

 MEG ENERGY	CHRISTINA LAKE REGIONAL PROJECT Phase 3A EPC for Central Plant Facilities	 SNC-LAVALIN
	SLI Project No. 511036	



 SNC-LAVALIN	<input type="checkbox"/> A1 Not suitable to initiate fabrication. modify as noted, resubmit for review
	<input type="checkbox"/> B1 Suitable to initiate fabrication as noted. modify as noted, resubmit for review
Vendor's drawing review for conformity with specifications and design drawing.	<input checked="" type="checkbox"/> C1 Suitable to fabricate to completion as noted. submit final documents including as-builts as required
This review does not relieve the vendor of his responsibility for errors in design and detailing as detailed in his contract.	<input type="checkbox"/> D1 Suitable to fabricate to completion. submit final documents including as-built documents as required
	<input type="checkbox"/> E1 Not suitable as final documents as noted. modify as noted and resubmit.
	<input type="checkbox"/> F1 Suitable as final documents. no further resubmittal required (unless revised by vendor)
Vendor: Ecodyne Limited (Canada) - 12123 No.: 32125-A-2053 Rev: C Date Rec'd 2013-03-13	
Doc. Title: D00.01 - AFTER FILTER DATA SHEET - Tag: 3A-F-208 A-G	
Client Code:	Project: MEG Phase 3A EPC
Reviewed by: <i>Lee</i>	Document No
Date: <i>APR 03, 2013</i>	P-5675-02-0020
	Submittal 03






Tags: 3A-F-208 A
3A-F-208 B
3A-F-208 C
3A-F-208 D
3A-F-208 E
3A-F-208 F
3A-F-208 G

- please keep only the current Revision on the data sheet
- page 1 & 2 are Rev 1 while pag 3 & 4 are Rev 2 please update the Rev # for all pages.
- Cover page revision number A, B, C do not match the Rev # on data sheet. please keep consistence.

			TITLE Data Sheet After Filter Vessel			CUSTOMER MEG ENERGY CORP. CHRISTINA LAKE FACILITY PHASE 3A ENGINEERS: SNC - LAVALIN PO. No. P-5675-02		
			SCALE: N/A			ECODYNE Limited <small>A Marmon Water/Berkshire Hathaway Company</small> <small>THIS DRAWING IS THE PROPERTY OF ECODYNE LIMITED. IT IS NOT TO BE USED FOR ANY PURPOSES DETRIMENTAL TO THE INTEREST OF THIS COMPANY AND IS SUBJECT TO RETURN UPON REQUEST.</small>		
C	2013 Mar 12	PAGE 3 PER SNC MARKU PAGE 4 - MEDIA	Shu	AV		BY	DATE	DRAWING NO. 32125-A-2053
B	2013 FEB 07	FIRSTREVISION	IA	AV	DRAWN	IA	2012 Nov 22	
A	2012 NOV 22	FIRST ISSUE	IA	AV	CHECKED	AV	2012 Nov 22	
REV	DATE	REMARKS	BY	CHKD	APPROVED	TB	2013 Feb 7	
								REV C

PRESSURE VESSEL DATA SHEET						Data Sheet No.: DS-CL03A-Y-200-F208	
Equipment Name After Filter Vessel						Requisition No.: 508298-200-45-MR-5675-0002	
DESIGN DATA						PAINTING & INSULATION	
Service HLS effluent water filtration						External Surface Preparation Per spec 085354-3010-PC-50 (D2)	
Operating Temperature 80.0 / 105 °C		Pressure 755.0 kPag		Internal Surface Preparation N/A		Structural Surface Preparation Per spec 085354-3010-PC-50 (S3) (Note 10)	
Design Temp. Min.: 5.0 °C		Max.: 120.0 °C		Vessel External Prime per spec 085354-3010-PC-50 (D2)		Vessel Internal Prime N/A	
Design Pressure @ Minimum Temperature: 1034 / FV kPag		@ Maximum Temperature: 1034 / FV kPag		Structural Prime Per spec 085354-3010-PC-50 (S3) (Note 10)		Vessel External Finish N/A	
Sour Service N/A		Lethal Service N/A		Vessel Internal Finish N/A		Structural Finish Per spec 085354-3010-PC-50 (S3) (Note 10)	
New Vessel MAWP Limited by 1 Top Head @ 1037.0 kPag		Corrosion Allowance - Shell / Heads 3.2 / 3.2 mm		External Insulation - Shell Per spec 085354-3010-IN-00 (Note 8)		External Insulation - Heads Per spec 085354-3010-IN-00 (Note 8)	
Wall Thickness - Shell / Heads 19.1 / 18.22/19.05 mm		Joint Efficiency - Shell / Heads 1.0 / 1.0		Internal Insulation N/A		External Cladding Per spec 085354-3010-IN-00	
Registration Alberta		Design Code ASME Sec VIII Div 1		Insulation - Bottom Head Per spec 085354-3010-IN-00		Insulation - Skirt N/A	
Code Stamp Yes, U Stamp		Orientation Vertical		Fireproofing - Skirt N/A		Fireproofing - Saddles N/A	
Post Weld Heat Treatment per Code		Head Type 2:1 Semi-elliptical					
Allowable Stress @ Design Temperature Per Code kPa		Ambient Temperature 10 / 39 °C		Max Wind Speed Indoor m/s		Minimum Metal Design Temperature -29 °C	
Fluid HLS Effluent Water		Fluid Density 955 kg/m³					
MATERIALS						QUALITY CONTROL / INSPECTION / TESTING	
Shell SA516 - 70N		Repads SA516 - 70N		Hydrotest Pressure Per Code kPag		Hydrotest Medium Water	
Heads SA516 - 70N		Fittings SA105N/SA234 WPB		Hydrotest Duration 1 hr. minimum hrs		Radiographic Inspection RT2	
Trays N/A		Supports 1 SA516 - 70N(R-Pads)		Ultrasonic Inspection per spec 085354-3010-EW-20		Magnetic Particle Inspection per spec 085354-3010-EW-20	
Bolts/Nuts SA193 B7/A194 2H		Flanges SA105 N		Dye Penetrant Inspection per spec 085354-3010-EW-20		Material Mill Test Reports 100% Traceability	
Nozzle-Necks A106 - B		Gaskets SPW SS 316		Post Weld Heat Treatment Records Per MR Section III		Hydrotest Reports Per MR Section III	
Internal Lining N/A		Pipe SA106 - B		Radiographic Inspection Reports Per MR Section III		Ultrasonic Inspection Reports Per MR Section III	
Internals SS 316L (Note 7)		Mist Eliminator N/A		Magnetic Particle Inspection Reports Per MR Section III		Dye Penetrant Inspection Reports Per MR Section III	
Structural Attachments - External 1 SA516 - 70N (Poison pads only)		Structural Attachments - Internal 1 SA516 - 70N (Poison pads only)		Fabricator Quality Control Manual Per MR Section III		Shop Inspection by Owner Yes	
Material Impact Test Required Per Code		Certified Elevated Temp Tests Req'd No		Welding Procedure Review/Approval Per MR Section III			
DIMENSIONAL/SHIPPING DATA						NOTES	
Vessel Size 3962 mm OD x 2540 mm T/T		Boot/Gas Dome 46.74 m³		Capacity 0.95 m		* To be specified / confirmed by Seller.	
Centerline/Bottom Seam Elevation 26100 kg		Weight - Empty 83100 kg		Weight - Hydrotest 71630 kg		1. All nozzles shall be flush with vessel inside surface.	
Weight - Operat'g 83100 kg		Weight - Shipping 26100 kg		O/A Shipping Dimensions (LxWxH) 6.5 x 4.5 x 4.5 m		2. Seller shall design and install all the internals.	
Nozzle Covers/Connection Plugs Yes		Shipping Cradles As required by shipping		Ocean Transport Protection NA		3. National Board registration req'd for vessels fabricated outside Canada.	
ACCESSORIES BY FABRICATOR						4. ABSA registration is required to obtain CRN for all vessels.	
Manway Davits Y		Ladders N		Ladder and Platform Clips N		5. Structural attachments are defined as any non-pressure part welded directly to the shell or head of the filter vessel.	
Pipe Support and Guide Clips Y		Lifting Lugs Y		Insulation Supports Y		6. Ambient temperatures are for filter package indoor building location.	
Insulation Supports Y		Pipe Coil N		Insulation Supports Bottom Head Y		7. Removable internals shall be fabricated from SS 316L.	
Fireproofing Supports Y		Nameplate Y		Legs Y		8. 38 mm (hot) mineral fiber c/w 0.8 mm corrugated aluminum cladding shall be provided and installed by Seller.	
Tray/Packing Supports N		Vortex Breaker N		Manway Internal Grab Rungs N		9. Seller shall provide a minimum of two (2) grounding lugs	
Siphon Drains on Nozzles N		Grounding Lugs Y				10. Uninsulated surfaces including vessel legs, davits, lugs and clips	
REVISIONS						 	
NO.	DATE	BY	CHK	APP	DESCRIPTION	PROJECT Christina Lake Regional Project Phase 3A	
A	8/May/12	DO	RW	SP	Issued for Squad Check	JOB NO.	508298
B	25/May/12	SM	RA	SP	Issued for Quote	TAG NO.	3A-F-208 A-G
0	14/Sep/12	CS	RA	SP	Issued for Purchase	LOCATION	Conklin, Alberta
1	22/Nov/12	IA	AV		Rev'd by Ecodyne	PAGE	1 of 4

PRESSURE VESSEL DATA SHEET						Data Sheet No.:		DS-CL03A-Y-200-F208	
Equipment Name			After Filter Vessel			Requisition No.:		508298-200-45-MR-5675-0002	
PROCESS CONDITIONS									
			Minimum	Normal	Maximum	Comments			
Flow Conditions									
No. After Filter vessels			6	7	7	Operating in parallel			
Design inlet flow rate per filter, Am ³ /h			35	142	166	Max. flow occurs with 1 filter in backwash			
Actual flow rate - package, Am ³ /h			0	995	995	0			
Inlet Conditions									
Fluid			HLS Effluent Water						
Type of Solids			Lime/Magox Solids						
Pressure, kPag				755	1034	0			
Temperature, °C			5	105	120				
Solids loading @ Inlet, NTU					< 50	NTU (Nephelometric Turbidity Unit)			
Corrosive contaminants, mg/L				< 2700		Chloride			
Water S.G. @ normal operating temp.				0.955					
Viscosity @ normal operating temp., cP				0.267					
Pressure Drop									
Across filter - clean @ max. flow, kPa			15.0	21	25	0			
Across filter - dirty @ max. flow, kPa			1	45	50	1			
Max allowable across Filter, kPa					70	2	by Others (Note 21)		
Outlet Conditions									
Pressure, kPag				730	0	Vessel only			
Solids loading @ outlet, NTU					< 2	NTU (Nephelometric Turbidity Unit)			
TSS @ outlet, mg/L					< 5	TSS (Total Suspended Solids)			
Backwash Cycle									
Frequency			Once / Day / Filter						
Fluid			Heated Clear Water @ 80°C						
* Indicates information to be provided/ confirmed by Seller.									
11) During normal operations, the flow shall be distributed to all 7 filters. While one is in backwash mode, rest 6 filters will process the total flow. 12) Reference the sequence chart for duration and flow rate of backwash. 1 13) Turndown depends on system design (by others). Unit turndown expected is 3 to 1 1 14) Seller shall supply first fill of media per details on page 4. 15) Relief valve shall be sized by Seller (Fire case to be included in sizing review). API & ASME to be reviewed and greater size to be selected. 0 16) All sight glasses shall be single glass and shall be supplied by Seller. 1 17) Seller shall confirm sizes and quantity of all connections. 18) Seller to confirm / optimise filter media data. 19) All open/close valves to be slow opening/closing (28 sec). To be supplied by others. 0 20) Control valves : One FCV per vessel to control equal flow to each vessel. To be supplied by others. 0 21) Maximum pressure drop across filter; one unit in backwash, remaining vessels at package design flow. 22) Vessels located indoors 2									
REVISIONS						 MEG Energy Corp.  SNC-LAVALIN			
NO.	DATE	BY	CHK	APP	DESCRIPTION				
A	8/May/12	DO	RW	SP	Issued for Squad Check	PROJECT Christina Lake Regional Project			
B	25/May/12	SM	RA	SP	Issued for Quote	Phase 3A			
0	14/Sep/12	CS	RA	SP	Issued for Purchase	JOB NO.	508298	TAG NO.	3A-F-208 A-G
1	7/Feb/13	IA	SC	AV	Rev'd by Ecodyne				
2	12/Mar/13	IA	SC	AV	Rev'd by Ecodyne	LOCATION	Conklin, Alberta	PAGE	3 of 4

PRESSURE VESSEL DATA SHEET					Data Sheet No.:		DS-CL03A-Y-200-F208	
Equipment Name			After Filter Vessel		Requisition No.:		508298-200-45-MR-5675-0002	
After Filter Details								
After Filter Media Specification(Note 18):								
1. Filter media support base:			65 cm (total depth)					
Material:			graduated anthracite coal					
Density:			0.8 g/cm ³ 					
Layer #	Sieve size	Depth (cm)	Volume / filter (m ³)	Package Volume (m ³)				
1.	1" x 3/4"	15	1.85	13				
2.	3/4" x 1/2"	10	1.25	8.75				
3.	1/2" x 1/4"	10	1.25	8.75				
4.	1/4" x 1/8"	15	1.85	13				
5.	1/8" x 1/16"	15	1.85	13				
Support base shall be installed over Johnson screen strainers with 2.5 mm slots.								
2. Filter media:			100 cm (depth)					
Material:			anthracite coal					
Density:			1.4 g/cm ³					
Effective Size:			0.6 - 0.8 mm					
Uniformity coefficient:			<= 1.5					
Moh's Hardness			>3					
Acid Solubility			< 2.5% by weight					
Media Volume:			12.5 m ³ per filter (87.5 m ³ total package)					
Notes: 								
1. Normal temperature of backwash water is expected to be 80 degrees C, however during start-up the temperature may be as low as 10 degrees C.								
2. Filter Media support base is: 								
Layer #	Sieve size							
1	1-5/8" x 13/16"							
2	9/16" x 13/16"							
3	5/16" x 9/16"	move to table						
4	3/16" x 5/16"							
5	3/16" x 3/32"							
REVISIONS								
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1	7/Feb/13	SC	AV	AV	Ecodyne note			
2	12/Mar/13	SC	AV	AV	Ecodyne note	LOCATION	Conklin, Alberta	PAGE 4 of 4