PennWest
Exploration

Proposed Sales Oil Pipeline

11-30-001-25W1M to 12-30-001-25W1M

Near Waskada, Manitoba

Manitoba Innovation, Energy and Mines
Petroleum Branch

Pipeline Application

Date: September 1, 2011

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1. Background

Penn West is proposing to construct an 8" pipeline to carry 15,000 bbls/day of oil production from the 11-30-001-25W1M Battery to 12-30-001-25W1M, where it will tie-in to the 6" Waskada to Cromer crude oil pipeline, also operated by Penn West. The proposed pipeline will be approximately 633m in length.

Penn West is submitting this application to the Manitoba Innovation, Energy and Mines – Petroleum Branch to seek approval for the above noted pipeline, as required by Section 149 (2) of the Oil and Gas Act.

2. Applicant Information

Penn West Petroleum Ltd. converted from an income trust into an exploration and production company in January 2011. Penn West is now operating under the trade name Penn West Exploration (TSX: PWT, NYSE: PWE).
Penn West is one of the largest conventional oil and gas producers in Canada. Based in Calgary, Alberta, Penn West operates throughout Western Canada on a land base encompassing over six million acres. Penn West operates a significant portfolio of opportunities with a dominant position in light oil in Canada.

2.1 Technical Qualifications

In the coming years Penn West will be focusing its capital investment on Waskada, a key resource play. Penn West has a processing facility at 11-30-001-25WPM and a 100 km sales pipeline that carries product out of the area.

2.2 Financial Qualifications

Penn West is a publicly traded company on both the TSX and NYSE. Penn West is capable of funding this proposed project.

3. Pipeline Need/Intended Use

The proposed 630 m pipeline is required to carry 15,000 bbls/day of oil production from the Penn West 11-30 Battery to 12-30 where it will tie into the existing Sales Pipeline to the Enbridge Cromer Terminal. The increase in capacity for shipping is required as a result of increased production in the area. The new pipeline will replace an existing 4" (114.3 mm) pipeline.

4. General Project Description

In Waskada Manitoba, Penn West Exploration (PWE) is planning to install a new NPS 8 (219.1 mm) Sales Oil pipeline to connect PWE's Battery at 11-30-001-25 W1M with existing facilities at 600 m away at 12-30-001-25 W1M. The pipeline is required to carry 15,000 bbls/day of oil production from the Penn West 11-30 Battery to tie into the Sales Pipeline to the Enbridge Cromer Terminal. A new LACT Unit (Coriolis Meter) will be installed at the Penn West 11-30 site. Pigging is required and a Sender at 11-30 and receiver at 12-30 will be installed.

Major components for this project include the following:

- NPS 8 (219.1 mm) Sales Pipeline from PW 11-30 to PW 12-30
- Decommission NPS 4 Pipeline from PW 11-30 to PW 12-30 (for future condensate)
- 1 - 10"x8" (273 mm x 219.1 mm) Pig Launcher, 1 - 10"x8" (273 mm x 219.1 mm) Pig Receiver
- Coriolis Meter (4" body, 8" (219.1 mm) flanges)
- Associated valves, pipe, fittings
- Fibre Optic and Copper direct buried wiring from 11-30 to 12-30 and termination
- ESDV at 12-30 (8" (219.1 mm) – 600#) w Nitrogen Set
- Provisions for Future Mixer, Butane Blending and Analyzer connections (Removable Spool)

4.1 Legal Description

The proposed pipeline will originate at the Penn West Waskada Oil Battery at 11-30-001-25W1M and will terminate at the 12-30-001-25W1M facility. The survey plan is included as Appendix A.

4.2 Design Basis

The normal discharge pressure of the sales oil pumps is 900 psig (6205 kPag) and the design flow rate is 15,400 BBL/d (2,448 m3/d) of 36 API 55 °C oil.

Design Basis for 11-30 to 12-30 Sales Oil Pipeline			
	Design	Minimum	Maximum
Flow Rate	2,448 m^3/day		2,448 m^3/day
Sales Pump Discharge Pressure	6205 kPag (900 psig)		7584 kPag (1100 psig)
Inlet Temperature	55 (°C)	20 (°C)	85 (°C)
Outlet Temperature	55 (°C)	20 (°C)	85 (°C)
Composition	36 API Oil		
Ambient Temperature	-40 (°C) to 40°C		

4.3 Proposed Pipeline Construction

The total length of the pipeline will be approximately 0.65 km. Based on survey information there will be one road crossing, one seasonal drainage ditch crossing, and eight pipeline crossings. This information requires field verification prior to construction.

At 11-30, the project will include the installation of a temperature transmitter and a Coriolis mass flow meter which will function as the 'lease automatic custody transfer' (LACT) meter for the sales oil. This flow meter will have 6"-600# ASME flange connections however the flow meter body is 4" to match the design flow rate. These transmitters will be connected to the existing Waskada Train 2 PCS.

The meter will be installed on the piping on the exterior of the sales pump building BU-960. The meter will be heat traced and insulated and will have prover taps with enviroboxes downstream for meter proving.

The sales oil will then flow through a new 600# ASME pig sender and then underground to the NPS 8 (219.1 mm) sales pipeline. The spec break from B31.3 – Boiler Branch piping to CSA Z662, Oil and Gas Pipeline Systems for pipelines will be made at the downstream flange of the isolation valves to the pig sender (See Appendix A) The sales oil pipeline from 11-30-001-25W1M to 12-30-001-25W1M will be constructed of Gr 359 Cat II steel – 8.63" (219.1 mm) with 0.25" (6.4mm) WT - rated for an MOP of 1349 psi (9,300 kPag) and have a minimum cover of 2.5 m on-lease (including the off-lease road crossing) and 1.5 m off-lease. The risers out of the ground will be 10D shop 'S' bends coated with Canusa HBE-95 or SPC SP-8888 epoxy. A transition piece will be installed downstream of the 'S' bend to take the wall thickness from 12.7 mm of the 219.1 mm O.D. Schedule 80 piping to the 6.4 mm W.T. of the 219.1 mm O.D. line pipe.

The section of pipeline on the 11-30 lease and off-lease going south will be trenched. From the road edge going west the pipeline will be drilled past the seasonal drainage maintaining the 2.5 m minimum coverage. The last section of pipeline, following the seasonal drainage, going west will be trenched.

The pipeline will be spaced from the existing sales oil pipeline in the ditch as per the requirements of Z662 at 30 cm minimal. The pipeline will be coated with YJ2K and cathodic protection (CP) will be installed. Bonded cables are to be run to an existing test station. The bond between the CP cable and the pipe will be achieved by exothermic welds, or by LB flange tab assemblies.

The pipeline will be hydro tested at 1.25 x MOP – 1686 psig (11,625 Kpag). The pressure test shall be in accordance with CSA Z662 clauses 8.6 – 8.10. Water shall be allowed to stabilize, and two pigs shall be used to displace air. Pressure test duration shall be a minimum 8 hours. Test will be a 4 hour strength test, followed by a minimum 4

hour leak test. No continuous pressure loss is allowable during the leak test. Any loss in pressure must be eventually recovered and there must be a direct correlation between the temperature increasing and the increase in pressure.

Following the construction and startup of the new sales oil pipeline, the existing 4" sales oil pipeline from the 11-30-001-25W1M oil processing facility to the tanks at 12-30-001-25W1M will be properly decommissioned for future use as a condensate pipeline. The line will be pigged of residual fluid and then an inhibitor batch will be run. Following this the line will be purged with N_2, and capped. CP must be maintained.

At the time of construction of the pipeline, electric and fibre optic cables are to be laid in the ditch. The cables will be properly protected with conduit and ditch padding and will be kept a minimum of 30 cm away from the pipeline to avoid interference with cathodic protection and alternatively to protect the cables from the heat of the pipeline.

At 12-30-001-25W1M the pipeline comes above grade and the spec break again will change from CSA Z662 for pipelines to B31.3 boiler branch piping at the upstream flanges of the isolation valves of the pig receiver. At this point the piping will then be tied into the existing NPS 6 sales line flowing the oil to Enbridge's Cromer terminal.

The tie-in point will be into the existing NPS 6 pipeline, downstream of the 12-30 Oil transfer pumps, P900/901 which pump into this line. An emergency shut down valve (ESDV) will be installed on the existing piping at this point in order to protect the pipeline from 12-30 to Enbridge (MOP 1100 psig) from overpressure from the sales pumps. Because the ESDV is installed downstream of the 12-30 transfer pumps, it will also protect the pipeline from any possible overpressure from those pumps. The existing NPS 6 Pig Launcher at 12-30 on the pipeline to Cromer will be modified such that the piping that ties into the launcher is NPS 6 not the existing NPS 4 in order to accommodate the new volumes. A removable spool piece will also be included to accommodate another concurrent project for blending.

The piping at the terminal end of this sales oil pipeline will include a tee with a blind flange for clean out in the event of wax buildup and will also incorporate a trough design for incoming wax.

4.4 Corrosion Control

The pipeline will be externally coated with YJ2K (85 deg C) and all girth welds will be coated using GTS 80 shrink sleeves. In addition a cathodic protection system will be installed.

For internal corrosion, smart pigs will be used annually to analyze pipeline integrity. Furthermore, a chemical program will be implemented to prevent corrosion. Penn West currently uses Coregard88 inhibitor."

4.5 Pipeline Safety System

The normal discharge pressure of the sales oil pumps is 900 psig (6205 kPag) and the design flow rate is 15,400 BBL/d (2,448 m3/d) of 36 API 55 °C oil. The maximum discharge pressure of the sales pumps is approximately 1200 psig (8270 kPag) in a dead head situation, i.e.: blocked flow. The newly constructed pipeline from 11-30 to 12-30 will be rated for 1349 psi (9,300 kPag), however, the 12-30 to Enbridge pipeline has an MOP of 1100 psig (7584 kPag) – and therefore requires protection from over pressure and this is accomplished by:

a) High discharge pressure speed control override control (pump speed will be reduced as the discharge pressure exceeds the high setpoint). This new control strategy will be implemented in the existing Waskada Train 2 Process Control System (PCS).
b) A single PAHH located on the discharge of each Sales Oil Pump before the manual isolation valve. Current alarm setting 7500 kPag (1087 psig).
c) The pumps are also equipped with a low flow shutdown. Based on the low flow set-point of 42 m^3/hr the pump discharge pressure under a low flow shutdown would be approximately 7722 kPag (1120 psig)
d) A new Emergency Shutdown Valve (ESDV) will be installed in the oil line to the Cromer terminal. This valve will be connected to the Waskada Train 2 PCS.
e) A new pressure transmitter installed upstream of the new ESDV in the oil line to the Cromer terminal, and connected to the Waskada Train 2 PCS, will close the ESDV when a PAHH is active at TBD kPag (TBD psig) and shutdown the Sales Oil Pumps at 11-30.

4.6 Specifications of Vessels

N/A – we do not have any process vessels associated with the pipeline project.

4.7 Air Dispersion Modeling

N/A – We will not be venting any gases from our pipeline.

5. Consultations with Landowners and Occupants

As per the requirements in the Oil and Gas Act, Drilling and Production Regulations, it is required that all parties who are or may be affected by any new energy developments are made aware of any new development and be given the opportunity to voice any concerns they may have. Notification of all landowners and occupants within the following distances is required:

- 1.5 km radius of the end points of the pipeline, and
- 0.5 km radius along the length of the proposed pipeline

Penn West has completed the notifications and the following information has been provided to the Petroleum Branch under separate cover due to privacy concerns:

- Names and addresses of all landowners, occupants and residents within the specified radiuses.
- A summary of consultations with each landowner, occupant or resident; including any concerns raised during the consultation process
- A summary of any actions taken or proposed to be taken by the applicant to address any concerns

6. Environmental

6.1 Environmental Protection Plan

Penn West has received confirmation that an Environmental Protection Plan will not be required for this pipeline project. The proposed pipeline is less than 10 km in length and will be located in an existing right-of-way, not in an area sensitive to environmental disturbance.

6.2 Emergency Response Plan

Penn West maintains a corporate level Emergency Response Plan (ERP) which is activated to deal with any emergencies that may arise.
Penn West's emergency number is **1-877-792-2990**. This number is attended 24 hrs. a day, 7 days per week.

7. Other Approvals

7.1 Municipalities

The proposed pipeline is not located within 1.5 km of any urban municipality, however Penn West intends to notify the RM of Brenda and the RM of Arthur of the project

7.2 Department of Municipal Affairs, Culture and Housing (Heritage Branch)

Penn West Land Department is still awaiting this information from our land broker. It will be forwarded to your office upon receipt.

7.3 Manitoba Infrastructure and Transportation

The proposed pipeline routing does not cross under a provincial road or highway therefore no approvals are required

7.4 Railway Crossings

The proposed pipeline routing does not cross under a railway therefore no approvals are required

7.5 Department of Fisheries and Oceans (Canada)

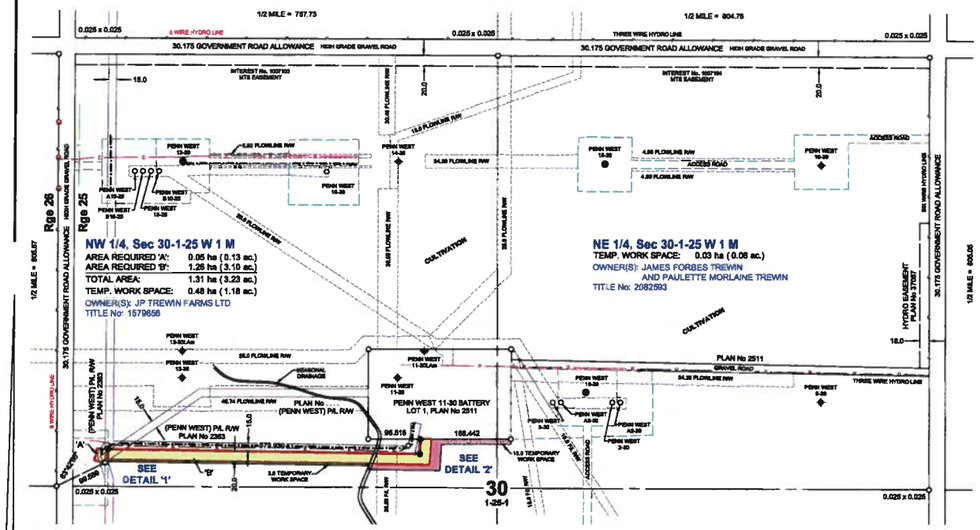
The proposed pipeline routing does not impact a waterway; therefore no approvals are required from the Department of Fisheries and Oceans (DFO).

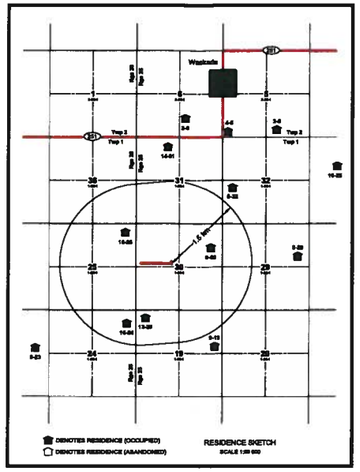
7.6 Utility or Right of Way Crossings

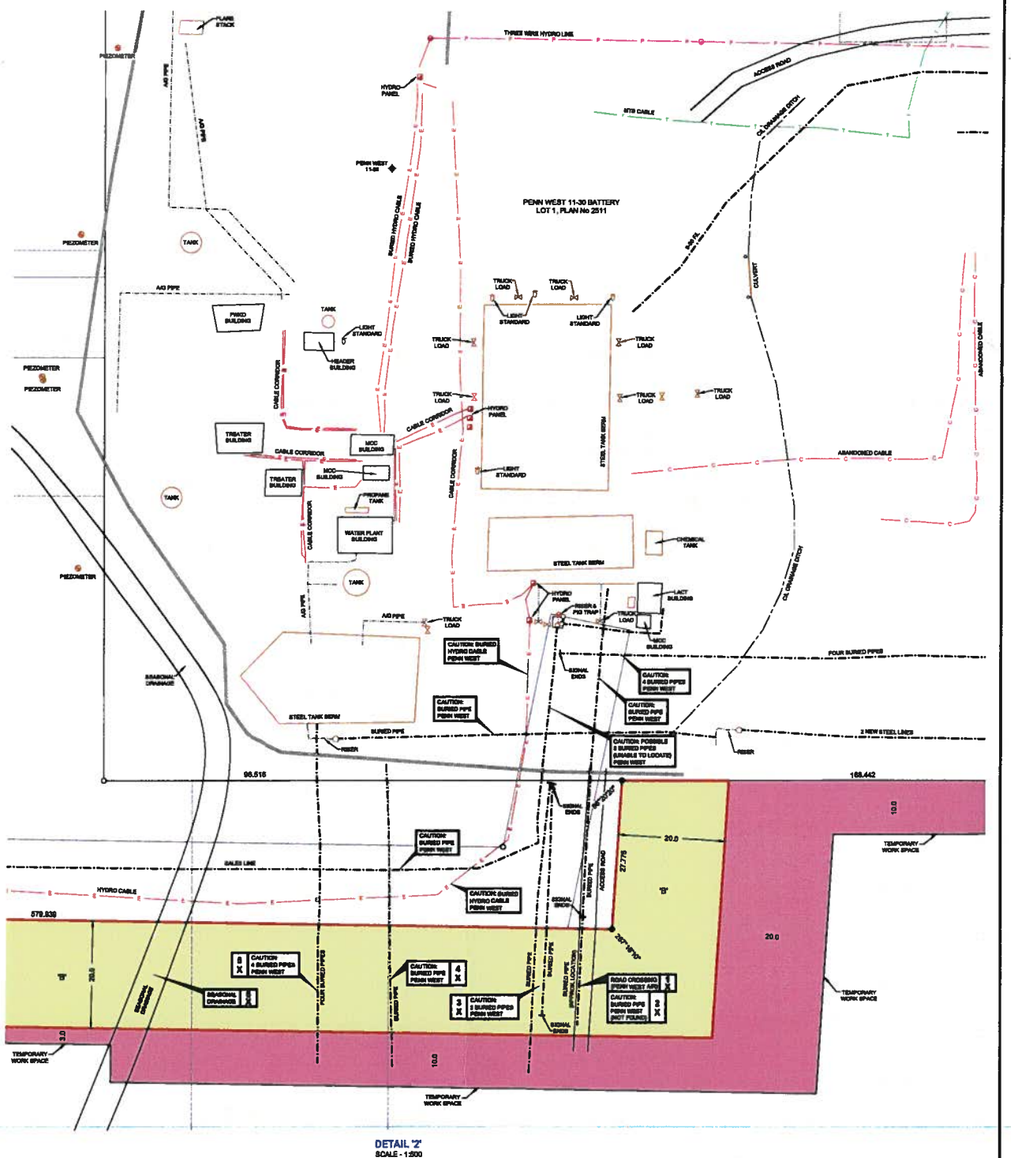
The proposed pipeline does not cross any registered utilities or 3rd party right-of-ways.

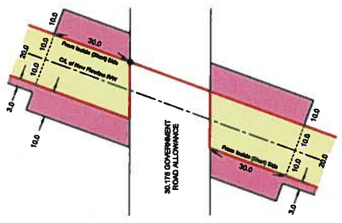
Appendix A

Pipeline Right of Way Survey Plan

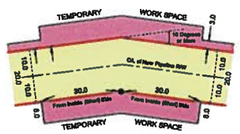




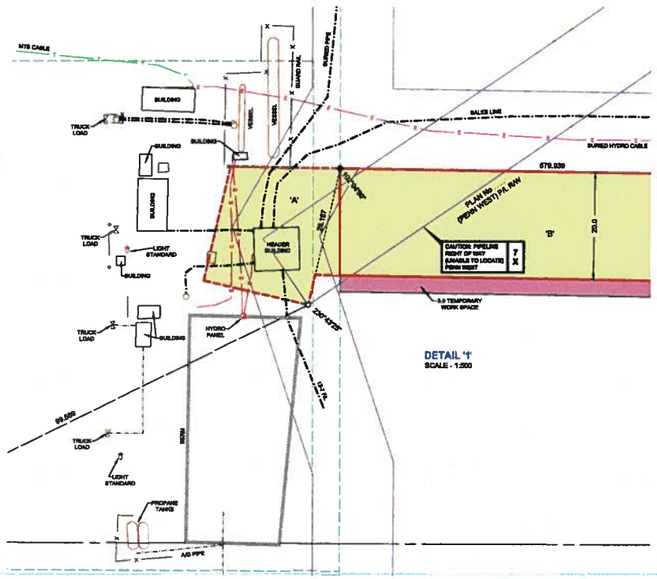




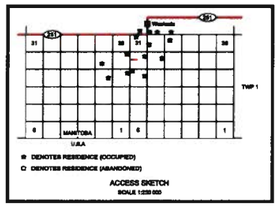
TYPICAL WORK SPACE FOR ROAD CROSSING
SCALE - 1:1000



TYPICAL WORK SPACE FOR A DEFLECTION
SCALE - 1:1000



DETAIL '1'
SCALE - 1:500



CROSSING / REFERENCE DRAWINGS

No.	DESCRIPTION	LOCATION	DRAWING No:
1X	PENN WEST ACCESS ROAD	NW 1/4, Sec 30	NOT ISSUED
2X	BURIED PENN WEST PIPE (NOT FOUND)	NW 1/4, Sec 30	NOT ISSUED
3X	2 BURIED PENN WEST PIPES	NW 1/4, Sec 30	NOT ISSUED
4X	BURIED PENN WEST PIPE	NW 1/4, Sec 30	NOT ISSUED
5X	4 BURIED PENN WEST PIPES	NW 1/4, Sec 30	NOT ISSUED
6X	SEASONAL DRAINAGE	NW 1/4, Sec 30	NOT ISSUED
7X	PENN WEST PIPELINE R/W (NO PIPE FOUND)	NW 1/4, Sec 30	NOT ISSUED

LEGEND:

SURVEY MONUMENTS FOUND SHOWN THUS: O
SURVEY MONUMENTS PLANTED SHOWN THUS: ●
0.025 x 0.025 IRON POSTS PLANTED SHOWN THUS: ■

BURIED PIPE SHOWN THUS:
BURIED CABLE SHOWN THUS:
BURIED ELECTRICAL CABLE SHOWN THUS: E
BURIED MTS CABLE SHOWN THUS: T
HYDRO POLE SHOWN THUS:
HYDROLINE SHOWN THUS:
UTILITY GAS LINE SHOWN THUS:
FENCE LINE SHOWN THUS:
TREE / BUSH LINE SHOWN THUS:
PORTIONS REFERED TO SHOWN THUS:
TEMPORARY WORK SPACE SHOWN THUS:

WELL LEGEND:

- LOCATION
- GAS WELL
- OIL WELL
- INJECTION WELL
- GAS INJECTION WELL
- SERVICE WELL
- SUSPENDED WELL
- ABANDONED WELL
- ABANDONED GAS WELL
- SUSPENDED GAS WELL
- ABANDONED OIL WELL
- SUSPENDED OIL WELL
- WATER WELL

PIPE SPECIFICATIONS:

Outside Diameter (mm):	219.1
Wall Thickness (mm):	6.4
Specification / Grade:	Z245.1 Gr 359 Cat 2
Pipe Material:	Steel
Product Conveyed:	-
Max. Operating Pressure (kPa):	7590
Min. Test Pressure (kPa):	-
Max. Operating Temperature:	-
Min. Operating Temperature:	-
Type of Joint:	Welded
Coating:	-
Method of Installation:	Trenched
Year of Installation:	2011
Cathodic Protection:	-

FACILITIES SOURCE DATA

	Yes	No	N/A
Legal Plans	☒	☐	☐
Land Titles	☒	☐	☐
Manitoba Telephone	☒	☐	☐
Manitoba Hydro	☒	☐	☐
Website Listing	☒	☐	☐
OTHER _____	☐	☐	☐

Distances shown as calc. are not to be included in total line lengths.

There are no urban or rural centres within 1.5 kms of the proposed pipeline right of way.

RIGHT OF WAY INFORMATION

	YES	NO
RIGHT-OF-WAY BOUNDARIES FLAGGED	☐	☒
BURIED FACILITIES LOCATED	☒	☐
BURIED FACILITIES FLAGGED	☐	☒

NOTE: Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and loss limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

Line Locates completed on the 23rd day of February, 2011.

I certify that the survey represented by this plan is correct to the best of my knowledge and was completed on the 14th day of June, 2011.

David Quirk
David J. Quirk
Manitoba Land Surveyor
MIDWEST SURVEYS INC.

SURVEYED BY: RM | CALC'D. BY: DQ | DRAWN BY: JR/JS

TOTAL LENGTH OF RIGHT-OF-WAY ALONG POSTED BOUNDARY = 633.881

REVISION / ISSUED

	DATE:	DESCRIPTION	JOB NO.
0	MARCH 15, 2011	- PLAN ISSUED	SM-0034-11-FIL
1	JUNE 21, 2011	- REVISED PIPELINE ROUTE	SM-0034-11-CON-R1
2	JULY 6, 2011	- REVISED PIPE SPECS (WALL THICKNESS)	SM-0034-11-CON-R2
3			
4			

PENN WEST
Petroleum Ltd.

PROJECT NAME: 11-30 (BATTERY SITE) To 12-30-1-25 W 1 M (TIE IN)

FILE No: 10-0386 | AFE No: A11370680 | SVL PROJECT No: PWP/015

PLAN SHOWING
PIPELINE CONSTRUCTION ALIGNMENT
IN
N 1/2, Sec 30,
Twp 1, Rge 25, W 1 M
R.M. OF BRENDA

SCALE = 1:5000
SHEET No. 1 of 1

MIDWEST SURVEYS INC.
David J. Quirk M.L.S.
ESTEVAN: (306) 634-3536 FAX: (306) 634-3184

REVISION: 2

SM-0034-11-CON-R2

Appendix B

Drawings

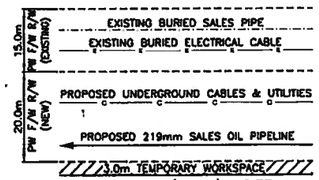
Pipeline Construction Alignment Sheet

Plot Plan

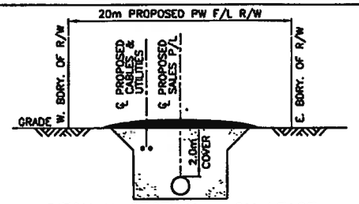
Piping and Instrument Diagram

Process Flow Diagram

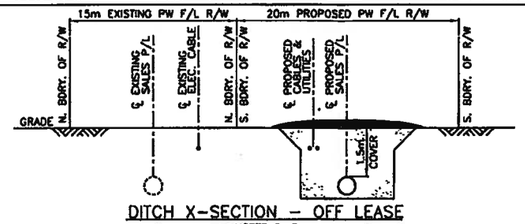
MISCELLANEOUS DETAILS
SCALE - N.T.S



TYPICAL F/L R/W DETAIL
NOTE 3

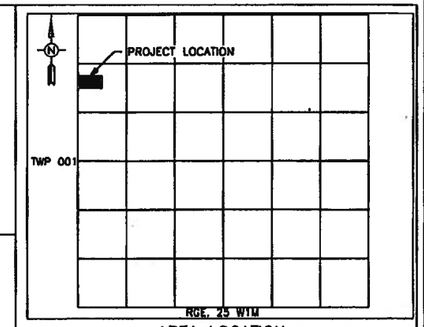


DITCH X-SECTION – ON LEASE
NOTES 2, 3



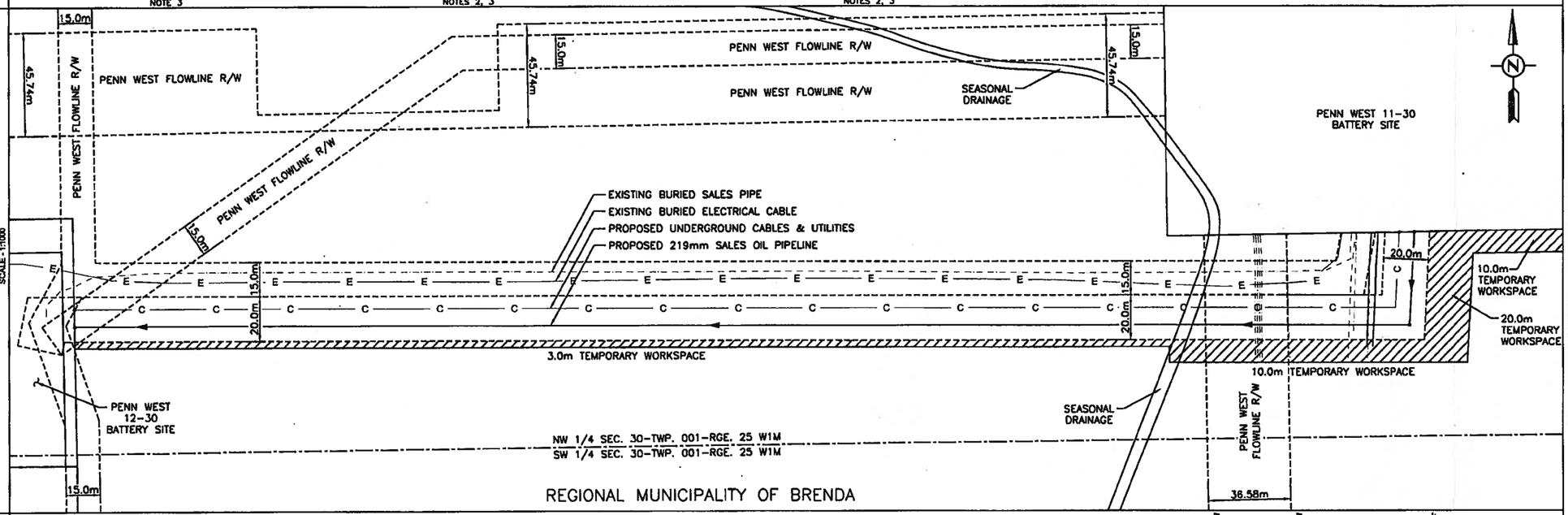
DITCH X-SECTION – OFF LEASE
NOTES 2, 3

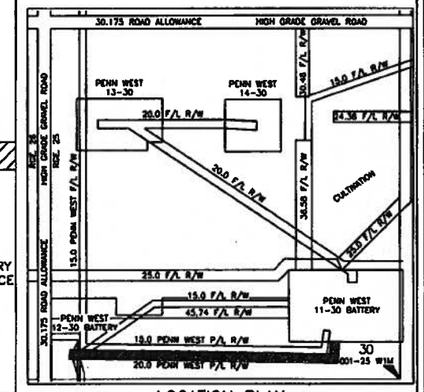
APEGM
Certificate of Authorization
HOCS Projects
No. 5058 Date: 13 JUL 11



AREA LOCATION
N.T.S.

MOSAIC / PLAN VIEW
SCALE - 1:1000



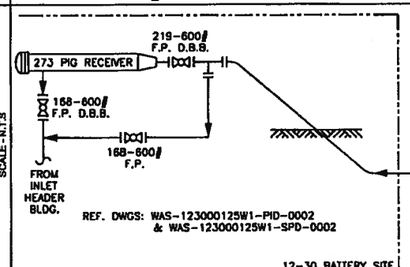


LOCATION PLAN
1:5000

SURVEY DATA

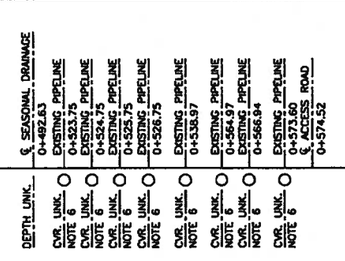
SURVEY DESCRIPTION	EAST BOUNDARY OF 12-30 BATTERY SITE	WEST BOUNDARY OF PENN WEST F/L R/W	EAST BOUNDARY OF PENN WEST F/L R/W	∠88° 20' 20" LT (INDUCTION BEND)	SOUTH BOUNDARY OF 11-30 BATTERY SITE
CHAINAGE	℄ 0+0.000	0+501.57	0+538.15	0+592.29	0+633.65

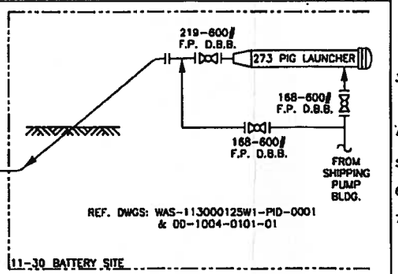
PIPELINE SCHEMATIC
SCALE - N.T.S



REF. DWGS: WAS-123000125W1-PID-0002
& WAS-123000125W1-SPD-0002

12-30 BATTERY SITE





REF. DWGS: WAS-113000125W1-PID-0001
& 00-1004-0101-01

11-30 BATTERY SITE

PIPELINE BASIC DATA

LICENCE No.: 23 PIPE CODE: TBA 219.1mm O.D. x 6.4mm W.T. GR. 359 CAT II STEEL M.O.P.: 9300 kPag H2S: 70 ppm CONTENT: OIL EFFLUENT COATING: YJ2K LENGTH: 640m	TEST PRESSURE: 11,625 kPag TEST METHOD: HYDRO TEST DURATION: 8hrs STABILIZED X-RAY: 100% DESIGN CODE: CSA Z662-07 SERVICE: SOUR

GENERAL NOTES:

1. ALL MEASUREMENTS SHOWN ARE IN METRES UNLESS OTHERWISE NOTED.
2. ALL PIPING TO HAVE A MINIMUM COVER OF: 2.50m – ON-LEASE, AND TOPPED WITH DOW HI-60 ROAD INSULATION AND PLANNING IN TRAFFIC AREAS, INCLUDING SERVICE RIG AREA. 1.50m – OFF-LEASE. THE ON-LEASE COVER OF 2.50m IS TO BE MAINTAINED APPROXIMATELY 5.0m WEST OF THE CENTRE OF THE EXISTING SEASONAL DRAINAGE AT STA. 0+492.64. AFTER WHICH, THE PIPELINE WILL TRANSITION INTO A MINIMUM COVER OF 1.5m.
3. ACTUAL LOCATION OF PROPOSED & EXISTING SALES OIL PIPELINES, CABLES & ELECTRICAL UTILITIES WITHIN THE 20.0m & 15.0m PENN WEST PIPELINE RIGHT-OF-WAYS TO BE CONFIRMED PRIOR TO THE TIME OF CONSTRUCTION.
4. AT TIME OF CONSTRUCTION, PIPELINES IS TO BE IN CLASS I (CSA Z662-07).
5. ALL ABOVE GRADE STEEL PIPING TO BE INSULATED AND HEAT TRACED AT 11-30.
6. PRIOR TO CONSTRUCTION, LOCATION AND DEPTH OF ALL EXISTING PIPELINES IS TO BE CONFIRMED BY CONSTRUCTION MANAGER.
7. ALL PIPELINE CROSSING SHALL HAVE A MINUMUM CLEARANCE OF 0.30m BETWEEN PIPELINES & CABLES.

SOUR DESIGN

PROVINCE OF MANITOBA
R.L. SAMBORSKI
Member
34086
13 JUL
REGISTERED PROFESSIONAL ENGINEER

DRAWING #	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPR
0	13-07-11	ISSUED FOR CONSTRUCTION	DKM	AR	RS

ENGINEER STAMP

HOCS PROJECTS
CALGARY, ALBERTA, CANADA

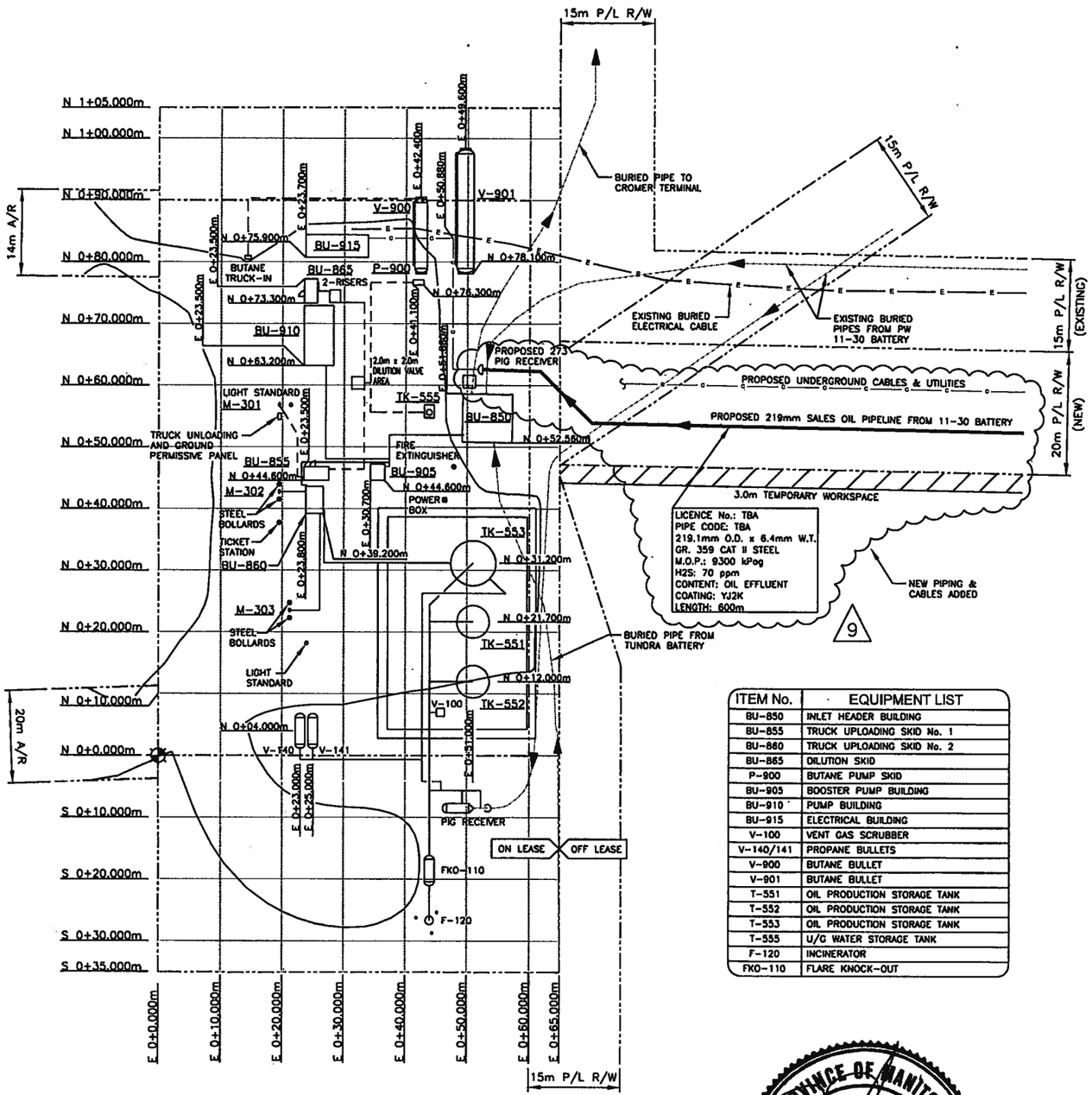
THIRD PARTY LOGO

SCALE: AS SHOWN | SIZE: D
EPCM PROJECT #: 1009

PennWest Exploration

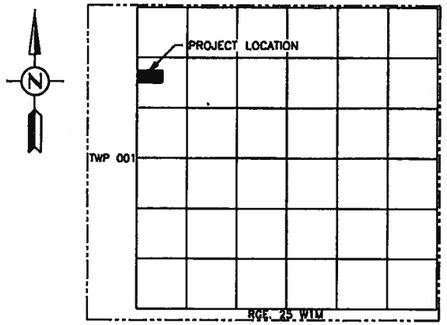
WASKADA, MANITOBA
219mm SALES OIL PIPELINE
FROM LSD 11-30 TO LSD 12-30-001-25 W1M
CONSTRUCTION ALIGNMENT SHEET

DWG # WAS-123000125W1-SPD-0001 | SHT 1 OF 1 | REV 0

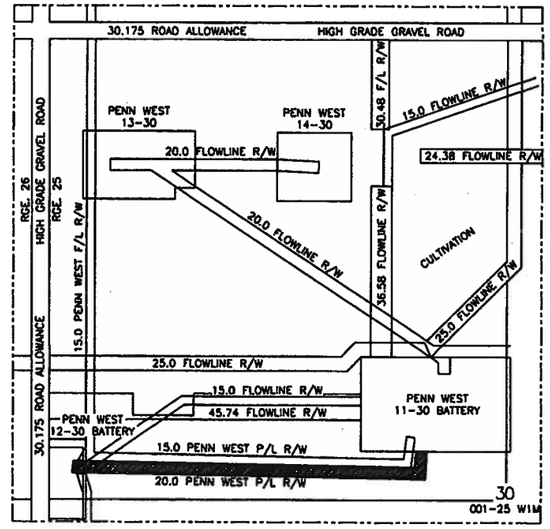


SITE PLAN
1:400

ITEM No.	EQUIPMENT LIST
BU-850	INLET HEADER BUILDING
BU-855	TRUCK UPLOADING SKID No. 1
BU-860	TRUCK UPLOADING SKID No. 2
BU-865	DILUTION SKID
P-900	BUTANE PUMP SKID
BU-905	BOOSTER PUMP BUILDING
BU-910	PUMP BUILDING
BU-915	ELECTRICAL BUILDING
V-100	VENT GAS SCRUBBER
V-140/141	PROPANE BULLETS
V-900	BUTANE BULLET
V-901	BUTANE BULLET
T-551	OIL PRODUCTION STORAGE TANK
T-552	OIL PRODUCTION STORAGE TANK
T-553	OIL PRODUCTION STORAGE TANK
T-555	U/G WATER STORAGE TANK
F-120	INCINERATOR
FKO-110	FLARE KNOCK-OUT



AREA LOCATION
N.T.S.



LOCATION PLAN
1:5000

APEGM
Certificate of Authorization
HOCS Projects
No. 5058 Date: 13-JUL-11

SOUR DESIGN

NON CLOUDED PIPING IS FOR INFORMATION ONLY

NOTES:
1. ALL COORDINATES ARE BASED ON TRILOGY AS-BUILT SURVEY.
2. FORMERLY FENMARK ENGINEERING DRAWING NUMBER: 1401-A-101, REV. 4, PROJECT NO. 554-04-04.
3. STAMP AND PERMIT APPLY TO NEW CONSTRUCTION ONLY.
4. FORMERLY VANTAGE ENGINEERING INC. DRAWING NUMBER: 100, REV. 5, PROJECT NO. 554-04-03.
5. ALL ABOVE GRADE STEEL PIPING TO BE INSULATED AND HEAT TRACED.
6. ALL PIPING TO HAVE A MINIMUM COVER OF 2500mm ON LEASE.
7. 114mm (4") CONDENSATE PIPELINE TO BE NITROGEN PURGED AND CAPPED WITH BLIND FLANGES FOR FUTURE INSTALLATION.

NOTE: ENGINEER'S STAMP APPLIES TO CLOUDED AREA ONLY

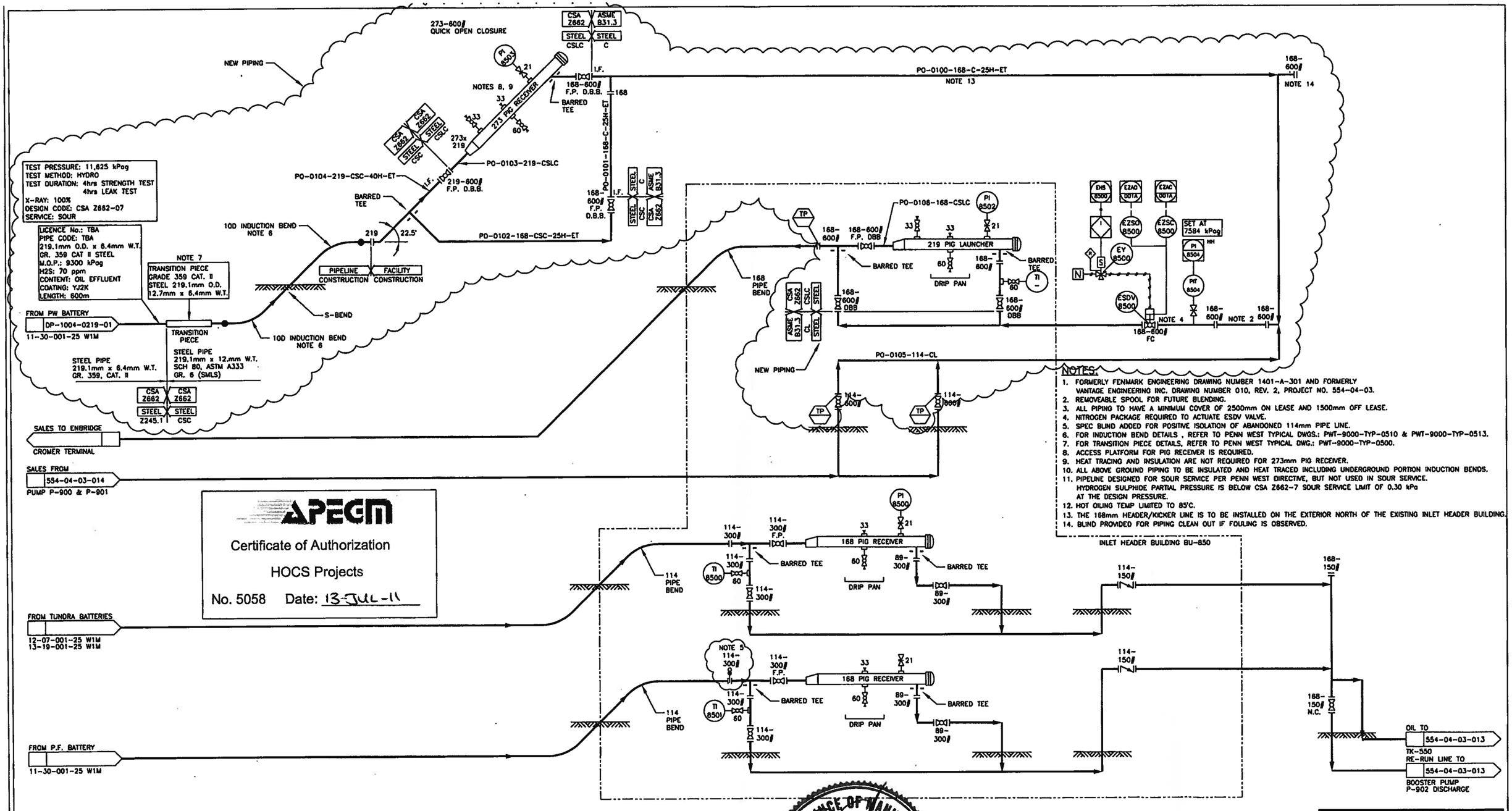
DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPR
9	07-13-11	ISSUED FOR NEW SALES OIL PIPELINE CONSTRUCTION (1009)	DKM	AR	RS
1	03-05-06	RE-ISSUED FOR CONSTRUCTION	VK		
2	08-10-06	CHANGED TITLE BLOCK	VK		
3	11-04-07	AS-BUILT (PROJECT NO. 554-04-04)	VK		
4	10-07-07	TK-500 REMOVED, TK-553 & INCINERATOR ADDED, ISSUED FOR CONSTRUCTION	VK/MOD		
5	26-11-07	AS-BUILT	AC		
6	01-04-11	RE-DRAWN TO AUTOCAD FORMAT (PROJECT/DWG. NO.'S 554-04-03/100)	DKM		
7	08-04-11	AS-BUILT (HOCS PROJECTS)	DKM		
8	15-04-11	NEW PIPING ADDED	DKM		

ENGINEER STAMP
PROVINCE OF MANITOBA
R.L. SAMBORSKI
Member
34086
REGISTERED PROFESSIONAL ENGINEER

HOCS PROJECTS
CALGARY, ALBERTA, CANADA
THIRD PARTY LOGO
SCALE: AS SHOWN | SIZE: D
EPCM PROJECT#: 1009

PennWest Exploration
WASKADA
LSD 12-30-001-25 W1M
PIPELINE STATION
PLOT PLAN
DWG# WAS-123000125W1-SPD-0002 | SHT 1 OF 1 | REV 9



APEGM
Certificate of Authorization
HOCS Projects
No. 5058 Date: 13-JUL-11

NOTES:

1. FORMERLY FENMARK ENGINEERING DRAWING NUMBER 1401-A-301 AND FORMERLY VANTAGE ENGINEERING INC. DRAWING NUMBER 010, REV. 2, PROJECT NO. 554-04-03.
2. REMOVEABLE SPOOL FOR FUTURE BLENDING.
3. ALL PIPING TO HAVE A MINIMUM COVER OF 2500mm ON LEASE AND 1500mm OFF LEASE.
4. NITROGEN PACKAGE REQUIRED TO ACTUATE ESDV VALVE.
5. SPEC BLIND ADDED FOR POSITIVE ISOLATION OF ABANDONED 114mm PIPE LINE.
6. FOR INDUCTION BEND DETAILS , REFER TO PENN WEST TYPICAL DWGS.: PWT-9000-TYP-0510 & PWT-9000-TYP-0513.
7. FOR TRANSITION PIECE DETAILS, REFER TO PENN WEST TYPICAL DWG.: PWT-9000-TYP-0500.
8. ACCESS PLATFORM FOR PIG RECEIVER IS REQUIRED.
9. HEAT TRACING AND INSULATION ARE NOT REQUIRED FOR 273mm PIG RECEIVER.
10. ALL ABOVE GROUND PIPING TO BE INSULATED AND HEAT TRACED INCLUDING UNDERGROUND PORTION INDUCTION BENDS.
11. PIPELINE DESIGNED FOR SOUR SERVICE PER PENN WEST DIRECTIVE, BUT NOT USED IN SOUR SERVICE. HYDROGEN SULPHIDE PARTIAL PRESSURE IS BELOW CSA Z662-7 SOUR SERVICE LIMIT OF 0.30 kPa AT THE DESIGN PRESSURE.
12. HOT OILING TEMP LIMITED TO 85°C.
13. THE 168mm HEADER/KICKER LINE IS TO BE INSTALLED ON THE EXTERIOR NORTH OF THE EXISTING INLET HEADER BUILDING.
14. BLIND PROVIDED FOR PIPING CLEAN OUT IF FOULING IS OBSERVED.

NOTE: ENGINEER'S STAMP APPLIES TO CLOUDED AREA ONLY

DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPR
0	12-07-05	ISSUED FOR CONSTRUCTION (FENMARK ENGINEERING)	MYC		
1	06-10-08	CHANGED TITLE BLOCK	VK		
2	11-04-07	AS-BUILT (PROJECT NO. 554-04-04)	VK		
3	01-04-11	RE-DRAWN TO AUTOCAD FORMAT (PROJECT/DWG. NO.'S 554-04-03/010)	DKM		
4	11-04-11	AS-BUILT (HOCS PROJECTS)	DKM		
5	15-04-11	NEW PIPING ADDED	RT		
6	13-07-11	ISSUED FOR NEW SALES OIL PIPELINE CONSTRUCTION (1009)	DKM	AR	RS

PROVINCE OF MANITOBA
R.L. SAMBORSKI
Member 34086
REGISTERED PROFESSIONAL ENGINEER
ENGINEER STAMP

SOUR DESIGN

NON CLOUDED PIPING IS FOR INFORMATION ONLY

HOCS PROJECTS
CALGARY, ALBERTA, CANADA
THIRD PARTY LOGO

SCALE	NTS	SIZE: D
EPCM PROJECT#:	1009	

PennWest Exploration

WASKADA
LSD 12-30-001-25 W1M
INLET HEADER BUILDING AREA
PROCESS & INSTRUMENT DIAGRAM

DWG#	WAS-123000125W1-PID-0002	SHT 1 OF 1	REV	6

REV	COMM. CODE	LINE NUMBER	PIPE CLASS	SIZE	INSUL. THK./ TYPE	TRACING TYPE	ORIGIN	TERMINATION	SCH/WT (mm)	C.A. (mm)	DESIGN		OPERATING		TEST	PWHT	X-RAY	HARDNESS TEST	COMMENTS	DRAWING REFERENCE NUMBERS
											PRESS. kPag	TEMP. °C	PRESS. kPag	TEMP. °C	PRESS. kPag					
A	PO	0100	C	168	25H	ET	PO-0101-168-C-25H-ET	PO-0106-168-CSLC	80	1.6	9300	-29/85	6357	55	15308	N/A	10%	-	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0101	C	168	25H	ET	PO-0102-168-CSC-25H-ET	PO-0100-168-C-25H-ET	80	1.6	9300	-29/85	6357	55	15308	N/A	10%	-	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0102	CSC	168	25H	ET	PO-0104-219-CSC-40H-ET	PO-0101-168-C-25H-ET	80	1.6	9300	-29/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0103	CSLC	219	-	-	PO-0104-219-CSC-40H-ET	PO-0100-168-C-25H-ET	80	1.6	9300	-45/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0104	CSC	219	40H	ET	NEW SALES OIL PIPELINE	PO-0102-168-CSC-25H-ET	80	1.6	9300	-29/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0105	CL	219	-	-	12-30 SALES OIL PUMPS	PO-0106-168-CSLC	80	1.6	9300	-29/85	6357	55	15308	N/A	10%	-	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0106	CSLC	219	-	-	PO-0100-168-C-25H-ET	CROMER SALES OIL PIPELINE	80	1.6	9300	-45/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002

APEGM

Certificate of Authorization

HOCS Projects

No. 5058 Date: 13-JUL-11

DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPD
0	13-07-11	ISSUED FOR CONSTRUCTION	DKM	AK	RS

PROVINCE OF MANITOBA
R. L. SAMBOROSKI
Member
34086
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL STAMP

NOTES:
1. DESIGN TEMPERATURE FOR INTERMITTENT HOT OILING. YJ2K COATING LIMITS TEMPERATURE TO 85°C.
2. TESTING OF CSA PIPING AS PER RESPECTIVE PENNWEST ME.S.008 CSA PIPING CLASS SPECIFICATION REV.1

HOCS PROJECTS
CALGARY, ALBERTA, CANADA

THIRD PARTY LOGO

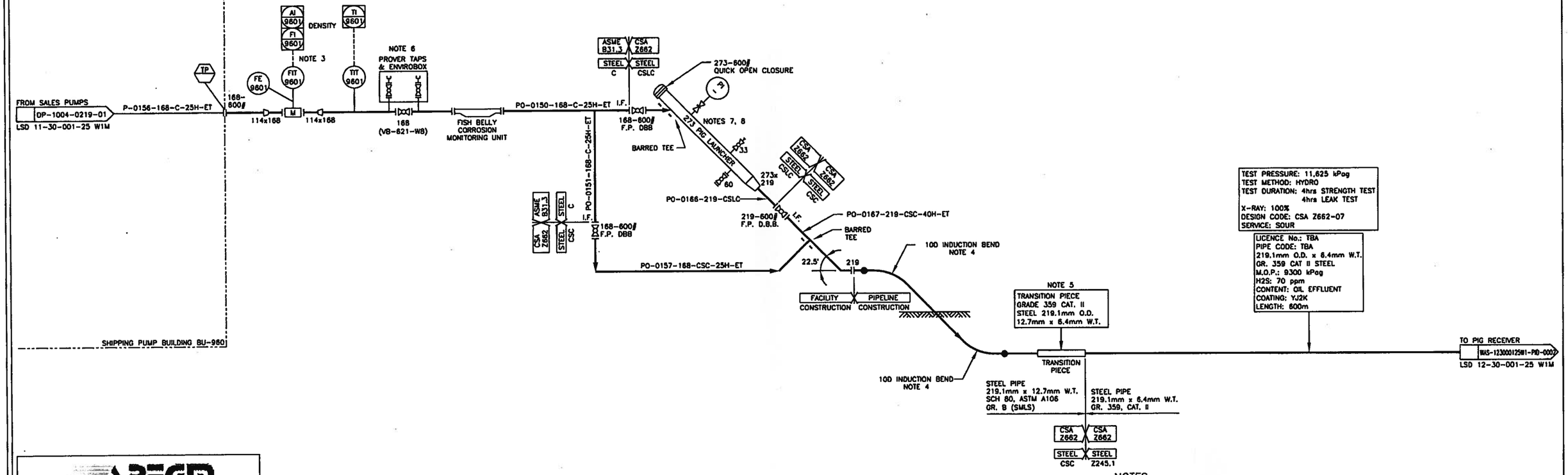
SCALE: NTS | SIZE: D

EPCM PROJECT#: 1009

PennWest Exploration

WASKADA, MANITOBA
SALES OIL PIPELINE AND METER
LSD 12-30-001-25 W1M
LINE LIST

DWG# WAS-123000125W1-LIS-0950 | SHT 1 OF 1 | REV 0



TEST PRESSURE: 11,625 kPag
TEST METHOD: HYDRO
TEST DURATION: 4hrs STRENGTH TEST
4hrs LEAK TEST
X-RAY: 100%
DESIGN CODE: CSA Z662-07
SERVICE: SOUR

LICENCE No.: TBA
PIPE CODE: TBA
219.1mm O.D. x 6.4mm W.T.
GR. 359 CAT II STEEL
M.O.P.: 9300 kPag
H2S: 70 ppm
CONTENT: OIL EFFLUENT
COATING: YJ2K
LENGTH: 600m

APEGM
Certificate of Authorization
HOCS Projects
No. 5058 Date: 13 JUL 11

NOTES:
1. ALL ABOVE GROUND PIPING TO BE INSULATED AND HEAT TRACED INCLUDING UNDERGROUND PORTION INDUCTION BEND.
2. ALL BELOW GROUND PIPE TO HAVE A MINIMUM COVER OF 2500mm ON LEASE AND 1500mm OFF LEASE.
3. FLOW AND DENSITY MEASUREMENT TO BE INTEGRATED INTO PIPELINE LEAK DETECTION SYSTEM.
4. FOR INDUCTION BEND DETAILS , REFER TO PENN WEST TYPICAL DWGS.: PWT-9000-TYP-0510 & PWT-9000-TYP-0513.
5. FOR TRANSITION PIECE DETAILS, REFER TO PENN WEST TYPICAL DWG.: PWT-9000-TYP-0500.
6. PROVIDE GROUNDING CONNECTION FOR PROVER TAPS.
7. ACCESS PLATFORM FOR PIG LAUNCHER IS TO BE PROVIDED.
8. HEAT TRACING AND INSULATION ARE NOT REQUIRED.
9. PIPELINE DESIGNED FOR SOUR SERVICE PER PENN WEST DIRECTIVE, BUT NOT USED IN SOUR SERVICE. HYDROGEN SULPHIDE PARTIAL PRESSURE IS BELOW SOUR SERVICE LIMIT OF 0.30 kPA AT THE DESIGN PRESSURE.
10. HOT OILING TEMP LIMITED TO 85°C.

SOUR DESIGN

DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPR
0	13-07-11	ISSUED FOR CONSTRUCTION	DKM	AR	RS

PROVINCE OF MANITOBA
R.L. SAMBORSKI
Member
34086
12 JUL 11
REGISTERED PROFESSIONAL ENGINEER
PERMIT STAMP

HOCS
HOCS PROJECTS
CALGARY, ALBERTA, CANADA
THIRD PARTY LOGO
SCALE NTS SIZE: D
EPCM PROJECT#: 1009

PennWest Exploration

WASKADA, MANITOBA
PROPOSED 273mm PIG LAUNCHER
AT LSD 11-30-001-25 W1M
PIPING AND INSTRUMENTATION DIAGRAM

DWG# WAS-113000125W1-PID-0001 SHT 1 OF 1 REV 0

REV	COMM. CODE	LINE NUMBER	PIPE CLASS	SIZE	INSUL. THK. / TYPE	TRACING TYPE	ORIGIN	TERMINATION	SCH/WT (mm)	C.A. (mm)	DESIGN		OPERATING		TEST PRESS. kPag	PWHT	X-RAY	HARDNESS TEST	COMMENTS	DRAWING REFERENCE NUMBERS
											PRESS. kPag	TEMP. °C	PRESS. kPag	TEMP. °C						
A	PO	0100	C	168	25H	ET	PO-0101-168-C-25H-ET	PO-0108-168-CSLC	80	1.6	9300	-29/85	6357	55	15308	N/A	10%	-	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0101	C	168	25H	ET	PO-0102-168-CSC-25H-ET	PO-0100-168-C-25H-ET	80	1.6	9300	-29/85	6357	55	15308	N/A	10%	-	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0102	CSC	168	25H	ET	PO-0104-219-CSC-40H-ET	PO-0101-168-C-25H-ET	80	1.6	9300	-29/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0103	CSLC	219	-	-	PO-0104-219-CSC-40H-ET	PO-0100-168-C-25H-ET	80	1.6	9300	-45/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0104	CSC	219	40H	ET	NEW SALES OIL PIPELINE	PO-0102-168-CSC-25H-ET	80	1.6	9300	-29/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0105	CL	219	-	-	12-30 SALES OIL PUMPS	PO-0108-168-CSLC	80	1.6	9300	-29/85	6357	55	15308	N/A	10%	-	NOTE 1	WAS-123000125W1-PID-0002
A	PO	0106	CSLC	219	-	-	PO-0100-168-C-25H-ET	CROMER SALES OIL PIPELINE	80	1.6	9300	-45/85	6357	55	NOTE 2	N/A	100%	10%	NOTE 1	WAS-123000125W1-PID-0002

APEGM

Certificate of Authorization

HOCS Projects

No. 5058 Date: 13-JUL-11

DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPD
0	13-07-11	ISSUED FOR CONSTRUCTION	DKM	AR	RS

PROVINCE OF MANITOBA
R.L. SAMBORSKI
Member
34086
REGISTERED PROFESSIONAL ENGINEER
BRANCH STAMP

NOTES:
1. DESIGN TEMPERATURE FOR INTERMITTENT HOT OILING. Y2K COATING LIMITS TEMPERATURE TO 85°C.
2. TESTING OF CSA PIPING AS PER RESPECTIVE PENNWEST ME.S.008 CSA PIPING CLASS SPECIFICATION REV.1

HOCS PROJECTS
CALGARY, ALBERTA, CANADA

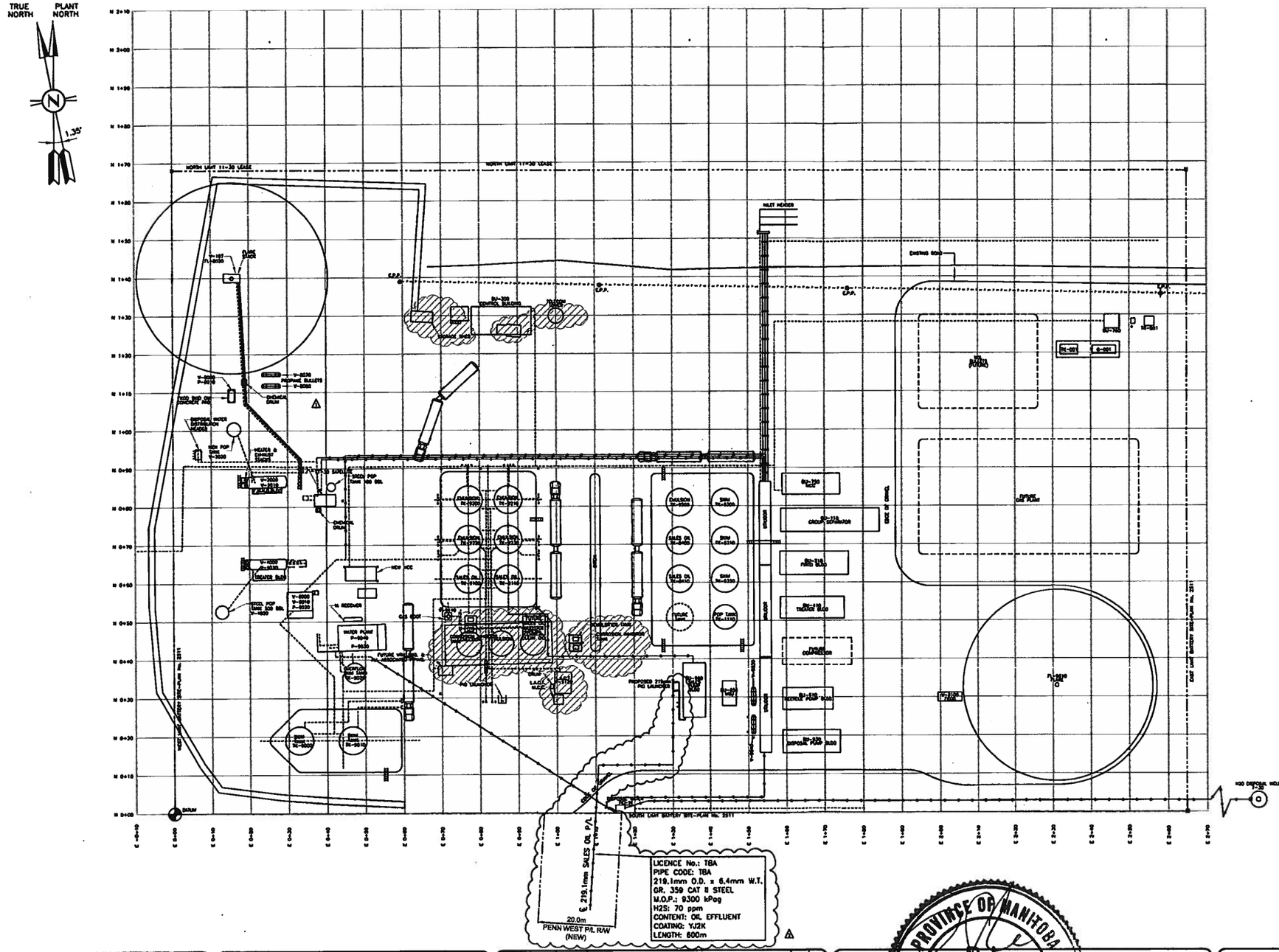
THIRD PARTY LOGO

SCALE: NTS | SIZE: D
EPCM PROJECT#: 1009

PennWest Exploration

WASKADA, MANITOBA
SALES OIL PIPELINE AND METER
LSD 12-30-001-25 W1M
LINE LIST

DWG# WAS-123000125W1-LIS-0950 | SHT 1 OF 1 | REV 0



TAG NO.	EQUIPMENT	BUILDING
FL-9810	FLARE	OUTSIDE
G-001	GENERATOR (TEMPORARY)	OUTSIDE
P-6120	RECYCLE PUMP	BU-610
P-6130	FWKO FEED PUMP	BU-610
P-8110	FKOD PUMP OUT PUMP	BU-810
P-9170	SALES OIL BOOSTER PUMP	BU-960
P-9180	SALES OIL BOOSTER PUMP	BU-960
P-9330	DISPOSAL WATER PUMP	BU-930
P-9340	DISPOSAL WATER PUMP	BU-930
P-9420	SALES OIL BOOSTER PUMP	BU-810
P-9430	SALES OIL BOOSTER PUMP	BU-810
P-9600	SALES OIL SHIPPING PUMP	BU-960
P-9810	SALES OIL SHIPPING PUMP	BU-960
TK-001	DIESEL TANK (TEMPORARY)	OUTSIDE
TK-1110	POP TANK	OUTSIDE
TK-9300	SKIM TANK	OUTSIDE
TK-9310	SKIM TANK	OUTSIDE
TK-9320	SKIM TANK	OUTSIDE
TK-9400	SALES OIL TANK	OUTSIDE
TK-9410	SALES OIL TANK	OUTSIDE
TK-9500	EMULSION TANK	OUTSIDE
TR-001	MANITOBA HYDRO TRANSFORMER	OUTSIDE
V-1100	GROUP SEPARATOR	BU-110
V-2100	FWKO VESSEL	BU-210
V-2110	FG SCRUBBER	BU-210
V-4100	TREATER VESSEL	BU-410
V-4110	FG SCRUBBER	BU-410
V-6100	FG COOLING DRUM	BU-610
V-6110	FG SCRUBBER	BU-610
V-8100	FLARE KNOCK-OUT DRUM	OUTSIDE
Z-8500	VRU PACKAGE	BU-850
V-9830	PROPANE BULLET (LEASING)	OUTSIDE
V-9840	PROPANE BULLET (LEASING)	OUTSIDE

NOTES:

1. PLANT DATUM COORDINATES:

   N. 5436478.689 } UTM, Zone 14
   E. 387308.027 } NAD 83
   (Elev.= 468.46)

2. ALL COORDINATES ARE IN METER WITH RESPECT TO PLANT DATUM.

EXISTING ABOVE GROUND POWER LINE

EXISTING POWER POLE E.P.P.

ABOVE GROUND PIPING

BELOW GROUND PIPING

TRUCK OUT CONNECTIONS

U/G CABLE

DEMOLITION SCOPE

APEGM
Certificate of Authorization
HOCS Projects
No. 5058 Date: 13 JUL-11

NOTES

DWG NUMBER	REFERENCE DRAWINGS TITLE

REV:	BY	DATE:	DESCRIPTION	CHK	APP
2	DKM	13 JUL 11	ISSUED FOR NEW SALES OIL P/L CONSTRUCTION (1009)	AA	RSC
1	RT	16 JUN 11	ISSUED FOR FLARE PURGE HAZOP	AO	MP
0	RT	27 APR 11	ISSUED FOR CONSTRUCTION	RS	MS

PROVINCE OF MANITOBA
R. SAMBORSKI
Member
34086
13-JUL-11
REGISTERED PROFESSIONAL ENGINEER
ENGINEER STAMP

HOCS
HOCS PROJECTS
CALGARY, ALBERTA, CANADA

DRAWN:	AO	DATE:	14 JUL 10
CHECKED:	RS	DATE:	27 APR 11
APPROVED:	MS	DATE:	27 APR 11
SCALE:	1:500	SIZE:	
JOB NO:	1004		

PennWest ENERGY

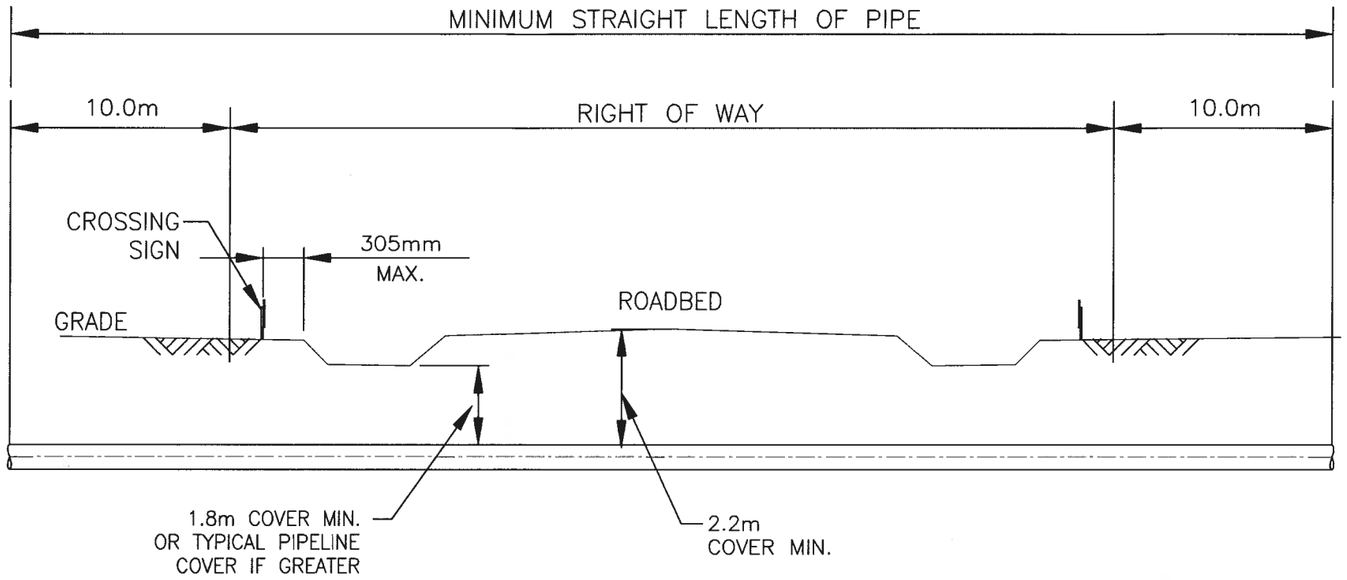
PROJECT: PENN WEST
WASKADA OIL BATTERY
LSD.11-SEC.30-TWP.1-RGE.25 W9M

TITLE: 11-30 BATTERY
PLAN NO. 2511 BLTO. TRAIN 2 PLOT PLAN

CADD REF: DD-1004-0101-01.dwg | DRAWING NO: DD-1004-0101-01 | REV: 2

Appendix C

Typical Profile and Cross Sections of Crossing



ROAD CROSSING DETAIL

SCALE: N.T.S.

NOTES:

1. CROSSING TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE GOVERNING AUTHORITIES REQUIREMENTS AND CSA Z662 (LATEST EDITION), BORED OR CUT INSTALLATION.

DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPR
A	11/02/02	ISSUED FOR INFORMATION	TVS		

ENGINEER STAMP

THIRD PARTY LOGO

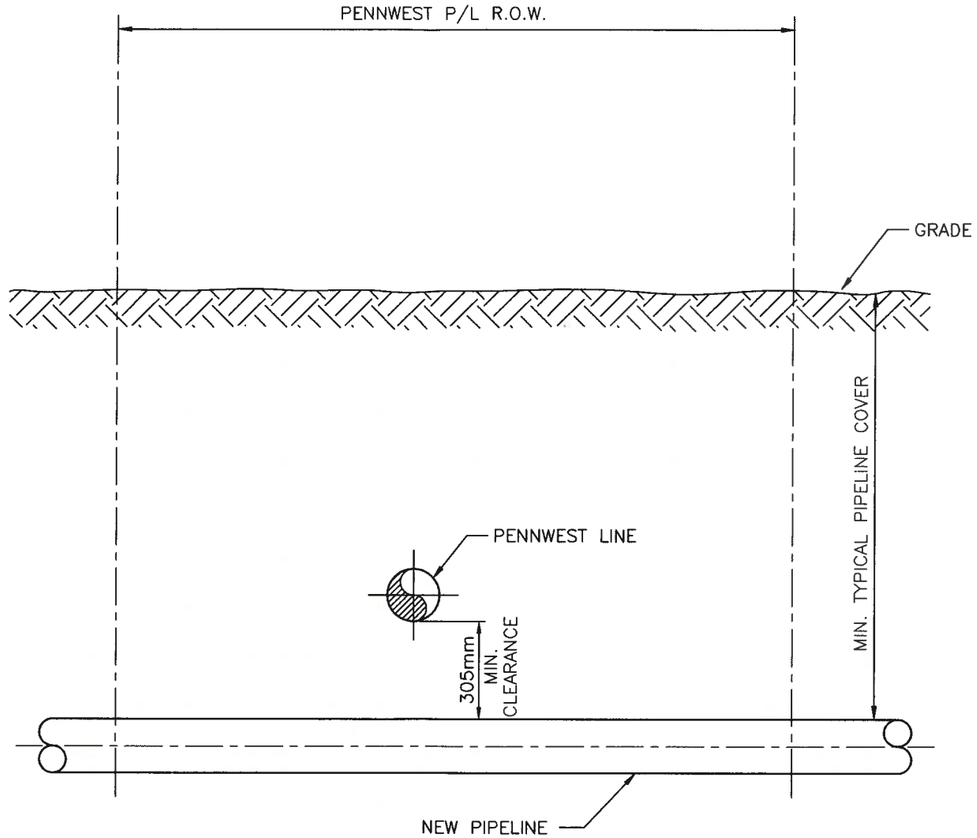
SCALE: NTS | SIZE: D

EPCM PROJECT#: –

PennWest Exploration

ROAD CROSSING STANDARD

DWG# STD-9000-CIV-0007 | SHT 1 OF 1 | REV A



PIELINE CROSSING DETAIL

SCALE: N.T.S.

DRAWING#	REFERENCE DRAWING TITLE

REV	DATE	DESCRIPTION	DWN	CHKD	APPR
A	11/02/02	ISSUED FOR INFORMATION	TVS		

ENGINEER STAMP

THIRD PARTY LOGO

SCALE	NTS	SIZE: D
EPCM PROJECT#:	–	

PennWest Exploration

PENNWEST PIPELINE CROSSING STANDARD

DWG#	STD-9000-CIV-0011	SHT 1 OF 1	REV	A