Canadian Natural

Procedure Number: IN-QP-010

Owner User Program – Pressure Vessel Repair Procedure
Vessel Firetube Repair - Replacement of Damaged Sections
12-9 Treater 630

Contents

Revision History

Date	Revision	By	Chk	Approver
Nov 24, 2011	1.3	AM	KM	AM

Static Data

Date:	January 21, 2013	**CNRL Facility:**	Central Brintnell Battery
Facility LSD:	12-09-81-22W4	**Vessel Description:**	Treater 630
A #:	A403458	**CRN:**	L0015.2
Vessel Serial #:	97015-3-30	**Fire tube Serial #:**	C80056
Vessel MAWP:	75 PSI	**Fire tube Thickness:**	0.375"
Owners Inspector:	IRIS Inspection Services	**Repair Organization:**	Exact Oilfield Developing Ltd.
Scope of Work:	Inspect and repair the deformation on the fire tube by replacing 16 feet of the damaged section of the tube. Ensure firetube checklist is complete and correct before job completion. Ensure QC package is complete and sent to Anthony Merle. **Bake-out not required because of sweet service**		

Scope

CP Jan 28, 2013

Installation of replacement section of severely pitted or collapsed firetube from ASME Section VIII Division I pressure vessel constructed of P-I Group 1 or 2 materials. Note that due to the high likelihood of repeat failure, all repairs on vessel firetubes must be post-weld heat treated (PWHT) regardless of whether the firetube was PWHT at time of manufacture.

Materials shall be of the same specification, grade, and dimensions as defined in the manufacturer's original registered design.

Procedure

Vendor Qualification

1. CNRL Owner's Inspector must review Contractor's Quality Control Program, welding procedures, and welder qualifications prior to the start of the repair. Any concerns must be brought the attention of the CNRL Integrity group.

Cut-Out

2. Define the area to be removed.
3. Perform UT of the cut area to determine if any laminations or discontinuities exist.
4. If laminations or discontinuities are identified, move the cut out area to attempt to avoid these defects.
5. Owner's Inspector shall approve the layout of the area to be removed prior to the initial cut being made.
6. Make sure the firetube has been sanitized and there are no explosive environments present.
7. Perform the cut.

Weld Preparation

8. The joint preparation shall be in accordance with the contractor's registered WPS.
9. The surface shall be cleaned to white metal for a distance of 10 mm beyond the expected weld area.
10. The weld area shall be MPI (where practical Wet Fluorescent MPI) examined for laminations and surface discontinuities. If laminations or surface discontinuities are identified they shall be brought to the attention of the Chief Inspector.

~~Hydrogen Bake Out and Sulfur Removal~~

~~**Note: Remove this section if firetube has not been in sour service**~~

11. ~~Vessels that have been exposed to sour or sulfur bearing process streams shall required the weld attachment area to undergo a "Bake Out" procedure. This procedure shall consist of heating the weld attachment area and 10 cm on each side to 315°C (600°F) for and holding that temperature for a minimum of 60 minutes. Bake out should be done prior to cutting out, if cutout is done thermally. Stipulate controls methods.~~
12. ~~Bake Out is performed by either induction coil (use thermocouples as control instrumentation) or propane torch (use temperature-sensitive crayons – upper and lower temperature to be controlled). Oxyacetylene torches are not acceptable.~~
13. ~~If induction coils are used, a 250°C (482°F) four-hour heat treatment may be substituted for the normal 450°C (842°F) one-hour heat treatment.~~

Welding

14. Minimum pre-heat shall be 80°C (176°F) for a 100 mm band on both sides of the weld attachment area.
15. The CNRL Owner's Inspector shall witness seal on the box being broken and ensure that once the box has been opened the electrodes are stored in an oven.
16. The CNRL Owner's Inspector shall approve the alignment and fit-up of the replacement section with only the tack welds in place.
17. Welding shall be in accordance with the contractor's registered PWHT WPS utilizing new E 7018-1 electrodes.
18. Inspect root weld using dry powder MT.
19. Complete the butt welds. No down hand welding shall be used.
20. Perform post weld heat treatment (PWHT). If firetube was PWHT at time of manufacture, perform PWHT as per U1A. If firetube was not PWHT at time of manufacture, perform PWHT by heating to 620°C (1150°F) and holding for 1 hour. PWHT may be performed by either oven or stress-relief truck. Heating rates shall be as per ASME Section VIII Division 1.
21. After PWHT, the weld area shall be wrapped with an insulating blanket and allowed to slow cool to 100°C (212°F). The cooling rate shall not exceed 260°C (500°F) / hour.

Post Weld Non-Destructive Examination (NDE)

22. Complete 100% RT of butt weld joints.
23. MT 12 hours after completion of the work
24. No hydro-test is required.

Documentation

25. The CNRL Owner's Inspector must make sure that Contractor has completed required QC documentation and jurisdictional documents.

26. The CNRL Owner's Inspector must sign off the jurisdictional documents and make sure one copy is submitted to the jurisdictional authority and one is included in the QC package.
27. Mail a hard copy of QC Documentation to:

    Anthony Merle c/o CNRL

    Suite 2500, 855 – 2nd Street SW

    Calgary AB, T2P 4J8

Travel Sheet

A #:	A403458	Date:	
Vessel LSD:	12-09-81-22W4	Facility:	Central Brintnell Battery

Step #	Description of Step	Insp. Point	Contractor		Insp. Point	Owners Inspector	
			Initial	Date		Initial	Date
	Scope Sign-Off					CP	Jan 28, 2013
Vendor Qualification							
Step 1	Ensure Vendor is Qualified						
Cut-Out							
Step 2	Mark Area						
Step 3	Perform UT						
Step 4	Move Area if Defects Found						
Step 5	Owners Inspector Approval						
Step 6	Ensure Removal of LEL						
Step 7	Perform Cut						
Weld Preparation							
Step 8	Joint Prep as per WPS						
Step 9	Surface Prep						
Step 10	Weld Area MPI for Discontinuities						
~~**Hydrogen Bake Out**~~							
~~Step 11~~	~~Perform Bake-Out (If Required)~~						
~~Step 12~~	~~Heating Method Used for Bake-Out~~						
~~Step 13~~	~~Substitution of Inductions Coils~~						
Welding							
Step 14	Pre-Heat						
Step 15	New Electrodes						
Step 16	Owners Acceptance of Fit-Up						
Step 17	Approved WPS						
Step 18	Inspect Root Weld						
Step 19	Completion of Weld						
Step 20	PWHT						
Step 21	Slow Cool						
Post-Weld Non-Destructive Examination (NDE)							
Step 22	Completion of Radiography						
Step 23	12 Hour MPI						
Step 24	No Hydrotest						
Documentation							
Step 25	Completion of Contractor Documentation						
Step 26	Owners Inspector Signs Jurisdictional Docs						
Step 27	Mail QC Docs to Anthony Merle						

H = Hold Point, W = Witness Point, R = Review Point

Final Sign-Off			
Contractor:		Owners Inspector:	

A-403458
TRC Mar 12/98

AB-23 (side 1) 97/11

ALBERTA LABOUR
Alberta Boilers Safety Association
200, 4208 - 97 Street
Edmonton AB T6E 5Z9

Partial/ *Partiel* ☐

MANUFACTURER'S DATA REPORT FOR PRESSURE VESSEL

DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR D'APPAREILS SOUS PRESSION

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression

Manufactured by *Construit par*	Name and address of Manufacturer/ *Nom et adresse du constructeur*: RCI
Manufactured for *Construit pour*	Name and address of Purchaser or Consignee/ *Nom et adresse du client ou de son représentant*: C.S. RESOURCES LTD. C/O MILLENIA RESOURCES CONSULTING
Ultimate owner *Utilisateur*	Name and address/ *Nom et adresse*: 150 1300 - 8th STREET CALGARY AB.
Location of installation *Lieu d'installation*	Address/ *Adresse*: PELICAN LAKE COMPLEX, WABASCA AB., LSD# 12-9-081-22W4M

Pressure vessel/ *Appareil*

Type/ *Genre*: HORIZONTAL EMULSION TREATER	Serial No./ *N° de série*: 97015-3-30	Year built/ *Année de fabrication*: 1998	Overall Length/ *Longueur totale*: 40'-0"
Provincial Registration No. - C.R.N./ *N° d'enregistrement provincial - N.E.C.*: L-0015.2	National Board No./ *N° National Board*	Drawing No./ *N° de dessin*: 97015.1/3-30REV2	Diameter/ *Diamètre*: 120"

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code. *Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux du code ASME.* YES

The design, construction and workmanship conform to CSA B51. *La conception, la construction et la façon sont conformes à ACNOR B51*	ASME	Division	Addenda/ *Supplément*	Code case No *N° de cas*
YES	Sec VIII	DIV 1	96	N/A

Manufacturers' partial data reports properly identified and signed by authorized inspectors have been furnished for the following items of the report, and attached to this report:
Les rapports partiels du constructeur adéquatement identifiés et signés par les inspecteurs autorisés ont été produits pour les items suivants du rapport, et attachés à ce rapport

N/A

Names of parts/ *Nom de la composante*	Item No./ *N° d'item*	Manufacturer's Name/ *Nom du constructeur*	Identifying Stamp/ *Estampe d'identification*

Shell/ *Virole*

Description	Material *Matériau*	Thickness *Épaisseur*	Corr Allow *Surépaisseur de corr*	Diameter *Diamètre*	Overall Length *Long totale*	Number of courses *Nombre de sections*	Girth Joints *Joints de circonférence* Type	Girth Joints R.T. Reading	Longitudinal Joints *Joints longitudinaux* Type	Longitudinal Joints R.T. Reading	Longitudinal Joints Efficiency *Efficacité*	P.W.H.T. *Traitement thermique* Temp	P.W.H.T. Time *Durée*
SHELL #1,2,3,4	SA516-70	.5	.0625	120"	10'-0"	4	1	FULL RT-1	1	RT-1	1.0	N/A	

Heads/ *Têtes*

Description	Material *Matériau*	Min. Thickness *Épaisseur min.*	Corr Allow *Surép. Corr*	Crown. Radius *Rayon couronn.*	Knuckle Radius *Rayon coude*	Ellipse Ratio *Rapp. ellipse*	Conical Apex Angle *Angle conique*	Hemisph. Radius *Rayon hémisph.*	Flat Diameter *Diam plat*	Side to pressure *Côté sous pression*
FT END	SA516-70	.691	.0625	N/A		2.1				CONCAVE
O.L END	SA516-70	.439	.0625			2.1				CONCAVE

Removable bolts used (describe other fastenings) *Boulons amovible utilisés (décrire tout autre attache)*: N/A

Mat'l Spec./ *Spéc du mat.* | Grade | Size/ Dimension

Pressure - Temperature/ *Pression - température*

Pressure Vessel Part *Partie de l'appareil*	Constructed for max allowable working pressure *Construit pour une pression maximale de marche permise*	At max. temp. *A une temp. max.*	Min Temp (when less than -29°C) *Temp. min (inférieure à -29°C)*	Test pressure (hydro-pneumatic or combination) *Pression d'épreuve (hydro-pneumatique ou combinaison)*
SHELL	75 PSI	300°F °C	-20°F °C	113 PSI

A403458

AB-35 (side 2)

Tube Section/ *Faisceau tubulaire*

Tubesheet/ *Plaque tubulaire*	Material/ *Matériau*	Diameter/ *Diamètre*	Nominal Thickness *Épaisseur nominale*	Corr. Allow. *Surépais. corrosion*	Attachment *Mode d'attachement*

Tube material/ *Matériau des tubes*	Diameter/ *Diamètre*	Nominal Thickness (gauge) *Épaisseur nominale (calibre)*	Number/ *Nbre*	Type (Straight or U) *Type (Droit ou U)*	Heating Surface *Surface de chauffe*

Jacket/ *Chemise*

Type of jacket/ *Genre de chemise*	Jacket closure *Fermeture de chemise*	Proof Test *Pression d'épreuve*	Heating Surface *Surface de chauffe*	Sketch/ *Schéma*

Safety Valve Outlets/ *Soupapes de sûreté*

Number/ *Nombre*	Dimension	Location/ *Endroit*

Nozzles and Openings/ *Tubulures et ouvertures*

Purpose/ *But*	Number *Nombre*	Dimension	Type	Material *Matériau*	Nominal Thickness *Épaisseur nominale*	Reinforcement material *Matériau de renfort*	How attached *Genre d'attaches*	Location/ *Endroit*
SEE SUPPLEMENTRY								
SHEETS								

Supports/ *Supports*

Skirt/ *Jupe*	Lugs/ Oreilles *No./ Nbre*	Legs/ Pieds *No./ Nbre*	Other/ *Autres* (Description)	Attached/ *Attaches* (Where and How/ *Méthode et endroit*)
Yes/ *Oui* ☐ No/ *Non* ☐				

Remarks/ *Observations* (Cubical capacity/ *Volume*)

VESSEL IS IMPACT TEST EXEMPT PER UCS-66
VOLUME OF VESSEL 3378 CU.FT
RADIOGRAPHY DONE PER UW-11(a)
SAFETY VALUE BY OTHERS

Certificate of Compliance/ *Certificat de conformité*

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51

Provincial Registered Design *Enregistrement provincial* L-0015.2

Manufacturer *Constructeur* RCI

Signature [signature] Date March 12/98

Certificate of Shop Inspection/ *Certificat d'inspection en usine*

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression
employed by *employé par* ABSA
of/ *de* Alberta
have inspected the above vessel and state that to the best of my knowledge and belief, the manufacturer has constructed the vessel in accordance with the Provincial registration CRN L-0015.2
and the requirements of standard CSA B51.
ai inspecté l'appareil précité et atteste que le sache, ceci que le constructeur a construit l'appareil en accord avec l'enregistrement provincial NRC et les exigences de la norme ACNOR B51

Inspector's Name *Nom de l'inspecteur* Tom Chalifoux

Signature [signature] AB28 Date March 12/98

Certificate of Compliance - Field Work/ *Certificat de conformité - Installation au chantier*

We certify that the field installation of all parts of the vessel conforms with the requirements of Provincial Regulations.

Nous certifions que l'installation au chantier de toutes les composantes de l'appareil est conforme aux règlements provinciaux.

Installer's Name *Nom de l'installateur* ______

Signature ______

Date ______

Certificate of Field Inspection/ *Certificat d'inspection - Installation au chantier*

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression
employed by *employé par* ______
have inspected the items not covered by the Shop Inspection Certificate and the installation of the items and state that to the best of my knowledge and belief the construction and assembly of the items are in accordance with the Provincial Regulations.
ai inspecté les composantes non couvertes par le certificat d'inspection en usine et l'installation de l'appareil et atteste que je sache, la construction et l'assemblage de l'appareil sont en accord avec les règlements provinciaux

Inspector's Name *Nom de l'inspecteur* ______

Signature ______ Date ______

A 403458

RCI RESOURCE CONSTRUCTORS (CANADA) INC.

HEAD OFFICE
PO Box 3120, 53251-RR 232
Sherwood Park, Alberta, T8A 2A6
Phone: (403) 417-7222, Fax: (403) 417-7220

1. Manufactured and certified by: RCI Resource Constructors Inc., 53251 RR 232 Sherwood Park, Alberta. T8A 2A6
(Name and Address of Manufacturer)

2. Manufactured for: C.S RESOURCES LTD. c/o MILLENIA RESOURCE CONSULTING 150, 1300-8th STREET, CALGARY, AB.
(Name and Address of Purchaser)

3. Location of installation: PELICAN LAKE COMPLEX, WABASCA AB., LSD# 12-9-081-22W4M
(Name and Address)

4. Type: Horizontal (Horz, Vert, or Sphere) | EMULSION TREATER (Tank, Sep., Heat Exh., Etc.) | 97015-3-30 (Mfgr's Serial No.) | L-0015.2 (CRN) | 97015.1/3 REV2 (Drawing No.) | N/A (Nat'l. Bd. No.) | 1998 (Year Built)

Purpose (Inlet, Outlet, Drain)	Item No.	Diameter or Size	Type	Material	Nominal Thk.	Reinforcement Material	How * Attached	Location
EMULSION INLET	N1	6"	150# RFWN	SA-105	SCH 80		WELDED	PIPE
		6"	PIPE	SA 106B	SCH 80		WELDED	SHELL
GAS OUTLET	N2	3"	150# RFWN	SA-105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	DOME
OIL OUTLET	N3	4"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	HEAD
WATER OUTLET	N4	2"	150# RFWN	SA 105	SCH 160		WELDED	SHELL
		2"	150# RFSO	SA105	SCH 160			
DRAIN	N5 A/B	3"	150# RFWN	SA105	SCH 80		WELDED	PIPE
		3"	PIPE	SA106B	SCH 80		WELDED	SHELL
ANODE	N6 A/E	4"	150# RFWN	SA105	SCH 80		WELDED	PIPE
		4"	PIPE	SA106B	SCH 80		WELDED	SHELL
		3/4"	STUD	SA-193B7M				
		3/4"	NUT	SA 1942HM				
RELIEF	N7	4"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	SHELL
WASH WATER INLET	N8 A/E	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		2"	150# RFSO	SA105	SCH 80			
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
WASH WATER INLET	N9 A/B	2"	150# RFWN	SA105	SCH 160		WELDED	PIPE
		2"	150# RFSO	SA105	SCH 160			
		2"	PIPE	SA106B	SCH 160		WELDED	SHELL
DESAND WATER OUTLET	N10 A/E	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
DESLUDGE OUTLET	N11 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	PIPE	SA106B	SCH 80		WELDED	SHELL
MANWAY	M 1/2	24"	150# RFSO	SA 105	SCH 40		WELDED	PIPE
		24"	PIPE	SA 106B	SCH 40		WELDED	SHELL
		24"	BLIND FLANGE	SA 105	SCH 40			
		24	GASKET	316SS	1/8"			
		1.25	STUD	SA193B7M				
		1.25	NUT	SA1942HM				
		24"	DAVIT	CS				
		24"	HANGE	CS				
DOME	D1	24"	HEAD	SA 516-70	SCH 40		WELDED	PIPE
		24"	PIPE	SA106B	SCH 40		WELDED	SHELL
		24"	PIPE	SA106B	SCH 40		WELDED	HEAD
		24"	150# RFSO	SA 105	SCH 40		WELDED	PIPE
		24"	GASKET	316SS	1/8"			
		1.25	STUD	SA193B7M				
		1.25	NUT	SA1942HM				
FIRE TUBE	FT 1/2	2'-5"	PLATE	SA 516-70N	1.375			
		2'-5"	PLATE	SA 516-70N	1.125			
		15.75	PLATE	SA 516-70	0.5			
		3"	GASKET	NEOPRENE	.1875			

Date March 12/98 Name RCI Resource Constructors Inc. Signed (Manufacturer) [signature] (Representative)

Date Mar 12/98 Name [signature] (Authorized Inspector) AB78 Commission Alberta AB78 (Nat'l Board Incl. Endorsement, State, Province and No.)

A-403438

RCI RESOURCE CONSTRUCTORS (CANADA) INC.

HEAD OFFICE
PO Box 3120, 53251-RR 232
Sherwood Park, Alberta, T8A 2A6
Phone: (403) 417-7222, Fax: (403) 417-7220

1. **Manufactured and certified by:** RCI Resource Constructors Inc., 53251 RR 232 Sherwood Park, Alberta. T8A 2A6
(Name and Address of Manufacturer)

2. **Manufactured for:** C.S. RESOURCES LTD. c/o MILLENIA RESOURCE CONSULTING 150, 1300 - 8th STREET, CALGARY, ALBERTA
(Name and Address of Purchaser)

3. **Location of installation:** PELICAN LAKE COMPLEX, WABASCA, AB, LSD # 12-9-081-22W4M
(Name and Address)

4. **Type:** Horizontal (Horz, Vert, or Sphere) — EMULSION TREATER (Tank, Sep., Heat Exh., Etc.) — 97015-3-30 (Mfgr's Serial No.) — L-00152 (CRN) — 97015.1/3 REV 2 (Drawing No.) — N/A (Nat'l. Bd. No.) — 1998 (Year Built)

Purpose (Inlet, Outlet, Drain)	Item No.	Diameter or Size	Type	Material	Nominal Thk.	Reinforcement Material	How* Attached	Location
FIRE TUBE	FT 1/2	.75"	STUD	SA 193B7M				
		.75"	NUT	SA 194 2HM				
DESLUDGE (SPARE)	N11 A/B	3"	BLIND FLANGE	SA 105	SCH 80			
		3"	GASKET	316SS	.125"			
		.625	STUD	SA193B7M				
		.625	NUT	SA194 2HM				
DESLUDGE OUTLET	N12 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	150# RFSO	SA 105	SCH 80			
		3"	PIPE	SA-106B	SCH 80		WELDED	SHELL
WATER LT	N13 A/B	2"	150# RFWN	SA 105	SCH 160		WELDED	PIPE
		2"	150# RFTRF	SA 105	SCH 160			
		2"	GASKET	316SS	.125"			
		.625"	STUD	SA-193B7M				
		.625"	NUT	SA 194 2HM				
		2"	PIPE	SA 106B	SCH 160		WELDED	SHELL
		2"	PIPE	SA 106B	SCH 160		WELDED	
TI	C1 A/B	.75"	COUPLING	SA 105	6000#		WELDED	SHELL
		.75"	COUPLING	SA 105	6000#		WELDED	SHELL
TE	C2 A/B	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
PI	C3	.50"	COUPLING	SA 105	6000#			
SAMPLE	C4 A/G	.75"	COUPLING	SA 105	6000#		WELDED	SHELL
		.75"	COUPLING	SA 105	6000#		WELDED	SHELL
SAMPLE	C5 A/G	.75"	COUPLING	SA 105	6000#		WELDED	SHELL
		.75"	COUPLING	SA 105	6000#		WELDED	SHELL
FUEL GAS	C6 A/B	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
LSLL	C7 AB	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
LSHH	C8 AB	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
OIL LT	C9 AB	1.0"	COUPLING	SA 105	6000#		WELDED	HEAD
SPARE	C10	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
		1.0"	PLUG	SA 105	6000#			
SPARE	C11	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
		1.0"	PLUG	SA 105	6000#			
	C12	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
		1.0"	PLUG	SA 105	6000#			
LG	C13 A/B	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
SAMPLE	C14	.75"	COUPLING	SA 105	6000#		WELDED	SHELL

Date March 12/98 Name RCI Resource Constructors Inc. Signed (Manufacturer) [signature] (Representative)

Date Mar 12/98 Name [signature] (Authorized Inspector) Commission Alberta AB 38 [Nat'l Board Incl. Endorsement, State, Province and No.]

Canadian Natural

Procedure Number: IN-QP-010

Owner User Program – Pressure Vessel Repair Procedure
Vessel Firetube Repair - Replacement of Damaged Sections
12-9 Treater 610

Contents

Revision History

Date	Revision	By	Chk	Approver
Nov 24, 2011	1.3	AM	KM	AM

Static Data

Date:	January 21, 2013	**CNRL Facility:**	Central Brintnell Battery
Facility LSD:	12-09-81-22W4	**Vessel Description:**	Treater 610
A #:	A403458	**CRN:**	L0015.2
Vessel Serial #:	97015-1-30	**Fire tube Serial #:**	C80055
Vessel MAWP:	75 PSI	**Fire tube Thickness:**	~~0.375"~~ Sched 40 TA
Owners Inspector:	IRIS Inspection Services	**Repair Organization:**	Exact Oilfield Developing Ltd.
Scope of Work:	Inspect and repair the deformation on the fire tube by replacing 18 feet 8" of the damaged section of the tube. Ensure firetube checklist is complete and correct before job completion. Ensure QC package is complete and sent to Anthony Merle. **Bake-out not required because of sweet service**		

Scope

CP Jan 28, 2013

Installation of replacement section of severely pitted or collapsed firetube from ASME Section VIII Division I pressure vessel constructed of P-I Group 1 or 2 materials. Note that due to the high likelihood of repeat failure, all repairs on vessel firetubes must be post-weld heat treated (PWHT) regardless of whether the firetube was PWHT at time of manufacture.

Materials shall be of the same specification, grade, and dimensions as defined in the manufacturer's original registered design.

Procedure

Vendor Qualification

1. CNRL Owner's Inspector must review Contractor's Quality Control Program, welding procedures, and welder qualifications prior to the start of the repair. Any concerns must be brought the attention of the CNRL Integrity group.

Cut-Out

2. Define the area to be removed.
3. Perform UT of the cut area to determine if any laminations or discontinuities exist.
4. If laminations or discontinuities are identified, move the cut out area to attempt to avoid these defects.
5. Owner's Inspector shall approve the layout of the area to be removed prior to the initial cut being made.
6. Make sure the firetube has been sanitized and there are no explosive environments present.
7. Perform the cut.

Weld Preparation

8. The joint preparation shall be in accordance with the contractor's registered WPS.
9. The surface shall be cleaned to white metal for a distance of 10 mm beyond the expected weld area.
10. The weld area shall be MPI (where practical Wet Fluorescent MPI) examined for laminations and surface discontinuities. If laminations or surface discontinuities are identified they shall be brought to the attention of the Chief Inspector.

~~Hydrogen Bake Out and Sulfur Removal~~

~~**Note: Remove this section if firetube has not been in sour service**~~

11. ~~Vessels that have been exposed to sour or sulfur bearing process streams shall required the weld attachment area to undergo a "Bake Out" procedure. This procedure shall consist of heating the weld attachment area and 10 cm on each side to 315°C (600°F) for and holding that temperature for a minimum of 60 minutes. Bake out should be done prior to cutting out, if cutout is done thermally. Stipulate controls methods.~~
12. ~~Bake Out is performed by either induction coil (use thermocouples as control instrumentation) or propane torch (use temperature-sensitive crayons – upper and lower temperature to be controlled). Oxyacetylene torches are not acceptable.~~
13. ~~If induction coils are used, a 250°C (482°F) four-hour heat treatment may be substituted for the normal 450°C (842°F) one-hour heat treatment.~~

Welding

14. Minimum pre-heat shall be 80°C (176°F) for a 100 mm band on both sides of the weld attachment area.
15. The CNRL Owner's Inspector shall witness seal on the box being broken and ensure that once the box has been opened the electrodes are stored in an oven.
16. The CNRL Owner's Inspector shall approve the alignment and fit-up of the replacement section with only the tack welds in place.
17. Welding shall be in accordance with the contractor's registered PWHT WPS utilizing new E 7018-1 electrodes.
18. Inspect root weld using dry powder MT.
19. Complete the butt welds. No down hand welding shall be used.
20. Perform post weld heat treatment (PWHT). If firetube was PWHT at time of manufacture, perform PWHT as per U1A. If firetube was not PWHT at time of manufacture, perform PWHT by heating to 620°C (1150°F) and holding for 1 hour. PWHT may be performed by either oven or stress-relief truck. Heating rates shall be as per ASME Section VIII Division 1.
21. After PWHT, the weld area shall be wrapped with an insulating blanket and allowed to slow cool to 100°C (212°F). The cooling rate shall not exceed 260°C (500°F) / hour.

Post Weld Non-Destructive Examination (NDE)

22. Complete 100% RT of butt weld joints.
23. MT 12 hours after completion of the work
24. No hydro-test is required.

Documentation

25. The CNRL Owner's Inspector must make sure that Contractor has completed required QC documentation and jurisdictional documents.

26. The CNRL Owner's Inspector must sign off the jurisdictional documents and make sure one copy is submitted to the jurisdictional authority and one is included in the QC package.
27. Mail a hard copy of QC Documentation to:

    Anthony Merle c/o CNRL

    Suite 2500, 855 – 2nd Street SW

    Calgary AB, T2P 4J8

Travel Sheet

A #:	A403458	Date:	
Vessel LSD:	12-09-81-22W4	Facility:	Central Brintnell Battery

Step #	Description of Step	Insp. Point	Contractor Initial	Contractor Date	Insp. Point	Owners Inspector Initial	Owners Inspector Date
	Scope Sign-Off					CP	Jan 28, 2013
Vendor Qualification							
Step 1	Ensure Vendor is Qualified						
Cut-Out							
Step 2	Mark Area						
Step 3	Perform UT						
Step 4	Move Area if Defects Found						
Step 5	Owners Inspector Approval						
Step 6	Ensure Removal of LEL						
Step 7	Perform Cut						
Weld Preparation							
Step 8	Joint Prep as per WPS						
Step 9	Surface Prep						
Step 10	Weld Area MPI for Discontinuities						
~~**Hydrogen Bake Out**~~							
~~Step 11~~	~~Perform Bake-Out (If Required)~~						
~~Step 12~~	~~Heating Method Used for Bake-Out~~						
~~Step 13~~	~~Substitution of Inductions Coils~~						
Welding							
Step 14	Pre-Heat						
Step 15	New Electrodes						
Step 16	Owners Acceptance of Fit-Up						
Step 17	Approved WPS						
Step 18	Inspect Root Weld						
Step 19	Completion of Weld						
Step 20	PWHT						
Step 21	Slow Cool						
Post-Weld Non-Destructive Examination (NDE)							
Step 22	Completion of Radiography						
Step 23	12 Hour MPI						
Step 24	No Hydrotest						
Documentation							
Step 25	Completion of Contractor Documentation						
Step 26	Owners Inspector Signs Jurisdictional Docs						
Step 27	Mail QC Docs to Anthony Merle						

H = Hold Point, W = Witness Point, R = Review Point

Final Sign-Off			
Contractor:		**Owners Inspector:**	

A-40345 6
TRC mar 12/98

AB-25 (side 1) 97/11

ALBERTA LABOUR
Alberta Boilers Safety Association
200, 4208 - 97 Street
Edmonton AB T6E 5Z9
Partial/ *Partiel* ☐

MANUFACTURER'S DATA REPORT FOR PRESSURE VESSEL

DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR D'APPAREILS SOUS PRESSION

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression

Manufactured by *Construit par*	Name and address of Manufacturer/ *Nom et adresse du constructeur*: RCI
Manufactured for *Construit pour*	Name and address of Purchaser or Consignee/ *Nom et adresse du client ou de son représentant*: C.S. RESOURCES LTD. C/O MILLENIA RESOURCE CONSULTING
Ultimate owner *Utilisateur*	Name and address/ *Nom et adresse*: 150 1300 - 8th STREET S.W. CALGARY AB.
Location of installation *Lieu d'installation*	Address/ *Adresse*: PELICAN LAKE COMPLEX WABASCA AB. LSD # 12-9-081-22W4M

Pressure vessel/ *Appareil*

Type/ *Genre*: HORIZONTAL EMULSION TREATER	Serial No/ *N° de série*: 97015 - 1 - 30	Year built/ *Année de fabrication*: 1998	Overall Length/ *Longueur totale*: 40'-0"
Provincial Registration No. - C.R.N./ *N° d'enregistrement provincial - N.E.C.*: L-0015.2	National Board No/ *N° National Board*:	Drawing No/ *N° de dessin*: 97015.1/3-30REV2	Diameter/ *Diamètre*: 120"

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code. YES
Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux du code ASME.

The design, construction and workmanship conform to CSA B51/ *La conception, la construction et la façon sont conformes à la norme B51*	ASME	Division	Addenda/ *Supplément*	Code case No/ *N° de cas*
YES	Sec VIII	DIV 1	96	N/A

Manufacturers' partial data reports properly identified and signed by authorized inspectors have been furnished for the following items of the report, and attached to this report:
Les rapports partiels du constructeur adéquatement identifiés et signés par les inspecteurs autorisés ont été produits pour les items suivants du rapport, et ajoutés à ce rapport: N/A

Names of parts/ *Nom de la composante*	Item No/ *N° d'item*	Manufacturer's Name/ *Nom du manufacturier*	Identifying Stamp/ *Estampe d'identification*

Shell/ *Virole*

Description	Material/ *Matériau*	Thickness/ *Épaisseur*	Corr Allow/ *Surépaisseur de corr*	Diameter/ *Diamètre*	Overall Length/ *Long totale*	Number of courses/ *Nombre de sections*	Girth Joints/ *Joints de circonférence* Type	Girth Joints RT Rating	Longitudinal Joints/ *Joints longitudinaux* Type	Longitudinal Joints RT Rating	Longitudinal Joints Efficiency/ *Efficacité*	P.W.H.T. Temp	P.W.H.T. Time Held/ *Temps durée*
SHELL #1,2,3,4	SA516-70	.5	.0625	120"	10'-0"	4	1	FULL RT-1	1	RT-1	1.0	N/A	

Heads/ *Têtes*

Description	Material/ *Matériau*	Min Thickness/ *Épais minim*	Corr Allow/ *Surép Corr*	Crown Radius/ *Rayon couronn*	Knuckle Radius/ *Petit rayon*	Ellipse Ratio/ *Rapp ellipse*	Conical Apex Angle/ *Angle conique*	Hemisph Radius/ *Rayon hémisph*	Flat Diameter/ *Diam plat*	Side to pressure/ *Côté sous pression*
FT END	SA516-70	.691	.0625	N/A		2.1				CONCAVE
O.L END	SA516-70	.4139	.0625			2.1				CONCAVE

Removable bolts used (describe other fastenings)/ *Boulons amovibles utilisés (décrire tout autre attache)*: N/A
Mat'l Spec./ *Spéc du mat.*: Grade: Size/ Dimension:

Pressure - Temperature/ *Pression - température*

Pressure Vessel Part/ *Partie de l'appareil*	Constructed for max. allowable working pressure/ *Construit pour une pression maximale de marche permise*	At max. temp./ *À une temp. max.*	Min Temp (when less than -29°C)/ *Temp min (inférieure à -29°C)*	Test pressure (hydro-pneumatic or combination)/ *Pression d'épreuve (hydro-pneumatique ou combinaison)*
SHELL	75 PSI	300°F °C	-20°F °C	[illegible]

AB-25 (side 2) 93/01

Tube Section/ Faisceau tubulaire

Tubesheet/ Plaque tubulaire	Material/ Matériau	Diameter/ Diamètre	Nominal Thickness Épaisseur nominale	Corr. Allow. Surépais. corrosion	Attachment Mode d'attachement

Tube material/ Matériau des tubes	Diameter/ Diamètre	Nominal Thickness (gauge) Épaisseur nominale (calibre)	Number/ Nbre	Type (Straight or U) Type (Droit ou U)	Heating Surface Surface de chauffe

Jacket/ Chemise

Type of Jacket/ Genre de chemise	Jacket closure Fermeture de chemise	Proof Test Pression d'épreuve	Heating Surface Surface de chauffe	Sketch/ Schéma

Safety Valve Outlets/ Soupapes de sûreté

Number/ Nombre	Dimension	Location/ Endroit

Nozzles and Openings/ Tubulures et ouvertures

Purpose/ But	Number Nombre	Dimension	Type	Material Matériau	Nominal Thickness Épaisseur nominale	Reinforcement material Matériau de renfort	How attached Genre d'attaches	Location/ Endroit
SEE SUPPLEMENTARY								
SHEETS								

Supports/ Supports

Skirt/ Jupe	Legs/ Oreilles No/ Nbre	Legs/ Pieds No/ Nbre	Other/ Autres (Description)	Attached/ Attaches (Where and How/ Méthode et endroit)
Yes/ Oui ☐ No/ Non ☐				

Remarks/ Observations (Cubical capacity/ Volume)

VESSEL IS IMPACT TEST EXEMPT ... [illegible]
VOLUME OF VESSEL 3378 CU.FT
RADIOGRAPHY DONE PER UW-11(a)
SAFETY VALVE BY OTHERS

Certificate of Compliance/ Certificat de conformité

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51

Provincial Registered Design / *Enregistrement provincial* L-0015.2

Manufacturer / *Constructeur* RCI

Signature C. Allison Date March 12/98

Certificate of Shop Inspection/ Certificat d'inspection en usine

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareils sous pression
employed by / *employé par* ABSA
of / *de* Alberta
have inspected the above vessel and state that to the best of my knowledge and belief, the manufacturer has constructed the vessel in accordance with the Provincial registration CRN L-0015.2
and the requirements of standard CSA B51.
ai inspecté l'appareil précité et atteste que je sache, ceci que le constructeur a construit l'appareil en accord avec l'enregistrement provincial NEC et les exigences de la norme ACNOR B51
Inspector's Name / *Nom de l'inspecteur* Tom Chalifoux
Signature [signature] AB78 Date Mar 12/98

Certificate of Compliance - Field Work/
Certificat de conformité - Installation au chantier

We certify that the field installation of all parts of the vessel conforms with the requirements of Provincial Regulations.

Nous certifions que l'installation au chantier de toutes les composantes de l'appareil est conforme aux règlements provinciaux.

Installer's Name / *Nom de l'installateur* ____

Signature ____

Date ____

Certificate of Field Inspection/ Certificat d'inspection - Installation au chantier

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareils sous pression
employed by / *employé par* ____
have inspected the items not covered by the Shop Inspection Certificate and the installation of the items and state that to the best of my knowledge and belief the construction and assembly of the items are in accordance with the Provincial Regulations
ai inspecté les composantes non couvertes par le certificat d'inspection en usine et l'installation de l'appareil et ... que je sache, la construction et l'assemblage de l'appareil sont en accord avec les règlements provinciaux
Inspector's Name / *Nom de l'inspecteur* ____
Signature ____ Date ____

RCI RESOURCE CONSTRUCTORS (CANADA) INC.

A-4C3454

HEAD OFFICE
PO Box 3120, 53251-RR 232
Sherwood Park, Alberta, T8A 2A6
Phone (403) 417-7222, Fax: (403) 417-7220

1. Manufactured and certified by: RCI Resource Constructors Inc., 53251 RR 232 Sherwood Park, Alberta. T8A 2A6
(Name and Address of Manufacturer)

2. Manufactured for: C.S RESOURCES LTD. c/o MILLENIA RESOURCE CONSULTING
(Name and Address of Purchaser) 150, 1300-8th STREET, CALGARY. AB.

3. Location of installation: PELICAN LAKE COMPLEX, WABASCA AB., LSD# 12-9-081-22W4M
(Name and Address)

4. Type: Horizontal (Horz, Vert, or Sphere) | EMULSION TREATER (Tank, Sep., Heat Exh., Etc.) | 97015-1-36 (Mfgr's Serial No.) | L-2015.2 (CRN) | 97015-1/3 REV 2 (Drawing No.) | N/A (Nat'l. Bd. No.) | 1998 (Year Built)

Purpose (Inlet, Outlet, Drain)	Item No.	Diameter or Size	Type	Material	Nominal Thk.	Reinforcement Material	How* Attached	Location
EMULSION INLET	N1	6"	150# RFWN	SA-105	SCH 80		WELDED	PIPE
		6"	PIPE	SA 106B	SCH 80		WELDED	SHELL
GAS OUTLET	N2	3"	150# RFWN	SA-105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	DOME
OIL OUTLET	N3	4"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	HEAD
WATER OUTLET	N4	2"	150# RFWN	SA 105	SCH 160		WELDED	SHELL
		2"	150# RFSO	SA105	SCH 160			
DRAIN	N5 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3	PIPE	SA 106B	SCH 80		WELDED	SHELL
ANODE	N6 A/E	4"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	SHELL
		3/4"	STUD	SA-193 B7M				
		3/4"	NUT	SA 194 2HM				
RELIEF	N7	4"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	SHELL
WASH WATER INLET	N8 A/E	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	150# RFSO	SA 105	SCH 80			
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
WASH WATER INLET	N9 A/B	2"	150# RFWN	SA 105	SCH 160		WELDED	PIPE
		2"	150# RFSO	SA 105	SCH 160			
		2"	PIPE	SA 106B	SCH 160		WELDED	SHELL
DESAND WATER OUTLET	N10 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
OIL SLUDGE OUTLET	N11 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
MANWAY	M 1/2	24"	150# RFSO	SA 105	SCH 40		WELDED	PIPE
		24"	PIPE	SA 106B	SCH 40		WELDED	SHELL
		24"	BLIND FLANGE	SA 105	SCH 40			
		24	GASKET	316 SS	1/8"			
		1.25	STUD	SA 193 B7M				
		1.25	NUT	SA 194 2HM				
		24"	DAVIT	CS				
		24"	FLANGE	CS				
DOME	D1	24"	HEAD	SA 516 70	SCH 40		WELDED	PIPE
		24"	PIPE	SA 106B	SCH 40		WELDED	SHELL
		24"	PIPE	SA 106B	SCH 40		WELDED	HEAD
		24"	150# RFSO	SA 105	SCH 40		WELDED	PIPE
		24"	GASKET	316 SS	1/8"			
		1.25	STUD	SA 193 B7M				
		1.25	NUT	SA 194 2HM				
FIRE TUBE	FT 1/2	2'-5"	PLATE	SA 516 70N	1.375			
		2'-5"	PLATE	SA 516 70N	1.125			
		15.75	PLATE	SA 516 70	0.5			
		3"	GASKET	NEOPRENE	.1875			

Date March 12/98 Name RCI Resource Constructors Inc. Signed (Manufacturer) O. Allison (Representative)

Date Mar 12/98 Name J.A. Chabillaux (Authorized Inspector) Commission Alberta AB 78
[Nat'l Board Incl. Endorsement, State, Province and No.]

A-40345G.

RCI RESOURCE CONSTRUCTORS (CANADA) INC.

HEAD OFFICE
PO Box 3120, 53251-RR 232
Sherwood Park, Alberta, T8A 2A6
Phone (403) 417-7222, Fax: (403) 417-7220

1. Manufactured and certified by: RCI Resource Constructors Inc., 53251 RR 232 Sherwood Park, Alberta. T8A 2A6
(Name and Address of Manufacturer)

2. Manufactured for: S. RESOURCES LTD. c/o MILLENIA RESOURCE CONSULTING
(Name and Address of Purchaser) 150, 1300-8th STREET, CALGARY, ALBERTA

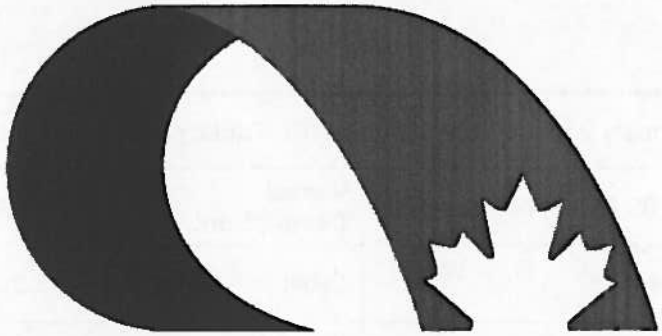
3. Location of installation: PELICAN LAKE COMPLEX, WABASCA, AB, LSD # 12-9-081-22W4M
(Name and Address)

4. Type: Horizontal (Horz, Vert, or Spher.) EMULSION TREATER (Tank, Sep., Heat Exh., Etc.) 97015-1-30 (Mfgr's Serial No.) L-00152 (CRN) 97015-1/3 REV 2 (Drawing No.) N/A (Nat'l Bd. No.) 1998 (Year Built)

Purpose (Inlet, Outlet, Drain)	Item No.	Diameter or Size	Type	Material	Nominal Thk.	Reinforcement Material	How Attached	Location
FIRE TUBE	FT 1/2	.75"	STUD	SA 193B7N				
		.75"	NUT	SA 1942 HM				
DESLUDGE (SPARE)	N11A/B	3"	BLIND FLANGE	SA 105	SCH 80			
		3"	GASKET	3165	.125"			
		.625	STUD	SA 193B7M				
		.625	NUT	SA 1942 HM				
DESLUDGE OUTLET	N12 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	150# RFSO	SA 105	SCH 80			
		3"	PIPE	SA-106B	SCH 80		WELDED	SHELL
WATER LT	N13A/B	2"	150# RFWN	SA 105	SCH 160		WELDED	PIPE
		2"	150# RFTRF	SA 105	SCH 160			
		2"	GASKET	3165	.125"			
		.625"	STUD	SA-193B7M				
		.625"	NUT	SA 1942 HM				
		2"	PIPE	SA 106B	SCH 160		WELDED	SHELL
		2"	PIPE	SA 106B	SCH 160		WELDED	
TI	C1 A/B	.75"	COUPLING	SA 105	6000 #		WELDED	SHELL
		.75"	COUPLING	SA 105	6000 #		WELDED	SHELL
TE	C2 A/B	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
PI	C3	.50"	COUPLING	SA 105	6000 #			
SAMPLE	C4 A/B	.75"	COUPLING	SA 105	6000 #		WELDED	SHELL
		.75"	COUPLING	SA 105	6000 #		WELDED	SHELL
SAMPLE	C5 A/B	.75"	COUPLING	SA 105	6000 #		WELDED	SHELL
		.75"	COUPLING	SA 105	6000 #		WELDED	SHELL
FUEL GAS	C6 A/B	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
LSLL	C7 AB	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
LSHH	C8 AB	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
OIL LT	C9 AB	1.0"	COUPLING	SA 105	6000 #		WELDED	HEAD
SPARE	C10	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
		1.0"	PLUG	SA 105	6000 #			
SPARE	C11	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
		1.0"	PLUG	SA 105	6000 #			
	C12	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
		1.0"	PLUG	SA 105	6000 #			
LG	C13 A/B	1.0"	COUPLING	SA 105	6000 #		WELDED	SHELL
SAMPLE	C14	.75"	COUPLING	SA 105	6000 #		WELDED	SHELL

Date March 12/98 Name RCI Resource Constructors Inc. Signed (Manufacturer) (Representative)

Date March 12/98 Name T.R. Halliburton (Authorized Inspector) Commission Alberta AB28 [Nat'l Board Incl. Endorsement, State, Province and No.]



Canadian Natural

Procedure Number: IN-QP-009

Owner User Program – Pressure Vessel Repair Procedure
Firetube Repair - Cracking
12-9 Treater 620

Contents

Revision History

Date	Revision	By	Chk	Approver
Nov 24, 2011	1.3	CP	AM	AM

Static Data

Date:	January 21, 2013	**CNRL Facility:**	Central Brintnell Battery
Facility LSD:	12-09-81-22W4	**Vessel Description:**	Treater 620
A #:	A0403457	**CRN:**	L0015.2
Vessel Serial #:	97015-2-30	**Fire tube Serial #:**	C80002
Vessel MAWP:	75 PSI	**Fire tube Thickness:**	0.375"
Owners Inspector:	IRIS Inspection Services	**Repair Organization:**	Exact Oilfield Developing Ltd.
Scope of Work:	Repair cracks to miters on return section of the firetube. - Miter 1 (hot side) grind out 10" length and ¼" deep and repair - Miter 4 (from hot side) grind out 4" and ¼" deep and repair Ensure QC package is complete and sent to Anthony Merle.		

Scope

CP Jan 28, 2013

1. The repair of cracks to a firetube designed to ASME Section VIII Division 1 and constructed of P-1 Group 1 or 2 materials. Note that due to the high likelihood of repeat failure, all crack repairs on firetubes must be post-weld heat treated (PWHT) regardless of whether the firetube was PWHT at time of manufacture.

Procedure

Vendor Qualification

1. The CNRL Owner's Inspector must review Contractor's Quality Control Program, welding procedures, and welder qualifications prior to the start of the repair. Any concerns must be brought the attention of the CNRL Integrity group.

Weld Preparation

2. Defects identified by MPI (where practical Wet Fluorescent MPI) shall be removed using an air arc gouger or grinder. Area shall be re-inspected (including beveled surfaces of weld prep) using MPI (where practical Wet Fluorescent MPI) to ensure all defects have been removed.
3. Area to be welded to shall be cleaned to white metal for a distance of 10 mm beyond the expected weld area.

~~Hydrogen Bake Out and Sulfur Removal~~

~~**Note: Remove this section if firetube has not been in sour service**~~

4. ~~Vessels that have been exposed to sour or sulfur bearing process streams shall required the weld attachment area to undergo a "Bake Out" procedure. This procedure shall consist of heating the~~

~~weld attachment area and 10 cm on each side to 315°C (600 F) for and holding that temperature for a minimum of 60 minutes. Bake out should be done prior to cutting out, if cutout is done thermally. Stipulate controls methods.~~

5. ~~Bake Out is performed by either induction coil (use thermocouples as control instrumentation) or propane torch (use temperature sensitive crayons – upper and lower temperature to be controlled). Oxyacetylene torches are not acceptable.~~
6. ~~If induction coils are used, a 250°C (482°F) four hour heat treatment may be substituted for the normal 450°C (842°F) one hour heat treatment.~~

Welding

7. Minimum pre-heat shall be 80°C (176°F) for a 100 mm band on both sides of the weld attachment area.
8. The CNRL Owner's Inspector shall witness seal on the box being broken and ensure that once the box has been opened the electrodes are stored in an oven.
9. Welding shall be in accordance with the contractor's registered PWHT WPS utilizing new E 7018-1 electrodes.
10. Use only stringer beads where the width of the weld weave is a maximum of 7 mm.
11. No down hand welding shall be used.
12. Perform dry powder MT on the first layer of welding.
13. Maximum inter-pass temperature shall not exceed 230°C (450°F).
14. Transition all fillet welds to ensure no areas of undercut or stress risers.
15. Upon completion of welding, perform post weld heat treatment (PWHT). If firetube was PWHT at time of manufacture, perform PWHT as per U1A. If firetube was not PWHT at time of manufacture, perform PWHT by heating to 620°C (1150°F) and holding for 1 hour. PWHT may be performed by either oven or stress-relief truck. Heating rates shall be as per ASME Section VIII Division 1.
16. After PWHT, the weld area shall be slow cooled to 100°C (212°F). The cooling rate shall not exceed 260°C (500°F) / hour.
17. Once the finished weld has cooled below 100°C (21°F) grind the cap of the weld smooth and contour to the original shape.

Post Weld Non-Destructive Examination (NDE)

18. MT 12 hours after completion of the work.
19. No hydro-test is required.

Documentation

20. The CNRL Owner's Inspector must make sure that Contractor has completed required QC documentation and jurisdictional documents.
21. The CNRL Owner's Inspector must sign off the jurisdictional documents and make sure one copy is submitted to the jurisdictional authority and one is included in the QC package.
22. Mail a hard copy of QC Documentation to:

    Anthony Merle c/o CNRL

    Suite 2500, 855 – 2nd Street SW

    Calgary AB, T2P 4J8

Travel Sheet

A #:	A0403457	Date:	
Vessel LSD:	12-09-81-22W4	Facility:	Central Brintnell Battery

Step #	Description of Step	Insp. Point	Contractor		Insp. Point	Owners Inspector	
			Initial	Date		Initial	Date
	Scope Sign-Off					CP	Jan 28, 2013
Vendor Qualification							
Step 1	Ensure Vendor is Qualified						
Weld Preparation							
Step 2	MPI for Indications						
Step 3	Clean Area to be Welded						
~~**Hydrogen Bake Out**~~							
~~Step 4~~	~~Perform Bake-Out (If Required)~~						
~~Step 5~~	~~Heating Method Used for Bake-Out~~						
~~Step 6~~	~~Substitution of Inductions Coils~~						
Welding							
Step 7	Pre-Heat						
Step 8	New Electrodes						
Step 9	Approved WPS's						
Step 10	Stringer Beads						
Step 11	No Down Hand Welding						
Step 12	Dry Powder MPI						
Step 13	Interpass Temperatures						
Step 14	Fillet Weld Transition						
Step 15	PWHT						
Step 16	Slow Cool						
Step 17	Grind Smooth						
Post-Weld Non-Destructive Examination (NDE)							
Step 18	12 Hour MPI						
Step 19	No Hydrotest						
Documentation							
Step 20	Completion of Contractor Documentation						
Step 21	Owners Inspector Signs Jurisdictional Docs						
Step 22	Mail QC Docs to Anthony Merle						

H = Hold Point, W = Witness Point, R = Review Point

Final Sign-Off			
Contractor:		Owners Inspector:	

A-403457
TRC Mar12/98

AB-25 (side 1) 97/11

ALBERTA LABOUR
Alberta Boilers Safety Association
200, 4208 - 97 Street
Edmonton AB T6E 5Z9

Partial/ *Partiel* ☐

MANUFACTURER'S DATA REPORT FOR PRESSURE VESSEL

DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR D'APPAREILS SOUS PRESSION

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression

Manufactured by *Construit par*	Name and address of Manufacturer/ *Nom et adresse du constructeur* RCI
Manufactured for *Construit pour*	Name and address of Purchaser or Consignee/ *Nom et adresse du client ou de son représentant* C.S. RESOURCES LTD. C/O MILLENIA RESOURCES CONSULTING
Ultimate owner *Utilisateur*	Name and address/ *Nom et adresse* 150 1300 - 8th STREET CALGARY AB.
Location of installation *Lieu d'installation*	Address/ *Adresse* PELICAN LAKE COMPLEX, WABASCA AB., LSD# 12-9-081-22W4M

Pressure vessel/ *Appareil*

Type/ *Genre* HORIZONTAL EMULSION TREATER	Serial No / *N° de série* 97015-2-30	Year built/ *Année de fabrication* 1998	Overall Length/ *Longueur totale* 40'-0"
Provincial Registration No. - C.R.N./ *N° d'enregistrement provincial - N.E.C.* L-0015.2	National Board No / *N° National Board*	Drawing No / *N° de dessin* 97015.1/3-30 REV2	Diameter/ *Diamètre* 120"

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code.
Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux du code ASME. YES

The design, construction and workmanship conform to CSA B51. *La conception, la construction et la façon sont conformes à ACNOR B51* YES	ASME Sec VIII	Division DIV I	Addenda/ *Supplément* 96	Code case No. *N° de cas* N/A

Manufacturers' partial data reports properly identified and signed by authorized inspectors have been furnished for the following items of the report, and attached to this report:
Les rapports partiels du constructeur adéquatement identifiés et signés par les inspecteurs authorisés ont été produits pour les items suivants du rapport, et attachés à ce rapport N/A

Name of parts/ *Nom de la composante*	Item No / *N° d'item*	Manufacturer's Name/ *Nom du constructeur*	Identifying Stamp/ *Estampe d'identification*

Shell/ *Virole*

Description	Material *Matériau*	Thickness *Épaisseur*	Corr Allow *Surépais de corr*	Diameter *Diamètre*	Overall Length *Long totale*	Number of courses *Nombre de sections*	Girth Joints *Joints de circonférence* Type	R.T *Radiog*	Longitudinal Joints *Joints longitudinaux* Type	R.T *Radiog*	Efficiency *Efficacité*	P.W.H.T. *Traitement therm* Temp	Time *Durée*
SHELL #1,2,3,4	SA516-70	.5	.0625	120"	10'0"	4	1	FULL RT-1	1	RT-1	1.0	N/A	

Heads/ *Têtes*

Description	Material *Matériau*	Min Thickn. *Épais minim*	Corr Allow *Surép Corr*	Crown Radius *Rayon couron.*	Knuckle Radius *Petit rayon*	Ellipse Ratio *Rapp ellipse*	Conical Apex Angle *Angle conique*	Hemisph. Radius *Ray. Hémisph*	Flat Diameter *Diam plat*	Side to pressure *Côté sous pression*
FT END	SA516-70	.691	.0625	N/A		2.1				CONCAVE
OIL END	SA516-70	.439	.0625			2.1				CONCAVE

Removable bolts used (describe other fastenings) *Boulons amovible utilisés (décrire tout autre attache)* N/A	Mat'l Spec./ *Spéc. du mat.*	Grade	Size/ *Dimension*

Pressure - Temperature/ *Pression - température*

Pressure Vessel Part *Partie de l'appareil*	Constructed for max. allowable working pressure *Construit pour une pression maximale de marche permise*	At max. temp. *À une temp. max.*	Min. Temp (when less than -29°C) *Temp. min. (inférieure à -29°C)*	Test pressure (hydro-pneumatic or combination) *Pression d'épreuve (hydro-pneumatique ou combinaison)*
SHELL	75 PSI	300°F °C	-20°F °C	113 PSI

AB-35 (side 2) 07/97

Tube Section/ *Faisceau tubulaire*

Tubesheet/ *Plaque tubulaire*	Material/ *Matériau*	Diameter/ *Diamètre*	Nominal Thickness *Épaisseur nominale*	Corr. Allow. *Surépais. corrosion*	Attachment *Mode d'attachement*
Tube material/ *Matériau des tubes*	**Diameter/ *Diamètre***	**Nominal Thickness (gauge) *Épaisseur nominale (calibre)***	**Number/ *Nbre***	**Type (Straight or U) *Type (Droit ou U)***	**Heating Surface *Surface de chauffe***

Jacket/ *Chemise*

Type of jacket/ *Genre de chemise*	Jacket closure *Fermeture de chemise*	Proof Test *Pression d'épreuve*	Heating Surface *Surface de chauffe*	Sketch/ *Schéma*

Safety Valve Outlets/ *Soupapes de sûreté*

Number/ *Nombre*	Dimension	Location/ *Endroit*

Nozzles and Openings/ *Tubulures et ouvertures*

Purpose/ *But*	Number *Nombre*	Dimension	Type	Material *Matériau*	Nominal Thickness *Épaisseur nominale*	Reinforcement material *Matériau de renfort*	How attached *Genre d'attaches*	Location/ *Endroit*
SEE SUPPLEMENTRY								
SHEETS								

Supports/ *Supports*

Skirt/ *Jupe*	Lugs/ Oreilles	Legs/ Pieds	Other/ *Autres* (Description)	Attached/ *Attaches*
Yes/ *Oui* ☐ No/ *Non* ☐	No./ Nbre	No./ Nbre		(Where and How/ *Méthode et endroit*)

Remarks/ *Observations* (Cubical capacity/ Volume)

VESSEL IS IMPACT TEST EXEMPT PER UCS-66
VOLUME OF VESSEL 3378 CU FT
RADIOGRAPHY DONE PER UW-11(a)
SAFETY VALUE BY OTHERS

Certificate of Compliance/ *Certificat de conformité*

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51

Provincial Registered Design *Enregistrement provincial* L-0015.2

Manufacturer *Constructeur* RCI

Signature Cl. Allison Date March 12/98

Certificate of Shop Inspection/ *Certificat d'inspection en usine*

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression
employed by *employé par* ABSA
of/ *de* Alberta
have inspected the above vessel and state that to the best of my knowledge and belief, the manufacturer has constructed the vessel in accordance with the Provincial registration CRN L-0015.2
and the requirements of standard CSA B51.
ai inspecté l'appareil précité et atteste que je sache, ainsi que le constructeur a construit l'appareil en accord avec l'enregistrement provincial NRC ______ et les exigences de la norme ACNOR B51

Inspector's Name *Nom de l'inspecteur* Jim Chalifoux

Signature JRChalifoux AB78 Date Mar 12/98

Certificate of Compliance - Field Work/ *Certificat de conformité - Installation au chantier*

We certify that the field installation of all parts of the vessel conforms with the requirements of Provincial Regulations.

Nous certifions que l'installation au chantier de toutes les composantes de l'appareil est conforme aux règlements provinciaux

Installer's Name *Nom de l'installateur* ______

Signature ______

Date ______

Certificate of Field Inspection/ *Certificat d'inspection - Installation au chantier*

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression
employed by *employé par* ______
have inspected the items not covered by the Shop Inspection Certificate and the installation of the items and state that to the best of my knowledge and belief the construction and assembly of the items are in accordance with the Provincial Regulations
ai inspecté les composantes non couvertes par le certificat d'inspection en usine et l'installation de l'appareil et atteste que je sache, la construction et l'assemblage de l'appareil sont en accord avec les règlements provinciaux

Inspector's Name *Nom de l'inspecteur* ______

Signature ______ Date ______

RCI RESOURCE CONSTRUCTORS (CANADA) INC.

A403457

HEAD OFFICE
PO Box 3120 53251-RR 232
Sherwood Park, Alberta, T8A 2A6
Phone: (403) 417-7222, Fax: (403) 417-7220

1. Manufactured and certified by RCI Resource Constructors Inc., 53251 RR 232 Sherwood Park, Alberta. T8A 2A6
(Name and Address of Manufacturer)

2. Manufactured for: C.S. RESOURCES LTD. c/o MILLENIA RESOURCE CONSULTING 150, 1300-8th STREET, CALGARY, AB.
(Name and Address of Purchaser)

3. Location of installation. PELICAN LAKE COMPLEX, WABASCA AB., LSD# 12-9-081-22W4M
(Name and Address)

4. Type: Horizontal (Horz, Vert, or Sphere) — EMULSION TREATER (Tank, Sep., Heat Exh., Etc.) — 97015-2-30 (Mfgr's Serial No.) — L-0015.2 (CRN) — 97015.1/3 REV 2 (Drawing No.) — N/A (Nat'l. Bd. No.) — 1998 (Year Built)

Purpose (Inlet, Outlet, Drain)	Item No.	Diameter or Size	Type	Material	Nominal Thk.	Reinforcement Material	How * Attached	Location
EMULSION INLET	N1	6"	150# RFWN	SA-105	SCH 80		WELDED	PIPE
		6"	PIPE	SA 106B	SCH 80		WELDED	SHELL
GAS OUTLET	N2	3"	150# RFWN	SA-105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	DOME
OIL OUTLET	N3	4"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	HEAD
WATER OUTLET	N4	2"	150# RFWN	SA 105	SCH 160		WELDED	SHELL
		2"	150# RFSO	SA105	SCH 160			
DRAIN	N5 A/B	3"	150# RFWN	SA105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
ANODE	N6 A/E	4"	150# RFWN	SA105	SCH 80		WELDED	PIPE
		4"	PIPE	SA106B	SCH 80		WELDED	SHELL
		3/4"	STUD	SA-193B7M				
		3/4"	NUT	SA 1942HM				
RELIEF	N7	4"	150# RFWN	SA105	SCH 80		WELDED	PIPE
		4"	PIPE	SA 106B	SCH 80		WELDED	SHELL
WASH WATER INLET	N8 A/E	3"	150# RFWN	SA105	SCH 80		WELDED	PIPE
		3"	150# RFSO	SA105	SCH 80			
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
WASH WATER INLET	N9 A/B	2"	150# RFWN	SA105	SCH 160		WELDED	PIPE
		2"	150# RFSO	SA105	SCH 160			
		2"	PIPE	SA106B	SCH 160		WELDED	SHELL
DESAND WATER OUTLET	N10 A/E	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	PIPE	SA 106B	SCH 80		WELDED	SHELL
DESLUDGE OUTLET	N11 A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	PIPE	SA106B	SCH 40		WELDED	SHELL
MANWAY	M 1/2	24"	150# RFSO	SA105	SCH 40		WELDED	PIPE
		24"	PIPE	SA 106B	SCH 40		WELDED	SHELL
		24"	BLIND FLANGE	SA 105	SCH 40			
		24	GASKET	316SS	1/8"			
		1.25	STUD	SA193B7M				
		1.25	NUT	SA1942HM				
		24"	DAVIT	CS				
		24"	HINGE	CS				
DOME	D1	24"	HEAD	SA 51670	SCH 40		WELDED	PIPE
		24"	PIPE	SA106B	SCH 40		WELDED	SHELL
		24"	PIPE	SA106B	SCH 40		WELDED	HEAD
		24"	150# RFSO	SA 105	SCH 40		WELDED	PIPE
		24"	GASKET	316 SS	1/8"			
		1.25	STUD	SA193B7M				
		1.25	NUT	SA1942HM				
FIRE TUBE	FT 1/2	2'-5"	PLATE	SA 51670N	1.375			
		2'-[illegible]"	PLATE	SA 51670N	1.125			
		15.75	PLATE	SA 51670	0.5			
		3"	GASKET	NEOPRENE	.1875			

Date March 12/98 Name RCI Resource Constructors Inc. Signed (Manufacturer) C. Allison (Representative)

Date Mar 12/98 Name [signature] (Authorized Inspector) Commission Alberta A878 (Nat'l Board incl. Endorsement, State, Province and No.)

RCI RESOURCE CONSTRUCTORS (CANADA) INC.

A403457

HEAD OFFICE
PO Box 3120, 53251-RR 232
Sherwood Park, Alberta, T8A 2A6
Phone: (403) 417-7222, Fax: (403) 417-7220

1. Manufactured and certified by: RCI Resource Constructors Inc., 53251 RR 232 Sherwood Park, Alberta, T8A 2A6 (Name and Address of Manufacturer)
2. Manufactured for: L.S. RESOURCES LTD. c/o MILLENIA RESOURCE CONSULTING (Name and Address of Purchaser) 150, 1300-8th STREET, CALGARY, ALBERTA
3. Location of installation: PELICAN LAKE COMPLEX, WABASCA, AB, LSD # 12-9-081-22W4M (Name and Address)
4. Type: Horizontal (Horz, Vert, or Sphere) EMULSION TREATER (Tank, Sep., Heat Exh., Etc.) 97015-2-30 (Mfgr's Serial No.) L-00152 (CRN) 97015-1/3 REV 2 (Drawing No.) N/A (Nat'l. Bd. No.) 1998 (Year Built)

Purpose (Inlet, Outlet, Drain)	Item No.	Diameter or Size	Type	Material	Nominal Thk.	Reinforcement Material	How Attached	Location
FIRE TUBE	FT 1/2	.75"	STUD	SA 193B7M				
		.75"	NUT	SA 194 2 HM				
DESLUDGE (SPARE)	N11A/B	3"	BLIND FLANGE	SA 105	SCH 80			
		3"	GASKET	316SS	.125"			
		.625	STUD	SA193B7M				
		.625	NUT	SA1942HM				
DESLUDGE OUTLET	N12A/B	3"	150# RFWN	SA 105	SCH 80		WELDED	PIPE
		3"	150# RFSO	SA 105	SCH 80			
		3"	PIPE	SA-106B	SCH 80		WELDED	SHELL
WATER LT	N13A/B	2"	150# RFWN	SA 105	SCH 160		WELDED	PIPE
		2"	150# RFTRF	SA 105	SCH 160			
		2"	GASKET	316SS	.125"			
		.625"	STUD	SA-193B7M				
		.625"	NUT	SA194 2HM				
		2"	PIPE	SA 106B	SCH 160		WELDED	SHELL
		2"	PIPE	SA 106B	SCH 160		WELDED	
TI	C1 A/B	.75"	COUPLING	SA 105	6000#		WELDED	SHELL
		.75"	COUPLING	SA 105	6000#		WELDED	SHELL
TE	C2 A/B	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
PI	C3	.50"	COUPLING	SA 105	6000#			
SAMPLE	C4 A/B	.75"	COUPLING	SA 105	6000#		WELDED	SHELL
		.75"	COUPLING	SA 105	6000#		WELDED	SHELL
SAMPLE	C5 A/B	.75"	COUPLING	SA 105	6000#		WELDED	SHELL
		.75"	COUPLING	SA 105	6000#		WELDED	SHELL
FUEL GAS	C6 A/B	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
LSL	C7 AB	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
LSHH	C8 AB	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
OIL LT	C9 AB	1.0"	COUPLING	SA 105	6000#		WELDED	HEAD
SPARE	C10	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
		1.0"	PLUG	SA105	6000#			
SPARE	C11	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
		1.0"	PLUG	SA 105	6000#			
	C12	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
		1.0"	PLUG	SA 105	6000#			
LG	C13A/B	1.0"	COUPLING	SA 105	6000#		WELDED	SHELL
SAMPLE	C14	.75"	COUPLING	SA 105	6000#		WELDED	SHELL

Date March 12/98 Name RCI Resource Constructors Inc. Signed (Manufacturer) Q. Allison (Representative)

Date Mar 12/98 Name (Authorized Inspector) Commission Alberta AB28 [Nat'l Board Incl. Endorsement, State, Province and No.]