



3098592

**Field Inspection Report**

Vessel # 3098592

<b>Client</b>	Canadian Natural Resources Ltd.		<b>Inspection Date</b>	May 16, 2001	
<b>Prov. Reg.#</b>	3098592		<b>Location</b>	Caribou	
<b>Equipment</b>	Glycol Contactor		<b>LSD</b>	d-62-C/94-A-16	
<b>Tag/Equip. #</b>			<b>Comp./Unit #</b>		
<b>Vessel Status</b>	In Operation		<b>Job #</b>	01-294	
<b>Manufacturer</b>	Wells Hall	<b>Serial #</b>	9579770	<b>MAWP/Temp</b>	1440 psi 130° F
<b>CRN#</b>	M2316.21	<b>Shell Material</b>		<b>Shell Thickness</b>	1.125 in
<b>Corrosion All.</b>	in	<b>Head Material</b>		<b>Head Thickness</b>	1.079 in
		<b>Head Material 2</b>		<b>Head Thickness 2</b>	in
		<b>Channel Material</b>		<b>Channel Thickness</b>	in
<b>Diameter</b>	24 in	<b>Length</b>	in 384 in	<b>RT</b>	1 HT Yes
<b>Year Built</b>	1995	<b>Next Inspection</b>	2005	<b>Inspection Type</b>	VEN/UT
<b>Service</b>	Sour	<b>Manway</b>	No	<b>Coating</b>	No
<b>PSV #.</b>	CE20577A10				
<b>Mfg.</b>	Farris	<b>Serial #</b>	CE20577A10	<b>Set Pressure</b>	1100 psi
<b>Type/Model</b>	26GA113120	<b>Capacity</b>	4365 SCFM	<b>Size</b>	1.000 in
<b>Date of Service</b>	2001/05/01	<b>Next Service</b>	2005	<b>Service Co.</b>	Unified

**Field Inspection Report**  
**Vessel # 3098592**

**Observations:**

**External**

Vessel painted, paint in good condition. Vessel supported by skirt and baseplate, bolted to skid, good condition. Roof seal around vessel appears weatherproof. No ground wire to vessel but G/W to skid secure.

**Internal**

Inspection through 4" flanged opening. Vessel shell/bottom head coated with liquids. No corrosion evident on areas visible for inspection.

**UT**

Measurements in inches min 10 spots each.

**Head**

Top - No access.

Bottom - 1.118 to 1.127

**Shell**

Upper - No access.

Lower - 1.128 to 1.139

Nozzles - No access.

Limited access to bottom of bottom head.

**PSV**

Located on vessel, vented to flareline, seal wire intact.

**Note**

No BC vessel registration # found on vessel.

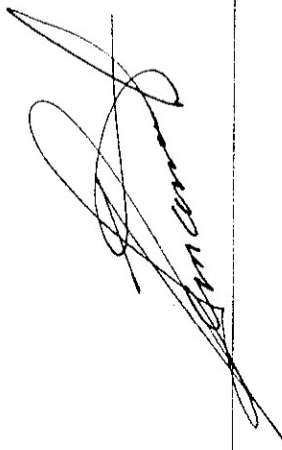
This vessel has been classed "sour service" but given a 4 year inspection interval based on low H2S levels and dilution of sour gas by sweet gas. Gas analysis report on file at RIS, WO 01-294.

**Recommendations:**

Vessel fit for service.

**Inspector:** Gerry Moran

**Reviewed by:**



VESSEL (A) : 3098592

DATE OF INSPECTION : 1995 OCT 27

Alberta Boilers Safety Association

## Certificate of Inspection

CANADIAN NATURAL RESOURCES LTD  
SUITE 2000, ESSO PLAZA  
425-1 STREET SW  
CALGARY AB

T2P 3L8

**LOCATION:** STOCK - CALGARY  
**COMPANY CODE:** UNIT # 12

**DESCRIPTION:** VERTICAL GLYCOL CONTACTOR

PREFERRED RE-INSP. INTERVAL: 2.00 YRS

CRN: M2316.21

**MANUFACTURER:** WELLS-HALL FAB. & CONST. LTD.

**SERIAL # :** 95-7977-0

**YEAR BUILT:** 1995

**HEATING SURFACE:**

m2

**CUBICAL CAPACITY:**

2.400 m3

PART	MAX. AUTHORIZED PRESSURE	MAX. TEMP	MIN. TEMP	ID/LOCATION	SAFETY VALVES SET/CAPACITY	AT TEMP
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**CONTACTOR**

9928 kPa

54 C SV


-29 C TO BE INSTALLED

0 kPa

**OWNER INSTRUCTIONS/REMARKS:**

CONTACT THE AREA SAFETY CODES OFFICER BEFORE PLACING THE VESSEL IN SERVICE.  
TO BE INSTALLED IN ACCORDANCE WITH THE SAFETY CODES ACT AND THE ADOPTED BOILERS AND PRESSURE VESSELS REGULATIONS.  
VERIFY THAT VESSEL IS PROTECTED BY A 'UV' SAFETY RELIEF VALVE, OF ADEQUATE CAPACITY, SET AT NO MORE THAN MAXIMUM PRESSURE AUTHORIZED, HAS BEEN INSTALLED IN ACCORDANCE WITH THE REGULATIONS.

**INSPECTOR:** BOYCHUK, MILTON MIKE STANLEY

**SIGNATURE:** 

**NOTE: REQUIREMENTS OF THE SAFETY CODES ACT AND THE REGULATIONS ISSUED THEREUNDER:**

THE OWNER OR PERSON IN CHARGE SHALL REPORT ALL ACCIDENTS INVOLVING A BOILER, PRESSURE VESSEL OR PRESSURE PIPING SYSTEM TO THE DISTRICT INSPECTOR IMMEDIATELY AND SHALL SEND A FULL REPORT IN WRITING TO THE CHIEF INSPECTOR AS REQUIRED BY THE ACT. NO REPAIRS OR ALTERATIONS MAY BE MADE UNLESS AUTHORIZED BY AN INSPECTOR.

WK #12

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only) **3098592.S**  
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1 **95-10-27**

Carlson

- Manufactured and certified by WELLS HALL FABRICATION & CONSTRUCTION LTD., 6115 30ST EDMONTON, AB T6P 1T8
- Manufactured for CANADIAN NATURAL RESOURCES, 2000, 425-1ST ST. S.W. CALGARY, AB. T2P-3L8
- Location of installation STOCK TBA

4. Type VERT. CONTACTOR 95-7977-0 (Name and address) 12316.21 33-A-6977-5 (Year built) 1995  
 (Manufacturer, tank) (Drawing No.)

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 1 1992  
 Year

6. Shell: SA 516 70 MT 1.125" (Nom. Thk. (in.)) 0.125" (Corr. Allow. (in.)) 21.75" ID (Dim. I.D. (ft. & in.)) 34'-10 1/2" O/A (Length (overall) (ft. & in.))  
 Special Service per UG-120(d)

7. Seams: EQUIV. DBL. BUTT FULL (Long. (Welded, Obli., Spig., Lap, Butt)) 150°F (H.T. Temp. (F)) 70 MINS. (Time (hr)) FULL (R.T. (Spot, Partial, or Full))

8. Heads: (a) Matl. SA 516 70 MT (Spec. No., Grade) (b) Matl. SA 516 70 MT (Spec. No., Grade)  
 (c) Matl. SA 516 70 MT (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)
(a) TOP	1.079	0.125			2:1				CONCAVE
(b) BTM	1.091	0.125			2:1				CONCAVE

9. MAWP (9928 KPa) (Matl., Spec. No., Gr., Size, No.) (540C)  
 Min. design metal temp. (-25°C) 1440 psi at max. temp. 1440 psi hydro., pneu., or comb. test pressure (14823 KPa) 2160 psi.

10. Nozzles, inspection and safety valve openings: -20 °F at 1440 psi. Hydro., pneu., or comb. test pressure (14823 KPa) 2160 psi.

Purpose (Inlet, Outlet, Drain)	No.	Diarm. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
INLET/OUTLET	2	4"	RFLWN	SA105N	600 ANSI		WELDED	SHELL/HEAD
LEG/INLET/LEG	3	3"	RFLWN	SA105N	600 ANSI		"	SHELL
DRAIN/PSV	2	2"	RFLWN/PIPE	SA105N SA106B	6000 SCLX140		"	SHELL/HEAD
LEG/OUT/PI	13	1"	RFLWN/PIPE	SA105N/SA106B	6000 SCLX14		"	SHELL
LEG/COIL	1	1 1/2"	RFLWN/PIPE	SA105N/SA106B	6000 SCLX14		"	SHELL

11. Supports: Skirt YES (Yes or no) Lugs 2 LIFT (No.) Other Attached WELDED TO HEAD (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:  
24" OD x 32' 5/8" x 1440# GLYCOL CONTACTOR W/3 PHASE SCRUBBER WT. = 11200 lbs  
IMPACT TESTS EXEMPT PER UG20(F) + UCS 66 HYDRD IN. HORIZONTAL VOL. = 84.7 FT<sup>3</sup>  
RADIOGRAPHY - 100% (EXCEEDS FULL) BUILT TO Dwg# 33-A-7977-0 UNIT #12  
 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. 19585 expires JULY 31, 1996.  
 Date Oct 27 1995 (Manufacturer) WELLS HALL FAB. & CONST. LTD. Signed [Signature]

CERTIFICATE OF SHOP INSPECTION  
 Vessel constructed by WELLS HALL FABRICATION & CONSTRUCTION LTD. at EDMONTON, ALBERTA  
 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 BOILER SAFETY ASSOCIATION

have inspected the component described in this Manufacturer's Data Report on OCTOBER 27, 19 95, 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 makes 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 95-10-27 Signed [Signature] (Inspected Inspector) Commissions ALBERTA 428 (Matl. Board (incl. endorsement), State, Prov. and No.)

48	2	1" SCH.XXH SMLS PIPE X 3 5/16" LG.	SA-106-B
49	1	1" SCH.XXH SMLS PIPE X 5" LG.	SA-106-B
50	2	3" -600 ANSI RF FLEXITALLIC GASKET X 1/8" THK	316 SS
51	16	3/4" X 4 3/4" LG. STUD C/W 2 HEX NUTS EACH	SA-193-B7M SA-194-2HM
52	1	2" -160 SMLS PIPE X 4 1/2" LG.	SA-106-B
53			

**\* QTY. SHOWN FOR ONE(1) UNIT: THREE(3) UNITS REQ'D.**

**GENERAL NOTES**

CONSTRUCTION IN ACCORDANCE WITH ASME CODE SEC.VIII DIV 1, 1992 ADD. 1994  
 APPROVED BY PROVINCIAL BOILER INSPECTOR.

PRESSURE 1440 psig, 9928 kPa, @ 130° F, 54° C  
 -20° F, -29° C @ 1440 psig, 9928 kPa.

ALLOWANCE 1/8 in., 3.2 mm.

TEST 2160 psig, 14893 kPa, (LTD BY DESIGN)

RELIEVE: YES, TO MIN. @ 1150° F.

COATING: 100%

ALL DIMENSIONS ARE TO REF. LINE UNLESS OTHERWISE NOTED.  
 ALL HOLES ARE TO STRADDLE VESSEL CENTER LINES UNLESS OTHERWISE NOTED.  
 ALL OPENINGS TO BE THOROUGHLY CLEANED INSIDE AND OUT.

ALL WELDS TO BE TO SPPC-SP6; 1 S/C ZINC CHROMATE PRIMER;  
 2 C VALSPAR ENAMEL (WARM GREY).

NET SHIPPING WT. 10000 lbs., 4536 kg.

VOLUME: 84.7 CUBIC FEET, 2.40 CUBIC METERS.

No: 93-6979-0, 93-6979-1, 93-6979-2

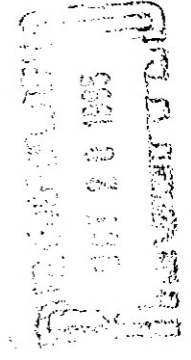
AND LONG SEAM SEE WELD DETAIL VI.

M 2316.21 BHA AUG 28 1995

TESTING: EXEMPT PER UG-20(1) & UCS-66

\* Revision: Mix. Lead All. Revised.

ALBERTA ENGINEERS SAFETY ASSOCIATION APPROVED BY SAFETY CODES ACT ACCEPTED M 2316.2 Revision * OCT 10 9 1995 E.B. (C. DESSAI, P. ENG. DESIGN SURVEY ENGINEER
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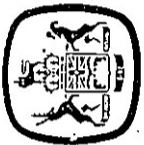


**-HALL FABRICATION & CONSTRUCTION LTD.**

CUSTOMER: CANADIAN NATURAL RESOURCES LIMITED	
SHOP ORDER: 93-6979	TAG No. V-300
CUST. No. F93-889	
24" OD X 32'-0" S/S X 1440# DP X 1/8" CA GLYCOL CONTACTOR C/W 3-PHASE INTEGRAL SCRUBBER SECTION	
DWN.BY: RICK L	DATE: 93-12-08
APP.BY: R. Haggback	DATE: 28 Dec 93
SCALE: AS SHOWN	DWG#: 33-A-6979-3

BY	APP	DATE
RL	BHA	08-24-95
RL	BHA	02-03-94
RL	BHA	01-10-94
AL	BHA	01-04-94
RL	BHA	12-22-93

AUG 28 1995



Province of  
British Columbia

Ministry of  
Municipal Affairs  
BOILER AND ELEVATOR SAFETY BRANCH  
BOILER AND PRESSURE VESSEL SAFETY

Safety Engineering  
Services Division  
Third Floor  
750 Pacific Boulevard South  
Unit 300  
Vancouver, British Columbia  
V6B 5E7  
Telephone: (604) 660-6250  
Fax: (604) 775-2345

Account # H7724  
12648

TO: WELLS-HALL FABRICATION &  
CONSTRUCTION LIMITED  
6115 - 30TH STREET  
EDMONTON  
ALBERTA  
T6P 1J8

Date: 95.09.07  
Jnl #: 13077

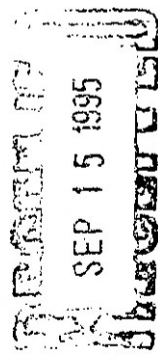
Attn: BRIAN HJALTE

DESIGN REGISTRATION

Drawings/documents	Description	Purpose
33-A-6979-5	24" OD GLYCOL CONTACTOR  Registered for: 1440 psi @ 130°F M.D.M.T: -20°F	Design Registration:  B.C. File: H7724 C.R.N: M2316.21 <b>REGISTERED</b>

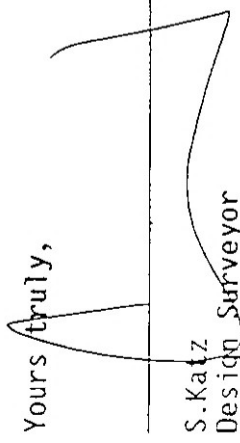
Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 64.00

(This is a revision for the file # H5157.)



K/cb  
\_ncl:  
cc:

Yours truly,

  
S. Katz  
Design Surveyor

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

C.C. B.C. ✓  
A 3098578 S  
95-10-26 MB

1. Manufactured and certified by WELLS HALL FABRIKATION & CONSTRUCTION LTD., 6115 30ST EDMONTON, AB. T6P 1J8  
(Name and address of manufacturer)  
Manufactured for CANADIAN NATURAL RESOURCES LTD. SUITE 2000, ESSO PLAZA 425 - 1ST ST S.W. CALGARY, AB. T2P 3L8  
(Name and address of purchaser)

3. Location of installation SITKOT TO BE ESTABLISHED @ A LATER DATE  
(Name and address)  
4. Type FUEL GAS SUBSCRIBER 95-7978-0 M2319.21 37-A-6980-1  
(Ident. No.) (Drawing No.) (Year built) 1995

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 1.  
Year 1992

6. Shell: SA 53 B ERW 0.375" 24" OD  
Special Service per UG-120(d) 5' 3/5 (7'-5 1/2" O/A)  
Nom. Thk. (In.) 0.0625 Corr. Allow. (In.) --- Diam. T.O. (In. & In.) --- Length (overall) (In. & In.) ---  
7. Seams: SMLS R.T. (Spot, Period, or Full) --- Equiv. DBL. BUTT SPOT No. of Courses 1  
Long. (Welded, DBL, Spig., Lap, Butt) --- Circ. (Welded, DBL, Spig., Lap, Butt) ---

8. Heads: (a) Matl. SA 516 70 (b) Matl. --- (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)
(a) TOP	0.345	0.0225			2:1				CONCAVE
(b) BTM	0.345	0.0225			2:1				CONCAVE

9. MAWP (1724 KPa) psi at max. temp. (93°C) 200 of F  
Min. design metal temp. (-22°C) -20 °F at 250 psi. Hydro., pneu., or comb. test pressure (2586 KPa) 375 psi.  
10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Dim. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
'ET/OUTLET	2	2	PIPE/RFLW	SA 106 B / SA 105	2CH 400 SCH 150		WELDED	SHELL/HEAD
W/H/INSP/LUC	2	2	CPLG	SA 105	302D #		"	SHELL
DRAIN	1	1	PIPE	SA 106 B	5/8" 160		"	HEAD
LG	2	3/4	TOL	SA 105	6080 #		"	SHELL
PI	1	1/2	TOL	SA 105	6020 #		"	SHELL

11. Supports: Skirt YES Lugs --- Legs --- Other --- Attached WELDED TO BTM HEAD  
(Yes or no) (No.) (Where and how)

12. Remarks: Manufacturer's Partial Date Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:  
24" OD X 5' 3/5 X 250# X 1/16" CA F.G. S.  
IMPACTS EXEMPT PER UG-70(F)  
X-RAY PER UG-11(a) 5(b) AS BUILT DWG # 37-A-7978-0 WT. = 1080 LBS  
--- VOL. = 18 FT<sup>3</sup>

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 ASME Code for Pressure Vessels, Section VIII, Division 1. "U" Certificate of Authorization No. 19595 Expires JULY 31, 1996.  
Date Oct 26/95 Co. name WELLS HALL FAB. & CONST. LTD. Signed R. WOOD (Representative)

Vessel constructed by WELLS HALL FAB. & CONST. LTD at EDMONTON, AB  
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 BOILER SAFETY ASSOCIATION.  
I have inspected the component described in this Manufacturer's Data Report on NOVEMBER 30, 19 95, 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 makes 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 95-10-26 Signed M. S. Sawadsky Commissioners ALBERTA 438



REG. No. **M2319-2**  
 DWG. No. **37-A-6980-1**

Design Press kPa <b>1724</b>	Design Temp. °C <b>-29/193</b>
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ACCEPTED  
 JAN 18 1994  
 Yr. Mo. Day Signed *M. V. S. Shaikh*  
 M. V. S. SHAIKH, P. ENG.  
 DESIGN SURVEY ENGINEER

GENERAL NOTES

CONSTRUCTION IN ACCORDANCE WITH ASME CODE SEC. VIII DIV 1, 1992 ADD. 1992

DESIGNED BY PROVINCIAL BOILER INSPECTOR.

DESIGN PRESSURE 250 psig, 1724 kPa @ 200' F, 93' C

DESIGN TEMP. 20' F, -29' C @ 250 psig, 1724 kPa.

ALLOWANCE 1/16" in., 1.59 mm.

THICKNESS 375 psig, 2586 kPa, (LTD BY SHELL)

RELIEVE: NIL *as per MRP*

REMARKS: SPOT PER UW-11-~~4~~ (RT-2) *for each like seam.*

REVISIONS ARE TO REF. LINE UNLESS OTHERWISE NOTED.

HOLES ARE TO STRADDLE VESSEL CENTER LINES UNLESS OTHERWISE NOTED.

DO NOT BE THOROUGHLY CLEANED INSIDE AND OUT.

ALL OPENINGS FOR SHIPMENT.

PRIMER: 1 S/C ZINC CHROMATE PRIMER; 2 S/C VALSPAR ENAMEL (WARM GREY)

SHIPPING WT. 1000 lbs., 454 kg.  
 18 CUBIC FEET, 0.509 CUBIC METERS.  
 93-6980-0, 93-6980-1, 93-6980-2  
 LONG SEAM SEE WELD DETAIL VI.

JAN 11 1994

TESTING: EXEMPT PER UG-20 (f)

**GENERAL FABRICATION & CONSTRUCTION LTD.**

CUSTOMER: CANADIAN NATURAL RESOURCES LTD.	
SHOP ORDER: 93-6980	TAG No. CUST. No. F93-889
<b>24" OD X 5'-0" S/S X 250 PSIG DP + 1/16" CA          FUEL GAS SCRUBBER</b>	
RL <i>12-22</i>	DWN. BY: RICK L DATE: 93-12-10 SCALE: AS SHOWN



Province of  
British Columbia

Ministry of  
Municipal Affairs,  
Recreation and Housing  
BOILER AND PRESSURE VESSEL  
SAFETY BRANCH

Safety Engineering  
Services Division  
Suite 300, 750 Pacific Boulevard  
Vancouver  
British Columbia  
V6B 5E7  
Telephone: (604) 660-6250  
Fax: (604) 660-6215

YOUR FILE

OUR FILE H5158  
Account # 12648

TO: WELLS-HALL FABRICATION &  
CONSTRUCTION LTD.  
6115 - 30th ST.,  
EDMONTON,  
ALBERTA  
T6P 1J8

Date: 94.02.16  
Jnl #: 9720

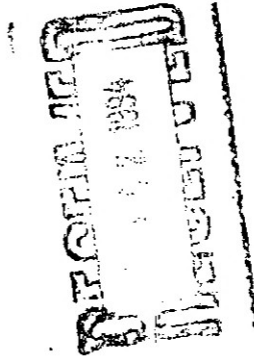
Attn: R. HAGLOCH

DESIGN REGISTRATION

BRITISH COLUMBIA MIN. OF MUNICIPAL AFFAIRS SAFETY ENGINEERING SERVICES DIVISION
REGISTERED
Date FEB 16 1994
B.C. File: H5158
C.R.N. M2319.21
Boiler / Pressure Vessel Branch

Drawings/documents	Description	Purpose
37-A-6980-2	FUEL GAS SCRUBBER  Registered for: 250 psi @ 200 °F	Design Registration:  B.C. File: H5158 C.R.N.: M2319.21

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 47.00



CC/st  
cl:  
CC:

Yours truly,

Susana Katz,  
Design Surveyor