Pressure Vessel Survey			
Location:	Point Tupper	**EM&IJ Report No.:**	PT-D2100E-090708-CR-R0
Client Name:		**Client Ref No.:**	PT-11564784-001-D2100E
Client Rep.:		**Inspector Name:**	Colin Robinson
WO No.:		**Inspection Date:**	July 08, 2009
SPO No.:		**System:**	Propane
Workscope No.:	PT-2009-D2100E-INT-01	**EM&IJ Job No:**	EMJ0132.43
Tag No.:	D2100E	**Equipment Description:**	Propane Storage Vessel D-2100E
Date of Last Inspection:	N/A	**Previous Records Seen:**	N/A
Drawing No.:	LA-B23-F-22-8052-01-Z4, 980047-2		

Inspection Summary

Item	Condition				Comments
External Ladders, Access and Support Structure	Good	Fair	Poor	NA	Internal inspection only
1. If applicable, check ladders, stairways, platforms and walkways that are connected to, or bearing on the vessel for signs of corrosion, missing components, or deterioration.	☐	☐	☐	☐	
2. If applicable, check vessel supports for signs of deterioration, settlement, deflection, and/or corrosion.	☐	☐	☐	☐	
3. If applicable, check coatings for signs of deterioration, rusts spots, cracks, blistering, and/or coating disbondment.	☐	☐	☐	☐	
4. a) For horizontally mounted vessels, check for signs of trapped moisture, resulting in corrosion between cradle support and vessel shell.	☐	☐	☐	☐	
b) For vertically mounted vessels on skirt support or support legs, check for condensation, resulting in corrosion on the bottom cap/ inside skirt support surface or area of attachment of the support legs to the bottom cap.	☐	☐	☐	☐	
5. Check the grounding connection is correctly installed, with cable connections tight and ground wires in good condition.	☐	☐	☐	☐	
6. Check all bolted connections for any signs of corrosion or mechanical damage.	☐	☐	☐	☐	
7. If applicable, check the vessel sliding foot free to move and hold-down bolts are free.	☐	☐	☐	☐	
Vessel External Surfaces	Good	Fair	Poor	NA	Internal inspection only
1. Check permanent identifying tags on vessel are legible and present the required information.	☐	☐	☐	☐	
2. If applicable, check that all bolts/studs extend fully through their nuts, having a protrusion beyond the nut of not less than one thread; flange bolts have bolt heads all on the side of the joint.	☐	☐	☐	☐	
3. If applicable, check bolted connections are in full contact with connected elements and connections for any signs of rust, corrosion or mechanical damage.	☐	☐	☐	☐	
4. If applicable, check insulation support bands and clips for signs of corrosion or breakage.	☐	☐	☐	☐	
5. Check all welded seams and connections for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	☐	☐	☐	☐	
6) If applicable, check insulation type, condition for any insulation damage and ingress of water. Record insulation type.	☐	☐	☐	☐	
7. Carry out visual inspection of the exterior surface of the vessel, including coatings for any signs of leaks, cracks, deformation, distortion, pitting, corrosion or other forms of deterioration. If so, specify type, location and extent.	☐	☐	☐	☐	
8. If applicable, check weep holes in reinforcement plates are not plugged.	☐	☐	☐	☐	
External Piping / Instrument Attachments	Good	Fair	Poor	NA	Internal inspection only
1. If applicable, check vessel trim, such as gauges, sight glasses, valves and other appurtenances, show signs of deterioration, or missing components, etc.	☐	☐	☐	☐	
2. If applicable, check if the PSV on the vessel is in calibration. Record tag number of PSV and calibration date.	☐	☐	☐	☐	
3. Inspect fittings, nozzles and other connections, including the surrounding vessel shell / head for any signs of distortion or cracks, wall loss, leakage, deterioration of coatings, etc. Specify extent and location.	☐	☐	☐	☐	

Inspection Summary

Item	Condition				Comments
Vessel Internal Surfaces	Good	Fair	Poor	NA	
1. Check for signs of corrosion, erosion, cracks, blisters, pitting, distortion, or other forms of deterioration on the internal vessel surfaces. If any, specify type, location and extent.	☒	☐	☐	☐	One isolated pit located between circ weld 9 and 10 from south end
2. Check all welded joints for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	☒	☐	☐	☐	All welded seams in good condition
3. Check all man-ways, nozzles and connections for distortion, cracks, corrosion, wall loss and other type of defects or failures. If any defects are noted, specify type, extent and location.	☒	☐	☐	☐	
4. If applicable, compare the results of performed wall thickness survey with previous reports for areas of wall thickness loss. Identify areas on inspection report.	☐	☐	☐	☒	UT measurements carried out as part of the external inspection completed prior to the internal inspection
5. Where applicable, check vessel internal cladding for signs of bulging, buckling, cracks, holes, etc. If any, specify type, location and extent.	☐	☐	☐	☒	Vessel had no cladding
6. Where applicable, check the vessel internal coating for signs of deterioration, such as: rust spots, blisters, coating disbandment, etc. If any, specify type, location and extent.	☐	☐	☐	☒	Vessel not coated
7. If possible, check gasket seals on all flanges for signs of corrosion and/or mechanical damage.	☐	☐	☐	☒	Vessel fully isolated with spades fitted during inspection
Internal Equipment/Piping /Supports	Good	Fair	Poor	NA	
1. Where applicable, check supports for vessel's internal equipment and components for signs of corrosion, distortion and deterioration.	☐	☐	☐	☒	
2. If applicable, check vessel's internals for signs of corrosion, distortion and deterioration, missing components etc.	☒	☐	☐	☐	Vortex breaker in good condition
3. If applicable, check if bolted connections are in full contact with connected elements and connections are free from rust or other deleterious material that may prohibit full contact.	☐	☐	☐	☒	

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

A thorough inspection was carried out in accordance with API 510 and 572.

The vessel was in good condition with no evidence of any distortion or cracking on the shell, dome ends or welded seams.

A pit was located on the shell between the 9th and 10th circumferential weld seams from the south end of the vessel. Facing north, the pit was located at the 3 o'clock position and was approximately 10mm in diameter and 2.5mm deep.

A Magnetic Particle Inspection was carried out on sample areas of circumferential and longitudinal welds. Where accessible, the intersection of the welds were tested. In addition, a Magnetic Particle Inspection was carried out on all accessible nozzles to shell welds. No defect indications noted.

Deposits were noted adjacent to nozzles N3B and N6. It was later determined that the deposits were sealant material used to attain a good seal on the adjacent valves. These valves were subsequently removed maintenance. Excess sealant was removed prior to closure of the vessel.

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

Photo 1 – General view looking south

Photo 2 – Close up of isolated pit between circ welds

Photo 3 – View of isolated pit between circ welds

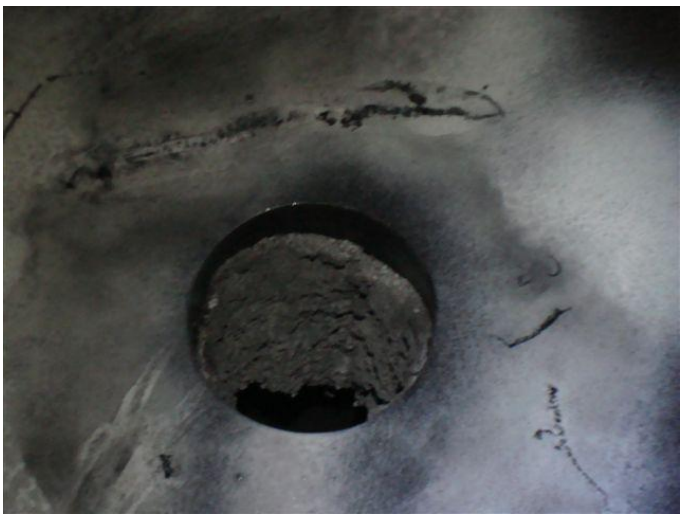


Photo 4 – Nozzle N3 showing deposits

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

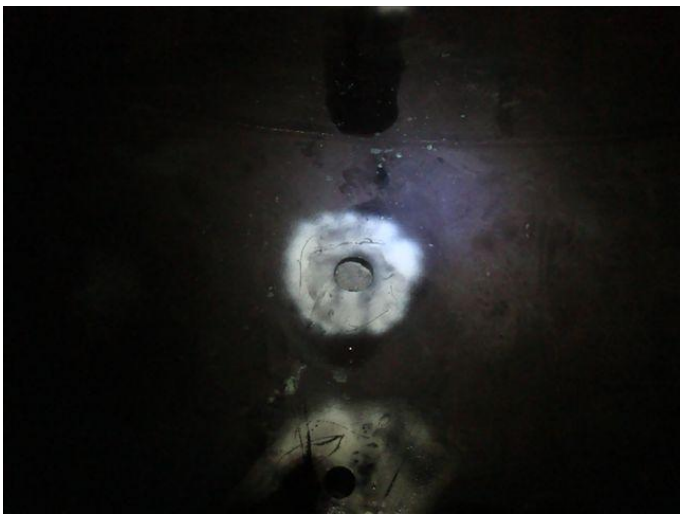


Photo 5 – Nozzle N3B and N4B

Photo 6 – Nozzle N6, N3B and N4B

Photo 7 – Vortex breaker on nozzle N2

Photo 8 – North foundation support - crack in concrete

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

Photo 9 – North Foundation support – crack in concrete

List of Attachments

Attachment 1: PT-D2100E-090708-NE-MPI

Attachment 2: 980047-2-4

End of Report.

INSPECTION REPORT

EM&I Jacques Ltd.

MPI Survey				
Location:	Point Tupper		**EM&IJ Report No.:**	PT-D2100E-090708-NE-MPI
Client Name:	Exxon Mobil Sable		**Client Ref No.:**	PT-11564784-001-D2100E
Client Rep.:	Dale Groves		**Inspector Name:**	Neil English
WO No.:	11564784		**Inspection Date:**	July 08, 2009
SPO No.:	4501905471		**Inspection Time:**	Various
Workscope No.:	PT-2009-D2100E-INT-01		**System:**	Propane Storage Vessel
Previous Report No.	N/A		**EM&IJ Job No:**	EMJ0132.31
Ref. Drawing No.:	980047-2-4			
Technician Certifications:	CGSB MPI LVL 2		**Certification Expiry Date:**	December 31, 2011
Inspection Code:	ASME VIII		**Inspection Procedure:**	MT401ASME
Material:	C/S		**Surface Condition:**	Wire brush cleaned
Consumables:	**Contrast: White**	**Type: 8901W**	**Manufacturer: Ardrox**	**Batch: 65082407**
Equipment:	**Type:** Electro Spec ES-X	**S/N: 12764**	**Calibration Due: 10 Lb Cal lift**	**Current Type: AC**

Inspection Summary

Comments:

Black on white Magnetic Particle Inspection was conducted on butane storage vessel D2100E. Nozzles N6, N3B, N4B, N5, M1, N10, were inspected. Two foot spot checks on every second circular seam were inspected in the 3, 6, and 9 o'clock positions, as well as any accessible Tee joint.

At time of inspection, no relevant indications were observed.

Foil strip type 1 indicator (brass finish) used to test sensitivity.

Neil English
CGSB: #11752

Ink
Manufacturer:
Type: 8031, Black Ink
Solution: Prepared bath, Aerosol
Batch:32111507

End of Report

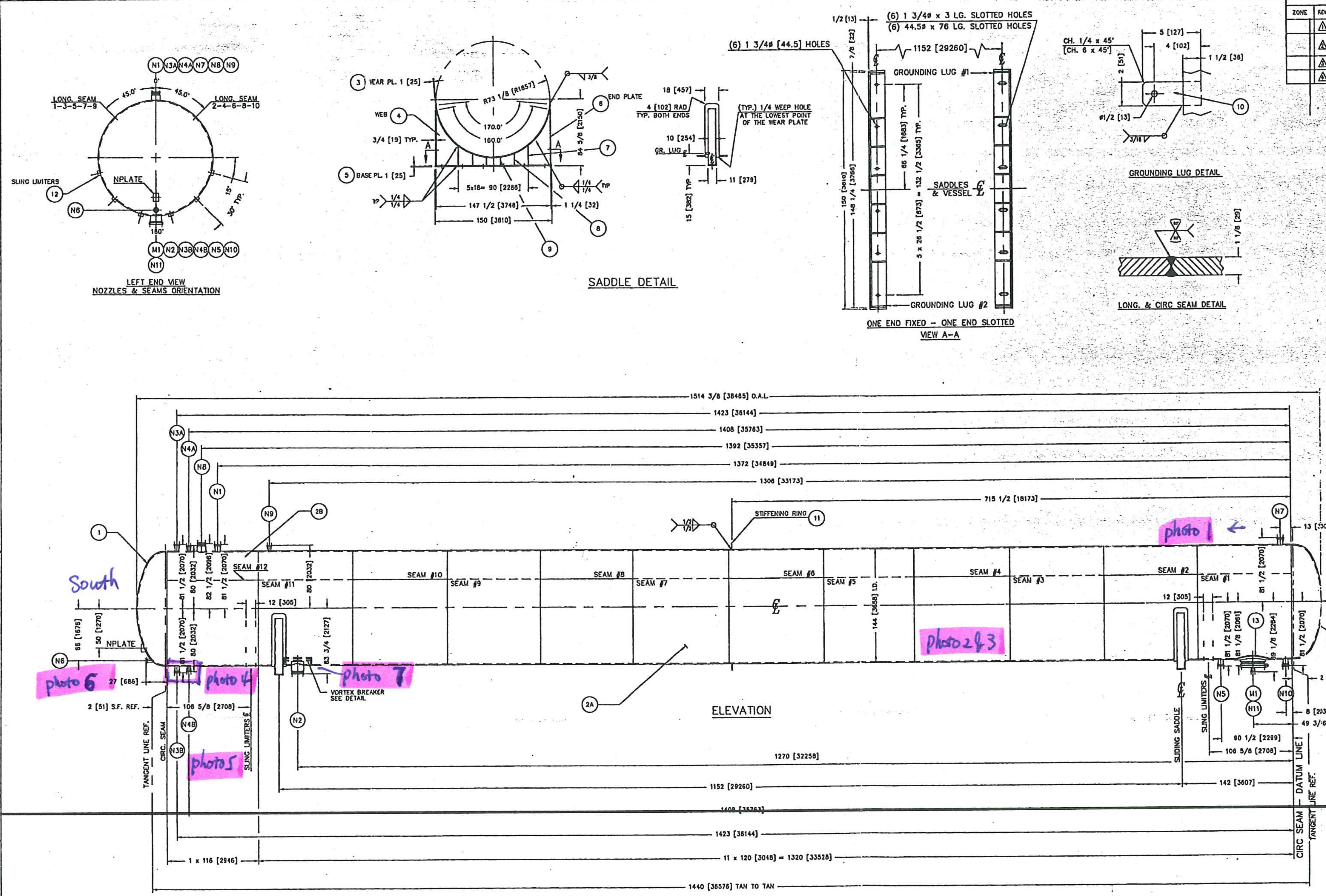
Inspector Name:	Neil English	Signature:	See Field Copy	Date:	

Permission to proceed does not constitute acceptance of design, calculations, test methods or materials developed or selected by Supplier and does not relieve Supplier from full compliance with contractual or other obligations.	**SABLE OFFSHORE ENERGY PROJECT REVIEW**
☒ 1. Reviewed and accepted (subject to minor comments). Submit final version in Data Book.	SUPPLIER: RNG PRO-TECH
☐ 2. Revise and resubmit. Work may proceed subject to incorporation of changes indicated.	P.O. NUMBER: ZAPM2103A
☐ 3. Revise and resubmit. Work may NOT proceed.	P.O. DESCRIPTION: VESSELS
☐ 4. No further review required. (for information only)	EQUIPMENT TAG NUMBERS: D2100-D, D2100-E
Name: Pat Webb, Date: 10 Aug/99	Sub. No. 004 — Date 99/08/10
SDRL Code(s): B01	P.O. No.: ZAPM2103A — Prime Code: 1-1B — Sequence No.: 1-190024-10011 — Sheet No. / Sub. No.: 001

AS-BUILT

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
	1	ITEM NUMBERS & B.O.M. ADDED	15-09-98	
	2	N2 SCH. INCREASED – B.O.M. UPDATED CLEANING & PAINTING SYSTEM ADDED	10-21-98	
	3	WELDING PROC. (*-P1) ADDED – NOTE 7 MODIFIED	07-12-98	
	4	PAINTING SYSTEM – REVISED	22-12-98	



MAJOR COMPONENT DESIGN DATA

VESSEL DESIGNED PER :

EDITION OF ASME CODE SECTION VIII DIVISION 1
CODE STAMP: SERIAL NO: NATIONAL BOARD NO:

DESIGN PRESSURE INTERNAL: 250 PSIG [1724 kPag] @ 149 DEG F [65°C]
DESIGN PRESSURE EXTERNAL: -11 PSIG [-76 kPag] @ 149 DEG F [65°C]
OPERATING PRESSURE:
HYDRO TEST: 375 PSIG [2586 kPag] @ 50 DEG F [10°C]

MAWP: 250 PSIG [1724 kPag]
MAP: 250 PSIG [1724 kPag]
MDMT: -17 DEG F [-27°C]

DESIGN LIQUID LEVEL : FULL
LIQUID S.G. (DESIGN) : 0.67
PWHT: NO
IMPACT TESTING NOT REQ'D PER UCS-66
INSULATION : NO

HEAD TYPE, TOP: 2:1 ELLIPSOIDAL

RADIOGRAPH: HEAD/SHELL: FULL UW-11(A) JOINT EFFICIENCY: HEAD/SHELL: 1
SHELL CIRC: FULL UW-11(A) SHELL CIRC: 1
SHELL LONG: FULL UW-11(A) SHELL LONG: 1

ESTIMATED WEIGHT: EMPTY: 242101 LBS [110046 kg]
TEST: 1116908 LBS [507686 kg]
OPERATING: 828222 LBS [376464 kg]

ESTIMATED CAPACITY: 104904 US GALLONS [397082 LITRES]

MATERIAL:

SHELL: SA-516-70N
HEADS: SA-516-70N
FLANGES: SA-105N
NOZZLES: SA-105N
BLINDS: SA-105N & SA-516-70N
REINFORCING PADS: SA-516-70N
SADDLES & WEAR PLATES: G40.21-44W & SA-516-70N
GASKETS: 316 S.S. SPIRAL WOUND GRAFOIL FILLED
[illegible]
EXTERNAL CLIPS: SA-516-70 & SA-36
VORTEX BREAKER: SA-36

REGISTRATION BY: PROVINCE OF NOVA SCOTIA
INSPECTION BY: PROVINCE OF QUEBEC

INTERNAL FINISH:
PLATES WITH MILL FINISH
WELDS WITH FLUX & SPATTER REMOVED

(2) SURFACE PREP. & PAINTING: 4800 SQ.FT

CLEANING :
SANDBLAST PER SSPC-SP10 EXTERNAL SURFACES ONLY
PAINTING :

PRIMER COAT: INTERZONE 954: 18 MILS
TOP COAT: INTERFINE 629 HS : 3 MILS
(4) TOTAL SYSTEM D.F.T. : 21 MILS

NOTE :
HYDROSTATIC TEST PRESSURE TO BE HELD FOR ONE HOUR

REV	P/N	ITEM	QTY	DESCRIPTION	MAT'L
2		13	1	PAD 3/4" – 49 1/4 O.D. x 32 7/8 I.D.	SA-516-70N
2		12	24	F.B. 3" x 3/8" x 6" LG.	SA-36 OR 44W
		11	1	PL. 1" THK x 6" WIDE (RING 4 PCS)	SA-516-70N
		10	2	FB. 2"WIDE X 5"LG. X 1/4" THK.	SA-36 OR 44W
2		9	4	PL. 9.25" WIDE X 10"LG. X 0.75" THK.	CSA G40.21-44W
2		8	4	PL. 9.25"WIDE X 14.47"LG. X 0.75"THK.	CSA G40.21-44W
2		7	4	PL. 9.25"WIDE X 24.46LG. X 0.75"THK.	CSA G40.21-44W
2		6	4	PL. 9.25"WIDE X 70.75"LG X 0.75"THK.	CSA G40.21-44W
2		5	2	BASE PLATE 11" WIDE X 150"LG X 1"TK.	CSA G40.21-44W
2		4	2	PL. 70.75" X 148.25 X .75" THK.	CSA G40.21-44W
2		3	2	WEAR PL 18" WIDE X 216 1/2" X 1" TK.	SA-516-70N
		2B	1	PL 116 WIDE X 455.93 LG X 1.125 THK.	SA-516-70N
		2A	11	PL 120 WIDE X 455.93 LG X 1.125 THK.	SA-516-70N
		1	2	2:1 HEAD 143.75" ID X 1.25 NOM. THK.	SA-516-70N

NOZZLE SCHEDULE

MARK	SERVICE	NOZZLE SIZE	NOZZLE DESCRIPTION	NOZZLE ORIENT	NOZZLE CORR. ALLOW.	NOZZLE NECK MAT'L	NOZZLE IMPACT TEST	NOZZLE NORMAL-IZED	FLANGE SIZE	FLANGE TYPE	FLANGE CLASS	FLANGE RATING	FLANGE FLG MAT'L	REINFORCING PAD MATERIAL	REINFORCING PAD IMPACT TEST	REINFORCING PAD NORMAL-IZED
N11	MANWAY BLIND CONNECTION	2	2 I.D. X .655 WALL	180.0	0.0625	SA 105 FORGING	N	Y	2	LWN	300#	708.15	A105	–	–	–
M1	MANWAY W/HINGED COVER & 2-300 RFLWN	24	24 I.D. X 4 WALL	180.0	0.0625	SA 105 FORGING	N	Y	24	F	150#	272.75	A105	SA 516 70	N	Y
N10	PURGE C/W BLIND	3	2.9 I.D. X 1.24 WALL	180.0	0.0625	SA 105 FORGING	N	Y	3	HB	300#	708.15	A105	–	–	–
N9	PRESS.VENT TO FLARE	2	2 I.D. X .655 WALL	0.0	0.0625	SA 105 FORGING	N	Y	2	LWN	300#	708.15	A105	–	–	–
N8	VENT C/W BLIND WITH 2"NPT	6	6 I.D. X 2.5 WALL	0.0	0.0625	SA 105 FORGING	N	Y	6	F	150#	272.75	A105	–	–	–
N7	RELIEF	4	3.83 I.D. X 1.305 WALL	0.0	0.0625	SA 105 FORGING	N	Y	4	HB	150#	272.75	A105	–	–	–
N6	THERMOWELL	2	1.94 I.D. X 1 WALL	180.0	0.0625	SA 105 FORGING	N	Y	2	HB	300#	708.15	A105	–	–	–
N5	TRANSFER	4	3.83 I.D. X 1.305 WALL	180.0	0.0625	SA 105 FORGING	N	Y	4	HB	150#	272.75	A105	–	–	–
N4B	LEVEL INDIC./TRIP	2	2 I.D. X .655 WALL	180.0	0.0625	SA 105 FORGING	N	Y	2	LWN	300#	708.15	A105	–	–	–
N4A	LEVEL INDIC./TRIP	2	2 I.D. X .655 WALL	0.0	0.0625	SA 105 FORGING	N	Y	2	LWN	300#	708.15	A105	–	–	–
N3B	LEVEL CONTROL	3	2.9 I.D. X 1.24 WALL	180.0	0.0625	SA 105 FORGING	N	Y	3	HB	300#	708.15	A105	–	–	–
N3A	LEVEL CONTROL	3	2.9 I.D. X 1.24 WALL	0.0	0.0625	SA 105 FORGING	N	Y	3	HB	300#	708.15	A105	–	–	–
N2	LIQUID OUTLET	10	9.56 I.D. X 3.25 WALL	180.0	0.0625	SA 105 FORGING	N	Y	10	F	150#	708.15	A105	–	–	–
N1	PRODUCT INLET	4	3.83 I.D. X 1.305 WALL	0.0	0.0625	SA 105 FORGING	N	Y	4	HB	150#	272.75	A105	–	–	–

WELDING PROCEDURES

PROCESS \ WPS / MAT'L	P1–P1	P1–P8	*–P1					
1 S.M.A.W.	PP-52-1	PP-07-1						
2 S.A.W. S.M.A.W.								
3 F.C.A.W.	PPT-19-1		PP-30					
4 S.A.W.	PP-516-5							

* CSA: G40.21-44W (3)

GENERAL NOTES:

1. FLANGE BOLT HOLES SHALL STRADDLE NORMAL VESSEL CENTERLINES UNLESS NOTED.
2. WELDS SHALL BE NEAT IN APPEARANCE, FREE OF SLAG, UNDERCUTS AND OTHER DEFECTS.
3. NOZZLE AND TAIL DIMENSION TOLERANCES SHALL BE +/– 1/8 INCH UNLESS OTHERWISE NOTED.
4. REINFORCING PADS AND PAD SECTIONS SHALL HAVE 1/4 INCH NPT WEEP HOLE LOCATED AS LOW AS POSSIBLE IN THE PAD WHEN THE VESSEL IS IN OPERATING POSITION. PLUG WEEP HOLE WITH HEAVY GREASE.
5. VESSEL SHALL BE CLEANED OF SCALE, OIL, WELD SPATTER AND ALL OTHER FOREIGN MATTER BEFORE HYDROSTATIC TESTING.
6. COAT ALL NOZZLE GASKET SURFACES WITH PROTECTIVE LUBRICANT BEFORE BLANKING FOR SHIPMENT.
7. (3) CLOSE OPENINGS WITH PROTECTIVE COVERS OF WOOD WITH FOUR OR MORE BOLTS. WELD END OPENINGS SHALL BE CLOSED WITH PIPE CAPS AND HEAVY TAPE.

D-2100E. Internal

UNE DIVISION DE/A DIVISION OF RNG GROUP INC.

RNG Pro-Tech Inc.
Sable Island Project - D2100 D/E
144" ID Propane Storage Bullets

SIZE	JOB NO.	DWG NO.	REV
D	1214-98	980047-2	4
SCALE: NTS	DATE: 08-26-98	SHEET: 1 OF 2	

EM&IJ Report No: PT-D2100E-090708-CR — Attachment 2 — PT-11564784-001-D2100E