

**STRATEGIC PETROLEUM RESE**

**ENGINEERING CHANGE PROPOSAL**

**SUMMARY SHEET**

**CLASS I CHANGE**

ECP NUMBER SJ-M/O-4639 TITLE Purchase and Install 7 New Rectifiers and Groundbeds at Sugarland

BUDGET SOURCE <input type="checkbox"/> SPR BLI _____ <input type="checkbox"/> CONTRACTOR BASELINE <input type="checkbox"/> AUD <input type="checkbox"/> OTHER: Lease Contractor	AUTHORITY <input checked="" type="checkbox"/> PCCB <input type="checkbox"/> ECC	
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SCHEDULE <input type="checkbox"/> YES MILESTONE NUMBER _____ CMCN NUMBER _____ <input checked="" type="checkbox"/> NO	TOTAL ESTIMATED COST OF CHANGE	
		FY 98      FY 99
	CAPITAL	\$7586      \$17,961
	EXPENSE	\$55,330      \$36,088
TOTAL	\$62,916      \$54,049	

PCCB/ECC SIGNATURES	DISPOSITION			COMMENTS CONDITIONS/LIMITATIONS
	C O N C U R	N O O N C U R	D A T E	
<i>APM Management And Maint. DOE MENTOR SITE OFFICE Michael M. [Signature]</i>	✓		3/19/04	
APM TECHNICAL ASSURANCE <i>[Signature]</i>	✓		3/17/04	
APM SYSTEMS AND PROJECTS <i>[Signature]</i>	✓		3/17/04	<i>Pentelcon w/ WIP</i>
APM MAINTENANCE AND OPERATIONS <i>[Signature]</i>	✓		3/15/04	
DEPUTY PROJECT MANAGER				
DOE CMO				
PROJECT MANAGER				
DEPUTY ASSISTANT SECRETARY - SPR				

*need vendor Data  
put into Cendra -  
need Dugs marked up*

PCCB/ECC ACTION

FULL APPROVAL       CONDITIONAL/LIMITED AP

Completed 1998 + 1999

### STRATEGIC PETROLEUM RESERVE ENGINEERING CHANGE PROPOSAL

ECP NUMBER <b>SJ-M/O-4639</b>		ECP TITLE <b>Purchase and Install 7 New Rectifiers and Groundbeds at Sugarland</b>		PAGE 1 OF 4	
CONTRACTOR CHANGE NO. / REV.		INITIATED BY <b>Eric Wells</b>	DATE <b>01/22/03</b>	SUBMITTED BY <b>Jill Derise</b>	DATE <b>1/22/03</b>
PRIORITY  <input type="checkbox"/> EMERGENCY  <input type="checkbox"/> URGENT  <input checked="" type="checkbox"/> ROUTINE		ORG / CONTRACTOR <b>Shell Pipeline Company LP</b>	PHONE NO. <b>(225) 675-6876</b>	ORG/CONTRACTOR <b>Shell Pipeline Company LP</b>	PHONE NO. <b>(504) 728-7366</b>
VALUE ENGINEERING <input type="checkbox"/> VEP (MANDATORY) <input type="checkbox"/> VECP (VOLUNTARY)		DRAWDOWN CRITICAL <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		ROM ESTIMATE  \$ <u><b>116,965.</b></u>	

#### DESCRIPTION:

**PROBLEM / EXISTING CONFIGURATION**  
**This ECP is being submitted as documentation of work that was done at Sugarland in 1998 and 1999. Cathodic protection levels provided by original deepwell groundbeds were inadequate to protect tank floors and manifold piping.**

**PROPOSED SOLUTION / ENHANCEMENT**  
**Individual surface groundbeds and rectifiers were installed for each tank, as well as a groundbed and rectifier to protect the manifold area near Tanks 1 and 2. Existing rectifiers were disconnected and placed in storage at Sugarland; existing deepwell groundbeds were abandoned in place.**

**New rectifiers were manufactured by JA Electronics and are air-cooled. Five (5) of the rectifiers are 30volt 50amp DC units (Serial #s: 98285, 98286, 98287, 99417, 99418), 1 is a 30volt 60amp DC unit (Serial #99419), and 1 is a 50volt 100amp DC unit (Serial #99420). See attached JA Electronics rectifier parts lists and drawings for installation details:**

- Rectifier SLT-1, Tank 1, Drawing #D-32975**
- Rectifier SLT-2, Tank 2, Drawing #D-32976**
- Rectifier SLT-3, Tank 3, Drawing #D-33306**
- Rectifier SLT-4, Tank 4, Drawing #D-33307**
- Rectifier SLT-5, Tank 5, Drawing #D-33308**
- Rectifier SLT-6, Tank 6, Drawing #D-32977**
- Rectifier SLT-7, Manifold Area by Tanks 1 and 2, Drawing #D-32978**

[Reference Shell Pipeline AFEs 149050, 1490<sup>76</sup>~~87~~, 349051, and 349073]

**REASON/JUSTIFICATION**  
**Cathodic protection did not meet DOT 850mv criteria throughout the terminal, therefore piping and tank floors were susceptible to higher corrosion rates. The purchase and installation of the rectifiers for \$25,547 are considered to be a capital improvement (therefore are "unfunded liability") because 5 rectifiers were additions to the facility and 2 were upgrades to existing rectifiers. The groundbed installations for \$91,418 were not considered to be capital improvements because the project entailed replacing deepwell with surface anodes.**

CI'S AFFECTED

TECHNICAL ANALYSIS/RECOMMENDATION	IMPLEMENTATION METHOD <input type="checkbox"/> SUBCONTRACT <input type="checkbox"/> M&O LABOR (LOE) <input type="checkbox"/> COMBINATION
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ENGINEERING	DATE	DOE SSR	DATE	<input type="checkbox"/> CONCUR <input type="checkbox"/> NONCONCUR
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## STRATEGIC PETROLEUM RESERVE

### ENGINEERING CHANGE PROPOSAL

#### SOFTWARE, HARDWARE, FIRMWARE CHANGE

CONTRACTOR CHANGE NUMBER	REVISION NUMBER	ECP NUMBER <i>SJ-M/O-4639</i>	Page 3 of 4
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SOFTWARE CHANGE ANALYSIS	HARDWARE/SOFTWARE AFFECTED
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	(NOTE: REDLINE CI BOM)
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DISPOSITION OF PARTS

REWORK SITE COMPONENTS ONLY     
  REWORK ALL SITE COMPONENTS     
  COMPONENTS NOT AFFECTED  
 OTHER (DESCRIBE) \_\_\_\_\_

COMPONENT COMPATIBILITY (LIST COMPONENTS SEPARATELY IF COMPATIBILITIES ARE DIFFERENT)

INTERCHANGABLE     
  DRAWDOWN COMPATIBLE     
  NONCOMPATIBLE

OPCS SUPPORT ENGINEER	DATE	FUNCTIONAL MANAGER	DATE
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IMPLEMENTATION/TEST COMMENTS

WITNESSED BY	DATE
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TEST APPROVED BY	DATE	CHANGE RELEASE AUTHORITY	DATE
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**STRATEGIC PETROLEUM RESERVE  
ENGINEERING CHANGE PROPOSAL  
CONFIGURATION CHANGE AFFECTED REPORT**

"TO BE COMPLETED BY TECHNICAL REVIEW PROCESS, ENGINEERING AND CONFIGURATION MANAGEMENT ORGANIZATION DEFINED PROCESS"

ECP NO. <b>SJ-46-4639</b>	CONTRACTOR CHANGE NO.	REV.	CHANGE CLASSIFICATION <input checked="" type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II
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FUNCTIONS AFFECTED			DOCUMENTS AFFECTED		
Y	N	ITEM	Y	N	ITEM
		LEVEL 1 <input type="checkbox"/> II <input checked="" type="checkbox"/> III <input type="checkbox"/> CRITERIA			ELECTRICAL
		PERFORMANCE CRITERIA	Y		315 - CATHODIC PROTECTION
		RAM			350 - STANDARDS
		INTERFACE CHARACTERISTICS			INSTRUMENTATION
		I/O POINTS			401 - BLOCK DIAGRAM
		DOE LEVEL I, II, III SCHEDULES			402 - LOOP DIAGRAMS
		GUARANTEES/DELIVERABLES			403 - INSTRUMENT PLANS AND DETAILS
		SAFETY/ENV/FP (CIRCLE ONE)			404 - INSTRUMENT WIRING DIAGRAM
		SECURITY REQUIREMENTS			409 - INSTRUMENT INDEX
		OPCS SOFTWARE			450 - STANDARDS
		OPCS HARDWARE			MAPPING
		OPCS FIRMWARE			501 - ALIGNMENT SHEETS
		RANGES/ I/O POINTS			509 - PIPELINE DWGS (MAINLINE VALVES, DRIPS, SCRAPER, TRAPS
		DIP SWITCH SETTINGS/JUMPERS			550 - STANDARDS
		MASTER CI LIST			ARCHITECTURAL
		WELLHEAD CONFIGURATION			720 - ELEVATIONS AND FLOOR PLANS
		SPARES/PROVISIONING REQUIREMENTS			750 - STANDARDS
		OPERATIONS MANUALS			DOCUMENTATION
		MAINTENANCE MANUALS			900 - RESERVED
		GOVERNMENT FURNISHED EQUIPMENT			901 - TECHNICAL/PERFORMANCE/DESIGN CRITERIA
		ENERGY USAGE			910 - DESIGN DESCRIPTION/BASIS
		VALUE ENG. (COST SAVINGS)			911 - PROCESS SET POINT DOCUMENTS
		OPERATIONS MODELS	Y		912 - EQUIPMENT LIST
		OTHER			913 - MOV LIST
DOCUMENTS AFFECTED					915 - ELECTRICAL SAFETY
Y	N	ITEMS			920 - I/O DOCUMENT
		PIPING			930 - OPERATION AND MAINTENANCE MANUALS
		101 - PROCESS FLOW DIAGRAMS			950 - STANDARD SPECIFICATIONS
		102 - MECHANICAL FLOW DIAGRAMS			970 - TASK SPECIFICATIONS
		103 - PIPING AND INSTRUMENTATION DIAGRAMS (P&ID'S)			990 - CONFIGURATION MANAGEMENT REPORTS 1.B.0.M
		104 - UTILITY FLOW DIAGRAMS			999 - RESERVED
		105 - GENERAL PIPING PLANS			COMMENTS:xn
		106 - AREA PLANS (MECHANICAL EQUIPMENT LOCATION)			
		122 - WELLHEAD DRAWINGS			
		130 - VALVE LIST			
		135 - LINE LIST			
		140 - PSV LIST			
		150 - STANDARDS			
		CIVIL/STRUCTURAL			
		201 - PLOT PLANS			
		202 - SITE WORK, GRADING (ROUGH & FINISH DRAINAGE FENCING			
		210 - FOUNDATIONS: LOCATION PLANS			
		216 - MINES (WEEKS ISLAND ONLY)			
		250 - STANDARDS			
		ELECTRICAL			
		301 - AREA CLASSIFICATION			
		302 - ONE LINE DIAGRAMS			
		303 - SCHEMATIC DIAGRAMS			
		304 - POWER PLANS AND DETAILS			
		305 - LIGHTING PLANS AND DETAILS			
		307 - SUBSTATION PLANS AND DETAILS			
		308 - WIRING DIAGRAMS			
		310 - GROUNDING			
		311 - CONDUIT & CABLE SCHEDULES (INCLUDING INSTRUMENTS)			
		313 - MCC/SWITCH GEAR EVALUATION & SCHEDULE			
Engineering		DATE	CONFIGURATION MANAGEMENT		DATE

**ENGINEERING CHANGE PROPOSAL  
LIFE CYCLE COST FORM**

<b>ECP NUMBER:</b> <p style="text-align: center; font-size: 1.2em; margin-top: 10px;">SJ-M/O-4639</p>	<b>ECP TITLE:</b> Purchase and Install 7 New Rectifiers and Groundbeds at Sugarland						
<b>EXECUTIVE SUMMARY:</b> This ECP is being submitted as documentation of work that was done at Sugarland in 1998 and 1999. Cathodic protection levels provided by original deepwell groundbeds were inadequate to protect tank floors and manifold piping from higher corrosion rates.							
<b>IMPLEMENTATION PLAN:</b> Individual surface groundbeds and rectifiers were installed for each tank, as well as a groundbed and rectifier to protect the manifold area near Tanks 1 and 2.							
<b>IMPLEMENTATION COST:</b> <table style="margin-left: auto; margin-right: auto; border: none;"><tr><td style="padding: 5px;"><b>DESIGN:</b></td><td></td></tr><tr><td style="padding: 5px;"><b>CONSTRUCTION:</b></td><td style="padding: 5px;">\$116,965</td></tr><tr><td style="padding: 5px;"><b>TOTAL:</b></td><td style="padding: 5px;">\$116,965</td></tr></table>		<b>DESIGN:</b>		<b>CONSTRUCTION:</b>	\$116,965	<b>TOTAL:</b>	\$116,965
<b>DESIGN:</b>							
<b>CONSTRUCTION:</b>	\$116,965						
<b>TOTAL:</b>	\$116,965						
<b>LIFE CYCLE COST:</b> Not applicable. The capital improvement component of the work was required to meet DOT cathodic protection levels of 850mv.							
<b><u>IMPACT SUMMARY:</u></b>							
<b>LEVEL I, II, and III CRITERIA:</b>	<b>CONTRACT COMPLETION DATES:</b>						
<b>CODES, REGULATIONS, PERMITS, ETC.:</b>	<b>GOVERNMENT-FURNISHED EQUIPMENT:</b>						
<b>SAFETY, ENVIRONMENTAL, FIRE PROTECTION SYSTEMS, SECURITY:</b>	<b>SCHEDULE:</b>						

SLT-1

(281) 879-9903

**JA ELECTRONICS** Manufacturing Co., Inc.*Cathodic Rectifiers and Related Equipment for Corrosion Control***RECTIFIER PARTS LIST****RECTIFIER PART NO.: ASY30-50AACFKMOZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub> (Clear)****RECTIFIER SERIAL NO.: 98285**

<u>COMPONENT</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
CIRCUIT BREAKER	1 ea.	Heinemann CE2-G3-U 10.0 amp
RECTIFIER BRIDGE	1 ea.	JAMA30-50ZNR1B1/5" Silicon
AC SURGE SUPPRESSOR	1 ea.	Z250LA40A ZNR
DC SURGE SUPPRESSOR	1 ea.	Z250LA40A ZNR
TRANSFORMER	1 ea.	JA Model 2501; 5 coarse & 10 fine
FILTER CHOKE	1 ea.	Model 212
RECTIFIER FUSE	3 ea.	A25X60-4
DC VOLTMETER	1 ea.	Hoyt Model 582; 0-30v FS; ri @ 0-30v
DC AMMETER	1 ea.	Hoyt Model 582; 0-50a FS; ri @ 0-50a
Combination Meter	N/A	
PANEL SHUNT	1 ea.	Holloway "SW" 50mv=50amp
A.C. Lightning Arrestor	N/A	
D.C. Lightning Arrestor	N/A	
COMBINATION AC/DC LIGHTNING ARRESTOR	1 ea.	LA 104
<b>ADDITIONAL COMPONENTS:</b>		
	1 ea.	115VAC-GFI JA-3ET Controller Pan/Motor "Aerial D.C.Failure" Indicator Assembly 1" x 3" Blue Unit Tags 4" Aluminum Mounting Pole

SLT-2

(281) 879-9903

# JA ELECTRONICS Manufacturing Co., Inc.

*Cathodic Rectifiers and Related Equipment for Corrosion Control*

## RECTIFIER PARTS LIST

RECTIFIER PART NO.: ASY30-50DAACFKMOZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub> (Clear)  
 RECTIFIER SERIAL NO.: 98286

<u>COMPONENT</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
CIRCUIT BREAKER	1 ea.	Heinemann CE2-G3-U 10.0 amp
RECTIFIER BRIDGE	1 ea.	JAMA30-50ZNRLEB1/5" Silicon
AC SURGE SUPPRESSOR	1 ea.	Z250LA40A ZNR
DC SURGE SUPPRESSOR	1 ea.	Z250LA40A ZNR
TRANSFORMER	1 ea.	JA Model 2501; 5 coarse & 10 fine
FILTER CHOKE	1 ea.	Model 212
RECTIFIER FUSE	3 ea.	A25X60-4
DC VOLTMETER	1 ea.	Hoyt Model 582; 0-30v FS; ri @ 0-30v
DC AMMETER	1 ea.	Hoyt Model 582; 0-50a FS; ri @ 0-50a
Combination Meter	N/A	
PANEL SHUNT	1 ea.	Holloway "SW" 50mv-50amp
A.C. Lightning Arrestor	N/A	
D.C. Lightning Arrestor	N/A	
COMBINATION AC/DC LIGHTNING ARRESTOR	1 ea.	LA 104

**ADDITIONAL COMPONENTS:**

- 1 ea. 115VAC-GFI
- JA-3ET Controller
- Pan/Motor "Aerial D.C. Failure" Indicator Assembly
- 1" x 3" Blue Unit Tags
- 4" Aluminum Mounting Pole

 SLT 4

(281) 879-9903

# JA ELECTRONICS Manufacturing Co., Inc.

*Catbodic Rectifiers and Related Equipment for Corrosion Control*

## RECTIFIER PARTS LIST

RECTIFIER PART NO.: ASY30-50HAACFKMOZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub>Z<sub>4</sub> (Clear)  
 RECTIFIER SERIAL NO.: 99417

<u>COMPONENT</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
CIRCUIT BREAKER	1 ea.	Heinemann CE2-G3-U 10.0amp
RECTIFIER BRIDGE	1 ea.	JAMA30-50ZNRLB1/5" Silicon
AC SURGE SUPPRESSOR	1 ea.	Z250LA40A
DC SURGE SUPPRESSOR	1 ea.	Z250LA40A
TRANSFORMER	1 ea.	JA Model 2501; 5 Coarse & 10 Fine
FILTER CHOKE	1 ea.	JA Model 212
RECTIFIER FUSE	3 ea.	A25X60-4
DC VOLTMETER	1 ea.	Hoyt Model 582; 0-30v FS; rl @ 0-30v
DC AMMETER	1 ea.	Hoyt Model 582; 0-50a FS; rl @ 0-50a
Combination Meter	N/A	
PANEL SHUNT	1 ea.	Holloway "SW" 50mv=50amp
A.C. Lightning Arrestor	N/A	
D.C. Lightning Arrestor	N/A	
COMBINATION AC/DC LIGHTNING ARRESTOR	1 ea.	Delta LA 104
<b>ADDITIONAL COMPONENTS:</b>		
	1 ea.	115 VAC - GFI
	1 ea.	Aerial Indicator Fan Assembly complete with JA-3ET, Base, Pan, Housing & Motor
	1 ea.	1" x 3" Blue Unit Tag: SLT 3

~~REDS~~  
SLT 3

(281) 879-9903

# JA ELECTRONICS Manufacturing Co., Inc.

*Cathodic Rectifiers and Related Equipment for Corrosion Control*

## RECTIFIER PARTS LIST

RECTIFIER PART NO.: ASY30-50HAACFKMOZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub>Z<sub>4</sub> (Clear)  
RECTIFIER SERIAL NO.: 99418

<u>COMPONENT</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
CIRCUIT BREAKER	1 ea.	Heinemann CE2-G3-U 10.0amp
RECTIFIER BRIDGE	1 ea.	JAMA30-50ZNRLB1/5" Silicon
AC SURGE SUPPRESSOR	1 ea.	Z250LA40A
DC SURGE SUPPRESSOR	1 ea.	Z250LA40A
TRANSFORMER	1 ea.	JA Model 2501; 5 Coarse & 10 Fine
FILTER CHOKE	1 ea.	JA Model 212
RECTIFIER FUSE	3 ea.	A25X60-4
DC VOLTMETER	1 ea.	Hoyt Model 582; 0-30v FS; r1 @ 0-30v
DC AMMETER	1 ea.	Hoyt Model 582; 0-50a FS; r1 @ 0-50a
Combination Meter	N/A	
PANEL SHUNT	1 ea.	Holloway "SW" 50mv-50amp
A.C. Lightning Arrestor	N/A	
D.C. Lightning Arrestor	N/A	
COMBINATION AC/DC LIGHTNING ARRESTOR	1 ea.	Delta LA 104
<b>ADDITIONAL COMPONENTS:</b>		
	1 ea.	115 VAC - GFI
	1 ea.	Aerial Indicator Pan Assembly complete with JA-3ET, Base, Pan, Housing & Motor
	1 ea.	1" x 3" Blue Unit Tag: SLT 4

SLT 5

(281) 879-9903

# JA ELECTRONICS Manufacturing Co., Inc.

*Cathodic Rectifiers and Related Equipment for Corrosion Control*

## RECTIFIER PARTS LIST

RECTIFIER PART NO.: ASY30-60HAACFKMOZ,Z<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub>Z<sub>4</sub> (Clear)

RECTIFIER SERIAL NO.: 99419

<u>COMPONENT</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
CIRCUIT BREAKER	1 ea.	Heinemann CE2-G3-U 15.0amp
RECTIFIER BRIDGE	1 ea.	JAMA30-60ZNRLB1/7" Silicon
AC SURGE SUPPRESSOR	1 ea.	Z250LA40A
DC SURGE SUPPRESSOR	1 ea.	Z250LA40A
TRANSFORMER	1 ea.	JA Model 300; 5 Coarse & 10 Fine
FILTER CHOKE	1 ea.	JA Model 225
RECTIFIER FUSE	3 ea.	A25X70-4
DC VOLTMETER	1 ea.	Hoyt Model 582; 0-40v FS; r1 @ 0-30v
DC AMMETER	1 ea.	Hoyt Model 582; 0-75a FS; r1 @ 0-60a
Combination Meter	N/A	
PANEL SHUNT	1 ea.	Holloway "SW" 50mv=75amp
A.C. Lightning Arrestor	N/A	
D.C. Lightning Arrestor	N/A	
COMBINATION AC/DC LIGHTNING ARRESTOR	1 ea.	Delta LA 104
<b>ADDITIONAL COMPONENTS:</b>		
	1 ea.	115 VAC - GFI
	1 ea.	Aerial Indicator Fan Assembly complete with JA-3ET, Base, Pan, Housing & Motor
	1 ea.	1" x 3" Blue Unit Tag, SLT 5

SLT-16

(281) 879-9903

**JA ELECTRONICS** Manufacturing Co., Inc.*Cathodic Rectifiers and Related Equipments for Corrosion Control***RECTIFIER PARTS LIST**RECTIFIER PART NO.: ASY30-50DAACEFKMOZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub> (Clear)  
RECTIFIER SERIAL NO.: 98287

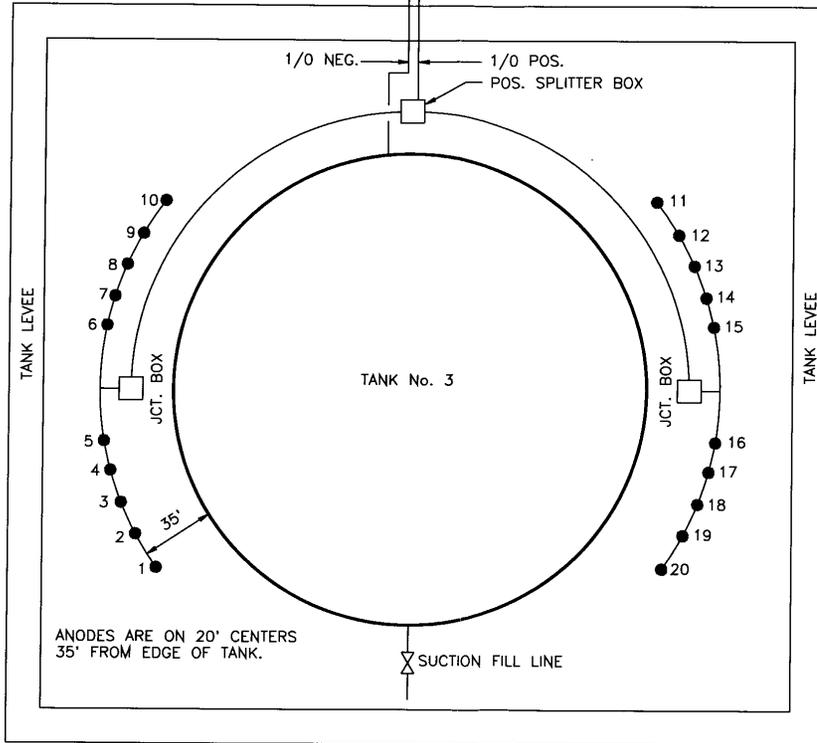
<u>COMPONENT</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
CIRCUIT BREAKER	1 ea.	Heinemann CE2-G3-U 10.0 amp
RECTIFIER BRIDGE	1 ea.	JAMA30-50ZNR/LB1/5" Silicon
AC SURGE SUPPRESSOR	1 ea.	Z250LA40A ZNR
DC SURGE SUPPRESSOR	1 ea.	Z250LA40A ZNR
TRANSFORMER	1 ea.	JA Model 2501; 5 coarse & 10 fine
FILTER CHOKE	1 ea.	Model 212
RECTIFIER FUSE	3 ea.	A25X60-4
DC VOLTMETER	1 ea.	Hoyt Model 582; 0-30v FS; rl @ 0-30v
DC AMMETER	1 ea.	Hoyt Model 582; 0-50a FS; rl @ 0-50a
Combination Meter	N/A	
PANEL SHUNT	1 ea.	Holloway "SW" 50mv-50amp
A.C. Lightning Arrestor	N/A	
D.C. Lightning Arrestor	N/A	
COMBINATION AC/DC LIGHTNING ARRESTOR	1 ea.	LA 104
<b>ADDITIONAL COMPONENTS:</b>		
	1 ea.	115VAC-GFI
		JA-3ET Controller
		Pan/Motor "Aerial D.C. Failure"
		Indicator Assembly
		1" x 3" Blue Unit Tags
		4" Aluminum Mounting Pole



ASPHALT ROAD

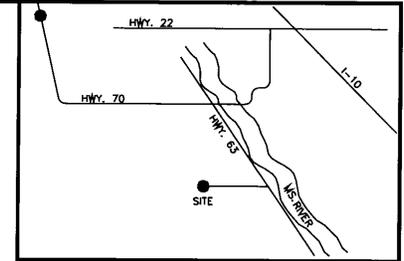
RECTIFIER SLT-3 208 V.A.C.

1/0 NEG. 1/0 POS. POS. SPLITTER BOX



ANODES ARE ON 20' CENTERS  
35° FROM EDGE OF TANK.

SUCTION FILL LINE



LOCATION MAP

ANODES WERE INSTALLED 12' DEEP ON 20' CENTERS. INSTALLED IN 8" PRE-PACKAGED CANISTERS WITH 2 BAGS OF LORESCO SC3 TO FILL REMAINING COLUMN.  
EACH ANODE HAS INDIVIDUAL LEAD THAT TERMINATES INTO A JCT. BOX.

WTL0WRY 01/11/00 14:30 Z:\New\_Orleans\corrosion\d33306.dwg - Eric\_Wells

**RECTIFIER DATA:**

A.P.M. No.: NA  
 ALIGN. SHEET No.: NA  
 R.O.W. No.: NA  
 SURVEY STA.: NA  
 JOB No.: 349073  
 RECTIFIER UNIT No.: SLT-3  
 RECT. RATING: 30 V, 50 A  
 INSPECTOR: ERIC WELLS  
 CONTRACTOR: SDF CONSTRUCTION  
 DATE INSTALLED: 9/9/99  
 COUNTY / STATE: ST. JAMES, LA.  
 LAND OWNER: DEPT. OF ENERGY  
 CORR. LOC. CODE: 73601  
 POWER CO.: STATION  
 POWER CONTRACT No.: NA

00	12/99	AS-BUILT	WTL	EAW	EAW
NO	DATE	DESCRIPTION OF REVISION	BY	ELEC ENGR	MECH ENGR

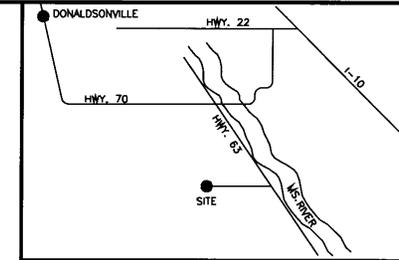
PIPELINE NAME

**EQUILON**  
PIPELINE COMPANY LLC

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RECTIFIER No. SLT-3  
TANK No. 3  
SUGARLAND TERMINAL

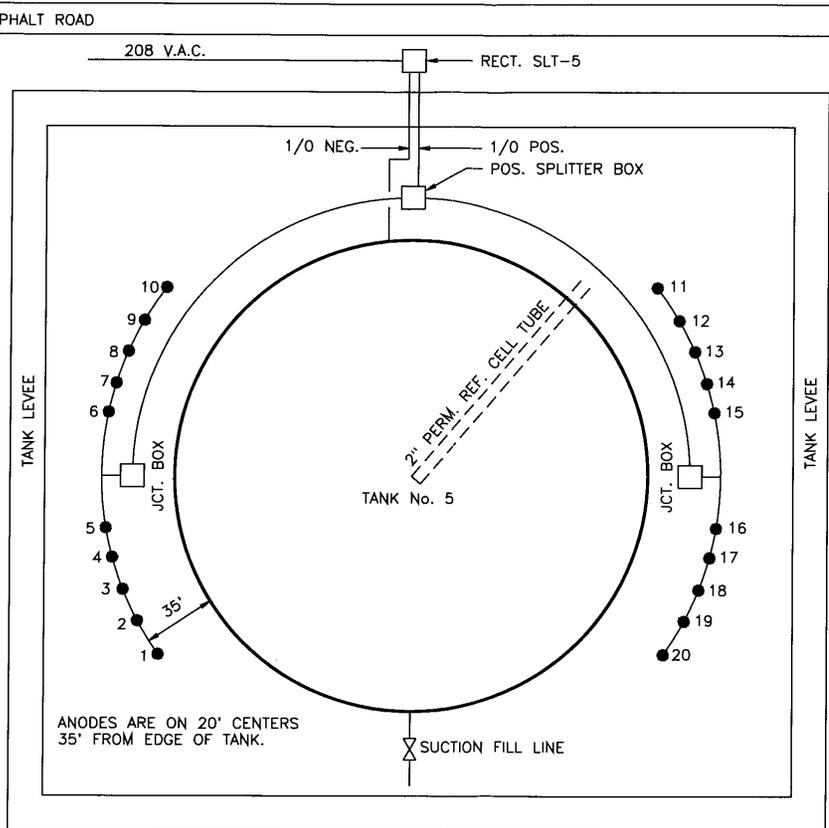
SCALE	NONE	DATE	D- 33306-	REV.	00
DRAWN	Bill Lowry	12/99			



LOCATION MAP

ANODES WERE INSTALLED 12' DEEP ON 20' CENTERS. INSTALLED IN 8" PRE-PACKAGED CANISTERS WITH 2 BAGS OF LORESCO SC3 TO FILL REMAINING COLUMB.

EACH ANODE HAS INDIVIDUAL LEAD THAT TERMINATES INTO A JCT. BOX.



ANODES ARE ON 20' CENTERS  
35' FROM EDGE OF TANK.



WTL0111/00 14:24 Z:\New\_Orleans\corrosion\d33308.dwg - Eric\_Wells

**RECTIFIER DATA:**

A.P.M. No.: NA  
 ALIGN. SHEET No.: NA  
 R.O.W. No.: NA  
 SURVEY STA.: NA  
 JOB No.: 349073  
 RECTIFIER UNIT No.: SLT-5  
 RECT. RATING: 30 V. 60 A  
 INSPECTOR: ERIC WELLS  
 CONTRACTOR: SDF CONSTRUCTION  
 DATE INSTALLED: 9/9/99  
 COUNTY / STATE: ST. JAMES, LA.  
 LAND OWNER: DEPT. OF ENERGY  
 CORR. LOC. CODE: 73601  
 POWER CO.: STATION  
 POWER CONTRACT No.: NA

NO	DATE	DESCRIPTION OF REVISION	BY	ELEC ENGR	MECH ENGR	APP
00	12/99	AS-BUILT	WTL	EAW	EAW	

PIPELINE NAME

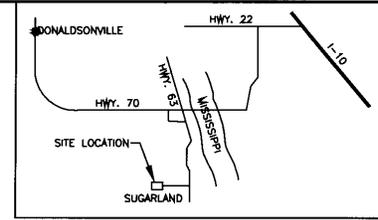
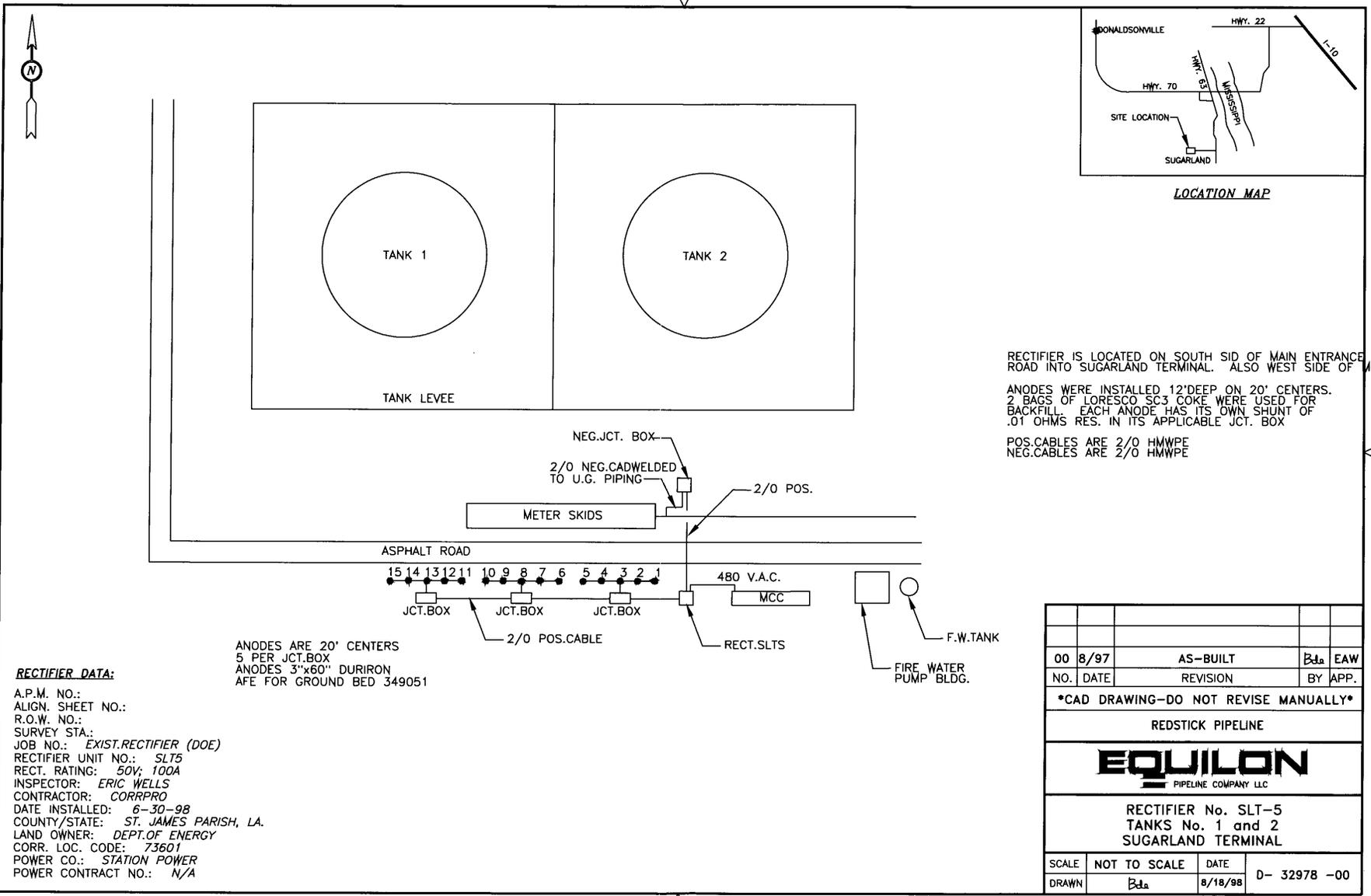
# EQUILON

PIPELINE COMPANY LLC

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RECTIFIER No. SLT-5 TANK No. 5 SUGARLAND TERMINAL			
SCALE	NONE	DATE	D- 33308-
DRAWN	Bill Lowry	12/99	REV. 00

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LOCATION MAP

RECTIFIER IS LOCATED ON SOUTH SID OF MAIN ENTRANCE ROAD INTO SUGARLAND TERMINAL. ALSO WEST SIDE OF MCC.

ANODES WERE INSTALLED 12'DEEP ON 20' CENTERS. 2 BAGS OF LORESCO SC3 COKE WERE USED FOR BACKFILL. EACH ANODE HAS ITS OWN SHUNT OF .01 OHMS RES. IN ITS APPLICABLE JCT. BOX

POS.CABLES ARE 2/0 HMWPE  
NEG.CABLES ARE 2/0 HMWPE

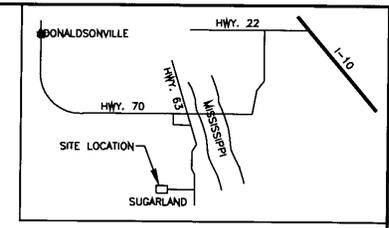
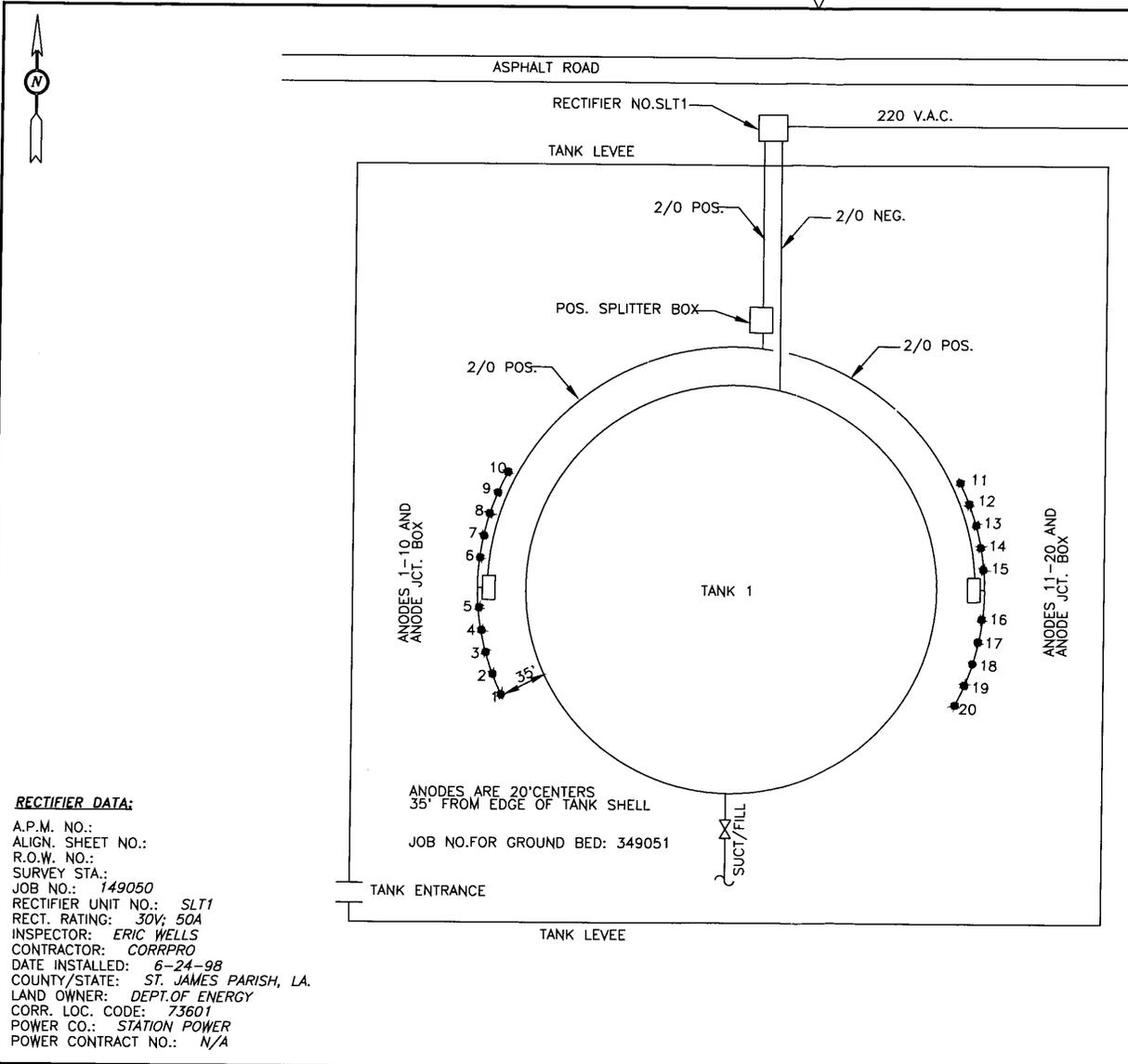
ANODES ARE 20' CENTERS  
5 PER JCT.BOX  
ANODES 3"x60" DURIRON  
AFE FOR GROUND BED 349051

**RECTIFIER DATA:**

A.P.M. NO.:  
ALIGN. SHEET NO.:  
R.O.W. NO.:  
SURVEY STA.:  
JOB NO.: EXIST.RECTIFIER (DOE)  
RECTIFIER UNIT NO.: SLT5  
RECT. RATING: 50V; 100A  
INSPECTOR: ERIC WELLS  
CONTRACTOR: CORRPRO  
DATE INSTALLED: 6-30-98  
COUNTY/STATE: ST. JAMES PARISH, LA.  
LAND OWNER: DEPT.OF ENERGY  
CORR. LOC. CODE: 73601  
POWER CO.: STATION POWER  
POWER CONTRACT NO.: N/A

00	8/97	AS-BUILT	Bda	EAW
NO.	DATE	REVISION	BY	APP.
*CAD DRAWING-DO NOT REVISE MANUALLY*				
REDSTICK PIPELINE				
<b>EQUILON</b> PIPELINE COMPANY LLC				
RECTIFIER No. SLT-5 TANKS No. 1 and 2 SUGARLAND TERMINAL				
SCALE	NOT TO SCALE	DATE	D- 32978 -00	
DRAWN	Bda	8/18/98		

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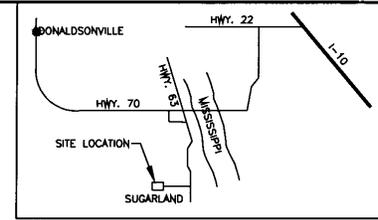
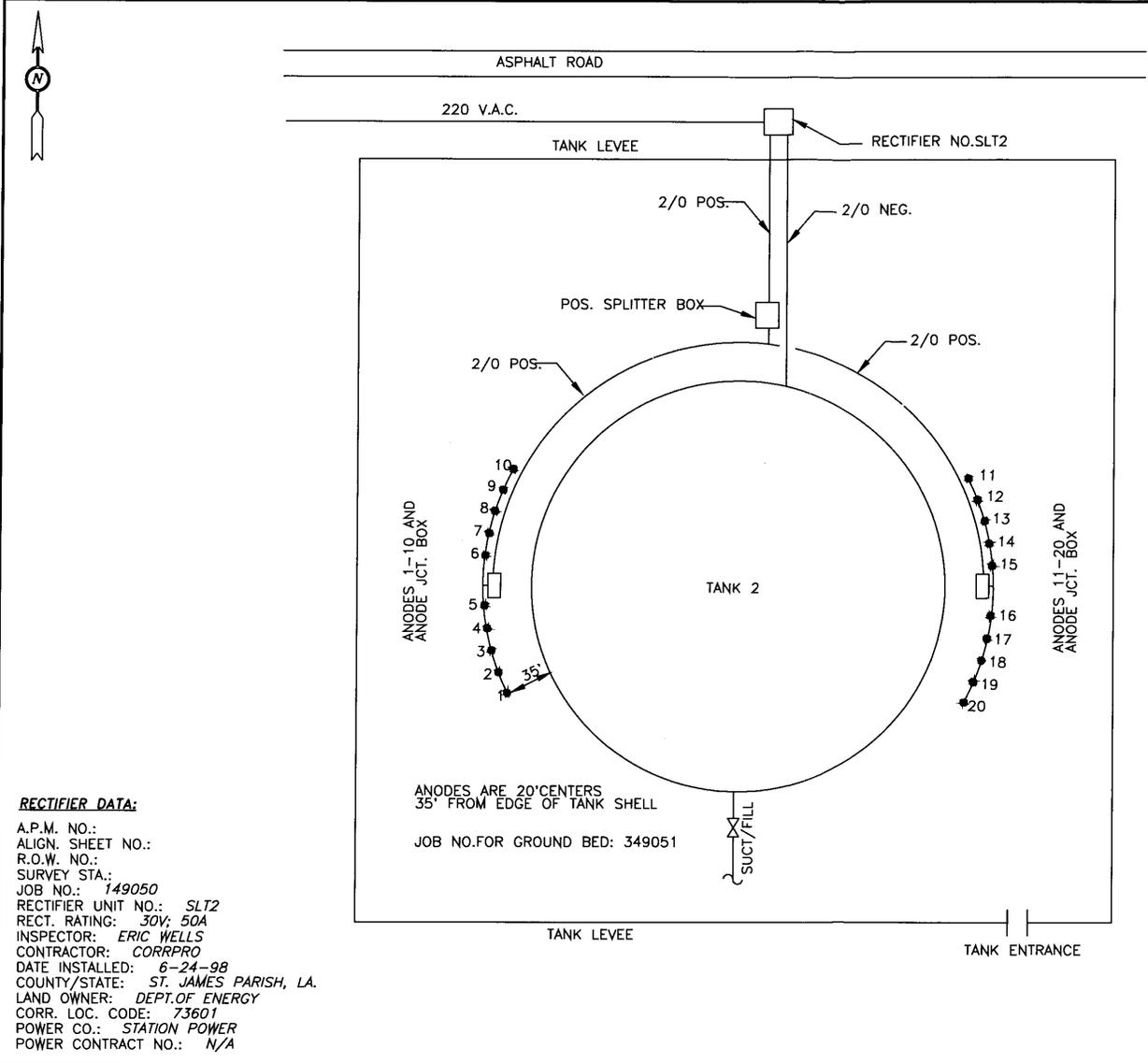
LOCATION MAP

RECTIFIER IS LOCATED NORTH OF TANK ON EDGE OF ASPHALT RD.  
 ANODES WERE INSTALLED 12'DEEP ON 20' CENTERS. 2 BAGS OF LORESCO SC3 COKE WERE USED FOR BACKFILL. EACH ANODE HAS ITS OWN SHUNT OF .01 OHMS RES. IN ITS APPLICABLE JCT. BOX  
 POS. CABLES ARE 2/0 HMWPE  
 NEG. CABLES ARE 2/0 HMWPE

**RECTIFIER DATA:**  
 A.P.M. NO.:  
 ALIGN. SHEET NO.:  
 R.O.W. NO.:  
 SURVEY STA.:  
 JOB NO.: 149050  
 RECTIFIER UNIT NO.: SLT1  
 RECT. RATING: 30V; 50A  
 INSPECTOR: ERIC WELLS  
 CONTRACTOR: CORRPRO  
 DATE INSTALLED: 6-24-98  
 COUNTY/STATE: ST. JAMES PARISH, LA.  
 LAND OWNER: DEPT. OF ENERGY  
 CORR. LOC. CODE: 73601  
 POWER CO.: STATION POWER  
 POWER CONTRACT NO.: N/A

00	8/97	AS-BUILT	Bda	EAW
NO.	DATE	REVISION	BY	APP.
*CAD DRAWING-DO NOT REVISE MANUALLY*				
REDSTICK PIPELINE				
<b>EQUILON</b> PIPELINE COMPANY LLC				
RECTIFIER No. SLT-1 TANK No. 1 SUGARLAND TERMINAL				
SCALE	NOT TO SCALE	DATE	D- 32975 -00	
DRAWN	Bda	8/13/98		

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LOCATION MAP

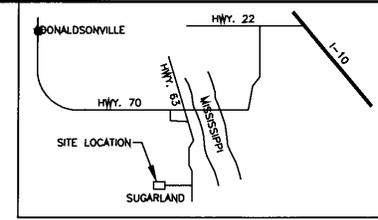
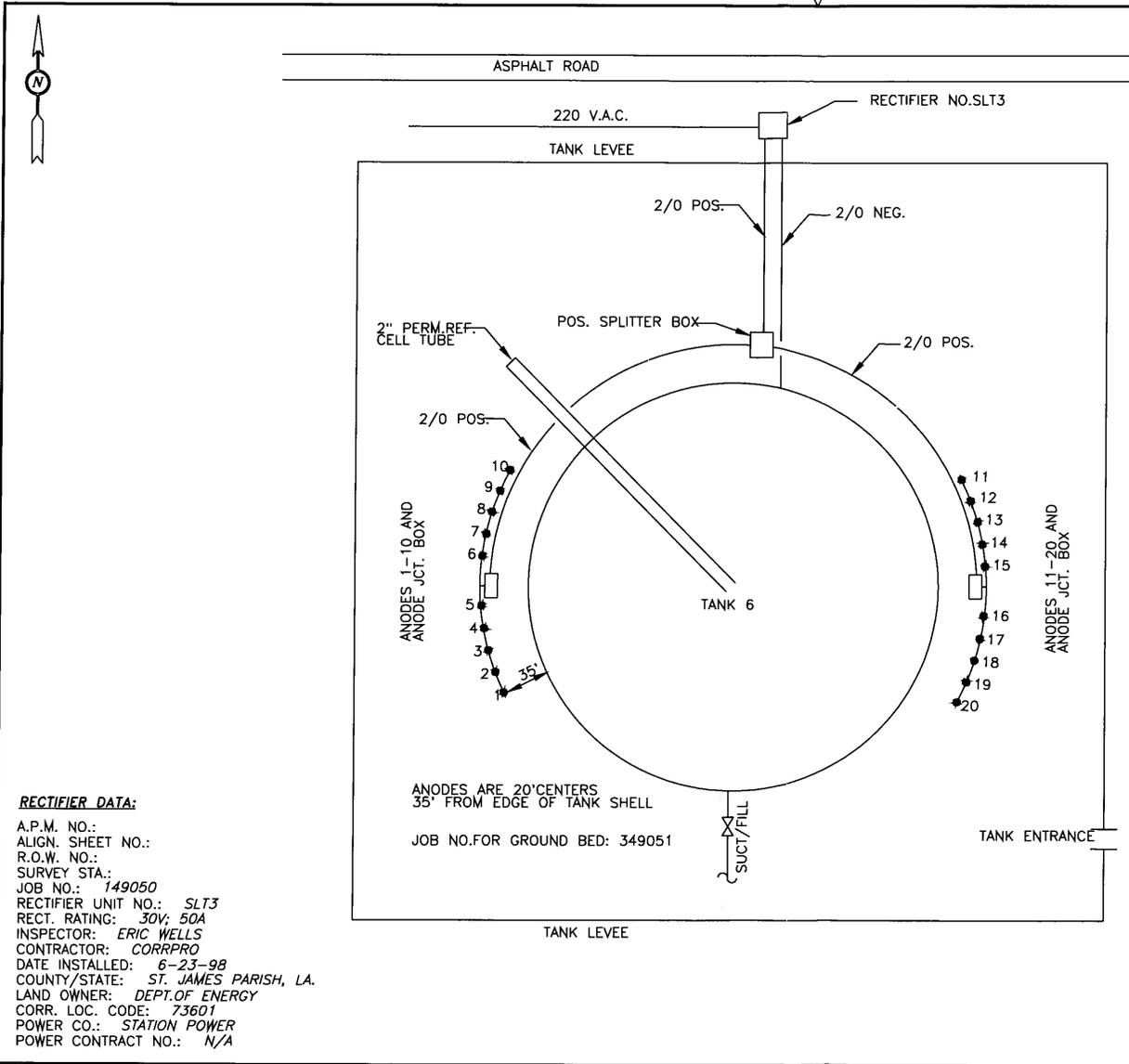
RECTIFIER IS LOCATED NORTH OF TANK ON EDGE OF ASPHALT RD.  
 ANODES WERE INSTALLED 12" DEEP ON 20" CENTERS. 2 BAGS OF LORESCO SC3 COKE WERE USED FOR BACKFILL. EACH ANODE HAS ITS OWN SHUNT OF .01 OHMS RES. IN ITS APPLICABLE JCT. BOX  
 POS. CABLES ARE 2/0 HMMWPE  
 NEG. CABLES ARE 2/0 HMMWPE

**RECTIFIER DATA:**  
 A.P.M. NO.:  
 ALIGN. SHEET NO.:  
 R.O.W. NO.:  
 SURVEY STA.:  
 JOB NO.: 149050  
 RECTIFIER UNIT NO.: SLT2  
 RECT. RATING: 30V; 50A  
 INSPECTOR: ERIC WELLS  
 CONTRACTOR: CORRPRO  
 DATE INSTALLED: 6-24-98  
 COUNTY/STATE: ST. JAMES PARISH, LA.  
 LAND OWNER: DEPT. OF ENERGY  
 CORR. LOC. CODE: 73601  
 POWER CO.: STATION POWER  
 POWER CONTRACT NO.: N/A

ANODES ARE 20" CENTERS  
 35' FROM EDGE OF TANK SHELL  
 JOB NO. FOR GROUND BED: 349051

00	8/97	AS-BUILT	Bda	EAW
NO.	DATE	REVISION	BY	APP.
*CAD DRAWING-DO NOT REVISE MANUALLY*				
REDSTICK PIPELINE				
<b>EQUILON</b> PIPELINE COMPANY LLC				
RECTIFIER No. SLT-2 TANK No. 2 SUGARLAND TERMINAL				
SCALE	NOT TO SCALE	DATE	D- 32976 -00	
DRAWN	Bda	8/13/98		

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LOCATION MAP

RECTIFIER IS LOCATED NORTH OF TANK ON EDGE OF ASPHALT RD.  
 ANODES WERE INSTALLED 12" DEEP ON 20' CENTERS. 2 BAGS OF LORESCO SC3 COKE WERE USED FOR BACKFILL. EACH ANODE HAS ITS OWN SHUNT OF .01 OHMS RES. IN ITS APPLICABLE JCT. BOX  
 POS. CABLES ARE 2/0 HMWPE  
 NEG. CABLES ARE 2/0 HMWPE

**RECTIFIER DATA:**  
 A.P.M. NO.:  
 ALIGN. SHEET NO.:  
 R.O.W. NO.:  
 SURVEY STA.:  
 JOB NO.: 149050  
 RECTIFIER UNIT NO.: SLT3  
 RECT. RATING: 30V; 50A  
 INSPECTOR: ERIC WELLS  
 CONTRACTOR: CORRPRO  
 DATE INSTALLED: 6-23-98  
 COUNTY/STATE: ST. JAMES PARISH, LA.  
 LAND OWNER: DEPT. OF ENERGY  
 CORR. LOC. CODE: 73601  
 POWER CO.: STATION POWER  
 POWER CONTRACT NO.: N/A

ANODES ARE 20' CENTERS  
 35' FROM EDGE OF TANK SHELL  
 JOB NO. FOR GROUND BED: 349051

00	8/97	AS-BUILT	Bda	EAW
NO.	DATE	REVISION	BY	APP.
*CAD DRAWING—DO NOT REVISE MANUALLY*				
REDSTICK PIPELINE				
<b>EQUILON</b> PIPELINE COMPANY LLC				
RECTIFIER No. SLT-3 TANK No. 6 SUGARLAND TERMINAL				
SCALE	NOT TO SCALE	DATE	D- 32977 -00	
DRAWN	Bda	8/13/98		