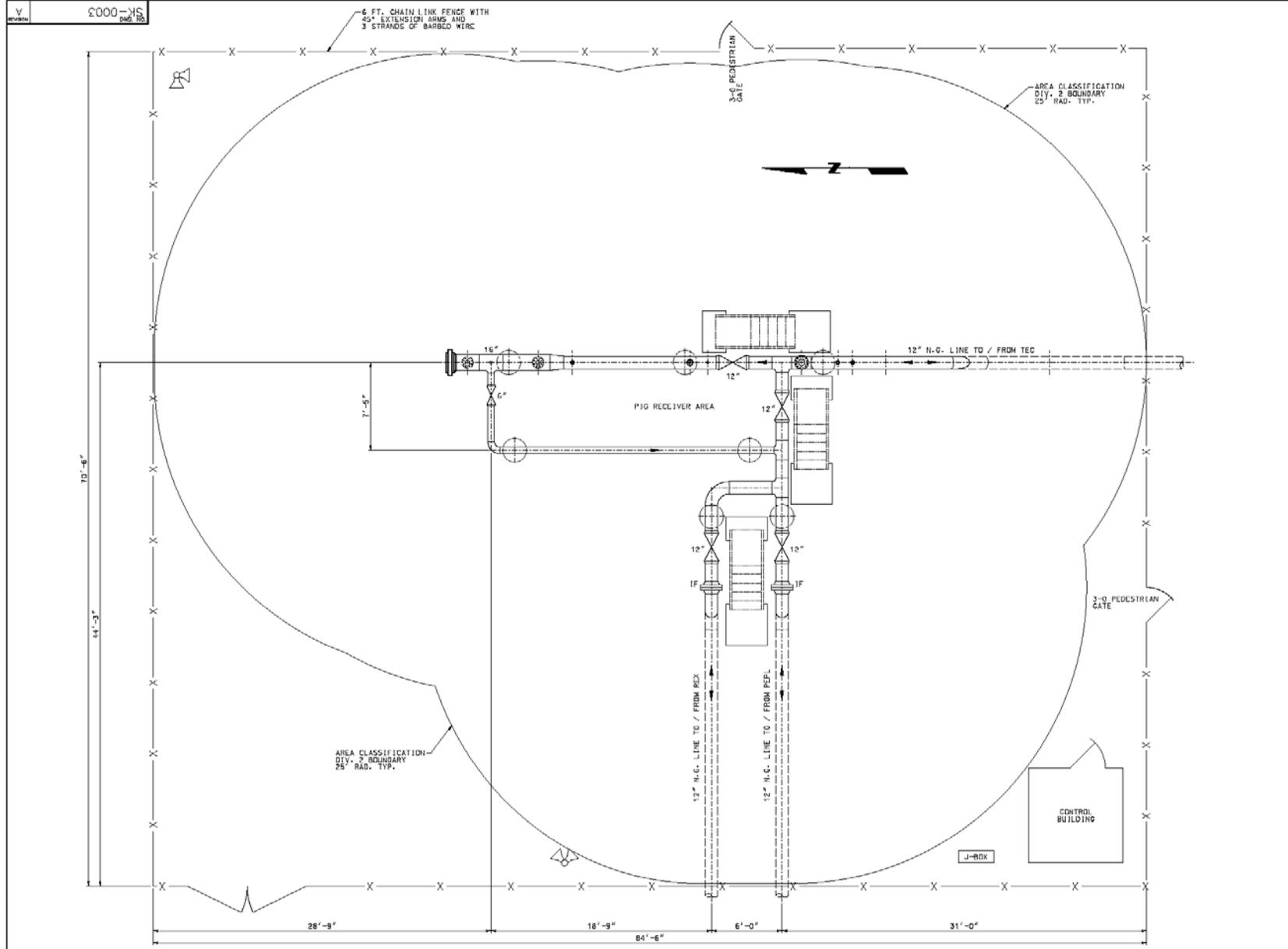
DWG. NO. SK-0002

REVISION
 A

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SK-0002

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REVIEW & COMMENT
DATE 10/01/09

NOTES:

REV.	DATE	DESCRIPTION	BY	CHK	APP
A	10/01/09	ISSUE FOR REVIEW			
1	09/28/09	ISSUE FOR REVIEW	RITCHEY		
2					
3					
4					
5					



CLIENT/PROJECT TITLE
TENASKA TAYLORVILLE ENERGY CENTER

PROJECT NO.
58007407

PLOT PLAN
PIG RECEIVER AREA

SCALE: 1/4" = 1'-0"
DRAWING NO. SK-0003
REVISION A

FILE NAME: \\TENASKA\NVP\NVP\SK-0003.dgn ANS D 22 x 34

SK-0003