

HYLAND 2000 INDUSTRIES LTD.



HYLAND 2000 INDUSTRIES LTD.  
8819-101 Str. Fort St. John, B.C. V1J 5K4  
Phone: (250) 785-1551 / Fax: (250) 785-7576  
GST# 893657999

JOB #: 2 - File Tubes 24" Repair.

### QUALITY CONTROL DATA FOR B.C.

REGISTRATION # AQP-2418

CUSTOMER: <u>CWRL</u>	CONTACT: _____
FIELD: <u>SOUTH BUICK</u>	L.S.D.: <u>D-78-I/94 AU</u>
DATE: <u>June 4/07</u>	COMPLETED BY: <u>G. OHLAND</u>

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CUSTOMER SPECIFICATIONS, LINE LISTS & P & I.D.'S, PRE & POST PROJECT INFO SHEET, SAFETY REQUIREMENTS, SAFETY MEETING FORMS AND EMERGENCY RESPONSE PLAN NOTE: SECTION 10 IS TO BE IN HYLAND'S COPY ONLY!!!	10



BRITISH COLUMBIA LINE LIST CODE

SPECIFICATION DESIGN

SERVICE GUIDE	SPEC	ANSI	M.O.P.	MAX TEST	MATERIAL	CODE	
AG	ACID, GAS	A	150	275#	425#	STEEL 1	
AL	AMINE LEAN	B	300	720#	1100#	ALLOY 2	
AR	AMINE RICH	C	600	1440#	2175#	PLASTIC 3	
BA	BREATHING AIR	D	900	2160#	3250#		
BD	BLOW DOWN	E	1500	3600#	5400#		
D	DRAIN	F	2500	6000#	9000#		
FG	FUEL GAS						
G	GAS						
GL	GLYCOL	NOTE: VALID FOR CARBON STEEL FLANGES ONLY					
HL	HYDROCARBON LIQUIDS		EXAMPLE: G - 889 - H001 - C1				
IA	INSTRUMENT AIR		GAS 3" LINE# 600# STEEL				
IG	INSTRUMENT GAS						
O	OIL						
P	PRODUCTION (OIL, WATER, GAS)						
SW	SALT WATER						
R	RELIEF						
V	VENT						
W	WATER						
WP	POTABLE WATER						

HYLAND'S COLOUR CODE SYSTEM FOR RECEIVING AND STORAGE OF PIPING MATERIAL:

RED	NON-CONFORMITY
GREEN	A-53-B SEAMLESS OR E.R.W.
YELLOW	A106 GRB SEAMLESS
BLUE	A-333-6 SEAMLESS
NO PAINT	STAINLESS STEEL (CLEAN MATERIAL)

TESTING NOTES:

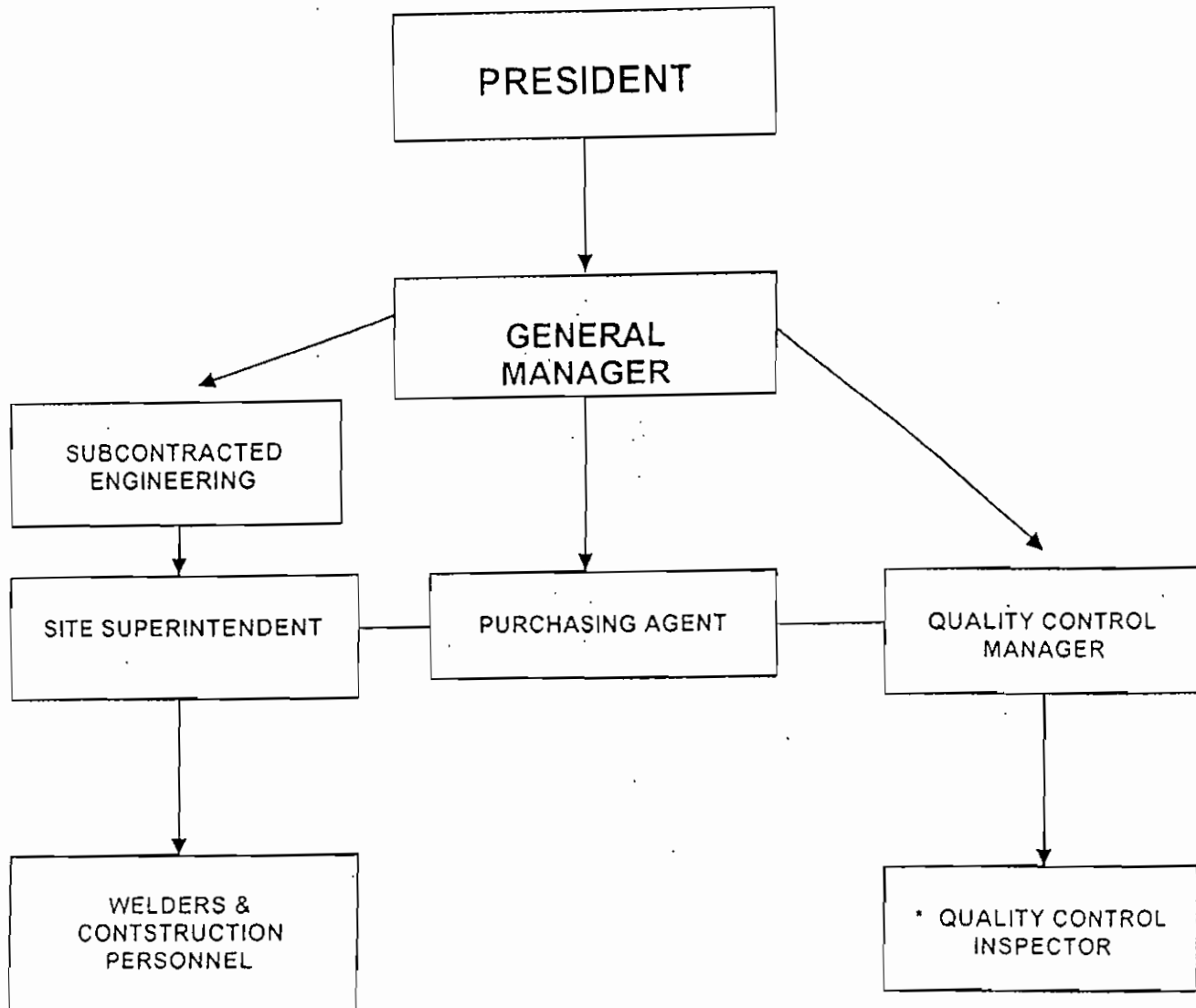
- DO NOT EXCEED (M.T.P.) MAXIMUM TEST PRESSURE OF FLANGE RATING.
- ALL BURIED UNDERGROUND PIPING - MINIMUM 8 HOUR TEST.
- ALL ABOVE GRADE AND EXPOSED PIPING - MINIMUM 1 HOUR TEST.
- A) BRING PRESSURE UP IN 500 PSI STEPS.  
 B) BLEED PRESS IN 500 PSI STEPS WITH 5 - 10 MINUTES BETWEEN STEPS.
- RECORD DEAD WIGHT TEST ON DEADWEIGHT TEST OFF. (RECORD ON CHART)
- MAKE SURE TO FILL OUT ALL INFORMATION ON CHART BEFORE TESTING.
- CHECK CALIBRATION SHEET IN RECORDER. (EXAMPLE: DATE, STATIC)
- NOTIFY (M.O.M.) E.I.B. 24 HOURS BEFOR TESTING @ 787-3409
- ENSURE ALL CHARTS SIGNED BY M.O.M.



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# QUALITY CONTROL MANUAL

## ORGANIZATION CHART



NOTE: More than one position may be held by one person.

\* This position is assigned to the Site Superintendent unless otherwise specified by the General Manager.

EXAMINATION & INSPECTION SHEET

Item	Comments	Int'l	N/A
Provincial Inspector notified?			
Weld Procedure Registered for work to be done?		<i>Yes</i>	
Welders have valid B.C. tickets?		<i>Yes</i>	
Material checked against specifications?	<i>no material added</i>	<i>Yes</i>	
NDT reviewed: Interpretation by Level II examiner?		<i>Yes</i>	
NDT reports reviewed: Mag or die pen?		<i>Yes</i>	
PWHT as per specs: Chart filed?		<i>Yes</i>	
Welding checked for Weld procedure?		<i>Yes</i>	
Welds identified by Welder's I.D.?		<i>Yes</i>	
Visual of system prior to test?		<i>Yes</i>	
Recorder Calibration sheets filed?	<i>NA</i>	<i>Yes</i>	
Pressure test records and charts filed?	<i>HYDRO Fill ONLY</i>	<i>Yes</i>	
Spool sheets filed?	<i>NA</i>	<i>Yes</i>	
MTR's filed?	<i>NA</i>	<i>Yes</i>	
Pile records filed?	<i>NA</i>	<i>Yes</i>	
Flanges bolted properly?	<i>NA</i>	<i>Yes</i>	
Unions & Flanges checked, taped & initialed prior to start-up?	<i>NA</i>	<i>Yes</i>	
Check valves in proper flow position?	<i>NA</i>	<i>Yes</i>	
Pre start-up form completed?	<i>NA</i>	<i>Yes</i>	
Painting & clean-up completed?			
Inspector has signed completion and test information?			

Signature: *[Signature]*

Project completion & release:

Inspector: \_\_\_\_\_ (print)

\_\_\_\_\_ (signature)

Hyland Supervisor: *G. Ottland* (print)

*[Signature]* (signature)

**DRAWING AND TRANSMITTAL**

To: \_\_\_\_\_  
\_\_\_\_\_

The following revised documents are enclosed:

DRAWING/DOCUMENT TITLE	REVISION NO.

*Refer to Section #1  
for pictures*

Obsolete drawings, etc., should be returned to the Q.C. Manager for disposal, per Paragraph, Section 1.1, Page 1.

Sign below and return one (1) copy to all controlled Manual holders when this has been completed.

  
\_\_\_\_\_  
Signed

HYLAND 2000 INDUSTRIES LTD.

PRE-JOB REVIEW

JOB #: \_\_\_\_\_ DATE: MAY 30

FIELD: S Buick L.S.D.: D-78-E / 94 A 11

COMPANY: CNR

DESCRIPTION OF JOB: Repair CRACKS on 24" Fire Tubes

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

RESPONSIBLE FOR:	OWNER	CONTRACTOR
DRAWINGS		<u>Pictures</u>
MATERIALS	<u>NR</u>	
ELECTRODES		<input checked="" type="checkbox"/>
NON DESTRUCTIVE EXAM	<input checked="" type="checkbox"/>	
HEAT TREATMENT	<input checked="" type="checkbox"/>	
PRESSURE TESTING	<u>STAMP AND Fill Tube ONLY</u>	

British Columbia Boiler and Pressure Vessel Act & Regulations require that a  
 Quality control Program be in place for work performed.

Details of Regulations made: \_\_\_\_\_

Owner's Representative: \_\_\_\_\_

Date Contracted: \_\_\_\_\_

[Signature]  
 \_\_\_\_\_  
 QUALITY CONTROL MANAGER / INSPECTOR:

MAY 30 / 07

DATE:

EXAMINATION & INSPECTION SHEET  
A.S.M.E. V111

Item	Comments	Int'l	N/A
PROCEDURE ACCEPTED BY CUSTOMER?			
WELD PROCEDURE REGISTERED FOR WORK TO BE DONE?		<i>[Signature]</i>	
WELDERS HAVE VALID B.C. TICKETS?		<i>[Signature]</i>	
CRACKS CHECKED AFTER REMOVAL, DYE PEN/MAG PART?		<i>[Signature]</i>	
MATERIAL: CHECKED AGAINST PO/DRAWING?		<i>[Signature]</i>	
MATERIAL: IDENTIFIED WITH CORRECT SA/SB SPECS?	NA	<i>[Signature]</i>	
MATERIAL: MTR'S CHECKED AGAINST?	NA	<i>[Signature]</i>	
FITUP: SHELL COURSES/FLUSH SHELL HEADS?	NA	<i>[Signature]</i>	
FITUP: TUBE SHEET/SHELL FIRETUBE?	NA	<i>[Signature]</i>	
FITUP: NOZZLES & FITTINGS?	NA	<i>[Signature]</i>	
X-RAY:	MAG.	<i>[Signature]</i>	
UT, MAG PARTICLE, DYE PEN EXAMINATION?		<i>[Signature]</i>	
INTERNAL INSPECTION AFTER WELDING?		<i>[Signature]</i>	
EXTERNAL INSPECTION AFTER WELDING?		<i>[Signature]</i>	
PWHT?		<i>[Signature]</i>	
HARDNESS TESTS?	NA	<i>[Signature]</i>	
HYDRO TEST?	Fit only	<i>[Signature]</i>	
OTHER TESTS (SPECIFY)?	NA	<i>[Signature]</i>	
B.C. REPAIR ALTERATION REPORT COMPLETED?		<i>[Signature]</i>	
NAME PLATE ATTACHED?			

Project completion & release:

Inspector: \_\_\_\_\_ (print)

\_\_\_\_\_ (signature)

Hyland Supervisor: G. G. Hyland (print)

[Signature] (signature)





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8819-101<sup>st</sup> Street  
Fort St. John, B.C.  
V1J 5K4  
Phone: (250) 785-1551  
Fax: (250) 785-7576

**BOILERS & PRESSURE VESSELS**  
REPAIR / ALTERATION REPORT  
PROV. REG. # 2807

A3151394

Name of Owner- CNRL

Location- d-78-I/94-A-11 S BUICK

Date -- JUNE 2 / 07

Type of Vessel -- FIRE TUBE

DIAMETER-- 24 IN

LENGTH -- 19 FT 6 IN

CRN -- N0417.21 YEAR- ?

SERIAL#-----95-1699

HEAD THICKNESS SHELL THICKNESS

MATERIAL SPEC. SA-516-70N

FLANGE RATING N/A

NDT. -TYPE/ PERCENT 100 % - MAG

BAKE OUT - Y/N YES

STRESS-REL. - YES

HYDRO TEST (PSI/KPA) - N/A

WELD PROC. - HOL--400 f

NOTES -

G.M. HYLAND 2000 IND  
GORDY OHLAND

COMPANY REP.

**Procedure**  
**continued...**

as to avoid the possibility of plastic deformation due to over heating.

4. *Bake Out* is performed in an oven, by 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.
5. If induction coils are used, a 250 C (482 F) four-hours heat treatment may be substituted for the normal 450 C (842 F) one-hour heat treatment.

---

**Preheat and Welding:**

6. Minimum pre-heat shall be 80 C (176 F) for a 100 mm band on both sides of the weld build-up area. Temperature is to be monitored by use of temple sticks or pyrometer.



**Note**

The 80 C (176 F) pre-heat temperature has been selected for alignment with NB-23, Appendix B assuming the specific carbon content of the material is not known.

7. Welds shall be completed using new 2.4 mm (3/32”) E 7018-1 electrodes.
- 
8. Maximum interpass temperature shall not exceed 230 C (450 F).
  9. The 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.
  10. Perform repair to the procedure as outlined in the registered WPS.
  11. Perform dry MPI on the root weld.
  12. Fill and cap using E7018 low hydrogen electrodes. Minimize the weave (maximum 4 times electrode size and minimize heat input).
  13. Ensure all fillet welds are transitioned to ensure there are no areas of undercut or stress risers.

**Procedure 5a: Firetube Repair Procedure - Cracking**

A#	3151394	Facility	BUICK SOUTH
CRN#	N0417.21	LSD	D-78-I / 94-A-11
S/N	95-1699		
MAWP	75 psi	Vessel Description	Treater
Material	SA516-70N (shell and heads)		
Shell Thickness	0.375"	Scope of Work: see below	
Head Thickness			

**Scope**

1. The repair of cracks to a firetube constructed of P-I Group 1 or 2 materials.
2. Severe cracking into the firetube parent metal or through wall cracking may require the replacement of a section of the firetube.

**Procedure**

**Weld Preparation**

1. Defects identified by Wet Fluorescent Magnetic Particle Inspection shall be removed using an air arc gouger or grinder. Area shall be reinspected (including beveled surfaces of weld prep) using WFMPI to ensure all defects have been removed.
2. 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:**

3. 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 450 C (842 F) 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.



**Note**

The Bake Out temperature shall be limited to 450 C (842 F) to stay within the elastic limit of a P1 material so

**Procedure**

continued...

14. Once the welds are completed 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 Welding NDE:**

15. Perform MT 12 hours after completion of the work

16. No hydrotest is required.

---

**Documentation:**

16. Ensure Company Approved Contractor has completed QC documentation.

17. Sign off ABSA AB-40 and ensure one copy is submitted to ABSA and one is retained on file in the equipment inspection file.

CNRL d-78-I(94-A-1) S. BUICK

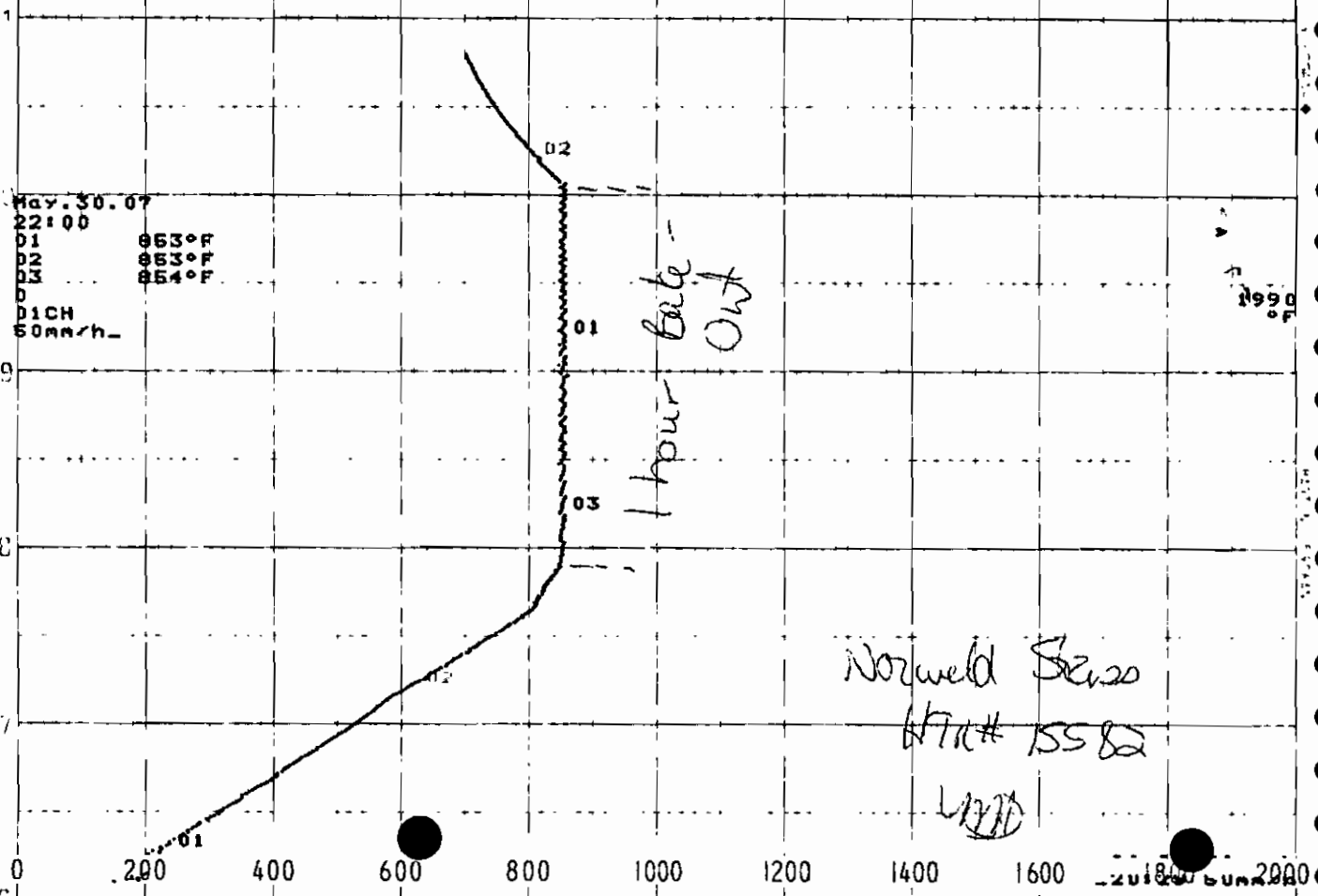
Procedure 2: Weld Build-Up of Wasted Areas			
Section	Comments	Sign Off	Date
Scope	Build up Fire tube 1 & 2 Repair		
Procedure	5a - A3151934.doc		
Weld Preparation			
Step 1	GRIND OUT CRACKS	[Signature]	MAY 31/07
Step 2			
Hydrogen Bake Out and Sulphur Removal			
Step 3	OVEN - 450°	[Signature]	MAY 31/07
Step 4			
Step 5			
Preheat and Welding			
Step 6	FRESH OUT OF BAKE OUT 80° monitored BY Heat Gun	[Signature]	MAY 31/07
Step 7	Weld up CRACKS	[Signature]	MAY 31/07
Step 8	M.T. All Repairs (PALADIN)	[Signature]	MAY 31/07
Step 9	M.T. All welds (PALADIN)	[Signature]	MAY 31/07
Step 10	Stress Rel fire tube	[Signature]	MAY 31/07
Step 11	M.T. 12 HRS AFTER COOLING	[Signature]	JUNE 1/07
Step 12			
Step 13			
Step 14			
Post Welding NDE			
Step 15	M.T. Repairs-	[Signature]	MAY 31/07
Step 16	M.T. 12 HRS AFTER COOLING	[Signature]	JUNE 1/07
Documentation			
Step 17			
Step 18			

May. 30. 07  
22:00  
01 0630 F  
02 0630 F  
03 0640 F  
0  
DICH  
60march

1 hour back -  
Out

Norweld Senso  
WTA# 15582  
L1310

1990  
of



# NORWELD STRESS LTD.



**HEAD OFFICE**  
Box 6333, Fort St. John BC V1J 4H8

TEL: (250) 787-0609 OR 785-1753  
FAX: (250) 787-0610  
CELL: (250) 787-6882 OR 262-6855

**BRANCH OFFICE**  
Grande Prairie  
TEL: (780) 539-5525  
FAX: (780) 539-5916

## heat treatment report

CHART / SHEET NUMBER **15582**

CLIENT **C.O.R.L** JOB NO. **AD-2-Lane Crdg**

SHIP STATE/ PROVINCE CUST P.O. NO.  
**d-78-T/94-A-11**

PROCEDURE REFERENCE			
RATE OF RISE	400 *F HR. MAX	RATE OF COOL	500 *F HR. MAX
UNRESTRICTED	800 *F	UNRESTRICTED FROM	700 *F
SOAK TEMP.	*F		*F
	842		
SOAK PERIOD	HRS.		MINS.
	1:05		65
PREHEAT	PREHEAT	INSULATION REMOVED	
0 *F MIN.	0 *F MAX	AT *F	
SPECIAL REMARKS			
held in oven to cool			
RECORDER NUMBER	CHART SPEED	CALIBRATED	
5564070	250 mm/hr	11/23/07	

HEAT SPECIFICATIONS APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

T/C		T/C	
01	} Oven load		
02			
03			

EQUIPMENT CONSUMABLES	QUANTITY
34' Oven	1

SIGHT TIME				HOURS	
TECH	DATE	START	FINISH	REGULAR	O.T.
WH	May 30/07	11:00 am	1:00 pm		4

TRAVEL TIME		HOURS	VEHICLE	MILEAGE
TECH	DATE			
WH	May 30/07	1	Pickup	

2 - Fire Tubes	
Hydrogen Bake	

SIGNED (TECHNICIAN) *[Signature]*  
NAME *Donnell* DATE *May 31/07*  
SIGNED (ACCEPTING AUTHORITY) *[Signature]*  
NAME \_\_\_\_\_ DATE \_\_\_\_\_

Five tubes left  
in oven overnight

50mm/h

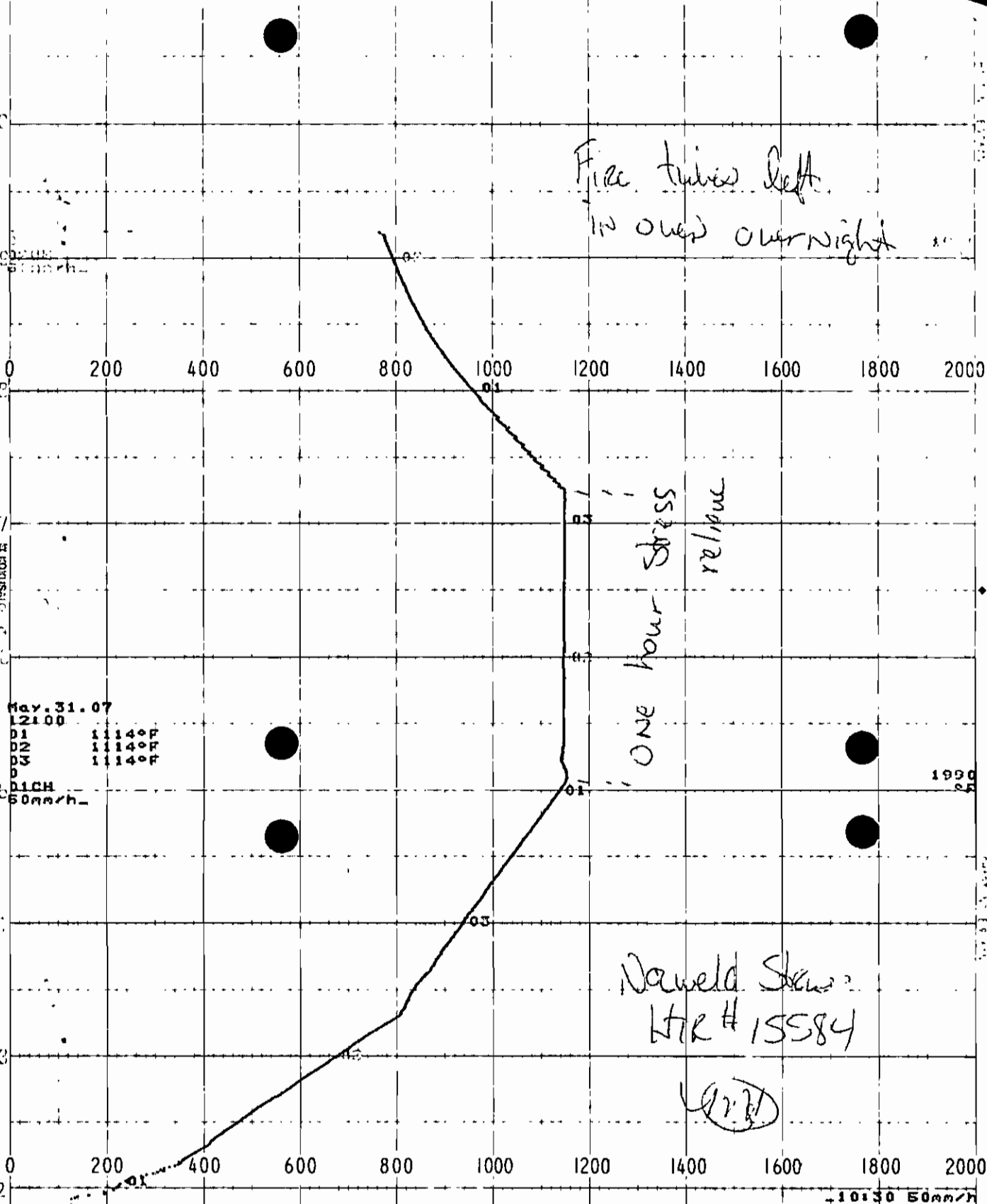
May. 31. 07  
12:00  
D1 11140P  
D2 11140P  
D3 11140P  
D4  
DICH  
50mm/h

1990

David S. ...  
HR # 15584

(Signature)

10:30 50mm/h





# NORWELD STRESS LTD.



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Box 6333, Fort St. John BC V1J 4H8

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FAX: (250) 787-0610  
CELL: (250) 787-6882 OR 262-6855

**BRANCH OFFICE**  
Grande Prairie  
TEL: (780) 539-5525  
FAX: (780) 539-5916

## heat treatment report

CHART / SHEET NUMBER **15584**

CLIENT C.N.O.R.L. Attn: Lane Craig

SHIP STATE/ PROVINCE CUST P.O. NO.  
d-78-I / 94-A-11

PROCEDURE REFERENCE			
RATE OF RISE	400 *F HR. MAX	RATE OF COOL	500 *F HR. MAX
UNRESTRICTED	800 *F	UNRESTRICTED FROM	800 *F
SOAK TEMP.	*F	*F	*F
SOAK PERIOD <u>1:05</u> HRS. MINS.			
PREHEAT	PREHEAT	INSULATION REMOVED	
<u>0</u> *F MIN.	<u>800</u> *F MAX	AT <u>heftinaven</u> *F	
SPECIAL REMARKS <u>Coal</u>			
RECORDER NUMBER	CHART SPEED	CALIBRATED	
<u>556407236</u>	<u>50mm/hr</u>	<u>MAY 23/07</u>	

HEAT SPECIFICATIONS APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

T/C		T/C	
01			
02	Oven Load		
03			

EQUIPMENT CONSUMABLES	QUANTITY
34' Oven Load	1

SIGHT TIME				HOURS	
TECH	DATE	START	FINISH	REGULAR	O.T.
W.H.	MAY 31/07	8:00	1:00am		5

TRAVEL TIME		HOURS	VEHICLE	MILEAGE
TECH	DATE			

2-20' Fire Tubes  
Stress After  
Repairs  
Complete

SIGNED (TECHNICIAN) \_\_\_\_\_  
NAME \_\_\_\_\_ DATE \_\_\_\_\_  
SIGNED (ACCEPTING AUTHORITY) \_\_\_\_\_  
NAME \_\_\_\_\_ DATE \_\_\_\_\_

**FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET** (A.) 3151394  
**As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1**

1. Manufactured and certified by IPC, Div. of Kvaerner Process Systems Inc. 6430 36 St SE, Calgary AB T2C 1G2  
(Name and address of Manufacturer)

2. Manufactured for Canadian Natural Resources Ltd. 200 425 1st St. S.W. Calgary, Alberta T2P 3L8  
(Name and address of Purchaser)

3. Location of installation South Buick Creek B.C. LSD D-78-1/84-A-11  
(Name and address)

4. Type: Horizontal Treater 95-1699  
(Tank, vert. or sphere) (Tank, separator, heat exch., etc.) (Mfg's. serial No.)

N-0817 21/A-3082 1 D-1699-09-01 Rev. 2-10 N/A 1995  
(CRN) (Drawing No.) 96-0124 R (Part. Bd. No.) (Year built)

Data Report Item Number

REMARKS

Purpose (Inlet, Outlet, Dm)	No.	Diameter or Size	Type	Material	Nominal Thickness	Reinforcement Material	How Attached	Location
N1 Pro. Inlet	1	8"	RFWN	SA192B	0.875"	N/R	Welded	Shell
N2 Vessel Drain	2	3"	RFWN	SA192B	0.437"	N/R	Welded	Shell
N6 LSD	1	4"	RFWN	SA192B	0.6748"	N/R	Welded	Shell
N6 FI	2	2"	RFWN	SA192B	0.342"	N/R	Welded	Shell/Head
N6 TI	2	2"	RFWN	SA192B	0.342"	N/R	Welded	Shell/Head
N7 TC	1	2"	RFWN	SA192B	0.342"	N/R	Welded	Shell
N8 HT&D	1	2"	RFWN	SA192B	0.342"	N/R	Welded	Shell
N10 Anode	8	4"	RFLWN	SA192H	0.75"	N/R	Welded	Shell
N11 MI Volt	1	4"	RFWN	SA192B	0.674"	N/R	Welded	Shell
N16 Sample	2	2"	RFWN	SA192B	0.342"	N/R	Welded	Head
N16 Relief	1	6"	RFWN	SA192B	0.663"	N/R	Welded	Shell
N17 Gas Out	1	4"	RFWN	SA192B	0.437"	N/R	Welded	Shell
N18 MLSD	1	4"	RFWN	SA192B	0.437"	N/R	Welded	Head
N19 OH LC	2	2"	RFWN	SA192B	0.342"	N/R	Welded	Head
N20 H2O LC	3	2"	RFWN	SA192B	0.342"	N/R	Welded	Head
N21 LG	4	2"	RFWN	SA192B	0.342"	N/R	Welded	Head
N22 H2O Out	1	6"	RFWN	SA192B	0.562"	N/R	Welded	Head
N23 OH Out	1	6"	RFWN	SA192B	0.562"	N/R	Welded	Head
N24 Dr. Off	1	2"	RFWN	SA192B	0.342"	N/R	Welded	Shell
N25 Grid	1	4"	RFWN	SA192B	0.437"	N/R	Welded	Head
M1 M2 Manway	2.00	24"	RFWN	SA192B	0.575"	SA81670	Welded	Shell

Certificate of Authorization Type U No. 18844 Expires Nov. 17, 1997

Date 20/1/96 Name IPC, Kvaerner Process Systems Signed [Signature]  
(Manufacturer) (Representative)

Date 96 01 24 Name [Signature] Commission ALBERTA 55(R)  
(Substantive Inspector) (Part. Bd. (incl. endorsements, State, Province and No.))

**Gord Ohland**

---

**From:** Anthony Merle [Anthony.Merle@cnrl.com]  
**Sent:** May 31, 2007 6:36 AM  
**To:** hyland@awink.com; Dellas Wiedman  
**Cc:** Keith McIntosh  
**Subject:** CNRL Repair Procedure for South Buick Treater  
**Attachments:** CNRL Repair Proc 5a - A3151394.doc

Received  
MAY 31/07

Any questions please contact Keith or myself, thanks.

**Anthony Merle**  
Integrity Coordinator  
Canadian Natural Resources Ltd.  
T: 403.517.7301  
C: 403.850.6020  
F: 403.517.7366



[www.wilsonjones.com](http://www.wilsonjones.com)



**BOILER & PRESSURE VESSEL  
CONTRACTOR LICENCE**

*This is to certify that:*

HYLAND 2000 INDUSTRIES LTD

Holds a licence class as:

A - Boiler, Pressure Vessel, and Pressure Piping

Exp. Date: 2008/06/30

Licence No: 2087

*M. Bishop*

Boiler Safety Manager



*[Signature]*

Signature of Holder

PROCEDURE:      **HOL 400 F**

APPLICATION:    **Fabrication:**

This procedure has been qualified for the production of proven notch toughness welds with and without PWHT. This procedure has also been qualified to produce welds acceptable to NACE MR-01-75 hardness.

MATERIAL:            **SA 106, SA 333, SA 350, SA 234, SA 420, SA 516-70, CSA Z245.1 etc.**

DIRECTION:            **1st Pass Up or Down: Remaining passes Up Hand.**

QUALIFICATION:

**Diameters: 44.45 mm to 323.9 mm (1.66" to 12.75")**

**Thickness: 1.5 mm to 13.7 mm (.068" to .539")**

**Materials: P1 Group 1 & 2**

**Toughness Tested: Yes**

TECHNIQUE:

**Pre Heat: 50 Deg F Minimum**

**PWHT: 1100 Deg (when applicable)**

**Polarity: REVERSE**

Pass    Electrode Diameter    Current

<b>1</b>	<b>E 6010</b>	<b>2.4 mm</b>	<b>50 - 100</b>
<b>2</b>	<b>E 7018</b>	<b>3.2 mm</b>	<b>90 - 138</b>
<b>3</b>	<b>E 7018</b>	<b>3.2 mm</b>	<b>90 - 150</b>
<b>4</b>	<b>E 7018</b>	<b>4.8 mm</b>	<b>180 - 275</b>

**WELDERS:** Please return this document to the job supervisor when you have been released from the job.



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785-1551 FAX: 785-7576



**MATERIAL ORDER**  
STRUCTURAL STEEL

Quote:

Purchase:

Pick-Up:

Delivery:


SUPPLIER: \_\_\_\_\_ FAX #: \_\_\_\_\_ QUOTE #: \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_ JOB# \_\_\_\_\_ Hyland Order # \_\_\_\_\_ DATE: \_\_\_\_\_

HYLAND CUSTOMER: \_\_\_\_\_ Charge to: \_\_\_\_\_ Project: \_\_\_\_\_

ORDERED BY: \_\_\_\_\_ Supplier Contact: \_\_\_\_\_

#	DESCRIPTION	QTY	SIZE	DWG #

*NA*  
*[Signature]*

Inspector Authorization: \_\_\_\_\_ Change Order #: \_\_\_\_\_



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# PIPE TEST LOG

AREA \_\_\_\_\_  
PLANT \_\_\_\_\_

PIPE TEST NO.	LINE DESCRIPTION	DATE INITATED	DATE COMPLETED	PREPARED BY

*Pipings (Fire Tubes)  
Listed on End and filled  
for Leach test only*

*[Signature]*



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NDT INSPECTION INFORMATION

COMPANY:		<i>Polaris</i>						TECHNICIAN:		<i>Hans Hansen</i>					
Radiography	(R.T.)	LEVEL I		LEVEL II		LEVEL III									
Ultrasonics	(UT)	YES		NO											
Liquid Penetrant	(LT)	YES		NO											
Magnetic Particle	(MT)	YES		NO											
Reg No.		<i>4038</i>													

COMPANY:								TECHNICIAN:							
Radiography	(R.T.)	LEVEL I		LEVEL II		LEVEL III									
Ultrasonics	(UT)	YES		NO											
Liquid Penetrant	(LT)	YES		NO											
Magnetic Particle	(MT)	YES		NO											
Reg No.															

COMPANY:								TECHNICIAN:							
Radiography	(R.T.)	LEVEL I		LEVEL II		LEVEL III									
Ultrasonics	(UT)	YES		NO											
Liquid Penetrant	(LT)	YES		NO											
Magnetic Particle	(MT)	YES		NO											
Reg No.															



MAGNETIC PARTICLE TESTING REPORT

MT/PT 1617

LIQUID PENETRANT TESTING REPORT

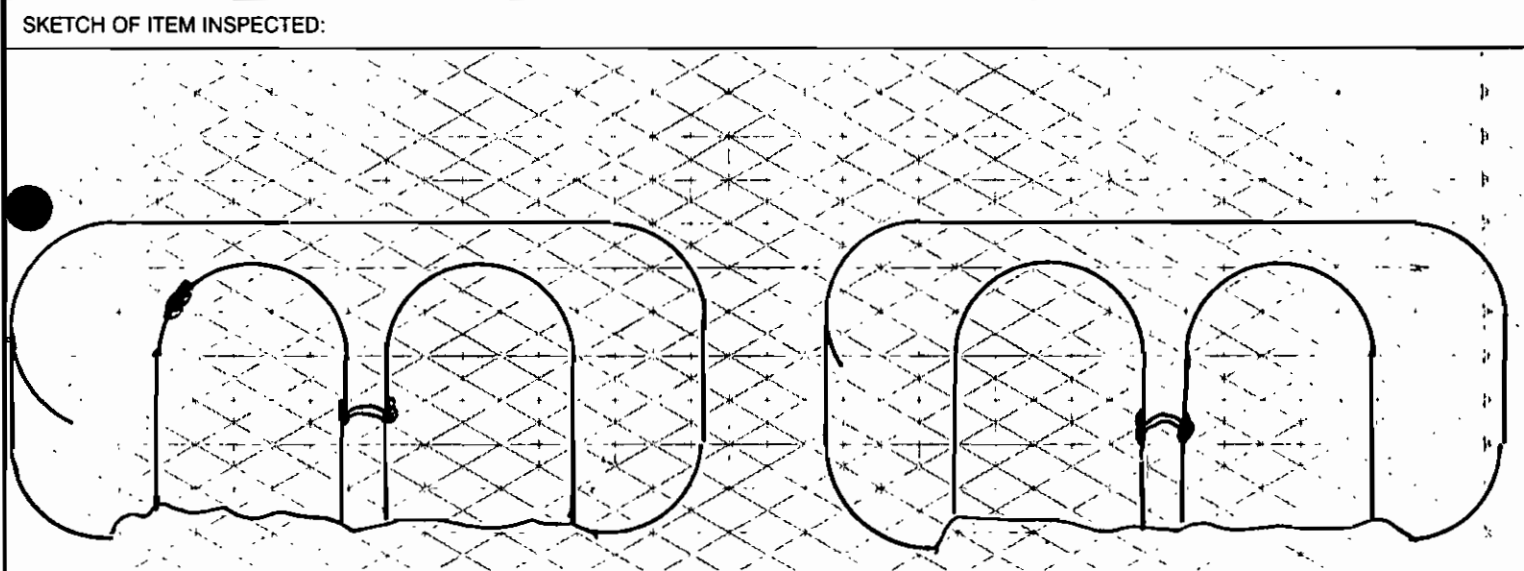
PAGE: 1 OF 1

CLIENT: C.N.R.L. DATE MAY 31 2007  
 LOCATION: d-78-I 94 A-11 S-BLUE-B P.O./AFE/JOB NO. \_\_\_\_\_  
 CONTRACTOR: HYLAND APPLICABLE CODE: A.S.M.E. B 31.3  
 ITEMS INSPECTED: FIRE TUBE FILLET WELDS NORMAL SERVICE

SURFACE CONDITION:  Clean Bare Metal  As Welded  As Ground  Machined  Shot Blast  Painted  Buffed  Other \_\_\_\_\_  
 EQUIPMENT TYPE:  Yoke  Coil  Bench  Prod  Serial No.: 4035  Last Calibration Date: JAN 15/07  
 Blacklight  Serial No.: \_\_\_\_\_  Blacklight Intensity Meets ASTM E709-95

MPI METHOD:  AC  DC  HW Rectified /  Continuous  Residual /  12V  120V  Other \_\_\_\_\_  
 MEDIUM:  Dry (Color \_\_\_\_\_)  Fluorescent \_\_\_\_\_  Black on White 8038 on 890/W  
 Wet Product Manufacturer: ARDOX

LPI PRODUCT MANUFACTURER: \_\_\_\_\_  
 PRODUCT TYPE: Penetrant \_\_\_\_\_ Emulsifier \_\_\_\_\_ Remover \_\_\_\_\_ Developer \_\_\_\_\_  
 Penetrant:  Visible  Fluorescent/Water Wash  Post Emulsified  Solvent Removable  
 Developer:  Wet  Dry  Nonaqueous Dwell Time: \_\_\_\_\_ Developer Time: \_\_\_\_\_



INSPECTION RESULTS: MAGNETIC PARTICLE INSPECTION OF THE REPAIR AREAS ON THE TWO FIRE TUBE FILLET WELDS SHOWED NO RELEVANT INDICATIONS AT THE TIME OF INSPECTION.

CLIENT REP (Sign): [Signature]  
 CLIENT REP (Print): \_\_\_\_\_  
 TECHNICIAN (Sign): [Signature] REG. # 4038  
 CGSB LEVEL II  
 ASNT LEVEL \_\_\_\_\_  
 SNT LEVEL \_\_\_\_\_  
 TECHNICIAN (Print): HARIS HAUSEN  
 ASSISTANT: ADAM BATES

DAILY COST ESTIMATE			
	RATE		COSTS
DAY RATE	<input checked="" type="checkbox"/> DAY @ \$	LOA	@ \$
ST. HR.	<u>4</u> HR @ \$ <u>130<sup>00</sup></u>	WELD(S)	@ \$
OT HR.	<u>2</u> HR @ \$	CONSUMABLES	
DT HR.	<u>2</u> HR @ \$		
	KMS @ \$	<u>1</u> CANS @ <u>16<sup>00</sup></u>	
TOTAL HOURLY \$ <u>520<sup>00</sup></u>			
TOTAL ESTIMATED DAILY COST: \$ <u>536<sup>00</sup></u> + <u>32<sup>16</sup></u> = \$ <u>568<sup>16</sup></u>			

This certificate or report is valid only for the work which was specifically requested. The company is not responsible for any views or opinions expressed by employees performing this work which fall outside the exact terms or reference. All certificates and/or reports are the results of work performed in conformance with applicable specifications and standards to the best of our ability and intent. However the company will not be responsible for deviations within the normal limits of accuracy in accordance with standard practices. Client Representative signature indicates acceptance of report, results and applicable charges.



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WELDING INFORMATION



**WELDER NAME:** Jeff Huscroft  
**Welder Alberta Number: "B"** N/A  
**Welder B.C. Number:** 67352  
**JOB NUMBER:** \_\_\_\_\_  
**STAMP:** 4

I am familiar with and agree to, weld to the below listed weld procedure(s) that have been specified by management.

WELD PROCEDURE:

		Diameter	Wall Thk's	Sweet or;	Cal.	Direction
	PWHT	Group	Group	Sour pipe		of travel
100	(pipeline)	No	2-3/8 - 12-3/4	.109 - .25	Both	I, II or III Down
200	(pipeline)	No	2-3/8 - 12-3/4	.250 - .500	Both	I, II or III Down
300	(pipeline)	No	2-3/8 - 12-3/4	.590 - .625	Both	I, II or III Down
1	(pipeline)	No	All	1/16 - .600	Both	241 Up
2	(plant)	No	All	.106 - .751	Both	241 Up or Down
3	(plant)	No	All	.106 - .751	Both	241 Up
4	(plant)	No	All	1.5	Both	241 Up
5	(plant)	Yes	All	0.125 - .799	Both	241 Up or Down
400 F	✓ (plant)	Yes / No	1- 12-3/4	.590 - .625	Both	241 Up or Down
500 F	(plant)	Yes / No	All	1/16 - .8	Both	241 Up or Down

Supervisor: [Signature]

Welder Signature: [Signature]

Management for: a) Stainless to Stainless . HOL-7  
 b) Stainless to Carbon . HOL-8

- E:
- a) Welder Picture and book is on file - DO NOT PUT COPY IN Q.C.
  - b) Weld procedure on file: DO NOT PUT COPY IN Q.C.

WELDING INFORMATION



WELDER NAME: SHEA, LUNDA GIO

Welder Alberta Number: "B"

Welder B.C. Number: PWP 7 PRESSURE #B  
01807 RW 90

JOB NUMBER: \_\_\_\_\_

STAMP: # 7

I am familiar with and agree to, weld to the below listed weld procedure(s) that have been specified by management.

WELD PROCEDURE:

		Diameter Group	Wall Thk's Group	Sweet or; Sour pipe	Cat.	Direction of travel
100	(pipeline)	No	2-3/8 - 12-3/4	.109 - .25	Both	I, II or III Down
200	(pipeline)	No	2-3/8 - 12-3/4	.250 - .500	Both	I, II or III Down
300	(pipeline)	No	2-3/8 - 12-3/4	.590 - .625	Both	I, II or III Down
1	(pipeline)	No	All	1/16 - .600	Both	241 Up
2	(plant)	No	All	.106 - .751	Both	241 Up or Down
3	(plant)	No	All	.106 - .751	Both	241 Up
4	(plant)	No	All	1.5	Both	241 Up
5	(plant)	Yes	All	0.125 - .799	Both	241 Up or Down
400 F	✓ (plant)	Yes / No	1 - 12-3/4	.590 - .625	Both	241 Up or Down
500 F	(plant)	Yes / No	All	1/16 - 8	Both	241 Up or Down

Supervisor: [Signature]

Welder Signature: [Signature]

- Management for:
- a) Stainless to Stainless HOL-7
  - b) Stainless to Carbon HOL-8

E:

- a) Welder Picture and book is on file - DO NOT PUT COPY IN Q.C.
- b) Weld procedure on file: DO NOT PUT COPY IN Q.C.









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**FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS**  
 (Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)  
 As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

**A3151394**

1. Manufactured and certified by IPC, Div. of Kvaerner Process Systems Inc. 5430 30 St SE, Calgary AB T2C 1G2  
(Name and address of manufacturer)

2. Manufactured for Canadian Natural Resources Ltd. 200 425 1st St. S.W. Calgary, Alberta T2P 3L8  
(Name and address of purchaser)

3. Location of installation South Buick Creek B.C. LSD D-78-1/94-A-11 C  
(Name and address)

4. Type Horizontal 95-1699 \*N-0617.21 D-1699-09-01 Rev. 10. SC N/A 1995  
(Horiz. or vert., tank) (Mfg's serial No.) (CRN) (Drawing No) (Mat. Id. No.) (Year Built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division I 1992  
(Year)

to 1994 N/A N/A  
Address (state) Code Case No. Special service per UG-120(a)

6. Shell: SA51670N 0.375" 0.0625 9'-11.25" 40'-0" S/S  
Mat. (Spec. No., Grade) Nom. Thk. (in.) Cor. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

7. Seams: Sngl. B Weld Full\* 100 1175 1 Sngl. B Weld \*Full 4  
Long. (Welded, Dbl., Sngl. Lap, Butt) R.T. (Spot or Full) Eff. (%) H.T. Temp. (°F) Time (hr) Girth (Welded, Dbl., Sngl. Lap, Butt) R.T. (Spot, Partial, or Full) No. of Courses

8. Heads: (a) Mat. SA51670N (b) Mat. SA51670N  
(Spec. No., Grade) (Spec. No., Grade)

Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
Firetube End	0.330"	0.0625"	114"	7.250"	N/A	N/A	N/A	N/A	Concave
Outlet End	0.404"	0.0625"	114"	7.250"	N/A	N/A	N/A	N/A	Concave

If removable, bolts used (describe other fastenings) N/A  
(Mat., Spec. No., Gz., Size, No.)

9. MAWP: 75 psi at max temp 250 °F  
 Min design metal temp. -13 °F at 75 psig psi Hydro. test, or corr'd test pressure 113 psig psi

10. Name, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Mat.	Nom. Thk.	Reinforcement Mat.	How Attached	Location
Attached LN Form								

11. Supports: Skrt No Lugs 2 Legs N/A Other 2 Saddles Attached Welded to W. Pad / Shell  
(Yes or No) (No.) (No.) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: N/A

(Name of part, item number, Mfg's name and identifying stamp)  
VOLUME 3300 Cu Ft WEIGHT 60000 lbs TAG TD-1040-5-00  
\*UN11A - Charpy Impact not required. UG944.3.20(1)-B  
Serial CRN # A-38821 Trailer

**CERTIFICATE OF SHOP COMPLIANCE**

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1, "U" Certificate of Authorization No. 1844 expires Nov. 12, 1997  
 Date 24/1/96 Co. name IPC, Div. Kvaerner Process Systems Inc. Signed [Signature]  
(Manufacturer) (Representative)

**CERTIFICATE OF SHOP INSPECTION**

Vessel constructed by IPC, Div. of Kvaerner Process Systems Inc. at Calgary Alberta, Canada  
 I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and / or the State or Province of Alberta and employed by Alberta Boilers Safety Association  
 have inspected the component described in this Manufacturer's Data Report on JAN 24 1996, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the inspector nor his employer make any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.  
 Date 24-01-96 Signed [Signature] Commissioned Alberta 55(R)  
(Inspector) (National Board and/or Provincial State, Prov. and No.)



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# PROJECT EMERGENCY RESPONSE PLAN

(POST IN OFFICE AND DISTRIBUTE TO ALL HANDS)

CUSTOMER: \_\_\_\_\_

FIELD OR AREA: \_\_\_\_\_ LSD: \_\_\_\_\_

NEAREST TOWN & FACILITIES: \_\_\_\_\_

DIRECTIONS FROM THE NEAREST TOWN: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

EMERGENCY MUSTER AREA: \_\_\_\_\_

## EMERGENCY PHONE NUMBERS

LOCAL CUSTOMER CONTACT: NAME: \_\_\_\_\_ NUMBER \_\_\_\_\_

W.C.B. \_\_\_\_\_

PROVINCIAL INSPECTOR: \_\_\_\_\_

PROVINCIAL ENVIRONMENT OFFICER: \_\_\_\_\_

AMBULANCE: \_\_\_\_\_

HELECOPTER SERVICE: \_\_\_\_\_

FIRE FIGHTING SERVICE: \_\_\_\_\_

R.C.M.P. \_\_\_\_\_

LOCAL HOSPITAL: \_\_\_\_\_



# SAFETY REQUIREMENTS

*POST COPY AT JOB SITE*

1 Document Safety meeting:	DAILY		BI WEEKLY	
	WEEKLY	x	SPECIAL ACTIVITIES	
2 Ensure the WCB form "Notice Of Project" is posted at the job site.				
3 Post your Emergency Response Plan:				
		YES	NO	
4 Fire Retardant Coveralls:		x		
5 Hard Hats:		x		
6 Safety Glasses:		x		
7 Safety Boots:		x		
8 Area Monitors:				
9 Personal Monitors:				
10 3RD Party Safety				
11 Signs:		x		
12 Seat Belts: worn on all Hyland equipment & trucks		x		
13 Barricades:		x		
14 Tail Gate Meetings: Daily		x		
15 Air Packs:				
16 Inspect & Change load lines before & after each job:		x		
17 _____				
18 _____				
19 _____				
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>SPECIAL ACTIVITIES</b>                      Requires Documentation                 </div>				
20 Legal & Open Ditch		x		
21 Heavy Lifts				
22 _____				

## Hazard Identification and Assessment

Site inspections should be made to identify hazards. All workers should be instructed to be aware of potentially hazardous situations and bring them to the attention of the Construction Supervisor.

### INDEX OF INSPECTIONS

Chemical and Fuel	Material Handling
Compress Gas Cylinders	Mechanical Power Systems
Confined Space Entry	Noise Exposure
Electrical Power Systems	Personal Protective Equipment
Emergency Instructions	Platforms/Scaffolding
Emergency Rescue Equipment	Pneumatic Power Systems
Ergonomic Factors	Pressure Vessels and Piping
Exit/Egress	Signs and Tags
Eye Bath and Showers	Stacking and Storage
Fire Protection	Stairs
First Aid Kits/Stations/Equipment	Trenching/Excavating
Hand and Portable Tools	Valves and Mechanical Controls
Hydraulic Power Systems	Vehicles and Equipment
Ladders	Warning Systems
Lifting Gear/Equipment	Waste Disposal
Lighting	WHMIS/TDG
Lock-Out Systems	Work Surfaces, Floor and Roadways



HYLAND 2000 INDUSTRIES LTD.

8824 - 101st STREET

FORT ST. JOHN, B.C.

V1J 5K5

PHONE: (250) 785-1551 FAX: (250) 785-7576

SAFETY MEETING

DATE: \_\_\_\_\_ JOB # \_\_\_\_\_

FIELD: \_\_\_\_\_ L.S.D.: \_\_\_\_\_

COMPANY: \_\_\_\_\_ CONTACT: \_\_\_\_\_

FOREMAN IN CHARGE: \_\_\_\_\_ CELL#: \_\_\_\_\_

- ALL PERSONNEL SAFETY GEAR TO BE WORN AT ALL TIMES.
- SMOKING IS PERMITTED IN DESIGNATED AREAS ONLY.
- SAFETY MUSTER AREA IS \_\_\_\_\_
- TAG LINES TO BE USED ON ALL LIFTS.
- ALL PERSONNEL TO BE CLEAN SHAVED.
- SAFETY BELTS TO BE WORN DURING OPERATION OF ALL EQUIPMENT.
- SAFETY HARNESSSES TO BE WORN ON ALL WORK OVER 10 FEET.
- ALL LADDERS TO BE TIED OFF.

SAFETY CONCERNS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

	PRINT NAME	SIGN NAME	COMPANY	H2S	WHIMIS	E/A
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

# HYLAND 2000 INDUSTRIES LTD.

## INCIDENT OR ACCIDENT REPORT FORM



CREW NAME: \_\_\_\_\_

DATE & TIME OF INCIDENT OR ACCIDENT: \_\_\_\_\_

LOCATION OF INCIDENT OR ACCIDENT: \_\_\_\_\_

REPORTED BY: \_\_\_\_\_ REPORTED TO: \_\_\_\_\_

### **INJURIES OR ILLNESS:**

NAME: \_\_\_\_\_

OCCUPATION: \_\_\_\_\_

BODY PARTS AFFECTED: \_\_\_\_\_

NATURE OF INJURY/ILLNESS: \_\_\_\_\_

OBJECT/EQUIPMENT/SUBSTANCE INFLECTING INJURY/ILLNESS: \_\_\_\_\_

PERSON(S) IN CONTROL OF ABOVE ITEM(S): \_\_\_\_\_

### **PROPERTY/EQUIPMENT DAMAGE:**

ITEM(S) DAMAGED: \_\_\_\_\_

NATURE OF DAMEGE: \_\_\_\_\_

ESTIMATED COST: \_\_\_\_\_

ACTUAL COST: \_\_\_\_\_

OBJECT/EQUIPMENT/SUBSTANCE INFLECTING DAMAGE: \_\_\_\_\_

PERSON(S) IN CONTROL OF ABOVE ITEM(S): \_\_\_\_\_

DESCRIPTION OF ACTIVITIES IMMEDIATELY PRIOR TO THE ACCIDENT:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DESCRIPTION OF INCIDENT OR ACCIDENT (INCLUDE INDIVIDUALS INVOLVED):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DIAGRAM:

NORTH