



Project Brintnell - Conversion to a truck unloading station

NPE DOCUMENT FRONT SHEET

NPE Document coversheet must be returned with all documents after review from client.

PO Number	Customer Name	
201-01-35-0003	CANADIAN NATURAL RESOURCES LIMITED	
PO Title	NPE Sales Order Number	
Sales Oil Pumps	SLS 336589	
Equipment Tag Number	Submission Date	Total Pages (inc front sheet)
P-661 A/B/C	11-Apr-12	4
Document Title	Customer Reference	
Mechanical Equipment Data sheets	D01	
Customer Document Number	NPE Document Number	Submittal Number
D01	6	

Rev	Date	Details or Purpose of Revision	Prepared	Check	Auth
0	09-Mar-12	First submittal	BT	BT	DO

NPE Contact Information 5049 74 Avenue SE, Calgary, AB T2C 3H2 ph.(403) 219-0270

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 Project Administrator Andrea Oliver
 Project Manager Darren O'Grady

NOTE: ACTION MAY BE REQUIRED. REFER TO STATUS CODE FOR INSTRUCTIONS.

Status Code

- 1 CERTIFIED FOR CONSTRUCTION. RELEASED FOR MANUFACTURE.
- 2 DRAWING APPROVAL REQUIRED. PARTIAL RELEASE FOR MANUFACTURE, PLEASE RETURN PRINT(S) WITH APPROVAL OR COMMENTS NOTED.
- 3 DRAWING APPROVAL REQUIRED. ALL WORK IS BEING HELD. PLEASE RETURN _____ PRINT(S) WITH APPROVAL OR COMMENTS NOTED.
- 4 THESE PRINTS ARE INCOMPLETE.
- 5 FOR RECORD ONLY.
- 6 FOR INFORMATION ONLY.

**EQUINOX ENGINEERING
DOCUMENT CONTROL**

PO #: 201-01-35-0003
 SEQ #: 0003
 SUB #: 0001
 DATE: APR 13, 2012

- V1 - Correct & Resubmit
Manufacturing may NOT proceed
- V2 - Correct & Resubmit
Manufacturing MAY proceed
- V3 - Review Not Required
Accepted for information purposes only
- V4 - Submit Final Documentation
- V5 - Manufacturing May Proceed
No further submissions are required

SIGNATURE:
 DATE: April 25, 2012

ROTARY PUMP - API 676

DOCUMENT NO. DS-C-600-G-07-00	PAGE 1 OF 3	REV. 0	DATE 01-23-12
PROJECT NO. 201-01-35	RFC/RFP NO.	RQ-C-600-G-08-00	
CLIENT CNRL	LOCATION	12-09-081-22 W4M	
PROJECT Brintnell - Conversion to a Truck Unloading Station	VENDOR		
SERVICE Sweet	TAG P - 661 A/B/C	QTY 3	
MODEL per Vendor	SIZE per Vendor	SERIAL	per Vendor

REV#

1 MANUFACTURER

2 APPLICABLE TO: PROPOSAL PURCHASE AS BUILT

3 SITE: _____ TYPE: Screw pump UNIT: L3HE 125/250 NO. STAGES: 1

4

5 GENERAL (3.1.1)

6 GEAR ITEM NO. _____ PUMP ITEM NO. _____ 3 x 50% NO. TURBINE DRIVEN _____

7 GEAR PROVIDED BY _____ MOTOR ITEM NO. _____ PUMP ITEM NO. _____

8 GEAR MOUNTED BY _____ MOTOR PROVIDED BY Vendor TURBINE ITEM NO. _____

9 GEAR DATA SHEET NO. _____ MOTOR MOUNTED BY Vendor TURBINE PROVIDED BY _____

10 NO. MOTOR DRIVEN _____ MOTOR DATA SHEET NO. _____ TURBINE MOUNTED BY _____

11 _____ TURBINE DATA SHEET NO. _____

12

13 OPERATING CONDITIONS

14 CAPACITY AT: MAX VISCOSITY 103.35 (Note 16) m³/h

15 MIN VISCOSITY _____ m³/h

16 DISCHARGE PRESSURE: MAXIMUM 5385.5 kPaa

17 NORMAL 5125 kPaa

18 SUCTION PRESSURE: MAXIMUM 642.8 kPaa

19 NORMAL 582.3 kPaa

20 DIFFERENTIAL PRESSURE: MAXIMUM 4542.7 kPa

21 MINIMUM _____ kPa

22 NPSH AVAILABLE 59.6 m

23 HYDRAULIC POWER _____ kW

24

25 LIQUID

26 TYPE OR NAME OF LIQUID Sales Oil

27 PUMPING TEMPERATURE: NORMAL 55 °C

28 MAX 60 °C MIN 45 °C

29 SPECIFIC GRAVITY MIN. 0.924 MAX. 0.935 (Note 14)

30 SPECIFIC HEAT _____ kJ/kg °C

31 VISCOSITY MAX 199.5 (Note 14) Cp NORM 131.5 Cp

32 CORROSIVE/ERROSIVE AGENTS Note 15

33 CHLORIDE CONCENTRATION Note 15 PPM

34 H₂S CONCENTRATION 0 PPM

35 LIQUID TOXIC FLAMMABLE OTHER _____

36

37 PERFORMANCE

38 RATED CAPACITY 116.8 m³/h

39 NPSH REQUIRED 5.1 m myc

40 RATED SPEED 1150 rpm

41 DISPLACEMENT _____ m³/h

42 VOLUMETRIC EFFICIENCY 96.3 %

43 MECHANICAL EFFICIENCY 93.7 %

44 kW AT MAXIMUM VISCOSITY 163 kW

45 kW AT RELIEF VALVE SETTING 186.5 kW

46 MAXIMUM ALLOWABLE SPEED 1800 rpm

47 MINIMUM ALLOWABLE SPEED 450 rpm

48

49 SITE AND UTILITY DATA

50 LOCATION INDOOR HEATED UNDER ROOF

51 OUTDOOR UNHEATED PARTIAL SIDES

52 GRADE MEZZANINE

53 ELECTRICAL AREA CLASSIFICATION CL _____ GR _____ DIV _____

54 WINTERIZATION REQ'D TROPICALIZATION REQ'D

55 SITE DATA RANGE OF AMBIENT TEMPS: MIN/MAX _____ / _____ °C

56 UNUSUAL CONDITIONS (2.1.23) DUST FUMES SALT ATMOSPHERE

57

58 CONSTRUCTION

59 CONNECTIONS

	SIZE	ANSI RATING	FACING	POSITION
40 SUCTION	<u>8</u>	<u>300</u>	<u>RF</u>	
41 DISCHARGE	<u>6</u>	<u>600</u>	<u>RF</u>	
42 GLAND FLUSH				
43 DRAINS <u>2ea</u>	<u>3/4"</u>	<u>FNPT</u>		
44 VENTS <u>2ea</u>	<u>1/4"</u>	<u>FNPT</u>		
45 JACKET				

46

47 PUMP TYPE INTERNAL GEAR TWIN-SCREW VANE

48 EXTERNAL GEAR THREE-SCREW PROGRESSING CAVITY

49 GEAR TYPE SPUR HELICAL

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51 REMARKS

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NOTE:

* A, B, C, ... : INDICATES A PRE-ORDER REVISION

0: INDICATES AN ORDER REVISION

1, 2, 3, ... : INDICATES A POST-ORDER REVISION

REV	DATE	BY	CHECKED	PROCESS	ELECT.	INSTR.	APPROVED	CLIENT	DESCRIPTION
0	23-Jan-12	JM	EA	EA	N/A	N/A	JG.		Issued for Purchase
B	12-Dec-11	JM	EA						Issued for Quotation
A	08-Dec-11	JM	EA						Issued for Review

ROTARY PUMP - API 676

DOCUMENT NO. DS-C-600-G-07-00	PAGE 2 OF 3	REV. 0	DATE 01-23-12
PROJECT NO. 201-01-35	RFO/RFP NO.	RQ-C-600-G-08-00	
CLIENT CNRL	LOCATION	12-09-081-22 W4M	
PROJECT Brintnell - Conversion to a Truck Unloading Station	VENDOR		
SERVICE Sweet	TAG P - 661 A/B/C	QTY 3	
MODEL per Vendor	SIZE per Vendor	SERIAL	per Vendor

1 MANUFACTURER	CONSTRUCTION		
2			
3 CASING	MATERIALS		
4 MAX ALLOWABLE PRESSURE <u>5102</u> kPag @ <u>438</u> °C	CASING <u>Carbon Steel</u>		
5 HYDROSTATIC TEST PRESSURE <u>2584</u> kPag	STATOR <u>Linear Steel with total Bronze</u>		
6 STEAM JACKET PRESSURE kPag @ °C	END PLATES		
7 ROTOR MOUNT <input type="checkbox"/> BETWEEN BEARINGS <input type="checkbox"/> OVERHUNG	ROTOR(S) <u>Hardened steel, A302-70</u>		
8 TIMING GEARS <input type="checkbox"/> YES <input type="checkbox"/> NO	VANES		
9 BEARING TYPE <input type="checkbox"/> RADIAL <input type="checkbox"/> THRUST	SHAFT		
10 LUBRICATION TYPE <input type="checkbox"/> CONSTANT LEVEL OILERS	SLEEVE(S)		
11 <input type="checkbox"/> PUMPED FLUID <input type="checkbox"/> RING OIL <input type="checkbox"/> OIL MIST	GLAND(S)		
12 <input type="checkbox"/> EXTERNAL <input type="checkbox"/> OIL FLOOD <input type="checkbox"/> GREASE	BEARING HOUSING		
13 LUBRICANT TYPE	TIMING GEARS		
14 MECHANICAL SEALS	SPECIAL MATERIAL TESTS (2.9.1.3)		
15 MANUFACTURER AND MODEL <u>John Crane</u>	LOW AMBIENT TEMP. MATERIALS TESTS (2.9.6)		
16 MANUFACTURER CODE <u>80 - See vs Sic, v110n</u>	REMARKS		
17 API 610 SEAL FLUSH PLAN <u>none - The pump has an</u>			
18 API 610 SEAL CODE <u>INTERNAL Flush</u>			
19 PACKING <input type="checkbox"/> LANTERN RING			
20 MANUFACTURER & TYPE	QA INSPECTION AND TEST		
21 NO. OF RINGS	<input type="checkbox"/> COMPLIANCE WITH INSPECTORS CHECK LIST <input type="checkbox"/> CERTIFICATION OF MATERIALS <input type="checkbox"/> FINAL ASSEMBLY CLEARANCES <input type="checkbox"/> SURFACE AND SUBSURFACE EXAMINATIONS <input type="checkbox"/> RADIOGRAPHY <input type="checkbox"/> ULTRASONIC <input type="checkbox"/> MAGNETIC PARTICLE <input type="checkbox"/> LIQUID PENETRANT <input type="checkbox"/> CLEANLINESS PRIOR TO FINAL ASSEMBLY <input type="checkbox"/> HARDNESS OF PARTS, WELDS AND HEAT AFFECTED ZONES <input type="checkbox"/> FURNISH PROCEDURES FOR OPTIONAL TESTS		
22 DRIVE MECHANISM	TESTS		
23 <input checked="" type="checkbox"/> DIRECT-COUPLED <input type="checkbox"/> V-BELT <input type="checkbox"/> GEAR	REQ'D WIT OBS HYDROSTATIC <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> MECHANICAL RUN <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> PERFORMANCE <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> NPSH <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
24 COUPLING MANUFACTURER	BASEPLATES		
25	<input checked="" type="checkbox"/> BY PUMP MANUFACTURER <input type="checkbox"/> SUITABLE FOR EPOXY GROUT <input type="checkbox"/> EXTENDED FOR <input type="checkbox"/> SUBSOLE PLATES BY PUMP MANUFACTURER <input checked="" type="checkbox"/> DRAIN-RUN <input type="checkbox"/> DRAIN-PAN		
26	REMARKS		
27 DRIVERS			
28 MOTOR (Please see Motor Data Sheet)			
29 MANUFACTURER <u>Weg</u>			
30 TYPE			
31 FRAME NO. <u>499T</u>			
32 CONSTANT SPEED <u>1150</u>			
33 VARIABLE SPEED Motor Suitable for VFD <u>311</u>			
34 KW <u>186.5</u> RPM <u>1150</u>			
35 VOLTS <u>460</u> PHASE <u>3</u>			
36 HERTZ <u>60</u> SERVICE FACTOR <u>1.15</u>			
37 ENCLOSURE TEFC			
38 STEAM TURBINE			
39 OTHER (SEE SEPARATE DATA SHEETS)			
40 OTHER PURCHASER REQUIREMENTS			
41 NAMEPLATE UNITS			
42 <input type="checkbox"/> CUSTOMARY UNITS <input checked="" type="checkbox"/> METRIC UNITS			
43 <input type="checkbox"/> RELIEF VALVES BY PUMP MFR. <input type="checkbox"/> INTERNAL <input type="checkbox"/> EXTERNAL			
44 PIPING FOR SEAL FLUSH FURNISHED BY			
45 <input checked="" type="checkbox"/> PUMP VENDOR <input type="checkbox"/> OTHER			
46 PIPING FOR COOLING/HEATING FURNISHED BY			
47 <input checked="" type="checkbox"/> PUMP VENDOR <input type="checkbox"/> OTHER			
48 <input checked="" type="checkbox"/> PROVIDE TECHNICAL DATA MANUAL			
49			
50 PREPARATION FOR SHIPMENT			
51 <input type="checkbox"/> DOMESTIC <input type="checkbox"/> EXPORT <input type="checkbox"/> EXPORT BOXING REQ'D			
52 <input type="checkbox"/> OUTDOOR STORAGE FOR MORE THAN 6 MONTHS			
53			
54 WEIGHTS			
55 PUMP <u>850</u> kg GEAR kg			
56 BASE <u>900</u> kg DRIVER <u>1275</u> kg			
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DOCUMENT NO.	DS-C-600-G-07-00	PAGE	3 OF 3	REV.	0	DATE	01-23-12
PROJECT NO.	201-01-35	RFQ/RFP NO.	RQ-C-600-G-08-00 \triangle				
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PROJECT	Brintnell - Conversion to a Truck Unloading Station \triangle		VENDOR				
SERVICE	Sweet	TAG	P - 661 A/B/C		QTY 3		
MODEL	per Vendor	SIZE	per Vendor	SERIAL	per Vendor		

REV*

1	MANUFACTURER				
2					

NOTES

- 1) Non-Grout base plate required
- ~~2) NDE to be performed as per requirements specified in API 076~~
- ~~3) Pumps over 150hp shall be supplied with a vibration switch~~
- 4) All pumps mechanical seals shall be from a single manufacturer who shall coordinate seal sizes and type with pump manufacturers to minimize number of variations.
- 5) The casting's country of origin and foundry location shall be provided for approval from Buyer.
- 6) Non-sparking type coupling guards shall be provided for pumps installed in classified areas.
- 7) Pumps will be installed by others in building.
- 8) The NPSHR shall be 1 meter less than NPSHA
- 9) (Note Deleted)
- 10) (Note Deleted)
- 11) (Note Deleted)
- 12) Vendor to indicate minimum applicable speed for the pump
- 13) 2 pumps operating and one standby - 3 x 50%
- 14) Properties at 45 °C (Failure Case of Sales Oil Storage Tanks TK-802/803 Heater)
- 15) Sales oil contains 0.5 vol% BS&W, Salinity = 0.22%, Sediments = Traces
- 16) Flow Rate of a single pump
- 17) Refer to electrical motor datasheet (2010135-DS-E-00-013-01) for all electrical requirements
- 18) Vendor to complete pump datasheet (DS-C-600-G-07-00) \triangle